MONTGOMERY COUNTY AIRPARK

AIRPORT LAYOUT PLAN UPDATE

FINAL REPORT

JULY 2002

PREPARED FOR:

MONTGOMERY COUNTY REVENUE AUTHORITY

DELTA
AIRPORT CONSULTANTS, INC.
engineers-planners

Austin, TX Charlotte, NC Harrisburg, PA Richmond, VA

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Chapter One
INVENTORY

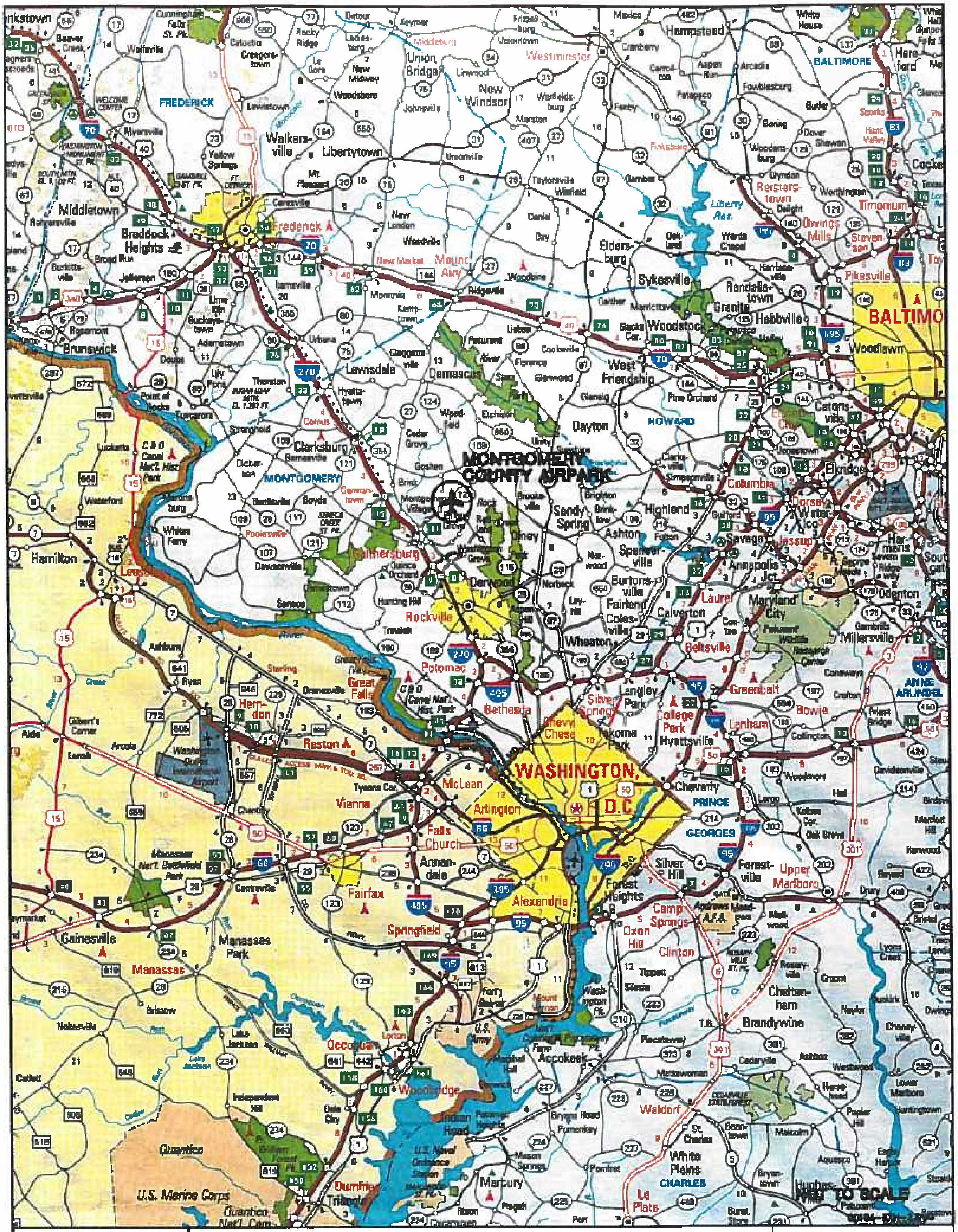
The purpose of the Airport Layout Plan (ALP) for Montgomery County Airpark is to provide the Montgomery County Revenue Authority (MCRA) with useful, understandable information and guidance to develop and maintain a safe and efficient airport. It also provides the Federal Aviation Administration (FAA) and the Maryland Aviation Administration (MAA) with information concerning the planned development at Montgomery County Airpark. The project was financed jointly by the FAA, MAA and MCRA. The inventory chapter of this report provides information pertaining to the airport history and description of existing airport facilities, is based on conditions as they existed in March 2001.

