Duplin County Airport
Airport Master Plan Update

Duplin County, North Carolina

April 2007

TALBERT & BRIGHT
Engineering & Planning Consultants

Airport Master Plan Update

DUPLIN COUNTY AIRPORT
North Carolina

Prepared For:

The Duplin County Board of Commissioners
And
Duplin County Airport Commission

Prepared By:

Talbert & Bright, Inc.
Engineering & Planning Consultants
4810 Shelley Drive
Wilmington, NC 28405

2007

Duplin County Commissioners

Mr. David J. Fussell, Sr. – Chairman
Mr. L. S. Guy – Vice Chairman
Mr. Harold Raynor
Mr. Cary Turner
Mr. Reginald Wells
Mrs. Zettie Williams

Duplin County Airport Commissioners

Mr. Jack Alphin
Mr. Albert Brown, Jr.
Mr. Joe Bryant
Mr. Larry Debose
Mr. L. S. Guy
Mr. Bob Johnson
Mr. Ricky Kennedy
Mr. Bob Quinn
Mr. Jerry Tysinger

Airport Manager

Mr. George Futrelle

INTRODUCTION

Duplin County initiated an Airport Layout Plan (ALP) Update to re-assess the future needs of the Duplin County Airport (DPL), as envisioned by Duplin County and the Airport Commission. Special emphasis is placed on developing a detailed Terminal Area expansion plan, including land acquisition. As part of this process, the County is implementing an Airport Land Use Ordinance to further secure long-term safety and protect Airport property interests.

Study Purpose

The Airport Layout Drawing (ALD) is the official drawing of record for DPL. The updated ALP drawings, as adopted by the County and accepted by the NCDOT Division of Aviation (NCDOA) and Federal Aviation Administration (FAA), enables the Airport to apply for improvements eligible under the state and federal airport-aid-programs. These improvements must be depicted on the ALD.

Study Background & Need

The previous 1990 Duplin County ALD is outdated and contains recommendations based on 17-year old data. The drawing no longer reflects the recent growth experienced by DPL nor does it reflect anticipated future demand by high-end business-class aircraft. These significant developments require a strategic plan to properly identify future space allocation and Airport property requirements as demand increases and funding becomes available.

Part of the strategic plan was this Master Plan Update along with an update of the associated ALP. The updated ALP drawings comply with NCDOA System Plan requirements and current FAA planning standards. In addition, the ALP conforms to planning recommendations found in the 2002 Duplin County Strategic Plan for Economic Development and Land Use.

Study Objective

The narrative describes the major improvements depicted on the ALP drawings, and identifies the priority of development necessary to meet general aviation demand within the Airport's service area. This includes projects to expand and upgrade facilities, equipment and services, as well as, projects for maintenance purposes. The phasing and costs of these capital improvements are quantified in a 20-year program, with the 5-year project costs estimated for Airport budgeting purposes, and programming of NCDOA capital improvement plan (CIP) funds.

Study Approach

The ALP Update effort entails the following major tasks as outlined below:

Section 1: Airport Inventory & Activity
- Airfield inventory, operational conditions and compliance issues
- Airport activity and service area characteristics

Section 2: Aviation Demand Forecasts
- Based aircraft and annual operations by type of aircraft
- Traffic mix, peaking and critical aircraft category

Section 3: Airport Facility Requirements
- Future airport land acquisition interests
- Recommended airfield and terminal area facility needs
- Airport geometric considerations

Section 4: Airport Terminal Area Alternatives & Development Plan
- Terminal area development alternatives
- Project priorities and phasing schedule
- Estimated project development costs

Section 5: Airport Layout Plan Drawings
- ALP – existing and planned airport infrastructure and land uses
- Airport Height and Land Use Ordinances

Section 6: Economic Impact of North Carolina Airports
- Economic Impact Summary for DPL

Dassault Falcon – Large Business Jet @ DPL

Duplin County Airport

Airport Master Plan Update

SECTION 1

AIRPORT INVENTORY & ACTIVITY

SECTION 1 - AIRPORT INVENTORY & ACTIVITY

Airport Service Level Role

DPL is a public-use general aviation airport. The NCDOA System Plan classifies the Airport as a 'blue' group facility; the middle tier of general aviation airports. DPL is designated as an FAA Airport Reference Code (ARC) B-II Category facility and ultimately an ARC C-II Category facility.

Airport Ownership and FBO Services

Duplin County manages and operates DPL and serves as the Fixed Base Operator (FBO) in providing pilot and aircraft services, including:

- Fuel sales (dispensing) - 100LL (piston) & Jet-A (turbine)
- Aircraft parking / aircraft auxiliary power unit (APU)
- Pilot lounge with flight planning, crew quarters, and showers
- Retail aeronautical equipment
- Travel arrangements / charter coordination
- Airport leases and rentals

Historical Airport Projects & Funding

Table 1-1 summarizes past Airport capital improvement projects as accomplished through federal and state grant assistance, and local-only projects. Since the initial Airport development, approximately $8.2 million has been invested into Airport improvements, excluding routine maintenance, upkeep projects, and private investments.

Table 1-1: Airport Improvement Projects

Year	Project	State	Federal	Local	Total
1974	Construct New Airport	$87,063.00	$370,053.85	$40,288.48	**$497,405.33**
1986	Erosion Control	$52,000.00		$52,000.00	**$104,000.00**
1990	Runway Extension / Localizer	$172,050.00			**$172,050.00**
1990	New Corporate and T-Hangar 2			$205,100.00	**$205,100.00**
1990	Relocate NDB	$26,578.00		$26,578.00	**$53,156.00**
1993	New Fuel Farm			$94,262.25	**$94,262.25**
1994	Precision Path Approach Indicator Lights	$9,562.50		$9,562.50	**$19,125.00**
1994	New Corporate Hangar-Murphy			$184,331.00	**$184,331.00**
1994	Land Acquisition for Expansion	$64,759.00	$518,072.00	$64,759.00	**$647,590.00**

1996	New Aircraft Parking Apron	$500,000.00		$55,556.00	**$555,556.00**
1997	Site Preparation - Runway Ext.	$500,000.00		$55,556.00	**$555,556.00**
1997	Terminal Renovation			$178,309.47	**$178,309.47**
1998	Pave and Light Runway Extension	$500,000.00		$55,555.00	**$555,555.00**
1999	Runway Safety Area Grading	$500,000.00		$55,555.00	**$555,555.00**
2000	Airfield Improvements - Phase II RSA	$500,000.00		$55,555.00	**$555,555.00**
	Grading - New Airfield Lighting -				
	Wetlands Mitigation - Parallel Taxiway				
2001	Site Preparation North Parallel Taxiway	$500,000.00		$55,555.00	**$555,555.00**
2001	Air 21 - Design South		$150,000.00	$16,667.00	**$166,667.00**
	Parallel Taxiway & Runway Widening				
2002	Pave and Light North Parallel Taxiway	$500,000.00		$55,555.00	**$555,555.00**
2003	Air 21 - Runway Rehabilitation		$150,000.00	$16,667.00	**$166,667.00**
2003	Runway Rehabilitation	$603,335.00		$67,037.00	**$670,372.00**
2003	Runway Rehabilitation (additional funds)		$369,424.00	$41,047.00	**$41,047.00**
2004	New Corporate / Maintenance Hangar			$842,166.83	
2004	Vision 100 - ALP Update/Land Use		$150,000.00	$16,667.00	**$166,667.00**
	Zoning Plan/Hgr Txwy/Terminal Area				
	Security Fencing				
2005	Wetlands Mitigation	$43,000.00		$4,778.00	**$47,778.00**
2005	Vision 100 - Continue Security Fencing		$150,000.00	$16,667.00	**$166,667.00**
2005	South Parallel Txwy-Site Preparation	$1,000,000.00		$111,111.00	**$1,111,111.00**
		$5,558,347.50	**$1,857,549.85**	**$2,171,785.53**	**$8,204,042.05**

Project costs do not include routine operational and maintenance costs assumed by the Airport Sponsor or third-party persons (airport tenants). Costs have been rounded.

Source: FAA/NCDOA - Grant Research, 2007.

Airport Property Ownership

The Airport property owned and dedicated for aeronautical purposes totals ±250 acres, acquired in fee-simple. In addition, the County owns two parcels totaling approximately 123 acres along the Airport Entrance Road which is reserved for future commercial/business park development.

Airfield Facilities & Conditions

Runway 5-23 is 6,002′ x 75′, and oriented in a northeast-southwest alignment. The terminal area is located west of the midfield, occupying about 22 acres. The Airport Entrance Road (SR 1398) connects the terminal area directly with Bowdens Road. The established Airport elevation is 137.4′ (mean sea level).

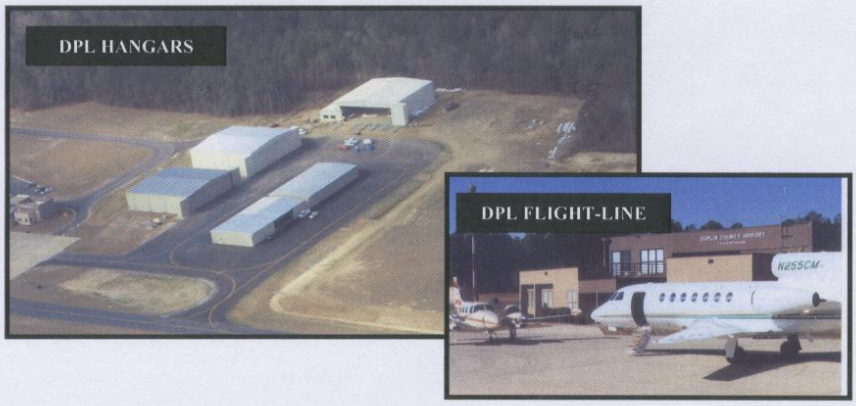


Table 1-2 lists the major airfield facilities, along with a corresponding assessment of physical condition based on an August 2004 site visit. The condition indicates the timing and magnitude of future maintenance/repair obligations, and costs.

Table 1-2: DPL Airport Facilities and Conditions

Airport Item	Description and Size	Condition
AIRPORT	± 250 Acres (Airport Fee-Simple Property Ownership) ±123 County (±68 ± 55Acres - County Property)	
Runway System	Runway 5-23: 6,002′ x 75′ (60′ RWY 5 Blast pad) 30,000 lbs. SWG ≈ 50,000 lbs. DWG N36°21′09E (Declination is 8°57′W and 5′W annually) Medium Runway Lighting (MIRL) [1] Runway numbers, threshold bar & centerline PAPI -2L – Rwy 5 and 23 [1] REIL - Rwy 5 and 23 [1]	Excellent Good Good Good Good
Taxiway System	Parallel Taxiway 'A': 3,700′ x 35′ - MITL By-pass Taxiway: 400′ x 35′ - MITL Exit Taxiway: 400′ x 40′ – MITL 30,000 lbs. SWG ≈ 50,000 lbs. DWG	 Good Good Good
Apron System	Apron 'A' (± 60,200 SF) – 17 Tiedowns Apron 'B' (± 15,000 SF) – ±3 Parking Positions Hangar Taxilane/Ramp (± 98,000 SF) 30,000 lbs (SWG) ≈ 50,000 (DWG)	 Good Good Good
Terminal Building	3,600 SF (lounge, retail counter, rest rooms, flight planning room, meeting-conference room, offices).	Fair
Fuel Storage Size	12,000 Gallons Aboveground 100LL Avgas 12,000 Gallons Aboveground Jet-A Fuel	Good Good
Airport Auto Lot	116′ x 58′ (6,350 SF / 706 SY) - 24 Spaces	Good
Airport Entrance Road	24′ Wide Paved 2-lane Road - ± 3,200 LF	Good
Airport Beacon	Located west of terminal building	Good
Electrical Vault	Located west of terminal building	Good
AWOS	Located midfield, on east side of airfield	Good
Wind Indicator	Located midfield, on east side of airfield	Good

[1] Common Traffic Advisory Frequency (CTAF) - The name given to a VHF radio frequency used at U.S. non-towered airports. Pilot-controlled lighting systems to turn on the taxiway and runway lights.

General Physical Condition Rating Guidelines:

Good: Physically and functionally secure, with no immediate attention required
Fair: Moderate physical deterioration evident, requiring immediate maintenance/repair
Poor: Major structural or physical deterioration, requiring reconstruction or replacement.

Table 1-3 lists pavement areas and condition, per a Pavement Condition Index (PCI) conducted in October 2006.

Table 1-3: Pavement Condition and Areas

Pavement Section (Per PCI)	Area (SF/SY)	Pavement Age (2006)	PCI Score (2006)
Apron A	56,000 / 6,220	10	83
Apron B	48,000 / 5,330	10	88
Runway 5-23 A	277,500 / 30,830	3	100
Runway 5-23 B	86,250 / 9,590	3	100
Runway 5-23 C	90,000 / 10,000	3	100
Taxiway A	12,400 / 1,380	3	100
Taxiway B	4,700 / 520	10	100
Taxiway C	147,000 / 16,330	4	100
Taxiway D[1]	16,750 / 1,860	3	100
TOTAL	738,600 SF / 82,070 SY		

[1] Taxiway 'D' designation new since last report (December 2004). Area needs to be verified upon release of report (estimated March 2006).

Note: Taxilane pavements were not analyzed in the PCI Investigation

Duplin County Airport has ± 60,000 SF of taxilane pavements, bringing

TOTAL PAVEMENT AREA = ± 798,600 SF OR 18.3 ACRES

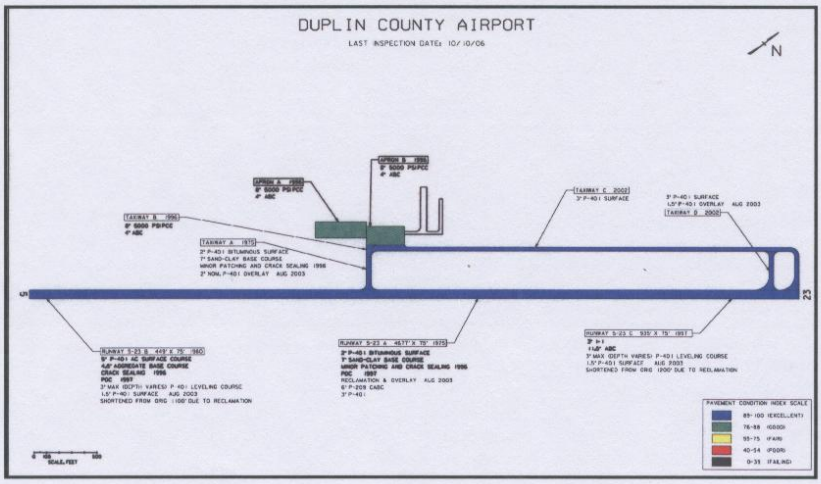
NCDOA PCI Thresholds:

>/= 75 Points-No action necessary

55 to 74 Points- Preventive Maintenance Needed

< 55 Points- Repair/Rehabilitate Pavements

Source: NCDOA - 2006 PCI Study, Duplin County Airport.



Talbert & Bright, Inc.

Table 1-4 lists information on each of the Airport hangars. All hangars have been financed by the Airport. The Airport occupies the end of Hangar # 4 for mower storage and other equipment.

Table 1-4: DPL Airport Hangars and Condition

Hangar #	Hangar Description and Size	Year Built/ Payment Expiration	Condition
#1	Corporate Hangar (2 to 3 Planes) 100′ x 100′: 10,000 SF	1990 (March, 2010)	Good
#2	Corporate Hangar (2 to 3 Planes) 100′ x 100′: 10,000 SF	1990 (March, 2010)	Good
#3	Corporate Hangar (2 to 3 Planes) 100′ x 100′: 10,000 SF	2004 (20-Year Lease)	Excellent
#4	4-Unit T-Hangar (4 Planes) 6,960 SF	1990 (March, 2010)	Good
#5	4-Unit T-hangar (4 Planes) 6,960 SF	1974 (March, 2010)	Fair
TOTAL	43,920 SF (14 to 17 Plane Storage Capacity)		

General Physical Condition Rating Guidelines:

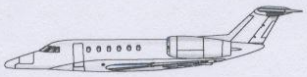
'Good': Physically and functionally secure, with no immediate attention required
'Fair': Moderate physical deterioration evident, requiring immediate maintenance/repair
'Poor': Major structural or physical deterioration, requiring reconstruction or replacement.

Source: Airport Records / TBI Airport Inventory Inspection, August 2004.

DPL Existing Operational Activity

Table 1-5 summarizes current aeronautical activity at DPL, including a "snapshot" of based aircraft and annual aircraft operations. Airport management reports a total of 19 based aircraft which includes 11 single-engine, 2 twin-piston engine, 1 turboprop and 5 business jets. DPL experiences approximately 15,000 operations (takeoffs and landings) per year. The critical based aircraft is a Cessna Citation VII (ARC Category C-II).

Table 1-5: DPL Aviation Activity (2004-2005)

Based Airworthy Aircraft		Annual Civilian Aircraft Operations	
Single-Engine Piston	11 (58%)	**Local Operations**	5,500 (37%)
Multi-Engine Piston	2 (11%)	**Itinerant Operations**	9,500 (63%)
Turbopropeller	1 (5%)	**Total Civilian Operations**	**15,000**
Business Jet	5 (26%)		
Total Based Aircraft	**19**	**Large Aircraft Operations**	**4,800 (32%)**
		Jet Operations	**7,700 (51%)**
Existing Critical Aircraft (ARC C-II) **Cessna Citation VII (Business Jet)**			

Based Aircraft (Defined) – An actively registered general aviation airplane stationed at a select airport, which regularly uses the airport as the primary "home-base" for filing flight plans, frequently uses available airport amenities, and/or maintains a formal commitment for long-term parking/storage.

Aircraft Operation (Defined) – An aircraft operation is one take off and/or landing of an aircraft (i.e., a touch & go consists of 2 operations). Aircraft operations are identified as local and itinerant. Local operations consist of those within a 25-mile radius of the Airport vicinity. Itinerant operations include flights having a terminus of flight from another Airport at least 25 miles away.

"Large" Aircraft Operation (Defined) – Aircraft weighing greater than 12,500 pounds (maximum gross weight) – indicative of "turbine-powered" aircraft with a turbo-propeller or turbofan gearbox using Jet-A (kerosene) fuel.

Critical Aircraft (Defined) - The largest aircraft within a family of FAA Airport Reference Code (ARC) that conducts at least 500 annual itinerant operations per year at the Airport. The FAA establishes airport design criteria in accordance with the Airport's ARC designation, which provides minimum safety standards with respect to the performance characteristics of the family of aircraft represented by the Airport's critical aircraft.

Note: Ultralights, sailplanes and gyrocopters not counted as based aircraft.
Note: Military operations not counted towards airport operations.

Source: Airport Inventory, September 2004.
Source: FAA Form 5010 Airfield Inspection Reports.

The following is a list of based aircraft arranged by size. The list was provided by the Airport Manager, January 2007.

#	N-Number	Aircraft Type	Aircraft Model
1	N650CJ	Medium-Cabin Jet	Cessna Citation VII
2	N360MC	Small-Cabin Jet	Cessna Citation I
3	N88MF	Medium-Cabin Jet	Westwind Astra Jet
4	N567WB	Small-Cabin Jet	Cessna Citation I
5	N89MF	Small-Cabin Jet	Cessna Citation
6	N600TC	Twin-Piston	Beech Baron
7	N7922Y	Twin-Piston	Piper Comanche
8	N1349D	Single-Piston	Cessna 170
9	N75956	Single-Piston	Cessna 172
10	N830FJ	Single-Piston	Mooney
11	N7123U	Single-Piston	Mooney
12	N59LA	Single-Piston	Citabria Adventure
13	N9DV	Single-Piston	Beech Bonanza
14	N8177W	Single-Piston	Piper Cherokee 180
15	N1418J	Single-Piston	Rockwell Commander
16	N829MU	Single-Piston	Beech Bonanza
17	N731MB	Single-Piston	Cessna
18	N91181	Single-Piston	Cessna
19	N543JD	Single-Piston	Piper Arrow

Table 1-6 lists known turboprop and jet aircraft users arranged by ARC. It should be noted that this list of users does not account for all 'business-class' operators at the Airport, including nighttime periods when the facility is not staffed.

The ARC is classified as follows:

Approach Category	Aircraft Approach Speed
A	Less than 90 knots
B	91 to 120 knots
C	121 to 140 knots
D	141 to 165 knots

Design Group	Aircraft Wingspan
I	Less than 49′
II	50′ to 79′
III	80′ to 117′

Table 1-6: DPL - Business Class Airport Users (Turboprop & Jet)

Company Name	Type of Aircraft	ARC	Annual Operations
Shelton Vineyards	King Air 300	B-II	100
Valley Proteins	King Air 200	B-II	500
Flight Options, Inc.	Raytheon Beechjet	B-I	100
House of Raeford Farms, Inc. ✈	Cessna Citation I	B-I	1,170
PSM Enterprises ✈	Citation I	B-I	835
Cargill, Inc.	Dassault Falcon 50	B-II	670
Iowa Beef Company	Dassault Falcon 10	B-II	200
Allen Canning Company	Dassault Falcon 50	B-II	150
Murphy Family Ventures, LLC ✈	Westwind Astra	C-II	835
Smithfield Foods, Inc.	Gulfstream Galaxy	C-II	670
Tailwind East, LLC ✈	Cessna Citation VII	C-II	1,170
Nationwide Insurance	Challenger 600	C-II	500
NetJets, Inc.	Gulfstream G500	D-III	100
Carolina Turkey – Butterball	--	--	--
DOCUMENTED BUSINESS-RELATED OPS. PER YEAR			**7,000**
DOCUMENTED BASED JET OPS. PER YEAR			**4,010**

✈ Indicates 'based' Duplin County Airport User.

Source: Airport Management Records / Interview (2004).

Jet Departure @ DPL

The following describes activity by major business users of the Airport. Major users are defined as those linked to substantial employment within Duplin County.

Smithfield Foods: Smithfield Foods is the world's largest producer of pork and the 5th largest producer of beef in the United States. The Virginia-based firm owns subsidiaries in Brazil, France, the UK, China, Mexico, and Poland. Smithfield conducts business in Duplin County in support of their pork operations. They fly a Gulfstream Galaxy (G200), a C-II business jet with significant range.

House of Raeford, Inc.: House of Raeford is a significant producer of poultry products. The company is based in Raeford, NC (25 miles west of Fayetteville) and has substantial production facilities in Duplin County. House of Raeford operates a Cessna Citation I at the Airport.

Murphy Family Ventures, LLC.: Murphy Farms was acquired and is now a division of Smithfield Foods. The pork producer supports Smithfield's operations nationally, including farms in Duplin County. Murphy Farms operates two turbine aircraft at the Airport: a Westwind Astra and a Cessna Citation I.

Nationwide Insurance, Inc.: Nationwide Insurance uses Duplin County for executive transportation. The Ohio-based insurer uses a Bombardier Challenger business jet to transport executives to and from corporate meetings.

Tailwind East, LLC: Tailwind East operates a Cessna Citation VII for private use. The limited liability corporation is not a commercial organization.

NetJets, Inc.: NetJets operates a Gulfstream V at the Duplin County Airport for executive transport nationally and internationally. Duplin County was a recent stop for a Gulfstream V enroute to Poland.

Cargill, Inc.: Cargill, Incorporated is a diversified company offering food and agricultural products and services. Cargill operates to Duplin County from their corporate headquarters in Minneapolis.

Allen Canning Company: Allen Canning is an international producer of canned vegetables for consumers and organizations (including the US Department of Defense). Allen operates a Falcon 50 into Duplin County from their corporate headquarters in Arkansas.

Carolina Soy Products: Carolina Soy produces soy cooking oil and meal for consumption. Their corporate headquarters is in Warsaw, NC. They operate a Raytheon Beechjet out of the Duplin County Airport.

DPL has recently accepted a proposal for an aircraft maintenance facility to base operations at the Airport. An enterprise capable of minor and major aircraft repairs is anticipated to draw a variety of additional activity and be a positive influence in attracting additional based aircraft.

Table 1-7 shows 'based' and 'transient' aircraft operations conducted at DPL. According to the Duplin County Airport Manager, nearly 60% to 80% of the peak-hour flights are conducted by business jets.

Table 1-7: DPL Aircraft Mix Use – Fleet Type (2004-2005)

Aircraft Type	% of Total Airport Operations	Annual Operations
TOTAL – AIRPORT	**100%**	**15,000**
Operations By DPL Based Aircraft		
Single-Engine	± 30%	2,000
Multi-Engine	± 10%	650
Business Jet	± 60%	4,000
SUBTOTAL – BASED	**100%**	**6,650**
Operations at DPL By Transient Aircraft		
Single-Engine Piston	± 30%	2,550
Multi-Engine Piston	± 10%	850
Turboprop	± 12%	1,000
Business Jet	± 45%	3,700
Rotorcraft	± 3%	250
SUBTOTAL – TRANSIENT	**100%**	**8,350**
Note: Does not include military operations.		

Source: Airport Management Questionnaire (9/04)

Airspace & Navigational Facilities

Figure 1-1 depicts the visual flight rule (VFR) airspace system and **Figure 1-2** depicts the instrument (IFR) airspace system surrounding DPL.

DPL is located within Class E uncontrolled airspace, which extends from 1,200′ above the ground to 18,000′ mean sea level (MSL), and includes a keyhole-extension for the Runway 23 instrument procedure from the northeast. When instrument conditions are not in effect, the airspace reverts to Class G general controlled and extends from the surface up to 18,000 feet MSL. The Airport is also located in close proximity to victor airways intersection *WALLO*, with connecting airways to New Bern, Rocky Mount, Wilmington, Fayetteville, Kinston, and Myrtle Beach. There are no military airways or special use airspace overlapping the Airport. The Duplin County Ground Communication Outlet (GCO) is linked to the Seymour Johnson clearance delivery frequency.

Multiple towers, ranging in height from 403′ to 576′ MSL (top elevation), are located near the Kenansville and Pink Hill (the Appendix contains a list of FAA published towers higher than 200′ above ground level).

Airport Instrument Approach Procedures

Table 1-8 lists information on the four (4) published instrument approaches for Airport. Minimums are as low as 500′ MSL and 1-mile visibility. Localizer approaches typically allow minimums as low as 250′ AGL and 1-mile visibility; however, according to Duplin County's NAVAID Technician, signal interference from terrain and trees does not allow minimums less than 500′ MSL.

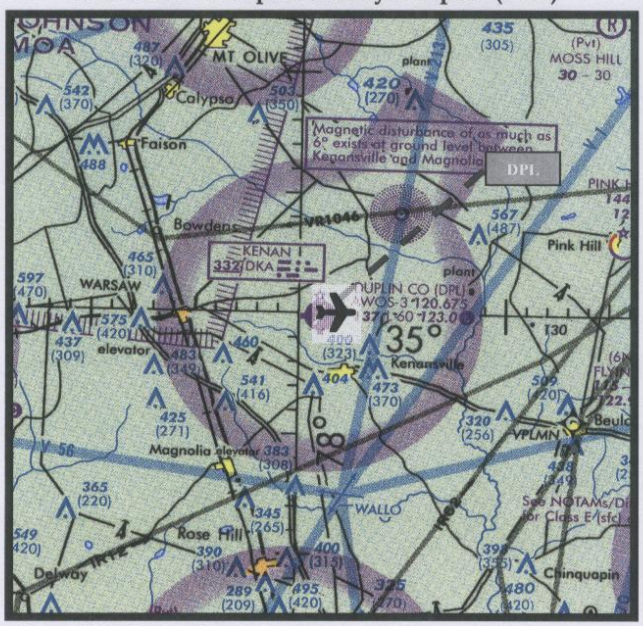
Table 1-8: DPL Airport Instrument Approaches

Runway	Approach Type	Visibility Minimums	Lowest Minimum Descent Altitude (MDA)
RWY 5	GPS[1]	1 mile (A-C); 1 ¼ mile (D)	520' MSL /384' AGL
RWY 23	GPS[1]	1 mile (A-C); 1 ¼mile (D)	500' MSL / 363' AGL
RWY 23	LOC[1]	1 mile (A-C); 1 ¼mile (D)	560' MSL / 423' AGL
RWY 23	NDB[1]	1 mile (A-C); 1 ¼ mile (D)	560' MSL / 423' AGL

[1] - Alternate Minimums Are Not Authorized
See Appendix for acronyms

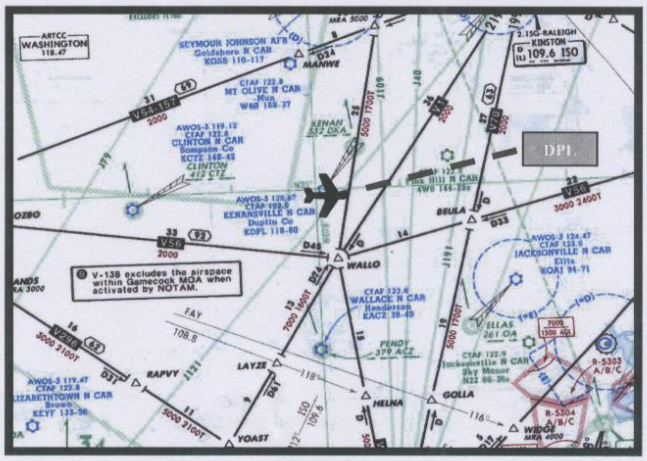
Source: US Terminal Procedures: NC (6/10/04)

FIGURE 1-1: Duplin County Airspace (VFR)



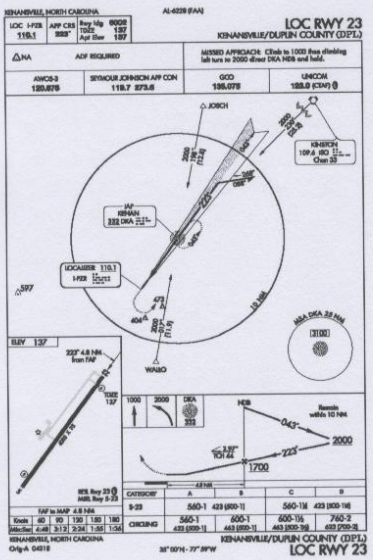
Source: North Carolina 2004 Sectional

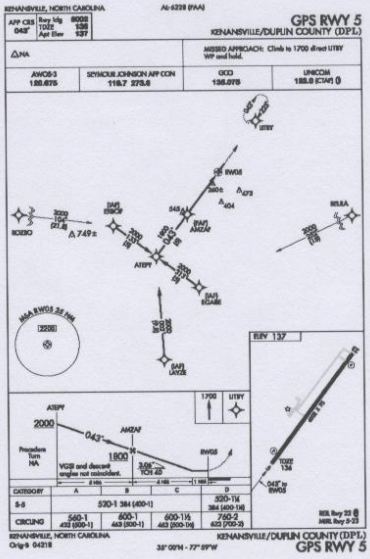
FIGURE 1-2: Duplin County Low Altitude IFR Enroute Chart

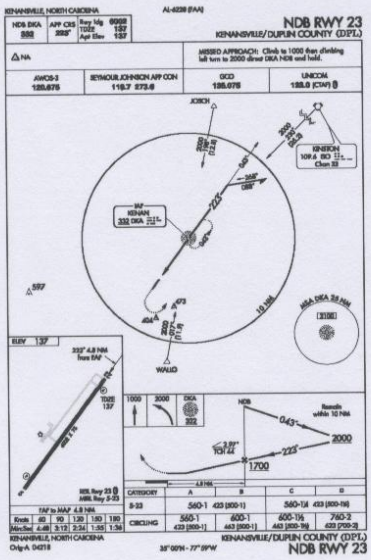


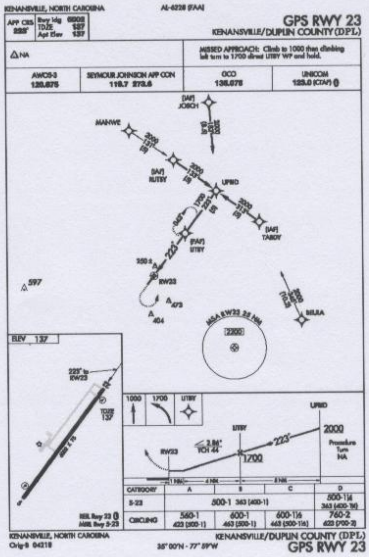
Source: Jeppesen Low Altitude Enroute Chart, (4/04)

Duplin County Instrument Approach Procedures









Talbert & Bright, Inc.

Airport Service Area & Characteristics

Figure 1-3 depicts the "Airport Service Area". The service area is a geographical area eliciting aviation demand and having favorable auto access to the Airport. It should be noted that the service area does not necessarily conform to geographical or political boundaries, but rather, is determined by application of service area influences. The service area population is approximately 10,000 to 15,000, and includes Kenansville, Magnolia, Warsaw, Bowdens and Beulaville.

FIGURE 1-3: Airport Service Area

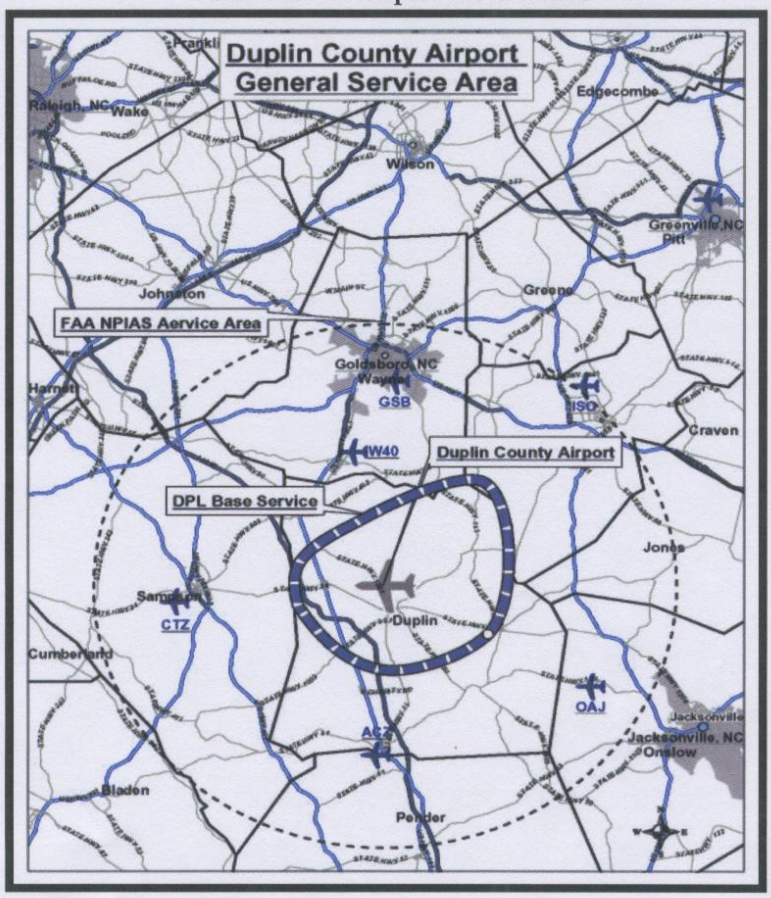


Table 1-9 lists information on surrounding public-use airports. An understanding of the capabilities and influence of these public-use airports provides insight into airport service roles and aviation demand.

Table 1-9: Surrounding Public-Use Airports

Airport Name/Sponsor	Airport Characteristics	Airport Activity (Aircraft/Operations)
Duplin County Airport (DPL)	Runway 5-23: 6,002' x 75' (30 S/50 D) Service Area Factors: + Runway Length + Runway Pavement Strength + Instrument Procedures + On-airport communication/WX + Full-Service FBO with A/P Service	19 Based Aircraft (12 SE/2 ME/5 Jet) 15,000 Annual Operations
Mount Olive Municipal (W40)	Runway 5-23: 4,250'x75' (20-26 SWG) Service Area Factors: + Proximity to Major Industry + Full Service FBO + Approach Minimums + Available Hangar Expansion Area	13 Based Aircraft (10 SE/3 ME) 17,000 Annual Operations
Henderson Field/Wallace (ACZ)	Runway 9-27: 3,998' x 75' (12.5 SWG) Service Area Factors: + Instrument Approaches + Available Hangar Expansion Area	20 Based Aircraft (17 SE/2 ME/1 R) 10,500 Annual Operations
Clinton-Sampson County (CTZ)	Runway 6-24: 4,220' x 75' (26 SWG) Service Area Factors: + Instrument Approaches + Pavement Strength	25 Based Aircraft (22 SE/2 ME/1 J) 13,500 Annual Operations

Sources: NOAA-FAA Sectional Aeronautical Chart, 2004 & FAA 5010 Master Records

Airport Vicinity Land Use

The land use surrounding the Airport is predominately agricultural wooded areas with sparse residences. A subdivision and associated golf course is located west of the Airport, along SR 1301.

In recent years, the County Planning Department has received an increase in proposed developments surrounding the Airport for residential purposes, including minor subdivisions. The ±123-acre tract of property along Airport Road is owned by Duplin County and is identified as a possible site for commercial/industrial development.

Duplin County does not exercise land use zoning; however, the County has adopted the *Duplin County Airport Height Restriction Ordinances* (2004) to regulate the height of land use in the Airport vicinity.

The ALP drawings depict the airspace and land use boundaries of these ordinances. The 1986 Duplin County Land Use Plan identified the Airport within a *Transitional Class*. A Transitional Class identifies lands most suitable for intensive urban development in the first ten years following preparation of a land classification plan. Surrounding land uses fall predominantly into the *Rural Class*, which provides for agricultural lands, forest management, mineral extraction, and other low intensity uses.

NCDOA, Airport Development Plan (NCADP) requirements

In 2003, the NCDOA implemented planning requirements for public-use airports statewide as part of the NC Airport System Plan. DPL is designated as a "blue group" airport, which relates to a set of NCDOA 'minimum' and 'recommended' design goals.

To remain eligible for NCDOA funding considerations, the following planning components, as mandated by the NCADP, must be met.

- √ Runway Approach Certification (Runway 5 & 23 Ends)
- √ Update ALP drawings
- √ Airport Rules and Regulations & Minimum Standards
- √ Airport Height Restriction Ordinance

√ Denotes that Duplin County has satisfactorily met requirement

Table 1-10 provides a comparison of current Airport facilities to the 19 NCADP components.

Table 1-10: NCADP (Blue Group Criteria)

NCDOT Criteria (Criteria #)	'Minimum' Criteria	'Recommended' Criteria
(1) Runway Approach	TSS Appendix 2 ▪	TSS Appendix 2 ▪
(2) Runway Safety Area (RSA)	FAA AC 150/5300	FAA AC 150/5300
(3) Runway Protection Zones (RPZ)	FAA AC 150/5300	FAA AC 150/5300
(4) Pavement Condition	2002 PCI Index ▪	2002 PCI Index ▪
(5) Runway Dimension	4,200' x 75' ▪	5,500' x 100' ▪
(6) Pavement Strength	12,500 swg ▪	30,000 dwg ▪
(7) Visual Navigational Aids	Rotating Beacon ▪ Lighted Windsock ▪ PAPI(2 Box) ▪ REIL-Optional ▪	Rotating Beacon ▪ Lighted Windsock ▪ PAPI(2 Box) ▪ REIL-Optional ▪
(8) Runway Edge Lighting	MIRL ▪	MIRL ▪
(9) Weather Reporting Capability	Certified Altimeter ▪	AWOS ▪
(10) Instrument Approach	Non Precision ▪	Precision (200'/¾)
(11) Taxiway Requirements	Turnarounds ▪	Full-Parallel
(12) Apron Requirements	15 Based/ 5 Itinerant	15 Based / 5 Itinerant
(13) Terminal Building	Designated Areas ▪	±2,500 ▪
(14) Taxiway/Apron Edge Lighting	Reflective ▪	MITL ▪
(15) Airfield Signage	Hold Signs ▪	Location/Guidance
(16) Ground Communication	Telephone/UNICOM ▪	RCO/GCO ▪
(17) Approach Lighting	N/A	N/A
(18) Aircraft Rescue & Fire Equip.	Fire Extinguisher ▪	Fire Extinguisher ▪
(19) Airport Maintenance/Equipment	Equipment Storage	Equipment Storage
▪ Denotes that NCADP Criteria has been attained.		

Source: *2003 NCDOT, Division of Aviation – Airport Development Plan Guidance*

Airport Compliance Standards

The following items have been identified as compliance issues or deficiencies as noted by prior airfield inspection documentation and current airport planning/design standards. These items should be mitigated in coordination with local officials and the NCDOA.

Airspace Obstructions: The FAA Form 5010-1 Airport Master Record (8/2004) identifies approach obstructions (trees) for both runway ends. In addition, trees and terrain lateral to the runway are a FAR Part 77 obstruction of the transitional surface.