A. GENERAL INFORMATION

1. Airport Location

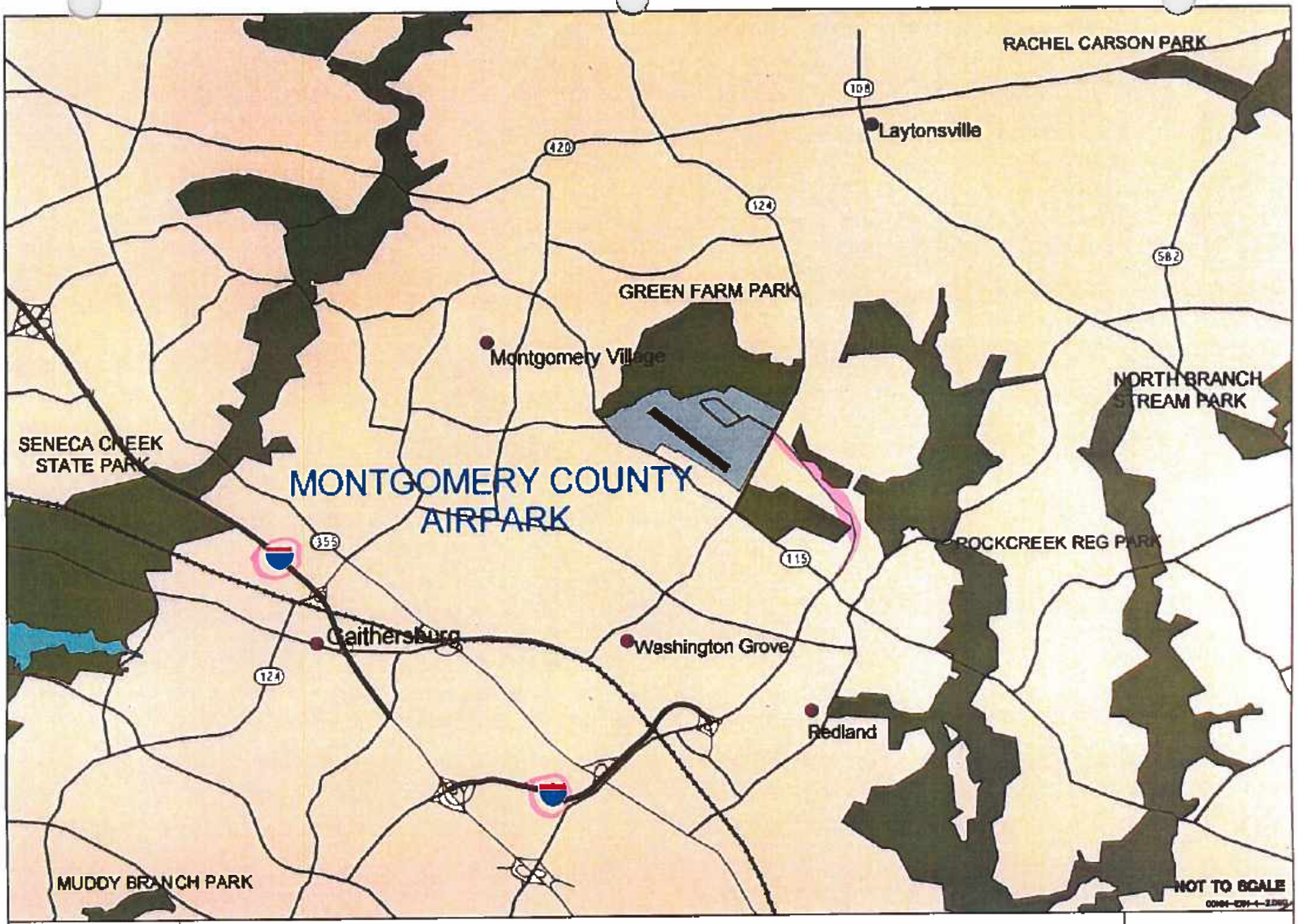
The City of Gaithersburg occupies 10 square miles in the heart of Montgomery County, Maryland. The southeastern border of the City lies just 13 miles from the northwestern border of Washington, D.C., and 18.5 miles northwest of the U.S. Capitol Building.

The Montgomery County Airpark is located in the northwestern portion of Montgomery County. It is located approximately three miles from the City of Gaithersburg and is accessible from Maryland Route 124, via Airpark Road. The Airpark is operated by Freestate Aviation, Inc. and presently consists of approximately 130 acres. The Montgomery County Revenue Authority owns the property and acts as grant sponsor for FAA funded airport improvement projects. **Exhibit 1-1**, Airpark Location Map, locates the Airpark relative to the State of Maryland and the eastern seaboard. **Exhibit 1-2**, Airpark Vicinity Map, identifies the immediate vicinity around the Airport.