RSA/Object Free Area (OFA) ARC C-II Encroachment: As a FAA ARC B-II facility, the RSA and OFA standards are sufficiently met. As a FAA ARC C-II facility, the RSA and OFA beyond the Runway 23 End is crossed by SR 1380.

RPZ - Rwy 5 End & 23 End: The Runway 5 RPZ (500′ x 1,700′ x 1,010′) beyond SR 1301 is not controlled by the Airport in fee or easement. The Runway 23 RPZ (500′ x 1,700′ x 1,010′) beyond SR 1380 is not controlled by the Airport in fee or easement.

Localizer Antenna: The localizer is placed ± 850′ beyond the Runway 5 End. As shown on the ALP, the localizer is planned to be relocated beyond the Runway 5 RSA and OFA, when functionally and economically feasible.

Duplin County Airport

Airport Master Plan Update

SECTION 2

AVIATION DEMAND FORECASTS

SECTION 2 - AVIATION DEMAND FORECASTS

Aviation Planning Forecast

Aviation forecasts are time-based projections that provide a reasonable expectation for anticipating potential airport activity, and serve as a guide in determining required airport infrastructure, equipment and service needs.

The relationship between activity and projected demand identifies the type, extent and timing of future airport improvements. In addition, forecasts serve to assess airport capacity characteristics, potential environmental effects, and the feasibility of development alternatives. Aviation demand forecasts have been prepared for the following:

- Based aircraft
- Annual activity
- Critical aircraft family
- Aviation passengers/visitors
- Peak-hour operations

Local-Area Forecast Factors and Assumptions

The following factors and assumptions have been incorporated into the forecasts of based aircraft and annual operations:

1) Duplin County is growing and attracting new industry, residents and tourism in a socio-economic segment of the population likely to rely on general aviation.

2) DPL offers competitive fuel prices and is a viable fueling stop for business-class aircraft traveling the mid-Atlantic and northeast corridor.

3) Several aircraft owners, currently on a hangar waiting list, are interested in relocating to DPL pending the availability of hangars.

4) A based aircraft maintenance facility will bolster activity and the prospects for additional based aircraft.

5) The GA industry is trending towards more sophisticated and cost-effective aircraft, both large and small.

Forecast of Based Aircraft and Annual Aircraft Operations

Table 2-1 summarizes the forecasts for based aircraft and annual operations for the 20-year planning period. The demand forecasts, combined with the inventory data, are used to identify airport facility requirements.

Table 2-1: Aviation Forecast Summary

DPL BASED AIRCRAFT FORECAST				
Aircraft Type (ARC Category)	**Existing (2005)**	**Phase 1 Year 2010 Short-Term (2005 - 2010)**	**Phase 2 Year 2015 Mid-Term (2011 - 2015)**	**Phase 3 Year 2025 Long-Term (2016 - 2025)**
Single-Engine (A-I & B-I)	8	10 to 12	12 to 16	16 to 25
Multi Engine Piston (B-I)	2	4 to 5	5 to 6	6 to 9
Multi-Engine Turbine (B-II)	1	1 to 2	3 to 4	4 to 6
Business Jets (Category B, C, & D)	4	5 to 6	6 to 7	7 to 8
Rotorcraft	0	0 to 1	0 to 1	1 to 2
Total Based Aircraft	**15**	**20 to 26**	**26 to 34**	**34 to 50**
DPL CIVILIAN AIRCRAFT OPERATIONS FORECAST				
Operations	**Existing (2005)**	**Phase 1 Year 2010 Short-Term (2005 - 2010)**	**Phase 2 Year 2015 Mid-Term (2011 - 2015)**	**Phase 3 Year 2025 Long-Term (2016 - 2025)**
Local	5,500 (37%)	7,000	8,000	10,000
Itinerant	9,500 (63%)	12,000	14,000	18,000
Total Civilian Operations	**15,000**	**19,000**	**22,000**	**28,000**

Source: Talbert & Bright, Inc. Forecast Analysis (2004)

Table 2-2 shows the number of forecast instrument operations and actual instrument approaches[1] conducted at DPL.

Table 2-2: Forecast of Instrument Activity

Actual Instrument Approach	Year 2005	Year 2010	Year 2015	Year 2020	Year 2025
Itinerant Traffic	390	500	590	680	780
Air Charter Traffic	50	60	70	80	90
Based Aircraft	40	80	100	110	120
Other - Training	50	80	100	130	150
TOTAL AIA's	**530**	**720**	**860**	**1,000**	**1,140**

Note: The percent of IFR Rated Pilots is based on FAA Forecasts (2000-2011), and trend line (2012-2021). The increase in the percent of IFR-rated pilots is extrapolated from FAA forecasts, indicating 1.3 percent growth in IFR training during the next 12 years.

Source: Talbert & Bright, Forecast Methods, July, 2004.

Future Critical Aircraft / Family of Aircraft

The critical aircraft is the largest airplane within an ARC family of aircraft conducting at least 500 annual operations (combination of 250 takeoffs and landings) per year at the Airport. The critical aircraft is evaluated with respect to size, speed and weight, and is important for determining airport design, as well as structural and equipment needs for both the airfield and terminal area facilities.

Three predominate categories of aircraft are: **1)** small single and twin-engine aircraft weighing less than 12,500 pounds; **2)** large twin turbo-propeller aircraft weighing up to 12,500 pounds; and, **3)** small to medium-cabin business jets weighing up to 80,000 pounds.

The general aviation industry, in terms of aircraft production and utilization, is growing at about 2% annually, with the business-class segment at 4% to 5% annually. Business jets will not only constitute a higher proportion of the business-class fleet, but will expand for small, medium and large cabin jets.

[1] Forecast based on unconstrained condition – IFR flight plans are completed and canceled after executing the full approach. An instrument approach is defined as an approach to an airport, with intent to land in accordance with an IFR, when visibility is less than three nautical miles and/or the cloud ceiling is at or below the minimum initial approach altitude. Military operations are not included in the AIA forecast.

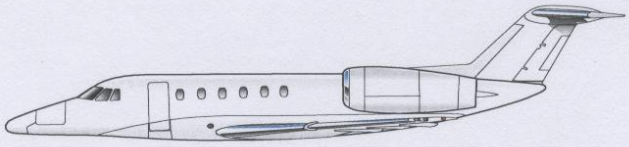
The recent certification of ultra-small turbojet engines is expected to bring about a proliferation of ultra-light, single-pilot business jets (3 to 5 seats), as represented by the new Cessna Citation Mustang and other jets currently in the FAA certification process. In addition, the use of smaller, more reliable turboprop engines in single-engine airframes is expected. These trends could have profound impacts within the next 5 to 10 years. The following is a list of Category B, C and D business-class aircraft, including piston, turboprop and jets:

- ARC B - Piston Aircraft	- ARC B - Turbine (Turboprop & Jets)	- ARC C - Turbine (Business Jets)
Twin-Engine (Piston)	Twin-Propeller (ARC B-I)	Medium-Cabin Jets (ARC C)
Beech (Baron Series)	Cessna Caravan	**Cessna 650 Series**
Beech (Duke)		**Cessna 680 Series**
Cessna 404 (Titan)	Twin-Propeller (ARC B-II)	**Cessna 750 Series**
Beechcraft (Duke Series)	**Piper PA-42 Cheyenne III**	**Learjet 24/25/31A/45/54/55/60**
Beech (King Air B100)	**Beechcraft King Air Series**	**Challenger 600/604**
Cessna 414 (Chancellor)	**Beechcraft Queen Air**	**Raytheon/Hawker 600/ 700**
Cessna 402 (Businessliner)	**Rockwell Shrike**	**Raytheon/Hawker 2000/2000EX**
Cessna 421 (Golden Eagle)	**Mitsubishi (MU-II) Marquis**	**IAI Jet Commander**
Piper PA-30-310 (Navajo)		**IAI Westwind I/ II**
Piper (Chieftan)	ARC B-II+10 Passengers	**Gulfstream Galaxy**
Piper PA-60-602P (Aerostar)	**Beechcraft (B300/350)**	**Rockwell Sabreliner 75A**
	Cessna 425 Conquest II	**Gulfstream G-III**
	Small-Cabin Business Jets	Large-Cabin Jets (ARC D)
	Lear (Various Models)	Bombardier Global Express
	Dassault (Falcon 10)	Gulfstream 400 & 500
	Rockwell (Sabre 40/60)	Lear 35/36
	Cessna Citation 550/560	
	Raytheon/Hawker 800XP/1000	
	Dassault Falcon 20/ 50	
	Dassault Falcon 900/ 900EX	
	Westwind Astra SP/SPX	

Aircraft Approach Category (AAC) - Grouping based on 1.3 times the stall speed of the aircraft at the maximum certified landing weight in the landing configuration (knots).

Note: The AAC is classified from A to E, and the airplane design group (ADG) is classified from I to IV. Combined, the two classifications produce an ARC which yields specific characteristics about the type of airplane (family) that the airport is designed to accommodate.

DPL BASED CRITICAL AIRCRAFT TYPE
ARC C-II (Medium Cabin – 6 to 10 passengers)
Cessna Citation 650 Series Business Jet



DPL TRANSIENT DEMAND AIRCRAFT TYPE
ARC D-II (Large Cabin – 8 to 16 passengers)
Gulfstream IV / V Series Business Jet

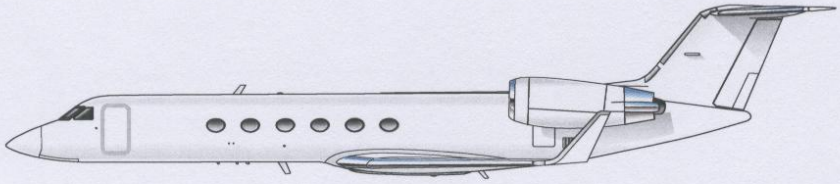


Table 2-3: Critical Aircraft Information – Performance Characteristics

Aircraft	Wing Span	Aircraft Length	Aircraft Height	Pax	Max. Gross Takeoff Weight	Takeoff Distance [1,2]	Appr. Speed (Knots)
Cessna Citation	53.5′	55.5′	17.8′	6-10	23,000 lbs.	±5,600′	126
Gulfstream	77.6′	88.4′	24.5′	10+	75,000 lbs.	±5,800′	140

Note 1: ISO (International Standard Observation): 59°F @ 29.92″
Note 2: Takeoff distance computed for Airport pressure altitude, and the following operating conditions: 90°F - no wind – normal aircraft operating takeoff conditions (no flaps, no runway grade)

Source: TBI, Aircraft Performance File, September 2004.

Airport Peaking Characteristics

Table 2-3 identifies general aviation peaking activity used to determine the allocation of space for various terminal facilities (i.e., terminal building, aircraft parking and auto parking).

The peak hour flights (PHF) and design hour passenger (DHP) are used to identify user space requirements during the average day of the peak month. The peaking activity is calculated using standard FAA demand/capacity guidelines. A 'composite' DHP is used to more heavily weight 'itinerant' users, which typically require more aircraft and passenger processing space than 'local' users. **The Airport's peak operating months typically occur from September to March.**

Table 2-3: Airport Peaking / Passenger Processing (2004-2025)

Year	Annual Civilian Operations	Average Peak "Month" Ops.	Average Peak "Day" Ops.	Average Peak "Hour" Ops.	Pax. Per Flight	Annual / Average Peak Hour Passengers
Year 2005	15,000	2,007	66	9	1.5 to 2.25	6
Year 2010	19,000	2,545	83	11	1.65 to 2.25	9
Year 2025	28,000	3,730	122	17	1.75 to 2.4	12

Aggregate Peak Month: (Annual Operations) * (10%)
Aggregate Peak Average Day: (Peak Month Operations)/30.4
Aggregate Peak Hour: (Peak Day Operations) * (15%)
Composite Design Hour Passenger: Average (Weighted Local & Itinerant Peak Passengers)

Note: 'Operations' = 'Flights' x 2
Note: Local operational peaking includes touch & go activity.

Source: Talbert & Bright, Inc. - Peaking Forecast Analysis: November, 2004.
Source: AOPA Airport Passengers Per Flight.

Table 2-4 identifies the automobile traffic associated with the general aviation peaking activity, measured as Average Daily Traffic (ADT). By the year 2025, DPL could anticipate nearly 45,000 visitor trips, and an average of 100 to 125 daily traffic movements during the peak month.

Traffic levels were determined for the following users:

- Based Aircraft Users
- Itinerant Passengers
- Airport Employees & Tenants
- Deliver / Service and Other Vehicles

The existing Airport entrance road and terminal area auto circulation is capable of accommodating the forecast level of automobile traffic.

Table 2-4: DPL Airport Automobile Traffic

Equivalent ADT	Year 2010	Year 2015	Year 2020	Year 2025
DPL Daily Auto Traffic				
Average Daily Traffic (ADT)	65	80	100	125
Peak Hour Traffic (12% of ADT)	8	10	12	15
Total Annual Airport Auto Traffic	**24,000**	**28,000**	**36,000**	**45,000**

Note: ADT – Average Daily Traffic
Note: 'Trip' = 'Movement / 2

Source: Talbert & Bright, Inc.

Duplin County Airport

Airport Master Plan Update

SECTION 3

AIRPORT FACILITY REQUIREMENTS

SECTION 3 - AIRPORT FACILITY REQUIREMENTS

Airport Design Factors

This Section identifies airfield and terminal area facility requirements. Facility recommendations have been determined from inventory findings and demand forecasts, and planned in accordance with FAA/NCDOA airport design standards and airspace criteria.

Runway Length Standards

The recommended runway length is **6,000'**. This length would accommodate 100% of the business jet fleet operating between 60% and 90% useful load for trips not exceeding 500 nautical miles.

The 6,000' length is determined by the following factors: **1)** performance requirements to satisfy medium and large jet takeoff length, landing and accelerate-stop distances; **2)** satisfy NCADP 'recommended' runway length standards; 3) consistent with insurance industry benchmarks set for large-cabin business jet runway length requirements; **4)** coincides with evolving FAA Federal Aviation Regulation Part 91k (fractional ownership) and proposed Part 135 (on-demand) regulations.

Taxiway System

A full parallel taxiway system should be considered as annual operations approach 20,000. The current 15,000 operations indicate the need for a full parallel taxiway system in the immediate future. The parallel taxiway system should be designed in accordance with ARC C-II standards as specified in FAA Advisory Circular 150/5300-13, *Airport Design*. This entails, at minimum, a 35' wide taxiway with 400' runway-to-taxiway centerline separation and 75' taxiway turn radius. An exit taxiway is planned at midfield and an additional bypass taxiway for the Runway 5 end. Taxiway pavement strength should be commensurate with the associated runway strength.

Taxilane System

The taxilanes provide access to hangar and ramp areas. Taxilanes should be designed in accordance with not less than ARC B-II standards, and ARC C-II standards for access to larger common hangars as specified by FAA Advisory Circular 150/5300-13, *Airport Design*. The taxilane strength should be commensurate with aircraft usage as needed between the airfield and associated hangar maneuvering areas. Hangar taxilanes should be of sufficient width to allow unencumbered aircraft wingtip clearance between fixed objects (hangars,

fence, fueling facilities, light poles, etc.). The *minimum* recommended taxilane object free area (TOFA) equals 1.2 times the airplane wingspan, plus 20′.

Navigational Aids / Lighting Aids & Signs

Various navigational and lighting improvements/upgrades are planned for the Airport. These projects include:

- Ultimate relocation of Localizer Antenna to 1,000′ Beyond Rwy 5 End
- Instrument Landing System (ILS), Glideslope Antenna / Shelter *
- Distance-to-go marker signs – Runway 5 & 23 Ends
- High Intensity Runway Edge Lights (HIRL) *
- Approach lighting system – Runway 23 End (long-term project)

* Note: The installation of an ILS Glideslope to provide vertical guidance to the RWY 23 End is a planned recommendation. However, the advent of improved GPS (RNAV) capabilities in the next 5 to 10 years could provide near-precision instrument approach capabilities for both runway ends. Although not required, High intensity edge lights (HIRL) are recommended with a precision procedure.

Also, refurbishment of existing airfield lighting and directional aids can be expected periodically throughout the planning period.

Future Airport Land Acquisition

The future Airport property boundary is based on the establishment of a precision instrument approach procedure to Runway 23. This necessitates a Building Restriction Line (BRL) at 750′, as opposed to the existing 500′, from the runway centerline, and larger RPZs beyond the runway ends. Land acquisition would also be required for the installation of the ILS glideslope antenna, critical area and shelter.

Aviation Easements are an option for areas unable to be acquired in fee. Easements are used to secure property interests in order to preserve safety areas and protect against incompatible land uses.

Future land acquisition as reflected on the ALP drawings includes the following:

Existing Fee Simple Property Interests (Aeronautical):	±250 Acres
Additional Fee Simple Property Interests (BRL & RPZ):	±140 Acres
Total Future Fee Simple Property Interests:	**±390 Acres**

Airside Facility Requirements - Summary

Table 3-1 provides a phased summary of the airfield facility requirements needed to accommodate the future level of Airport activity.

Table 3-1: Summary of Airside Facility Requirements

Airport Component	Existing (2005)	Phase 1 Short-Term (Year 2010)	Phase 2 Mid-Term (Year 2015)
RUNWAY 5-23 **Runway Strength** **Runway Marking** **Instrument Approach** **Runway Lighting**	6,002' x 75' 50,000 (DW) Rwy 5: NPI 1-mile Rwy 23: NPI 1-mile MIRL PAPI-2L Rwy 5&23 REIL Rwy 5&23 Airport Signage	6,002' x 100' 80,000 (DW) Rwy 5: NPI 1-mile Rwy 23: NPI 1-mile MIRL PAPI-2L Rwy 5&23 REIL Rwy 5&23 Airport Signage Distance-to-Go Signs Airport Signage	6,002' x 100' 80,000 (DW) Rwy 5: NPI 1-mile Rwy 23: PI ¾-mile Rwy 23: PI ½-mile Glideslope/MALSR MIRL/HIRL REIL Rwy 5&23 PAPI-2L Rwy 5&23 Distance-to-Go Signs Airport Signage
Taxiway System	Partial Taxiway 35' to 40' Wide MITL	Full-Parallel 35' to 40' Wide MITL	Full-Parallel 35' to 40' Wide MITL
Airport Navigational And Weather Aids	Rotating Beacon Windsock Segmented Circle AWOS GPS (RNAV) GCO	Airport Beacon Windsock Segmented Circle AWOS GPS (LPV) GCO	Airport Beacon Windsock Segmented Circle AWOS GPS (GLS PA) GCO

Source: TBI - Airport Facility Requirement Summary – November, 2004
Source: FAA Advisory Circular 150/5300-13, Change #8, Airport Design,

Terminal Area Facilities

Table 3-2 summarizes applicable NCADP terminal area standards for 'blue group' facilities.

Table 3-2: NCADP – Terminal Area (Blue Group)

Component / NCADP #	NCADP Standards	Airport Currently Meets Criteria
Aircraft Apron Requirements (#12)	Minimum: A paved aircraft parking area capable of parking 15 based aircraft and 5 itinerant aircraft. Of the 20 tie-downs, allotment for 2 multi-engine aircraft is required. Tie-downs should be provided for all parking spaces. Spaces between aircraft and for taxilanes should meet FAA guidelines. Pavement strength for the itinerant parking area should match the runway pavement strength.	Marginal
	Expansion: Document the existing ramp is at least 75% occupied with airworthy aircraft and/or there is a documented change in the size and/or type of transient aircraft that justifies an expansion (transient areas needs room for 3 large corporate jets that use the field 8 times a month). Any deviations will be based on a case-by-case basis.	No
Terminal Building (#13)	Minimum: Must include designated FBO/Operational area, flight planning room, public meeting room, and public restrooms.	Yes
	Recommended: Up to 2,500 square feet. NCDOA participation based on current square footage rate for commercial building and participation percentage reevaluated annually. This includes all utility tie-ins. Additional space at Sponsor cost.	Yes
Taxiway & Apron Edge Lighting (#14)	Minimum: Reflective markings or markers Minimum: Medium intensity taxiway lights (MITL)	Yes
Aircraft Rescue & Fire Fighting Equipment (#18)	Minimum: At least 1 fully-charged fire extinguisher available and easily accessible 24 hours a day for use around the main apron area. Fire extinguishers at Sponsor cost.	Yes
Airfield Equipment & Storage Building (#19)	Minimum: Airfield maintenance equipment (approved tractor and attachments) and an approved building to store equipment. Request considered every ten years.	No

Source: NCDOA- NCADP.

Terminal Area Planning & Design

The terminal area includes facilities necessary for processing people and aircraft. Additional terminal area facilities are needed to satisfy future based aircraft demand, itinerant traffic, and expansion of on-airport business tenants. Overall, the terminal area is capable of expansion, but necessitates the purchase of additional Airport property. While there is some existing expansion area, these efforts are essential for providing immediate hangar demand space, and the reservation of areas to accommodate long-term user demands.

In addition, terminal area facilities must conform to FAA/NCDOA airport planning standards and incorporate local land use regulations and environmental factors, as appropriate.

Table 3-3 summarizes terminal area facilities for accommodating demand projected for the 20-year planning period.

Table 3-3: Summary – Landside/Terminal Facility Requirements

Facility Peaking Information	Phase 1 (Year 2010)	Phase 2 (Year 2015)	Phase 3 (Year 2025)
Building (3,600 SF)	**4,000 to 4,200 SF**	**4,000 to 4,200 SF**	**4,800 to 5,200 SF**
Apron (102,200 SF) (17 Tie-Downs) **Parking (Small)** **Parking (Large)**	**115,000 SF** 18 Parking Spaces (15 Small Aircraft) (2 Large Aircraft) (1 Helicopter)	**130,000 SF** 20 Parking Spaces (15 Small Aircraft) (3 Large Aircraft) (2 Helicopter)	**175,000 SF** 25 Parking Spaces (18 Small Aircraft) (5 Large Aircraft) (2 Helicopter)
Total (44,000 SF) **T-Hangar Units (8 Units) (14,000 SF)** **Common Hangar 3 Units – 30,000 SF** **SASO Maintenance Hangar**	**70,000 SF** 4 Unit (7,000 SF) 4 Unit (7,000 SF) +8 Unit (14,000 SF) **16 Units - 28,000 SF** 1 Unit (10,000 SF) 1 Unit (10,000 SF) 1 Unit (10,000 SF) +1 Unit (6,000 SF) **4 Units - 36,000 SF** **6,000 to 12,000 SF**	**80,000 SF** 4 Unit (7,000 SF) 4 Unit (7,000 SF) 8 Unit (14,000 SF) **16 Units - 28,000 SF** 1 Unit (10,000 SF) 1 Unit (10,000 SF) 1 Unit (10,000 SF) 1 Unit (6,000 SF) +1 Unit (10,000 SF) **6 Units - 46,000 SF** **6,000 to 12,000 SF**	**117,000 SF** 4 Unit (7,000 SF) 4 Unit (7,000 SF) 8 Unit (14,000 SF) +6 Unit (10,500 SF) +6 Unit (10,500 SF) **28 Units - 49,000 SF** 1 Unit (10,000 SF) 1 Unit (10,000 SF) 1 Unit (10,000 SF) 1 Unit (10,000 SF) 1 Unit (6,000 SF) +1 Unit (6,000 SF) +1 Unit (10,000 SF) **7 Units - 62,000 SF** **6,000 to 12,000 SF**
(12,000 - 100LL) (12,000 - Jet A) Storage Volume	18,000 – Jet A 12,000 100LL **30,000 Gallons**	28,000 – Jet A 12,000 100LL **40,000 Gallons**	28,000 – Jet A 12,000 100LL **40,000 Gallons**
Parking Lot (SF) (6,350 SF) ***(24 Spaces)***	**11,500 SF** 25 to 30 Spaces	**14,500 SF** 30 to 40 Spaces	**22,000 SF** 40 to 50 Spaces

Note: + denotes additional facilities per applicable planning period.

Source: Talbert & Bright, Inc. Terminal Facility Requirement Summary – December, 2004.

The following is a brief summary of improvements:

Terminal Building: The present building is sufficient to accommodate pilot, passenger and visitor demands during normal peak usage. **However, expansion or replacement of the terminal building is being contemplated within the next 5 to 10-years, as the existing building has structural problems and would become less adequate for more frequent business/corporate-related users.**

Siting factors considered in terminal building location include:

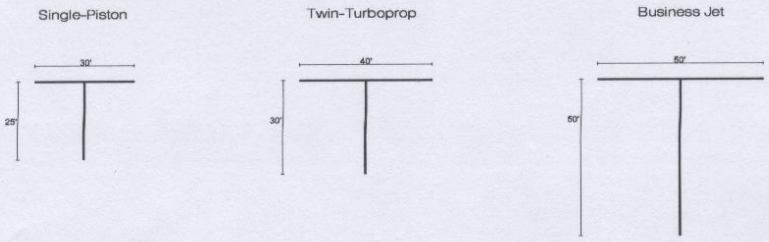
* Transition from old to new terminal building
* Size and cost of apron expansion needed to front new terminal building
* Aircraft towing distance between building and hangars
* Ample apron depth for the turning radius of large jets
* Line-of-sight from building to airfield and Airport entrance road
* Quantity of earthwork and site preparation
* Paved slope gradients & ability to pave taxiway fillets
* Relocation of Airport fuel storage & dispensing
* Capability to have covered drive-up curbside auto parking
* Relocation of Airport vault & beacon
* Location of utilities / and potential relocation & hook-up

Apron: The main apron requires expansion to accommodate large aircraft parking positions and maneuvering areas, including parking space for re-fuelings. The 48,000 SF (160′ x 300′) apron facing the terminal building allows parking for to 1 large, or 2 small to medium-cabin business jets.

Because based aircraft are towed to-and-from the hangar by the Airport Staff, this sometimes leaves 1 parking space available for transient aircraft in front of the terminal building. This is also made difficult because the hangar access taxilane connects the main apron not far from the terminal building, and next to the auto access gate. Wingtip clearances between jets do present maneuvering problems. The turning diameter of a large business jet is about 100′ to 125′. At minimum, future apron will support additional parking, and an exit taxiway to the proposed parallel taxiway system.

Duplin County Airport Terminal Apron

The 56,000 SF (140′ x 400′) tie-down and fueling apron south of the terminal building allows parking for up to 15 small to medium sized aircraft. This is the minimum number of parking positions as required by NCDOA, 'blue group' parking criteria. The following are typical tie-down and parking position sizes for small, medium and large aircraft. In the future, apron will likely be needed for flight training aircraft(s), and for temporary parking positions for maintenance aircraft. **Apron expansion totals an additional 40,000 to 60,000 square feet.**



Hangars: It is anticipated that nearly all based aircraft will be hangared. A variety of hangars can be expected for storing fixed and rotorcraft. Hangar development is typically tied-to aircraft waiting-list occupancy (typically 3 to 5 aircraft), favorable hangar payment/lease schedules, and rates.

The majority of hangar storage will be for 4 to 8-seat aircraft. T-hangars with 8 to 14-units are the most economical. Clearspan common/executive hangars typically range from 4,400 to 10,000 square feet, with the larger hangars housing multiple aircraft. The trend towards larger, special-purpose common hangars is expected, including those that include aeronautical businesses/office space. At minimum, at least one 120′ x 120′ (12,000 SF) hangar should be planned for such purposes.

A reasonable prospect for accommodating a future Special Aviation Service Organization (SASO) typically involves a hangar ranging from 8,000 SF to 12,000 SF. Similarly, DPL has received interest from a helicopter operator, desiring to base (hangar) one or more helicopters in the near future.

It is recommended that helicopter maneuvering and parking be separated from the fixed-wing aircraft. DPL is also interested in providing hangar space for overnight transient aircraft. Hangar #1 is currently used for this purpose.

The based aircraft potential and SASO tenant prospects would require an additional 50,000 to 80,000 SF of hangar space. In addition, existing hangar units will likely require some form of refurbishment during the planning period.

Aircraft Fuel: Total annual fuel sales average between 160,000 and 200,000 gallons. The existing fuel dispensing system provides self-service (75′ hose length), with both tanks operated by a common credit card machine. Fuel trucks are not used. **The Airport desires to separate the 100LL and Jet-A fuel dispensing areas in the future**.

Typically, when fuel transport deliveries occur less than 15 days apart, additional fuel storage capacity is required (assumes split-loads at 90% tanker capacity). **At present, the fuel transport delivery truck off-loads with access gained from the aircraft apron. In the future, it is preferred that the fuel delivery truck have a dedicated off-loading area.**

Below is a sample of common small, medium and large-cabin business jets, arranged by FAA ARC category, showing fuel capacities and hourly burn rates. The average hourly fuel burn rate is 250 gallons, as the typical business jet is flown an average of 1 to 1½ hours per flight. For single-leg fights this equates to up to 375 gallons, or 750 gallons for return trips.

Business Jet Model	ARC	Fuel Capacity	Hourly Burn
Beechcraft Beechjet 400	ARC B-II	780 Gallons	185 GPH
Cessna Citation II (550)	ARC B-II	800 Gallons	175 GPH
Cessna Citation VII (650)	ARC B-II	1,100 Gallons	225 GPH
Dassault Falcon 20	ARC B-II	1,400 Gallons	285 GPH
I.A.I Westwind II	ARC C-I	1,400 Gallons	250 GPH
Raytheon/Hawker 125	ARC C-I	1,500 Gallons	215 GPH
Challenger, 601	ARC C-II	2,500 Gallons	250 GPH
Learjet 36	ARC D-I	1,100 Gallons	200 GPH
Gulfstream IV	ARC D-II	4,400 Gallons	475 GPH
AVG. CAPACITY & BURN RATE:		**1,600 Gallons**	**250 GPH**

An additional 8,000 to 10,000 storage tank will be required for Jet-A in the next 5 to 10 years, and sooner if one or more additional turbines are based at the Airport or if existing aircraft are upgraded to a large-cabin jet(s).

Auto Parking: Additional auto parking, for peak hour periods or Airport events, will require expansion in the near-term. Auto parking for the common hangars can be expanded along Airport Entrance Road, as these hangars often incorporate employee/business office space. **Proposed additional public auto parking totals about 7,200 SF.**

Fencing / Auto Gate: Replacement and new fencing is needed within the terminal area. There are some sections of 4′ fence, which should be replaced by 8′ fence. Additional auto access gate(s) are recommended for containing future terminal area growth against unauthorized entry, and wildlife incursions.

Duplin County Airport

Airport Master Plan Update

SECTION 4

AIRPORT TERMINAL AREA ALTERNATIVES & DEVELOPMENT PLAN

SECTION 4 – AIRPORT TERMINAL AREA ALTERNATIVES & DEVELOPMENT PLAN

This Section integrates facility requirements in order to identify alternatives for future terminal area expansion. A detailed 5-year Airport Development Plan based on the preferred terminal expansion option is also included. The alternatives provide the technical basis for arriving at a single, preferred development concept to carry-forward as part of the update to the ALP drawings.

TERMINAL BUILDING/AREA ALTERNATIVES

Terminal Building Options

The building site analysis identifies the most suitable location for the Airport's terminal building, at such time a 'new' or 'replacement' building is pursued. Since the terminal building is the core of the terminal area, this analysis allows a comparison of how future demand-driven expansion of the apron, hangars, auto parking and aircraft services impacts possible building locations. From this, two (2) terminal building alternatives were considered:

- **Terminal Building Alternative #1 (existing building site)**
- **Terminal Building Alternative #2 (new building site)**

Following review and comments received by the Airport, Alternative #2 was favored as the preferred 'building' location. See alternatives on following pages.

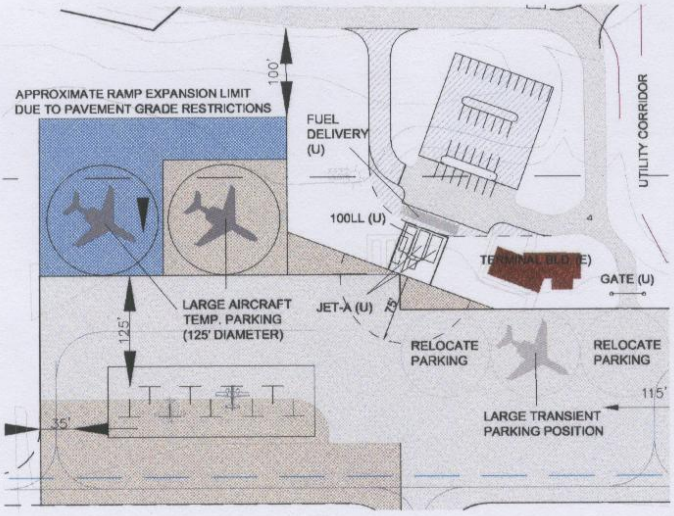
Terminal Area Options

With a preferred terminal building location, a site analysis was performed to identify the most feasible option for expanding terminal area facilities. This allows the Airport to anticipate the development of future facilities for select users, identify the short and long-term space allocation for key terminal area components, determine future Airport property interests and assign a priority to planned improvements. From this, two (2) terminal area alternatives were considered:

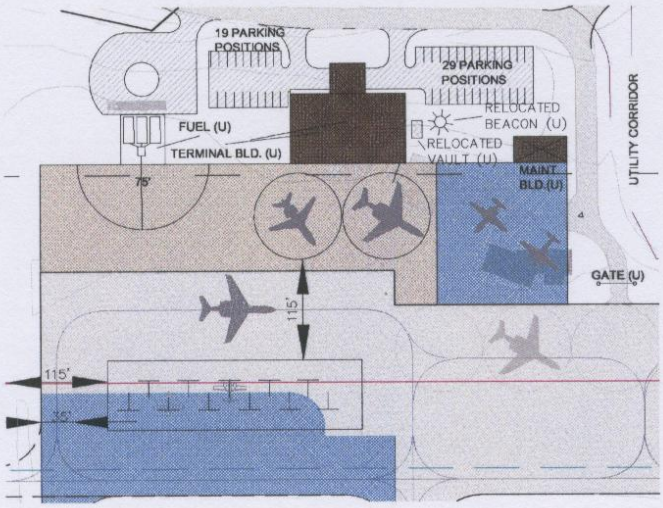
- Terminal Area Alternative #1
- Terminal Area Alternative #2

Following review and comments received by the Airport, Alternative #2 was favored as the preferred building location. See alternatives on following pages.

TERMINAL BUILDING - ALTERNATIVE #1

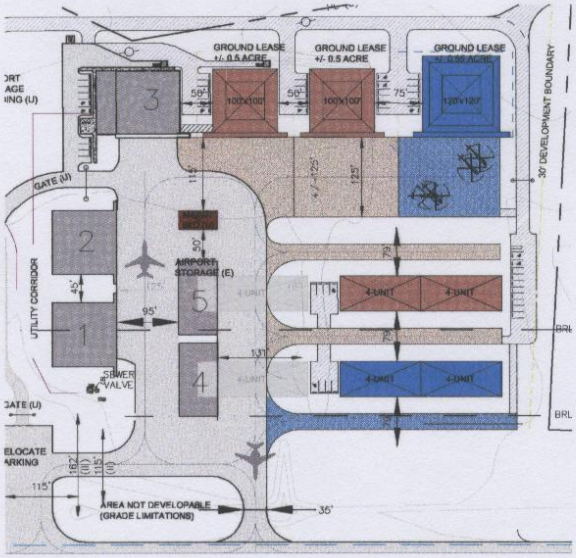


TERMINAL BUILDING - ALTERNATIVE #2

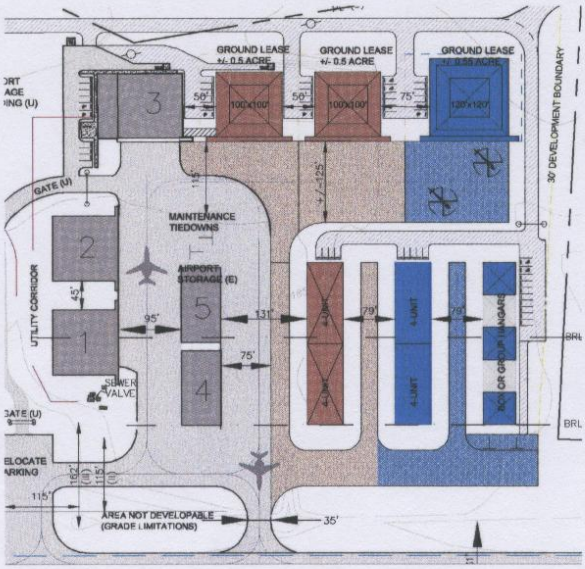


Talbert & Bright, Inc.

TERMINAL AREA - ALTERNATIVE #1



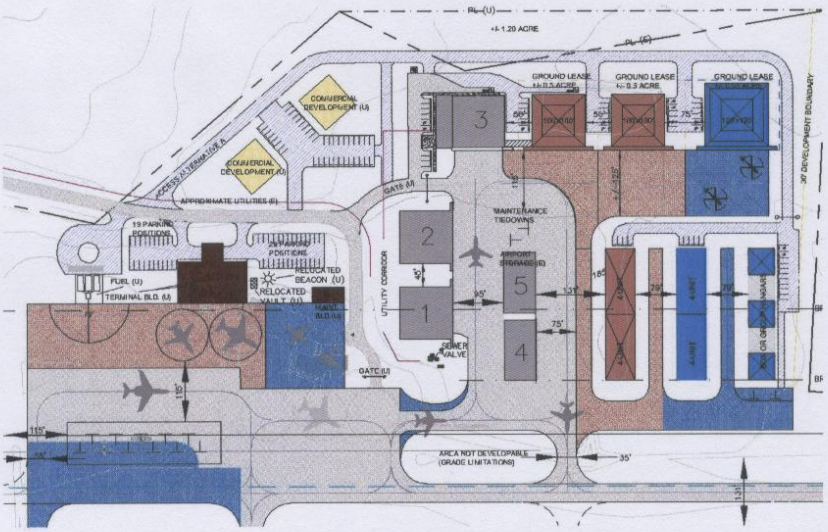
TERMINAL AREA - ALTERNATIVE #2



Talbert & Bright, Inc.

PREFERRED TERMINAL PLAN (DEPICTED ON ALP DRAWINGS)

TERMINAL BUILDING - OPTION #2 *
TERMINAL AREA OPTION – OPTION #2 *



* Note: Ultimate site development to incorporate applicable building code standards, County planning regulations and fire code regulations. This detailed analysis to be conducted on a case-by-case basis during the engineering and design phase of project improvements and construction.

Talbert & Bright, Inc.

AIRPORT DEVELOPMENT PLAN

This Section incorporates the facility requirements into a phased 5-year airport development plan. This plan provides guidance and a strategic approach for continued maintenance, upgrade and expansion of facilities. The ALD[2] depicts proposed capital improvements as documented by the ALP Update recommendations.

The development plan is broken-down into planning phases, as follows:

- Phase 1 (0-5 Years) – Short Term Planning Period
- Phase 2 (6-10 Years) – Intermediate Planning Period
- Phase 3 (11-20 Years) – Long-Term Planning Period

Within each phase, projects are grouped into the following categories:

- Airfield
- Terminal Area

Overall, the development plan has been structured to respond to needs, and provide reasonable flexibility to meet short and long-range goals. The following page provides an outline of major projects within Phase 1 and **Table 4-1** provides the opinion of probable costs for Phase 1. **Table 4-2 and 4-3** outline the major projects within Phase 2 and Phase 3 respectively.

[2] It should be noted that the development plan does not represent an obligation of local funds, nor does it require a funding commitment without justification of demand levels; the expressed desire, intent, and ability of the Airport Sponsor to achieve airport land use compatibility, coupled with favorable community and business support of the airport, remains an important funding consideration.

PHASE 1 (0-5 YEARS)
AIRPORT DEVELOPMENT PROGRAM

AIRFIELD

Land Acquisition/Glide Slope/Precision Approach

Note: Property acquisition expected to consist of a combination of fee-simple and avigation (air right) easements.

South Parallel Taxiway 'A' & By-Pass Taxiway
Grading, Paving, Lighting

Widen Runway 5-23 from 75' to 100'
Relocate/Install MIRL
Relocate PAPI-2L – Runway 23 End
Mark Runway

Strengthen Runway 5-23 from 50,000 DWG to 80,000 DWG

Establish GPS LNAV/VNAV Approach Procedures – Runway 23
Remove obstructions

Install MALSR Approach Lighting System

TERMINAL AREA

Apron Expansion
Relocate Vault, Fuel Farm, Beacon

Construct New Terminal Building

Terminal Area Public Auto Parking

Airport Equipment/Maintenance Building

Table 4-1: Estimated Project Costs (0-5 Year Development Program)

Year	Project Description	Estimated Project Cost *
AIRFIELD		
2008	South Parallel Taxiway	$900,000
2009	Widen Runway 5-23 from 75' to 100': 50,000 lbs. DWG	$1,500,000
2010	Overlay/Strengthen Runway 5-23 - 50,000 to 80,000 lbs. DWG	$1,450,000
2011	Acquire Land for Glide Slope Critical Area, Glide Slope Equipment and required grading for a precision approach	$3,000,000
2012	Install MALSR Approach Lighting System	$800,000
TERMINAL AREA		
2008	Airport Equipment/Maintenance Building	$100,000
2009	Construct New Terminal Building	$850,000
2009	Terminal Area Auto Parking	$125,000
2009	Apron Expansion	$500,000
	TOTAL (0-5 YEARS)	**$9,225,000**

Source: TBI, Development Cost Estimates for TIP – December, 2006.

Table 4-2: 6-10 Year Development Program

Year	Project Description
6-10	Purchase Property – BRL
6-10	Install Wildlife Perimeter Fence
6-10	Grade/Expand Main Apron (PCC)
6-10	Relocate Existing Jet-A Fuel Tank
6-10	Construct Common Hangar/Apron/Access/Utilities
6-10	Construct T-Hangar Unit/Taxiway
6-10	Install New 8,000 to 10,000 Gallon Jet-A Tank

Source: TBI, Development Estimates – October 2005.

Table 4-3: 10+ Year Development Program

Year	Project Description
10+	Purchase Property
10+	Construct Mid-Field Exit Taxiway
10+	Relocate/Grade Localizer & Shelter Beyond OFA
10+	Terminal Area Fence & Auto Gate
10+	Grade/Expand Main Apron (PCC)
10+	Construct Common Hangar/Apron/Access/Utilities
10+	Construct T-Hangar Unit/Taxiway
10+	Refurbish Airport Beacon
10+	Refurbish Airport AWOS-3
10+	Refurbish Apron Lighting
10+	Overlay Airport Entrance Road
10+	Rehabilitate Medium Intensity Edge Lights
20+	Remove/Relocate SR 1380 Beyond OFA

Source: TBI, Development Estimates – October 2005.

Duplin County Airport

Airport Master Plan Update

SECTION 5

AIRPORT LAYOUT PLAN DRAWINGS AND AIRPORT ORDINANCES

SECTION 5 - AIRPORT LAYOUT PLAN DRAWINGS AND AIRPORT ORDINANCES

This Section includes the full set of ALP Update drawings. The proposed improvements include projects recommended to meet safety and demand-related needs throughout the 20-year planning period.

The ALP drawings are the result of discussions with local, state and federal officials to determine the optimum plan to create a safe, efficient, economical and durable facility. In addition, the ALP drawings have been updated to reflect airport design standards in accordance with FAA Advisory Circular 150/5070-6A, *Airport Master Plans*, 150-5300-13, *Airport Design* (Change #8), and in conformance with the FAA-ATL-ADO Airport Layout Plan Checklist (May, 2004).

The following are the ALP drawing sheets updated as part of this plan:

- Sheet 1 - Airport Layout Drawing
- Sheet 2 - Terminal Area Drawing
- Sheet 3 - Airport Airspace Drawing
- Sheet 4 - Inner Approach (Runway 5 End) Drawing (E/U)
- Sheet 5 – Inner Approach (Runway 23 End) Drawing (E/U0
- Sheet 6 – Land Use Drawing
- Sheet 7 - Airport Property Map

Airport Layout Drawing (ALD)

The ALD serves as the official drawing of record for DPL. The ALD consists of a scaled single-page drawing depicting existing and planned improvements throughout the 20-year Airport Development Plan. Specifically, the ALD depicts the limits of airport property interests, land uses and configuration of facilities in compliance with geometric design separation and clearance standards, including airspace and navigational (NAVAID) facilities. Existing or future deviations/ modifications to standards, if applicable, are appropriately noted.

Major components of the ALD include:

- Depiction of Airport Facilities and Land Use;
- Basic Data Table;
- Runway Data Table;
- Modification to Airport Design Standards (none noted);
- General Notes; and
- Wind Rose Data and Crosswind Coverage Data

Terminal Area Drawing

A scaled drawing depicting close-in terminal area features for the airside and landside layout. The drawing shows required separation requirements and design standards, and includes general notes, data sources, and a legend noting key drawing symbols. Key facilities shown on the drawing include:

- Apron Configuration and Aircraft Parking Positions;
- Aircraft Taxiways and Taxilanes;
- Airport Terminal Building;
- Terminal Roadway Circulation and Auto Parking;
- Aircraft Hangars and Airport Buildings;
- Fueling Facilities;
- Fencing;
- Airport Storage Facilities;
- Commercial/Tenant Operating Areas; and
- Reserved Terminal Area Space for Long-Term Development.

Airport Airspace Drawing

A scaled drawing identifying the limits of recommended land use control for the height of objects surrounding the Airport. Airspace features correspond with the ultimate runway dimension as depicted on the ALD. A digital USGS base map at a scale of 1" = 2,000' is used as the base map, in which each of the Federal Aviation Regulations (FAR) Part 77, Subpart C imaginary surfaces (primary, horizontal, conical, approach and transitional) is depicted in plan and profile view. The approach surface is depicted in full-length view using 50-foot contour intervals. An obstruction data table provides structure disposition per existing and future FAR Part 77 surfaces. In addition, the drawing includes an isometric cut-away view of airspace features, general notes, data sources, and a legend for key drawing symbols.

Inner-Approach Drawing(s)

A scaled drawing depicting close-in plan and profile approach features beyond each runway end. The drawing identifies obstruction and non-compatible land uses within the runway protection zone and airspace surfaces extending beyond runway centerline. Airspace surfaces are depicted for disposition of obstructions to navigable airspace. The limits of drawing extend to a point where the FAR Part 77, Subpart C approach surface reaches 100′ height above the runway end elevation. Obstructions are indexed in plan and profile view, with an obstruction table used to denote existing and future obstructions to FAR Part 77 surfaces. The recommended mitigation of obstructions are noted, to correspond with the Airport's development plan. A general note section includes data sources and applicable reference. A legend is used to note key drawing symbols.

Land Use Drawing

A scaled drawing depicting existing and planned land uses, both on and off the Airport. The drawing provides recommended land uses for aviation and non-aeronautical land uses within the Airport vicinity, as designated by local planning and ordinances. The following are major items depicted on the drawing:

- Airfield Operating Areas;
- Terminal Area;
- Ground Access System;
- Other Aeronautical and Non-Aeronautical Uses; and
- Surrounding Land Use Areas/Designations

Airport Property Map

A scaled drawing depicting airport property interests as consistent with the ALD. This drawing documents past Airport land acquisition, including fee-simple and easement tracts, and summarizes how theses tracts have been acquired or released (i.e., federal funds, surplus property, local funds, etc.). A drawing table lists an inventory of all Airport property parcels by number; including the grantor, grantee, type of interest, acreage, grant project number, purpose, and book, page and date of recording.

Airport Ordinances

Airport Sponsors accepting federal grant funds must comply with grant assurances specified by the FAA and NCDOA, including, to the extent reasonable, ensuring compatibility of land uses around the Airport with existing and future aircraft operations.

Statutory Authority

Duplin County has enacted zoning controls around the Airport to promote compatibility between surrounding land uses and Airport operations. Duplin County has jurisdiction to control land uses for public-use airports according to North Carolina Statute 63-31, which states:

> "Every political subdivision may adopt, administer, and enforce, under the powers and in the manner and upon the conditions hereinafter prescribed, airport zoning regulations, which regulations shall divide the area surrounding any airport within the jurisdiction of said political subdivision into zones, and, within such zones, specify the land uses permitted, and regulate and restrict the height to which structures and tree may be erected or allowed to grow."

The County Board of Commissioners has adopted the following ordinance to control development within the Airport's area of influence:

- *Airport Height Restriction Ordinance*

Ordinance Administration

The Duplin County Planning Department is the governmental authority that evaluates permits for land use based on the Airport Height and Land Use Ordinances. The Duplin County Planning Department and Airport Commission must jointly approve building permit applications requiring a variance from the respective ordinances. The Duplin County Planning Administrator may issue a permit once the requisite approval is received from the Planning Department and Airport Commission. Both ordinances may be amended, as needed.

Existing Duplin County Zoning Regulations

Duplin County has no official Land Use Plan; however, the County adopted a Subdivision Regulation in 2003 to establish procedures and standards for the development and subdivision of land within its territorial jurisdiction.

The County has also developed a Land Use Classification Map. This map designates the Duplin County Airport in a 'transitional' zone, which is an area considered suitable for urban development. A principal reason for this classification is the availability of municipal water, sewer, and three-phase power at the Airport. The transition zone encompasses the airfield and terminal area, extending just beyond SR 1301 (Bowdens Road) and SR 1380 (Best Road). The current density standards and minimum lot sizes from the *Duplin County Subdivision Regulation* are summarized below. To the extent possible, the Airport Land Use Ordinance has been structured for consistency with the corresponding County Subdivision Regulations.

21,780 SF	Minimum area for new minor subdivision parcels of 10 lots or less
1,500 SF	Minimum townhouse lot size
12,000 SF	Minimum lot size for un-zoned parcels with public water & sewer.
21,780 SF	Minimum lost size for un-zoned parcels without public water & sewer.
25 Acres	Minimum lot size of a Planned Unit Development (PUD). Residential density determined by overall average residential density no greater than the maximum density for the particular area in the County's land use plan (sum of dwelling units divided by total gross area). A minimum of 25% dedicated to common open space.
10 Acres	Division of land into parcels where no street right-of-way is involved.
2 Acres	The division of a tract in single ownership whose entire area is not greater than two (2) acres into not more than three (3) lots.

AIRPORT HEIGHT RESTRICTION ORDINANCE (OVERLAY ZONE)

Purpose and Intent

Duplin County adopted a Airport Height Restriction Ordinance in 2004 to protect the airspace around DPL. The Ordinance is used to control the height of natural and manmade objects within the prescribed ordinance boundary. The ordinance narrative specifies permit requirements for existing and proposed structures, as delineated by the ordinance map.

Ordinance Development

The overlay ordinance was created to comply with NCDOA requirements and is modeled after guidelines in FAA Advisory Circular 150/5190-48, *A Model Zoning Ordinance to Limit the Height of Objects Around Airports*. The Ordinance boundary is based on five airspace zones specified by FAR Part 77.25:

1. Primary Surface Zone
2. Transitional Surface Zone
3. Horizontal Surface Zone
4. Approach Surface Zone
5. Conical Surface Zone

The geometric dimensions are determined from the Airport's service level and instrument approach capabilities. Each Ordinance zone corresponds with the ALP Update Airspace Drawing.

Airport Height Ordinance Map

A map depicting the plan and profile boundaries of height zones used to regulate and restrict the height of structures and objects of natural growth, and otherwise regulating the use of property in the vicinity of DPL. The height zones are based on Airport elevations and coordinates. The ordinance map is GIS compatible with County property database information.

AIRPORT LAND USE ZONING ORDINANCE

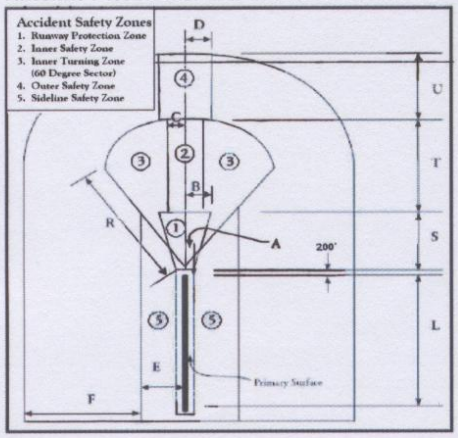
Purpose and Intent

Duplin County developed an *Airport Land Use Ordinance* to promote land use compatibility between the Airport and surrounding property. The Ordinance establishes 'safety zones' around the Airport to ensure compatibility of land uses through regulating the types and density of development within proximity to the airfield. The Ordinance specifies permit requirements for existing and proposed structures, as delineated by boundaries shown on the Ordinance map.

Ordinance Development

The boundary and dimensions of the land use safety zones used for the *Duplin County Land Use Ordinance* were modeled from National Transportation Safety Board (NTSB) research into the distribution of aircraft accidents around airports, as conducted by the California Transportation Institute (CTI). This guidance was used to establish the two-dimensional "safety zones" boundaries, which are a function of runway length as shown below.

Model Safety Zone Diagram



SAFETY ZONE DIMENSION

DIMENSION	RUNWAY LENGTH CATEGORY
	Runway 6,000' or more
A	500'
B	875'
C	500'
D	500'
E	1000'
F	5000'
R (60° Sector)	5000'
S	2500'
T	2500'
U	5000'

The five (5) safety zones identified in the Duplin County Ordinance include:

Airport Safety Zone 1 – Runway Protection Zone (RPZ)
Airport Safety Zone 2 – Sideline Safety Zone
Airport Safety Zone 3 – Inner Safety Zone
Airport Safety Zone 4 – Inner Turning Zone
Airport Safety Zone 5 – Outer Safety Zone

The regulated land uses, or limitation, specified within each safety zone were determined from similar land use ordinance adopted by other Airport Sponsors, as modified for Duplin County through recommendations provided by the Planning Board, and input received through public opportunity.

Within each safety zone, conformity with compatible land uses was categorized by six (6) major land use classifications, as follows:

- Agriculture, Farming & Animal Keeping
- Public Use Facilities, Institutions & Utilities
- Residential
- Commercial Recreational
- Commercial Business, Retail & Services
- Commercial Industrial, Manufacturing & Warehousing

Each major land use classification contains a categorization of minor types of developments which could reasonably be expected or proposed in the vicinity of the Airport. For each safety zone, the limitations for each minor category were assigned one of the following conforming or non-conforming recommendations, for which a building permit would be accepted or denied:

Permitted Use: The associated land use groups are at a level of intensity or density, or location, which is not considered to present a significant risk to the safety of persons on the ground or to persons in aircraft overflying the proposed use (refer to 'Y' Conditional Use in Land Use Matrix Table).

Conditional Use (Special Permit): A permit issued by the Planning Board that authorizes the recipient to make use of property in accordance with the requirements of this Ordinance as well as any additional requirements imposed by the Planning Board (refer to 'C' Conditional Use in Land Use Matrix Table).

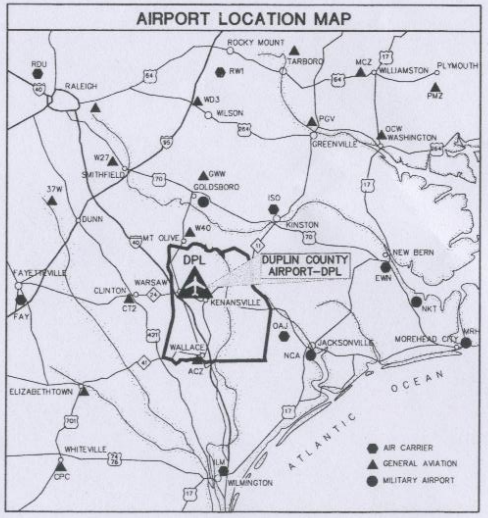
Prohibited Use: The associated land use groups are at a level of intensity or density, or location, which presents a significant risk to the safety of persons on the ground or to persons in aircraft overflying the proposed use (refer to 'N' Conditional Use in Land Use Matrix Table).

Airport Land Use Ordinance Map

A map depicting, in plan view, the boundaries of airport impact zones used to ensure compatibility of land uses and development densities, and otherwise regulating the use of property in the vicinity of the Duplin County Airport. The ordinance map is GIS compatible with County property database information.

AIRPORT LAYOUT PLAN DRAWINGS

DUPLIN COUNTY AIRPORT (DPL)
DUPLIN COUNTY, NORTH CAROLINA

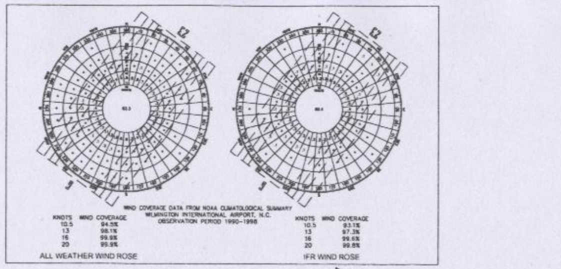


DRAWINGS:

SHEET NO. 1 AIRPORT LAYOUT PLAN
SHEET NO. 2 TERMINAL AREA DRAWING
SHEET NO. 3 AIRPORT AIRSPACE DRAWING
SHEET NO. 4 INNER-APPROACH (RUNWAY 5 END) DRAWING (E/U)
SHEET NO. 5 INNER-APPROACH (RUNWAY 23 END) DRAWING (E/U)
SHEET NO. 6 LAND USE DRAWING
SHEET NO. 7 AIRPORT PROPERTY MAP

JANUARY 2007
NCDOT DOA PROJECT NO.: 36237.13.4.1
DUPLIN COUNTY PROJECT NO.: 44-7534-000
TBI PROJECT NO.: 2302-0401

TALBERT & BRIGHT
Engineering & Planning Consultants



LEGEND

EXISTING	ULTIMATE	
		BUILDINGS/STRUCTURES (PHASING ON SHEET 2)
		RESIDENTIAL/OFF AIRPORT STRUCTURES
		OTHER BUILDINGS
		PROPERTY LINE
		RUNWAY SAFETY AREA (RSA)
		BUILDING RESTRICTION LINE (BRL)
		RUNWAY OBSTACLE FREE ZONE (ROFZ)
		RUNWAY OBJECT FREE AREA (ROFA)
		RUNWAY PROTECTION ZONE (RPZ)
		AIRPORT REFERENCE POINT (ARP)
		WIND CONE AND SEGMENTED CIRCLE
		WIND TEE
		RUNWAY THRESHOLD LIGHTS
		RUNWAY END IDENTIFIER LIGHTS (REIL)
		VISUAL APPROACH SLOPE INDICATORS (VASI)
		PRECISION APPROACH PATH INDICATORS (PAPI)
		MEDIUM APPROACH LIGHTING SYSTEM (MALSR)
		LOCALIZER ANTENNA MAST
		ROTATING BEACON
		GLIDE SLOPE ANTENNA
		AUTOMATED WEATHER OBSERVATION STATION (AWOS)
		HOLD POSITION MARKING
		FENCING
		GROUND CONTOUR
		CREEK/INTERMITTENT DRAINAGE
		ROADWAY
		BENCHMARK
		NON-DIRECTIONAL RADIO STATION (NDB)
		AUTO ACCESS GATE
		TREE(S)/WOODED AREA
		AIRPORT PAVED AREAS

NOTES

EXISTING AIRPORT REFERENCE POINT – BEGINNING AT THE SOUTHWEST END OF THE NORTHEAST–SOUTHWEST RUNWAY 5–23, THENCE ALONG THE CENTERLINE N36°21'09"E (TRUE) 3001' TO THE ARP COORDINATES: LATITUDE NORTH 35°00'00.232" LONGITUDE WEST 77°58'54.102".

ULTIMATE AIRPORT REFERENCE POINT – BEGINNING AT THE SOUTHWEST END OF THE NORTHEAST–SOUTHWEST RUNWAY 5–23, THENCE ALONG THE CENTERLINE N36°21'09"E (TRUE) 3001' TO THE ARP COORDINATES: LATITUDE NORTH 35°00'00.159" LONGITUDE WEST 77°58'53.981".

PRIOR TO WIDENING THE RUNWAY TO 100' THE CENTERLINE WILL TRAVERSE THE MIDDLE OF THE 75' WIDE PAVEMENT AND THE RUNWAY PROTECTION ZONES (RPZ) WILL LIE ASTRIDE THE EXTENSIONS OF THIS LINE. THE LOCATIONS OF THE ULTIMATE CENTERLINE AND RPZ CORRESPOND TO THE 100' WIDE RUNWAY.

GEODETIC DATA FOR RUNWAY FROM GROUND CONTROL SURVEY, PROVIDED BY: GREENHORNE AND O'MARA, INC. MAY, 1998.
5580 CENTERVIEW DRIVE, SUITE 100–BLADEN BUILDING RALEIGH, N.C.
COORDINATES ARE BASED ON NAD83 DATUM.
ELEVATIONS ARE IN FEET BASED ON NVGD29 DATUM. MEAN SEA LEVEL (MSL).

DIGITAL BASE MAPPING WAS PREPARED FROM AERIAL PHOTOGRAPHY JANUARY, 1991 BY: PIEDMONT AERIAL SURVEYORS, GEEENSBORO, N.C.

BASE MAPPING UPDATED FROM RECORD DRAWINGS BY TALBERT AND BRIGHT FOR CURRENT AIRPORT LAYOUT DRAWING & AIRPORT MASTER PLAN UPDATE.

EXISTING AIRPORT PROPERTY LINE TAKEN FROM: "DUPLIN COUNTY AIRPORT PROPERTY SURVEY". A BOUNDARY SURVEY OF THE DUPLIN COUNTY AIRPORT, SURVEYED BY RICHARD C. MARSHALL, JR., AND MAP PREPARED BY: GREENHORNE AND O'MARA, INC. JUNE, 1997.
5580 CENTERVIEW DRIVE, SUITE 100–BLADEN BUILDING RALEIGH, N.C.

THE NCDOT, DIVISION OF AVIATION CLASSIFIES DPL AS A "BLUE" GROUP AIRPORT

(E) EXISTING CONDITION

(U) ULTIMATE/FUTURE CONDITION

LOCALIZER COORDINATE DATA

EXISTING	LATITUDE NORTH	34°58'31.153"
COORDINATES	LONGITUDE WEST	77°59'06.940"
ULTIMATE	LATITUDE NORTH	34°59'30.332"
COORDINATES	LONGITUDE WEST	77°59'05.585"
SOURCE: TALBERT & BRIGHT INC.		

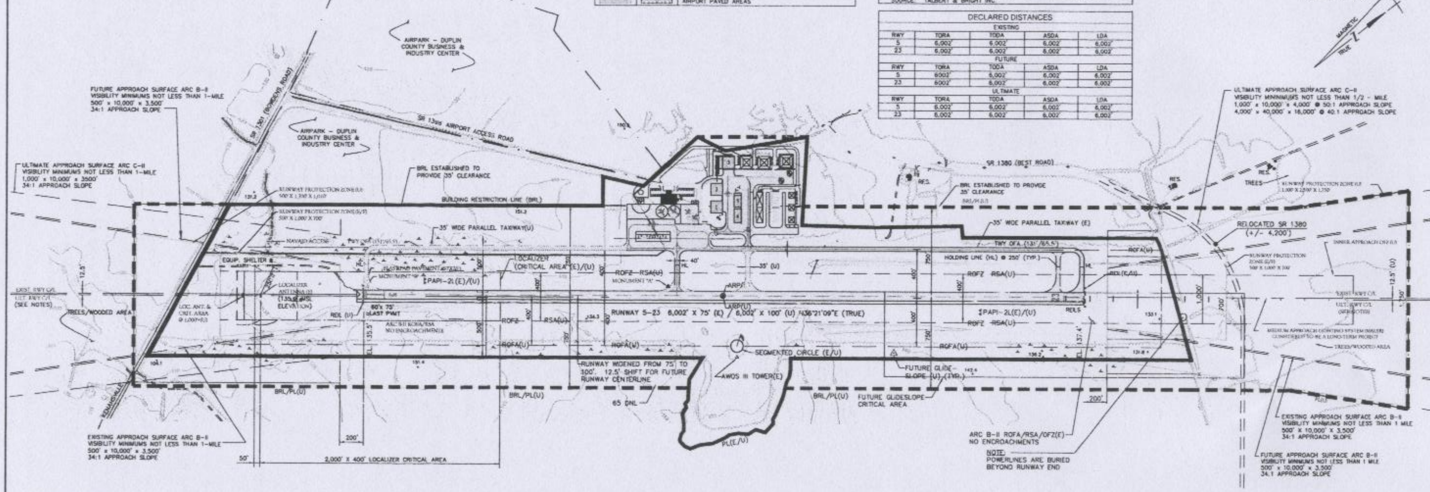
DECLARED DISTANCES

RWY	TORA	TODA	ASDA	LDA
EXISTING				
5	6,002'	6,002'	6,002'	6,002'
23	6,002'	6,002'	6,002'	6,002'
FUTURE				
5	6002'	6,002'	6,002'	6,002'
23	6002'	6,002'	6,002'	6,002'
ULTIMATE				
5	6,002'	6,002'	6,002'	6,002'
23	6,002'	6,002'	6,002'	6,002'

FAA NRA TRACKING NO. 2006-ASO-269-NRA

APPROVED
2-18-2008
N.C. DIVISION OF AVIATION

1"=400'
SCALE IN FEET



CFR PART 77 RUNWAY APPROACH AND RPZ DATA

RUNWAY END	EXISTING	ULTIMATE
5	NON-PRECISION APPROACH SURFACE VISIBILITY MINIMUMS NOT LESS THAN 1-MILE 500' X 10,000' X 3,500' 10,000' @ 34:1 SLOPE RUNWAY PROTECTION ZONE (RPZ) 500' X 1,000' X 700'	NON-PRECISION APPROACH SURFACE VISIBILITY MINIMUMS NOT LESS THAN 1-MILE 1,000' X 10,000' X 3,500' RUNWAY PROTECTION ZONE (RPZ) 500' X 1,700' X 1,010'
23	NON-PRECISION APPROACH SURFACE VISIBILITY MINIMUMS NOT LESS THAN 1-MILE 500' X 10,000' X 3,500' 10,000' @ 34:1 SLOPE RUNWAY PROTECTION ZONE (RPZ) 500' X 1,000' X 700'	PRECISION APPROACH SURFACE VISIBILITY MINIMUMS NOT LESS THAN 1/2-MILE 1,000' X 50,000' X 16,000' 10,000' @ 50:1 SLOPE 40,000' @ 40:1 SLOPE RUNWAY PROTECTION ZONE (RPZ) 1,000' X 2,500' X 1,750'

AIRPORT DESIGN STANDARDS DIMENSIONAL DATA

AIRPORT REFERENCE CODE (ARC) ITEM	EXISTING ARC B-II	ULTIMATE ARC C-II
RUNWAY SAFETY AREA (RSA) WIDTH	150'	400'
RSA BEYOND R/W END	300'	1000'
RUNWAY OBSTACLE FREE ZONE (OFZ) WIDTH	400'	400' (1)
OFZ BEYOND R/W END	200'	200' (1)
RUNWAY OBJECT FREE AREA (OFA) WIDTH	500'	800'
OFA BEYOND R/W END	300'	1000'
RUNWAY CENTERLINE TO AIRCRAFT PARKING	250'	500'
TAXIWAY CENTERLINE TO AIRCRAFT PARKING	65.5'	65.5'
HOLDING POSITION MARKING (DIST. FROM RW ℄)	200'	250'
NO RUNWAY SAFETY AREA (RSA) OBJECT PENETRATIONS (E/U)		
NO RUNWAY OBSTACLE FREE ZONE (OFZ) OBJECT PENETRATIONS (E/U)		

(1) INNER APPROACH OFZ 400' WIDTH EXTENDS 200' BEYOND LAST LIGHT UNIT IN APPROACH LIGHTING SYSTEM WITH 50:1 SLOPE

* FOR DEPICTION & CLARIFICATION PURPOSES ARC C/D STANDARDS SHOWN ON ALD ONLY.

AIRPORT DATA

ITEM		EXISTING	ULTIMATE
AIRPORT REFERENCE POINT	LATITUDE NORTH	35°00'00.23"	35°00'00.16"
(ARP COORDINATES)	LONGITUDE WEST	77°58'54.10"	77°58'53.98"
ESTABLISHED AIRPORT ELEVATION (MEAN SEA LEVEL)		137.4'	137.4'
NORMAL MAXIMUM TEMPERATURE – HOTTEST MONTH		89°F	89°F
AIRPORT REFERENCE CODE (ARC)		B-II	C-II
AIRPORT LIGHTING AIDS		BEACON/SC & LWC	BEACON/SC & LWC
AIRPORT NAVAIDS		LOC/NDB/GPS	ILS/NDB/RNAV
AIRPORT WEATHER AIDS		AWOS III	AWOS III
NCDOT, DOA GA GROUP		BLUE	BLUE
CRITICAL AIRCRAFT TYPE		CITATION V	GULFSTREAM 200

RUNWAY END ELEVATIONS FROM AS-BUILT AIRPORT LAYOUT DRAWING, DATED JANUARY, 2004 ROUNDED TO NEAREST TENTH.

NCGS MONUMENT DATA

MONUMENT A "KENANPORT"	LATITUDE NORTH	34°59'56.991"	ELEV.133.05
GEODETIC COORDINATES	LONGITUDE WEST	77°58'58.119"	
MONUMENT B "KENANPORT AZ MK"	LATITUDE NORTH	34°59'36.907"	ELEV.133.69
GEODETIC COORDINATES	LONGITUDE WEST	77°59'15.915"	
SOURCE: NORTH CAROLINA GEOLOGICAL SURVEY			

RUNWAY DATA

ITEM		EXISTING 5	EXISTING 23	ULTIMATE 5	ULTIMATE 23
COORDINATES (NAD83)	LATITUDE NORTH	34°59'36.33"	35°00'24.14"	34°59'36.25"	35°00'24.06"
	LONGITUDE WEST	77°59'15.48"	77°58'32.72"	77°59'15.36"	77°58'32.60"
RUNWAY END ELEVATION		135.5'		137.4'	
LENGTH X WIDTH		6,002' X 75'		6,002' X 100'	
EFFECTIVE GRADIENT		0.02%		SAME	
PAVEMENT SURFACE		ASPHALT		SAME	
PAVEMENT STRENGTH		30 SWG	50 DWG	70 DWG	
RUNWAY MARKING		NPI	NPI	NPI	PIR
RUNWAY EDGE LIGHTING		MIRL	MIRL	HIRL	HIRL
TAXIWAY EDGE LIGHTING		MITL	MITL	MITL	MITL
VISUAL APPROACH AIDS		PAPI-2L	PAPI-2L/REIL	PAPI-2L/REIL	PAPI-2L/REIL MALSR (LONGTERM)
INSTRUMENT APPROACH AIDS		GPS (RNAV)	LOC/GPS	GPS(RNAV)	ILS/GPS-WAAS
APPROACH VISIBILITY MINIMUMS		(NPI) 1-MILE	(NPI)1-MILE	(NPI)1-MILE	(PI)1/2-MILE
APPROACH SLOPE		34:1	34:1	34:1	50:1
TOUCHDOWN ZONE ELEVATION (TDZE)		136.4'	137.4'	136.4'	137.4'

* (SWG) SINGLE WHEEL GEAR (DWG) DUAL WHEEL GEAR

NCDOT–DOA APPROVAL OF THIS AIRPORT LAYOUT DRAWING (ALD) 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 FINISHES OF STRUCTURES. NCDOT–DOA CONCERNS ARE OBSTRUCTIONS, IMPACT ON ELECTRONIC AIDS AND ADVERSE EFFECT OF CONTROLLER VIEW OF AIRCRAFT APPROACHES AND GROUND MOVEMENTS, WHICH COULD ADVERSELY AFFECT THE SAFETY, EFFICIENCY OR UTILITY OF THE AIRPORT.

CONSTRUCTION NOTICE REQUIREMENT

TO PROTECT OPERATIONAL SAFETY AND FUTURE DEVELOPMENT, ALL PROPOSED CONSTRUCTION ON THE AIRPORT MUST BE COORDINATED BY THE AIRPORT OWNER WITH NCDOT–DIVISION OF AVIATION PRIOR TO CONSTRUCTION. REVIEW TAKES APPROXIMATELY 60 DAYS.

TALBERT & BRIGHT
ENGINEERING & PLANNING CONSULTANTS
4810 SHELLEY DRIVE WILMINGTON, NC 28405
PHONE: 910.763.5350 FAX: 910.762.6281
EMAIL: tbi@tbiam.com

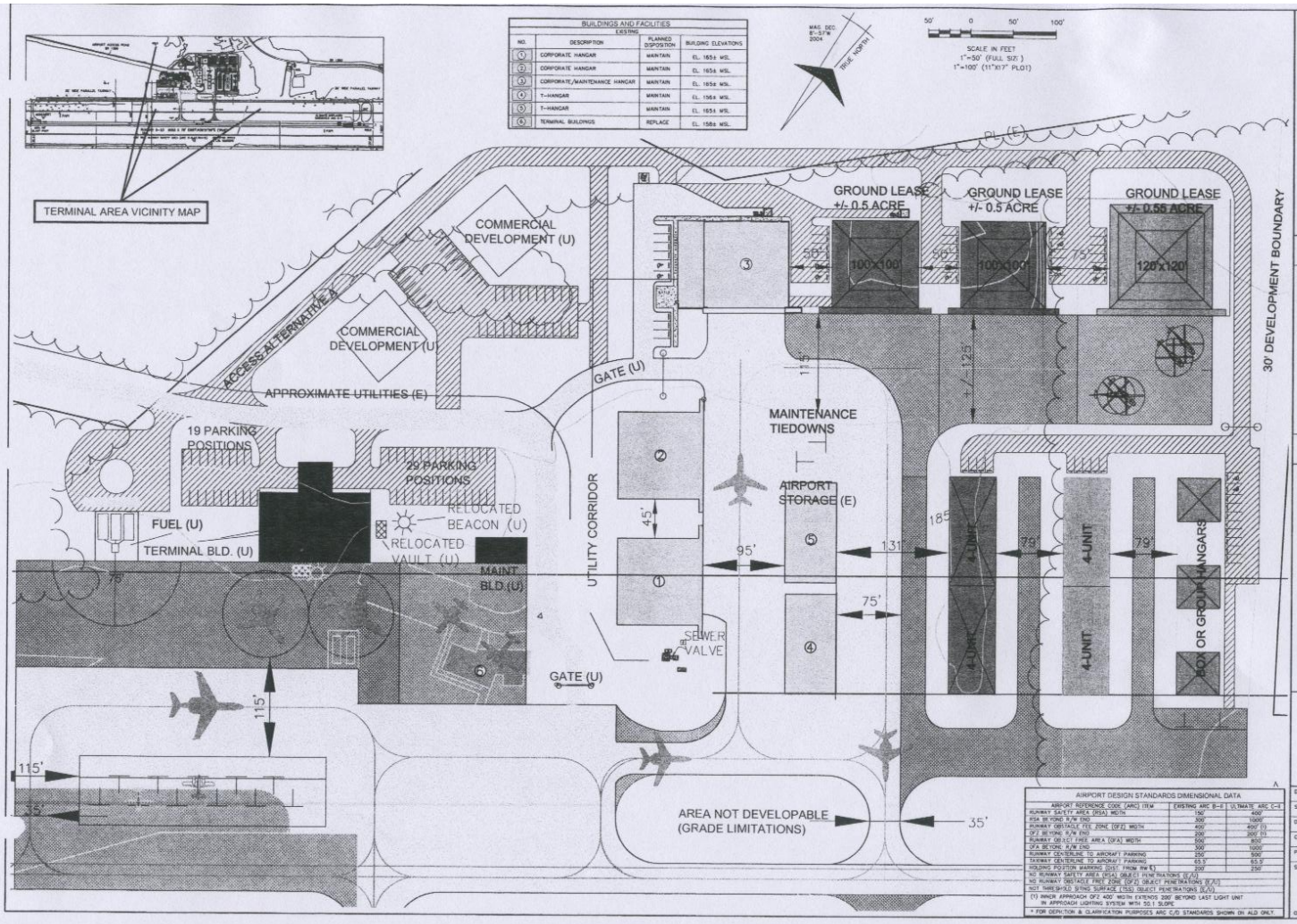
REVISIONS

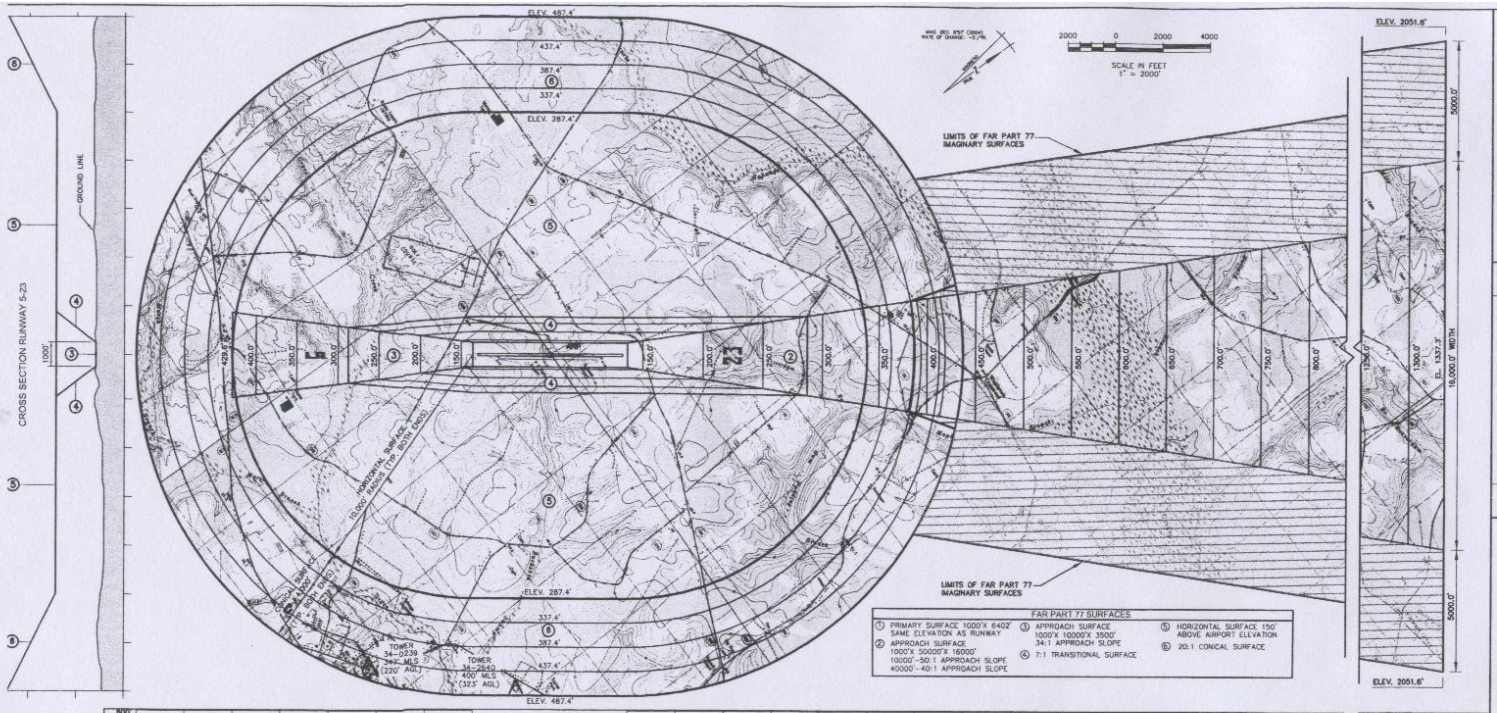
REV NO	DESCRIPTION	DATE
1	PER NCDOT PROJECT NO. [illegible]	7/08
2	PER OWNER LETTER 1/4/08	1/08
3	ALD UPDATE/ [illegible] NCDOT PROJECT NO. [illegible]	11/09
4	AMENDED UPDATE	11/10

AIRPORT LAYOUT DRAWING

DUPLIN COUNTY AIRPORT - (DPL)
DUPLIN COUNTY, NORTH CAROLINA

Representative:	
Title:	
Signature:	
Date:	
DUPLIN COUNTY AIRPORT COMMISSION	
Date	JANUARY 2007
Scale	1"=400'
Drawn	LSW
Checked	TPM
Project No.	2302-0401
Sheet No.	1
Of	SEVEN


TERMINAL AREA VICINITY MAP
BUILDINGS AND FACILITIES
EXISTING
NO. | DESCRIPTION | PLANNED DISPOSITION | BUILDING ELEVATIONS
1 | CORPORATE HANGAR | MAINTAIN | EL. 165± MSL
2 | CORPORATE HANGAR | MAINTAIN | EL. 165± MSL
3 | CORPORATE/MAINTENANCE HANGAR | MAINTAIN | EL. 165± MSL
4 | T-HANGAR | MAINTAIN | EL. 156± MSL
5 | T-HANGAR | MAINTAIN | EL. 165± MSL
6 | TERMINAL BUILDINGS | REPLACE | EL. 158± MSL
MAG. DEC. 8° 51'W 2004
TRUE NORTH
SCALE IN FEET
1"=50' (FULL SIZE)
1"=100' (11"X17" PLOT)
PL (E)
GROUND LEASE +/- 0.5 ACRE
GROUND LEASE +/- 0.5 ACRE
GROUND LEASE +/- 0.55 ACRE
100'x100'
100'x100'
120'x120'
30' DEVELOPMENT BOUNDARY
COMMERCIAL DEVELOPMENT (U)
COMMERCIAL DEVELOPMENT (U)
ACCESS ALTERNATIVE A
APPROXIMATE UTILITIES (E)
GATE (U)
19 PARKING POSITIONS
29 PARKING POSITIONS
FUEL (U)
TERMINAL BLD. (U)
RELOCATED BEACON (U)
RELOCATED VAULT (U)
MAINT. BLD. (U)
UTILITY CORRIDOR
MAINTENANCE TIEDOWNS
AIRPORT STORAGE (E)
SEWER VALVE
GATE (U)
4-UNIT
4-UNIT
4-UNIT
4-UNIT
BOX OR GROUP HANGARS
AREA NOT DEVELOPABLE (GRADE LIMITATIONS)
AIRPORT DESIGN STANDARDS DIMENSIONAL DATA
AIRPORT REFERENCE CODE (ARC) ITEM | EXISTING ARC B-II | ULTIMATE ARC C-II
RUNWAY SAFETY AREA (RSA) WIDTH | 150' | 400'
RSA BEYOND R/W END | 300' | 1000'
RUNWAY OBSTACLE FEE ZONE (OFZ) WIDTH | 400' | 400' (1)
OFZ BEYOND R/W END | 200 | 200' (1)
RUNWAY OBJECT FREE AREA (OFA) WIDTH | 500' | 800'
OFA BEYOND R/W END | 300 | 1000'
RUNWAY CENTERLINE TO AIRCRAFT PARKING | 250' | 500'
TAXIWAY CENTERLINE TO AIRCRAFT PARKING | 65.5' | 65.5'
HOLDING POSITION MARKING (DIST. FROM RW ℄) | 200' | 250'
NO RUNWAY SAFETY AREA (RSA) OBJECT PENETRATIONS (E/U)
NO RUNWAY OBSTACLE FREE ZONE (OFZ) OBJECT PENETRATIONS (E/U)
NOT THRESHOLD SITING SURFACE (TSS) OBJECT PENETRATIONS (E/U)
(1) INNER APPROACH OFZ 400' WIDTH EXTENDS 200' BEYOND LAST LIGHT UNIT IN APPROACH LIGHTING SYSTEM WITH 50:1 SLOPE
* FOR DEPICTION & CLARIFICATION PURPOSES ARC C/D STANDARDS SHOWN ON ALD ONLY
TALBERT & BRIGHT
ENGINEERING & PLANNING CONSULTANTS
4815 SHELLEY DRIVE WILMINGTON, NC 28403
PHONE: 910.763.5350 FAX: 910.762.6231
EMAIL: talbrt@atbi.com
AIRPORT UPDATE
ALD UPDATE (INCLUDES ALL RUNWAYS EXCEPTED)
PER CURRENT & LATEST FAA STANDARDS
PER BUDGET PROJECT NO. 8.0921070
REVISIONS
REVISIONS
DUPLIN COUNTY AIRPORT - (DPL)
DUPLIN COUNTY, NORTH CAROLINA
TERMINAL AREA DRAWING
FINAL DRAWING SET
Date JANUARY 2007
Scale 1"=50'
Drawn LSW
Checked TPW
Project No. 2302-0401
Sheet No. 2
OF SEVEN



NOTES:

1. BASE MAPPING FROM USGS 7.5(M) QUADRANGLE
2. AIRPORT REFERENCE POINT – BEGINNING AT THE SOUTHWEST END OF THE NORTHEAST- SOUTHWEST RUNWAY 5/23, THENCE ALONG THE CENTERLINE N38°21'09"E (TRUE) 3001' TO THE ARP COORDINATES: LATITUDE NORTH 35°00'00.16" LONGITUDE WEST 77°58'53.98"
3. GEODETIC DATA FOR RUNWAY FROM GROUND CONTROL SURVEY, PROVIDED BY: GREENHORNE AND O'MARA, INC. MAY, 1998, 5580 CENTERVIEW DRIVE, SUITE 100–BLADEN BUILDING RALEIGH, N.C. COORDINATES ARE BASED ON NAD83 DATUM ELEVATIONS ARE IN FEET BASED ON NVGD29 DATUM, MEAN SEA LEVEL (MSL)
4. RUNWAY END ELEVATIONS FROM AS-BUILT AIRPORT LAYOUT DRAWING, DATED JANUARY, 2004 ROUNDED TO NEAREST TENTH
5. AIRPORT AIRSPACE DRAWING COINCIDES WITH AIRPORT HEIGHT RESTRICTION ORDINANCE, ADOPTED MAY, 2003
6. NO PART 77 SURFACE OBSTRUCTIONS NOTED BETWEEN BREAKLINES

TOWERS NOTED WITHIN FAR PART 77 SURFACES

FAA TWR#	MSL	AGL	FAR PART 77 SURFACE	FAR PART 77 OBSTRUCTION
34-0239	34.7'	220'	CONICAL (±450' MSL)	NO
34-2640	400'	323'	CONICAL (±450' MSL)	NO

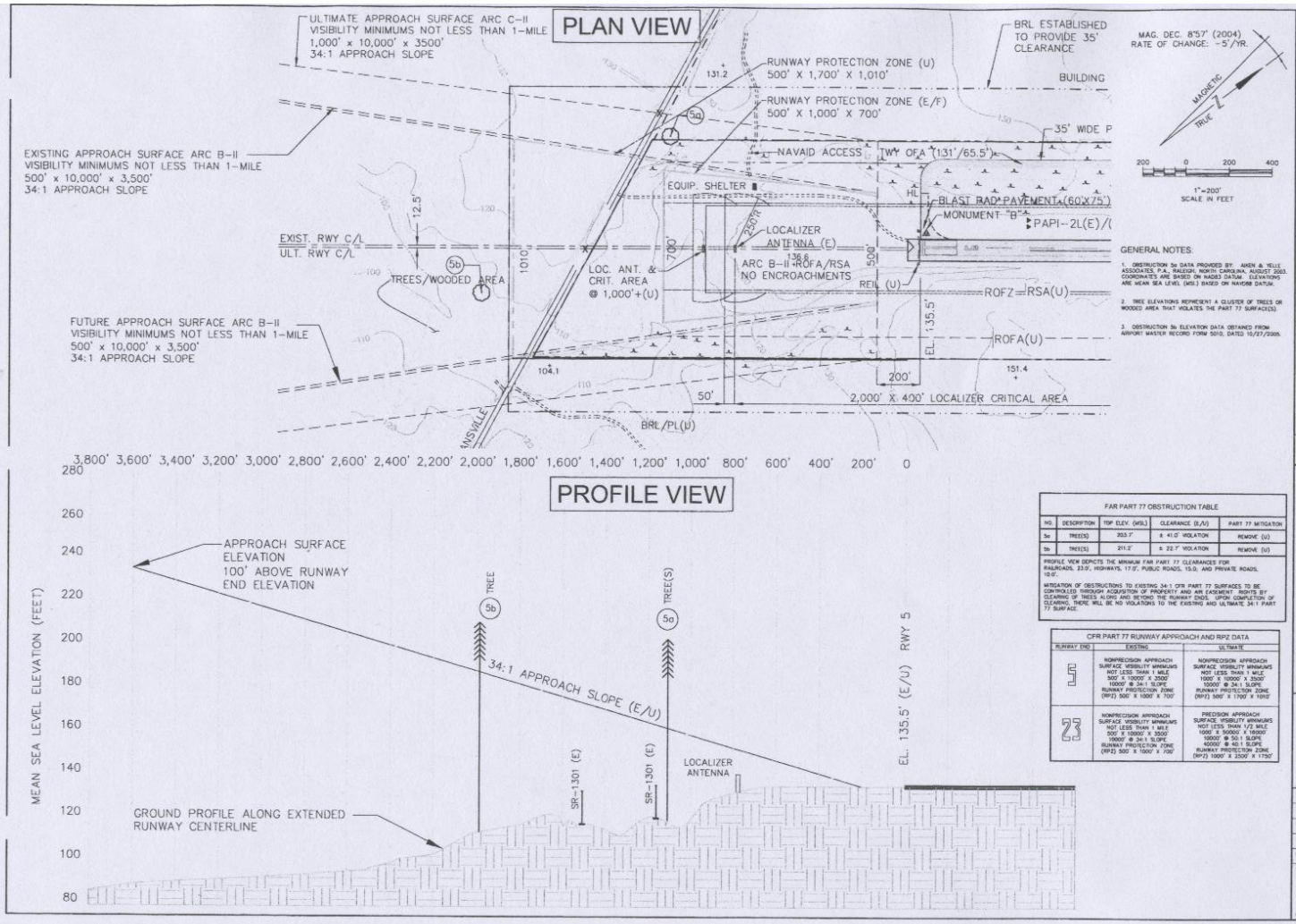
TALBERT & BRIGHT
ENGINEERING & PLANNING CONSULTANTS
4810 SHELLEY DRIVE WILMINGTON, NC 28403
PHONE (910) 313-1700 FAX (910) 762-5381
EMAIL talbert@bright.com

REV/NO	REVISIONS	DATE
4	AIP/ALP UPDATE	11/05
3	ALP UPDATE (INCLUDES NDOT PROJECT #33.9224020)	11/03
2	ALP UPDATE	7/98
1	PER NDOT PROJECT NO. 9.7424370	7/98
	DEVELOPED FROM	DATE

DUPLIN COUNTY AIRPORT - (DPL)
DUPLIN COUNTY, NORTH CAROLINA
PART 77 DRAWING

FINAL DRAWING SET

Date	JANUARY 2007
Scale	1"=50'
Drawn	LSW
Checked	TPM
Project No.	2302-0401
Sheet No.	3
OF	SEVEN



GENERAL NOTES:

1. OBSTRUCTION 5a DATA PROVIDED BY: AIKEN & YELLE ASSOCIATES, P.A., RALEIGH, NORTH CAROLINA, AUGUST 2003. COORDINATES ARE BASED ON NAD83 DATUM. ELEVATIONS ARE MEAN SEA LEVEL (MSL) BASED ON NAVD88 DATUM.

2. TREE ELEVATIONS REPRESENT A CLUSTER OF TREES OR WOODED AREA THAT VIOLATES THE PART 77 SURFACE(S).

3. OBSTRUCTION 5b ELEVATION DATA OBTAINED FROM AIRPORT MASTER RECORD FORM 5010, DATED 10/27/2005.

FAR PART 77 OBSTRUCTION TABLE

NO.	DESCRIPTION	TOP ELEV. (MSL)	CLEARANCE (E/U)	PART 77 MITIGATION
5a	TREE(S)	203.7'	± 41.0' VIOLATION	REMOVE (U)
5b	TREE(S)	211.2'	± 22.7' VIOLATION	REMOVE (U)

PROFILE VIEW DEPICTS THE MINIMUM FAR PART 77 CLEARANCES FOR RAILROADS, 23.0', HIGHWAYS, 17.5', PUBLIC ROADS, 15.0, AND PRIVATE ROADS, 10.0'.

MITIGATION OF OBSTRUCTIONS TO EXISTING 34:1 CFR PART 77 SURFACES TO BE CONTROLLED THROUGH ACQUISTION OF PROPERTY AND AIR EASEMENT RIGHTS BY CLEARING OF TREES ALONG AND BEYOND THE RUNWAY ENDS. UPON COMPLETION OF CLEARING, THERE WILL BE NO VIOLATIONS TO THE EXISTING AND ULTIMATE 34:1 PART 77 SURFACE.

CFR PART 77 RUNWAY APPROACH AND RPZ DATA

RUNWAY END	EXISTING	ULTIMATE
5	NONPRECISION APPROACH SURFACE VISIBILITY MINIMUMS NOT LESS THAN 1 MILE 500' X 10000' X 3500' 10000' @ 34:1 SLOPE RUNWAY PROTECTION ZONE (RPZ) 500' X 1000' X 700'	NONPRECISION APPROACH SURFACE VISIBILITY MINIMUMS NOT LESS THAN 1 MILE 1000' X 10000' X 3500' 10000' @ 34:1 SLOPE RUNWAY PROTECTION ZONE (RPZ) 500' X 1700' X 1010'
23	NONPRECISION APPROACH SURFACE VISIBILITY MINIMUMS NOT LESS THAN 1 MILE 500' X 10000' X 3500' 10000' @ 34:1 SLOPE RUNWAY PROTECTION ZONE (RPZ) 500' X 1000' X 700'	PRECISION APPROACH SURFACE VISIBILITY MINIMUMS NOT LESS THAN 1/2 MILE 1000' X 50000' X 16000' 10000' @ 50:1 SLOPE 40000' @ 40:1 SLOPE RUNWAY PROTECTION ZONE (RPZ) 1000' X 2500' X 1750'

TALBERT & BRIGHT
ENGINEERING & PLANNING CONSULTANTS
4810 SHELLY DRIVE WILMINGTON, NC 28405
PHONE: 910.763.5300 FAX: 910.762.6281
EMAIL: tbinfo@talbert-bright.com

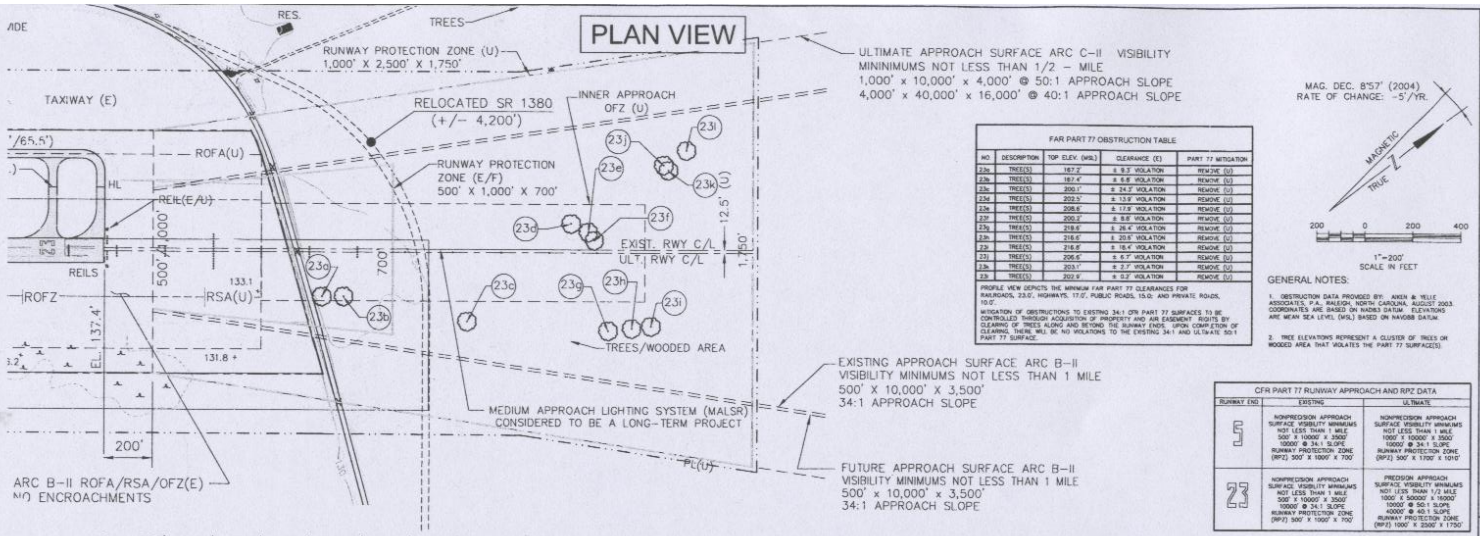
REV. NO.	DESCRIPTION	DATE
4	AIRFIELD UPDATE	11/06
3	ALP UPDATE (INCLUDES TCDOT PROJECT NO.8.0224020)	11/03
2	PER DNREF LETTER 7/14/98	7/98
1	PER FAA/DOT/FAR PART 77 & TERPS	7/98
	REVISIONS	

DUPLIN COUNTY AIRPORT - (DPL)
DUPLIN COUNTY, NORTH CAROLINA

RUNWAY 5 END
INNER APPROACH DRAWING (E/U)

FINAL DRAWING SET

Date	JANUARY 2007
Scale	1"=200'
Drawn	KAC
Checked	TPM
Project No.	2302-0401
Sheet No.	4 OF SEVEN



FAR PART 77 OBSTRUCTION TABLE				
NO.	DESCRIPTION	TOP ELEV. (MSL)	CLEARANCE (E)	PART 77 MITIGATION
23a	TREE(S)	187.2'	± 9.3' VIOLATION	REMOVE (U)
23b	TREE(S)	187.4'	± 6.8' VIOLATION	REMOVE (U)
23c	TREE(S)	200.1'	± 24.2' VIOLATION	REMOVE (U)
23d	TREE(S)	202.5'	± 13.9' VIOLATION	REMOVE (U)
23e	TREE(S)	208.6'	± 17.6' VIOLATION	REMOVE (U)
23f	TREE(S)	209.3'	± 8.8' VIOLATION	REMOVE (U)
23g	TREE(S)	218.6'	± 26.4' VIOLATION	REMOVE (U)
23h	TREE(S)	216.6'	± 20.6' VIOLATION	REMOVE (U)
23i	TREE(S)	216.8'	± 18.4' VIOLATION	REMOVE (U)
23j	TREE(S)	206.6'	± 6.7' VIOLATION	REMOVE (U)
23k	TREE(S)	203.1'	± 2.7' VIOLATION	REMOVE (U)
23l	TREE(S)	202.9'	± 0.2' VIOLATION	REMOVE (U)

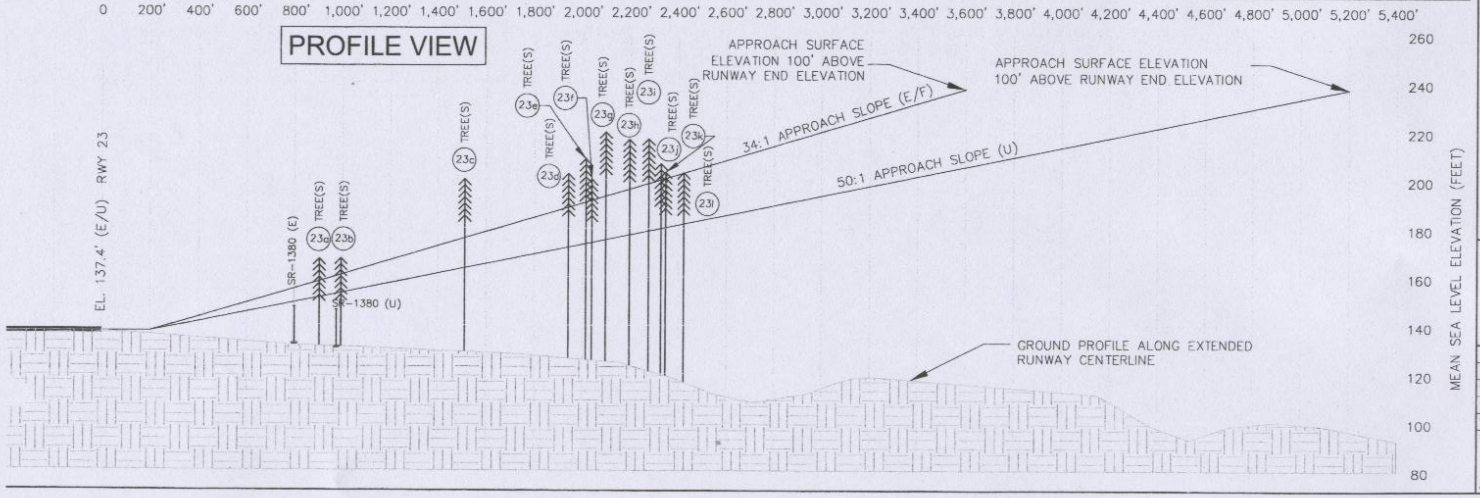
PROFILE VIEW DEPICTS THE MINIMUM FAR PART 77 CLEARANCES FOR RAILROADS, 23.0', HIGHWAYS, 17.0', PUBLIC ROADS, 15.0' AND PRIVATE ROADS, 10.0'.
MITIGATION OF OBSTRUCTIONS TO EXISTING 34:1 CFR PART 77 SURFACES TO BE CONTROLLED THROUGH ACQUISITION OF PROPERTY AND AIR EASEMENT RIGHTS BY CLEARING OF TREES ALONG AND BEYOND THE RUNWAY ENDS. UPON COMPLETION OF CLEARING, THERE WILL BE NO VIOLATIONS TO THE EXISTING 34:1 AND ULTIMATE 50:1 PART 77 SURFACE.

GENERAL NOTES:

1. OBSTRUCTION DATA PROVIDED BY: AIKEN & YELLE ASSOCIATES, P.A., RALEIGH, NORTH CAROLINA, AUGUST 2003. COORDINATES ARE BASED ON NAD83 DATUM. ELEVATIONS ARE MEAN SEA LEVEL (MSL) BASED ON NAVD88 DATUM.

2. TREE ELEVATIONS REPRESENT A CLUSTER OF TREES OR WOODED AREA THAT VIOLATES THE PART 77 SURFACE(S).

CFR PART 77 RUNWAY APPROACH AND RPZ DATA		
RUNWAY END	EXISTING	ULTIMATE
5	NONPRECISION APPROACH SURFACE VISIBILITY MINIMUMS NOT LESS THAN 1 MILE 500' X 10000' X 3500' 10000' @ 34:1 SLOPE RUNWAY PROTECTION ZONE (RPZ) 500' X 1000' X 700'	NONPRECISION APPROACH SURFACE VISIBILITY MINIMUMS NOT LESS THAN 1 MILE 1000' X 10000' X 3500' 10000' @ 34:1 SLOPE RUNWAY PROTECTION ZONE (RPZ) 500' X 1700' X 1010'
23	NONPRECISION APPROACH SURFACE VISIBILITY MINIMUMS NOT LESS THAN 1 MILE 500' X 10000' X 3500' 10000' @ 34:1 SLOPE RUNWAY PROTECTION ZONE (RPZ) 500' X 1000' X 700'	PRECISION APPROACH SURFACE VISIBILITY MINIMUMS NOT LESS THAN 1/2 MILE 1000' X 50000' X 16000' 10000' @ 50:1 SLOPE 40000' @ 40:1 SLOPE RUNWAY PROTECTION ZONE (RPZ) 1000' X 2500' X 1750'



TALBERT & BRIGHT
ENGINEERING & PLANNING CONSULTANTS
4813 SHELLEY DRIVE WILMINGTON, NC 28403
PHONE: 910-392-2200 FAX: 910-392-2207
EMAIL: tbinc@ecu.rr.com

4	AIP/ALP UPDATE	11/05	
3	ALP UPDATE (INCLUDES 1 INCH = 50 SCALE VERSION)	1/03	
2	PER ADOT PROJECT NO. 9.197240.03	2/98	
1	PER ADOT PROJECT NO. 9.197240.03	3/96	
NO.	DESCRIPTION	BY/DATE	

DUPLIN COUNTY AIRPORT - (DPL)
DUPLIN COUNTY, NORTH CAROLINA

RUNWAY 23 END
INNER APPROACH DRAWING (E/U)

FINAL DRAWING SET

Date	JANUARY 2007
Scale	1"=200'
Drawn	KAC
Checked	TPM
Project No.	2302-0401
Sheet No.	5
OF	SEVEN

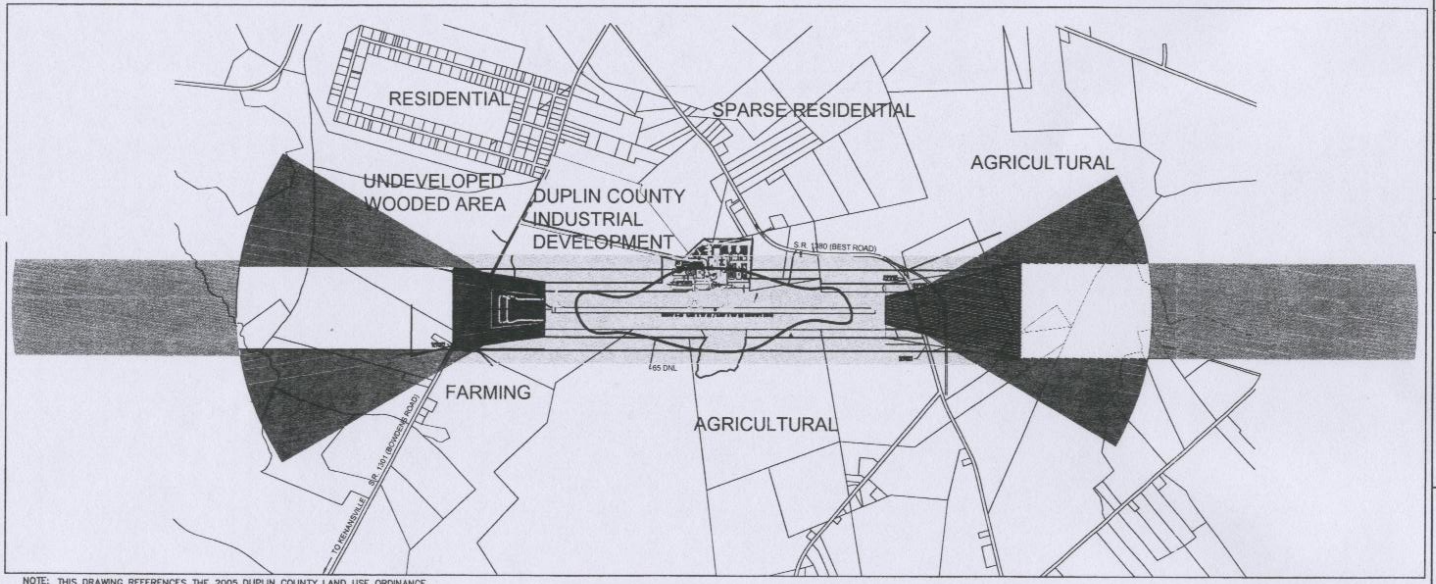
LEGEND

- ZONE 1 – RUNWAY PROTECTION ZONE
- ZONE 2 – SIDELINE SAFETY ZONE
- ZONE 3 – INNER SAFETY ZONE
- ZONE 4 – INNER TURNING ZONE
- ZONE 5 – OUTER SAFETY ZONE

BASEMAPPING SOURCE : DUPLIN COUNTY PARCEL MAPS.
ZONE DATA SOURCE : NTSB ACCIDENT INVESTIGATIONS 1984–1991

MAG. DEC. 8°-37'W 2004
TRUE NORTH

900' 0 900' 1,800' 2,700'
SCALE IN FEET
1"=900' (FULL SIZE)
1"=1,800' (11"X17" PLOT)



NOTE: THIS DRAWING REFERENCES THE 2005 DUPLIN COUNTY LAND USE ORDINANCE.

TALBERT & BRIGHT
ENGINEERING & PLANNING CONSULTANTS
4810 SHELLEY DRIVE WILMINGTON, NC 28405
PHONE: 910-392-2123 FAX: 910-763-5351
EMAIL: talbertbright@yahoo.com

REV. NO	DESCRIPTION	DATE
4	AIP/ALP UPDATE	11/05
3	ALP UPDATE (INCLUDES NDOF PROJECT NO.9-924-003)	1/03
2	PER OWNER LETTER 7/4/98	7/98
1	PER TRANSMITTAL DATED 8/18/97	1/98

REVISIONS

DUPLIN COUNTY AIRPORT - (DPL)
DUPLIN COUNTY, NORTH CAROLINA
LAND USE DRAWING

FINAL DRAWING SET

Date	JANUARY 2007
Scale	1"=900'
Drawn	LSW
Checked	TPM
Project No.	2302-0401
Sheet No.	6
of	SEVEN

LEGEND	
	AIRPORT FEE-SIMPLE PROPERTY (E)
	AIRPORT FEE-SIMPLE PROPERTY (U)
	COUNTY PROPERTY
	COUNTY PROPERTY LINE
	AIRPORT PROPERTY LINE
	ULTIMATE AIRPORT PROPERTY LINE
	LOCALIZER ANTENNA MAST
	GLIDE SLOPE ANTENNA

EXISTING PROPERTY INTERESTS

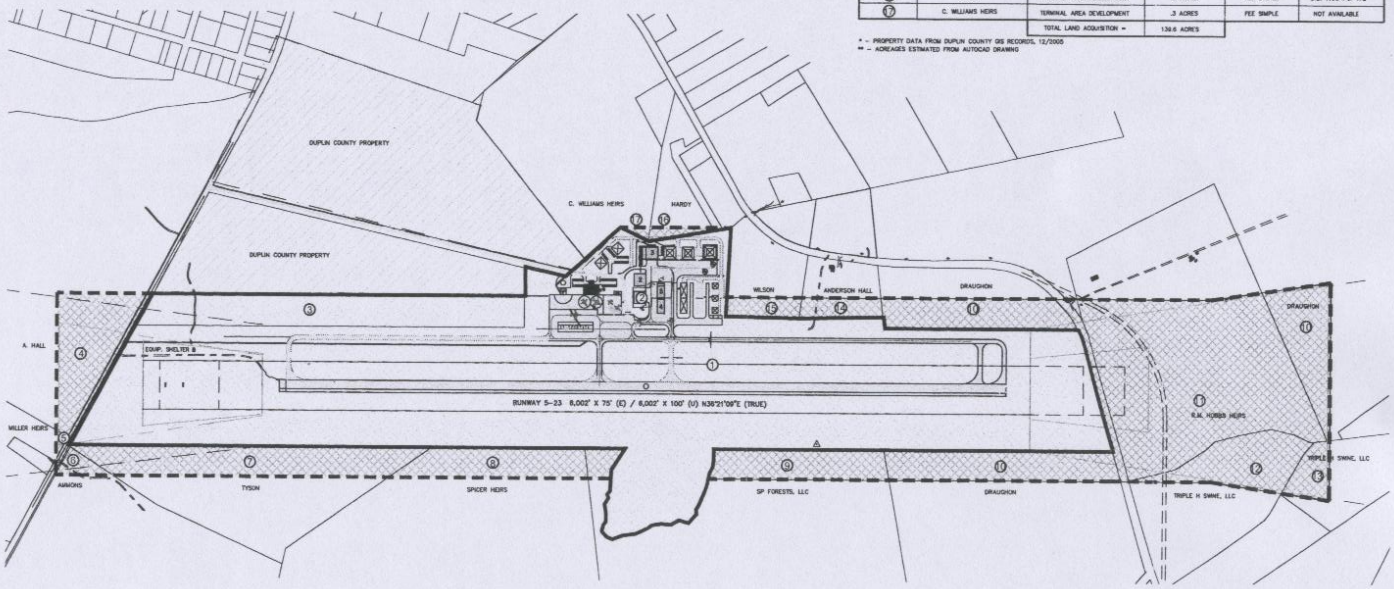
PARCEL NO.	OWNER*	USE	ACRES **	TITLE	REFERENCE
1	DUPLIN COUNTY AIRPORT COMMISSION	AERONAUTICAL USE	178.4 ACRES	FEE SIMPLE	D.B. 743 PG. 779
2	DUPLIN COUNTY	AERONAUTICAL USE	53.8 ACRES	FEE SIMPLE	D.B. 1033 PG. 181
3	DUPLIN COUNTY AIRPORT COMMISSION	AERONAUTICAL USE	18.0 ACRES	FEE SIMPLE	D.B. 1318 PG. 433
		EXISTING ACREAGE =	250.2 ACRES		

* - PROPERTY DATA FROM DUPLIN COUNTY GIS RECORDS, 11/2005
** - ACREAGES ESTIMATED FROM AUTOCAD DRAWING

FUTURE PROPERTY INTERESTS

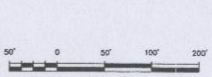
PARCEL NO.	OWNER*	USE	ACQUISITION**	TITLE	REFERENCE
4	ARTHENA HALL	BRL/RPZ PROTECTION	11.5 ACRES	FEE SIMPLE	D.B. 606 PG. 213
5	MILLER HEIRS	BRL/RPZ PROTECTION	.3 ACRES	FEE SIMPLE	D.B. 566 PG. 189
6	AMMONS	BRL/RPZ PROTECTION	1.3 ACRES	FEE SIMPLE	D.B. 639 PG. 302
7	TYSON	BRL PROTECTION	14.6 ACRES	FEE SIMPLE	D.B. 802 PG. 50
8	SPIDER HEIRS	BRL PROTECTION	8.1 ACRES	FEE SIMPLE	NOT AVAILABLE
9	SP FORESTS, LLC	BRL PROTECTION	9.3 ACRES	FEE SIMPLE	D.B. 1357 PG. 330
10	DRAUGHON	BRL/RPZ PROTECTION	28.4 ACRES	FEE SIMPLE	D.B. 1411 PG. 799
11	HOBBS HEIRS	BRL/RPZ PROTECTION	47.8 ACRES	FEE SIMPLE	NOT AVAILABLE
12	TRIPLE H SWINE, LLC	BRL/RPZ PROTECTION	8.3 ACRES	FEE SIMPLE	D.B. 1367 PG. 284
13	TRIPLE H SWINE, LLC	BRL/RPZ PROTECTION	3.0 ACRES	FEE SIMPLE	D.B. 1350 PG. 646
14	ANDERSON HALL	BRL PROTECTION	2.5 ACRES	FEE SIMPLE	D.B. 979 PG. 700
15	WILSON	TERMINAL AREA DEVELOPMENT	2.3 ACRES	FEE SIMPLE	D.B. 636 PG. 226
16	HARDY	TERMINAL AREA DEVELOPMENT	.9 ACRES	FEE SIMPLE	D.B. 1190 PG. 472
17	C. WILLIAMS HEIRS	TERMINAL AREA DEVELOPMENT	.3 ACRES	FEE SIMPLE	NOT AVAILABLE
		TOTAL LAND ACQUISITION =	139.6 ACRES		

* - PROPERTY DATA FROM DUPLIN COUNTY GIS RECORDS, 12/2005
** - ACREAGES ESTIMATED FROM AUTOCAD DRAWING



NOTES

1. EXISTING AND FUTURE LAND ACQUISITION ACREAGE IS APPROXIMATE AND ESTIMATED FROM: DUPLIN COUNTY GIS RECORDS- NOVEMBER, 2005
2. UNDERGROUND UTILITIES ARE NOT SURVEYED



SCALE IN FEET
1"=400' (FULL SIZE)
1"=800' (11"X17" PLOT)

TALBERT & BRIGHT
ENGINEERING & PLANNING CONSULTANTS
4810 SHELLEY DRIVE WILMINGTON, NC 28403
PHONE: 910.763.5300 FAX: 910.763.5301
EMAIL: tbdrive@atmail.com

REV'NO	DESCRIPTION	DATE
1	MAP FILE UPDATE	11/05
2	ALS UPDATE (INCLUDE PROJECT HOLD 93C4402)	1/06
3	PER OWNER LETTER 7/4/06	7/06
4	PER SUBDIVISION PLAT & 9/07/07	9/07

REVISIONS

DUPLIN COUNTY AIRPORT - (DPL)
DUPLIN COUNTY, NORTH CAROLINA
AIRPORT PROPERTY MAP

FINAL DRAWING SET

Date	JANUARY 2007
Scale	1"=400'
Drawn	LSW
Checked	TPW
Project No.	2302-0401
Sheet No.	7 OF SEVEN

Duplin County Airport

Airport Master Plan Update

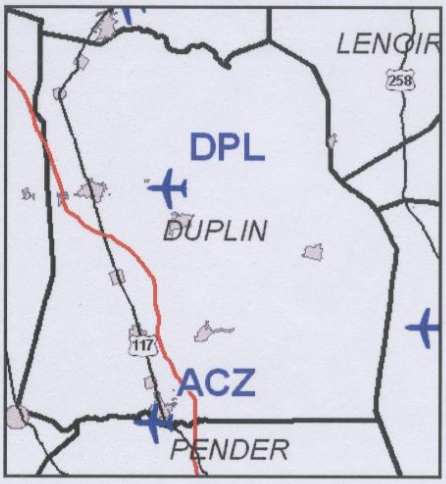
SECTION 6

ECONOMIC IMPACT OF NORTH CAROLINA AIRPORTS

Economic Impact of North Carolina Airports – 2006 Study

Duplin County Airport (DPL) ***Duplin County***

Runway: 6,002′ x 75′
Services: Charter Aircraft, General Aviation, Military Aircraft, Helicopter, Jet Fuel, Avgas, Aircraft Repair, Car Rental, Vending, Hangar Rental, Tie Down, and Observation Points.
Tenants/Users Reporting: 6 - 10



Economic impacts consist of three types: direct, indirect, and induced impacts. Direct impacts result from economic activities that result from tenants and other business users who have a direct involvement with the airport. Indirect impacts result from economic activities that typically take place away from the airport, but are still attributable to the airport. Induced impacts result from successive spending and are the multiplier effects of the direct and indirect impacts.

Duplin County Airport Economic Impact Summary

Impact Type	Jobs	Economic Impact per Year	Payroll per Year
Direct	11	$2,996,500	$689,800
Indirect	45	$5,871,400	$115,800
Induced	14	$730,900	$79,200
Total Impact	70	$9,598,800	$884,800

The airport also provides the county with a significant source of property tax revenue with 17 based aircraft at a calculated value of $24,150,000, which would result in ad valorem taxes of $185,960 based on the county rate of $0.77 per $100. This study estimated that there were 12,230 visitors to the area that utilized the Duplin County Airport.

ITRE

NCDOT DIVISION OF AVIATION

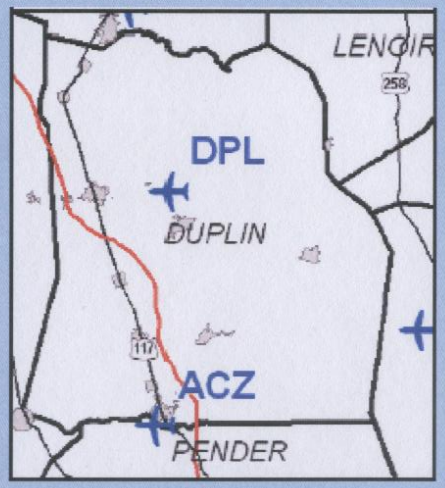
Economic Impact of North Carolina Airports 2006

Duplin County Airport DPL

Economic Impact of North Carolina Airports 2006

The economic impact of aviation and airports can be viewed from several perspectives.

- Jobs
- Transportation Access
- Economic Development



Duplin County Airport - DPL

Economic Impact of North Carolina Airports 2006

Jobs - management of the airport to mechanics at the maintenance shop

Transportation Access - Emergency medical transportation, chartered flights, personal and business trips

Economic Development - Access to an airport is high on the list of priorities for all businesses.

The NC Commerce Department tells us that one of the first questions clients ask them regards the availability of air service in the area.

Duplin County Airport - DPL

Economic Impact of North Carolina Airports 2006

Duplin County Airport
Economic Impact Totals

Jobs	70
Economic Impact per Year	$9,598,800
Payroll per Year	$884,800

Duplin County Airport - DPL

Economic Impact of North Carolina Airports 2006

The three types of economic impacts:

Direct Impact - considers economic activities that results from tenants and other business users that have a direct involvement in the airport.

Indirect Impact - considers economic activities that typically take place away from the airport, but are still attributable to the airport.

Induced Impact - considers successive spending and are the multiplier effects of the direct and indirect impacts.

Economic Impact of North Carolina Airports 2006

Economic Impact Study Overview

The purpose of this study is to describe and document the importance of a range of airport services across the state.

Surveys were mailed to airport managers, tenants, and users to obtain the number of full time employees, total revenue, and percent business activity attributed to the airport.

These results were then processed, placed into three impact categories (direct, indirect, and induced), and published.

Economic Impact of North Carolina Airports 2006

Duplin County Airport
Economic Impact Summary

Impact Type	Jobs	Economic Impact per Year	Payroll per Year
Direct	11	$2,996,500	$689,800
Indirect	45	$5,871,400	$115,800
Induced	14	$730,900	$79,200
Total Impact	**70**	**$9,598,800**	**$884,800**

Duplin County Airport - DPL

Economic Impact of North Carolina Airports 2006

Comparison Between 1996 and 2006 Economic Impact Study

Year	Expenditures	Jobs
1996	$1,058,401	14
2005	$9,598,765	69
% Change	807%	393%

Investments	
Federal	$1,119,424
State	$5,171,889
Local	$747,924
Total	$7,039,237

Duplin County Airport - DPL

Economic Impact of North Carolina Airports 2006

Economic Impact Summary

Duplin County Airport provides the county with a significant source of property tax revenue with 17 based aircraft at a calculated value of $24,150,000.

This results in ad valorem* taxes of $185,960, based on the county rate of $0.77 per $100.

An estimated 12,230 visitors came to the area that utilized the Duplin County Airport.

*based on average values per aircraft. Your actual value may vary.

Duplin County Airport - DPL

Economic Impact of North Carolina Airports 2006

1. Our airport is an important part of our community
2. Aviation is a key element of economic development because it
   - Enables economic growth
   - Creates jobs
3. The importance of aviation will continue to grow with
   - An emphasis on efficiency
   - A focus on safety
4. Aviation infrastructure funding has an outstanding return on investment

Duplin County Airport - DPL