MONTGOMERY COUNTY AIRPARK LOCATION MAP

EXHIBIT 1-1



MONTGOMERY COUNTY AIRPARK
VICINITY MAP

EXHIBIT
1-2

2. Airport History

Montgomery County Airpark was established in 1960 when the Montgomery County Revenue Authority (MCRA) acquired approximately 116 acres from Montgomery County Airpark, Inc. (an organization led by Mr. William E. Richardson, President, that had purchased approximately 389 acres in the surrounding area for development). An exclusive use 99-year lease was granted to Montgomery County Airpark, Inc. to construct and operate the airport. When the Airpark was constructed, emphasis was placed on rezoning the existing adjacent land, which was at the time zoned residential. This land was ultimately rezoned for industrial use, and much of the land adjacent to the Airpark developed as a conservation area. As a result, there is currently a large industrial park and other light industrial and commercial uses adjacent to, and in the vicinity of, the existing Airpark property. The original Richardson's family philosophy of combining Airpark development with surrounding compatible land use, has been accomplished.

The 1960 lease agreement was amended in 1967 to reduce the amount of property leased to Montgomery County Airpark, Inc. and remove the exclusive use provision from property not lease to the firm. The amended lease involved several property transactions around the perimeter of the airport property and resulted in approximately 125 acres dedicated airport property under control of the Revenue Authority. Approximately 38 acres of this total was leased back to Montgomery County Airpark, Inc. under the amended agreement. The Revenue Authority purchased approximately ten additional acres, with assistance from the FAA Airport Development Aid Program (ADAP) in 1980, bringing the total dedicated airport property to approximately 135 acres. No additional land acquisition or release has occurred since 1980.

3. Airport Role

Montgomery County Airpark is an airport serving general aviation. The general aviation operations are the majority of the civil aircraft operations. These operations include single-

engine and twin-engine aircraft used for flight training, as well as passenger and cargo charters using twin-engine aircraft. The Airpark had approximately 140,000 aircraft operations in 2000. There are 248 based aircraft at the Airpark, of which half are business aircraft. The Montgomery County Airpark is one the busiest airports in Maryland.

4. Airport Classification

The FAA is required to publish the "National Plan of Integrated Airport Systems" (NPIAS) as mandated by the Airport and Airways Improvement Act of 1982. This FAA planning document is intended to identify the nation's airport needs over a ten year planning period, representing a continuous planning effort. Likewise, the Maryland Aviation System Plan (MASP) identifies the state's airport needs.

Airports contained in the NPIAS are categorized by their role. The role reflects one of five basic airport service levels which describe the type of service that the airport is expected to provide to the community at the end of the five year planning period. The service level also represents funding categories for the distribution of federal aid. The five basic service levels include:

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

In addition to defining the role of the airport, the FAA has a system to correlate airport design criteria to the operating (approach speed) and physical (wingspan) characteristics of the most demanding aircraft currently using or expected to use an airport with greater than 500 annual operations. This airport classification system is contained in FAA Advisory Circular (AC) 150-5300-13. The Airport Reference Code (ARC) system is comprised of two components. The first component, depicted by a letter (A-E), designates the aircraft

approach category, determined by approach speed, and the second component, depicted by a roman numeral (I-VI), designates the airplane design group, determined by the wingspan. **Table 1-1** identifies the Aircraft Approach Categories and Aircraft Design Groups that have been established by the FAA.

The NPIAS lists Montgomery County Airpark as a Reliever Airport. The Maryland Aviation Administration (MAA) identifies the Airpark as a "primary general aviation" facility. The current airport reference code is B-II. Examples of aircraft that may typically operate at a B-II airport and their respective airport reference code classifications are listed in **Table 1-2.**

Table 1-1
Montgomery County Airpark
Approach Categories and Design Groups

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

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

Table 1-2
Montgomery County Airpark
Typical Aircraft

Aircraft	ARC	Approach Speed (Knots)	Wing Span (ft.)	Max Takeoff Weight (lbs.)
Cessna 150	A-I	55	33	1,600
Cessna 172	A-I	61	36	2,658
Beech Bonanza F33A	A-I	70	34	3,400
Piper Navajo	B-I	100	41	6,200
Beech Baron 58P	B-I	101	38	6,200
Cessna Citation I	B-I	108	47	11,850
Beech King Air B200	B-II	103	55	12,500
Cessna Citation II	B-II	108	52	13,300
Dassault Falcon 50	B-II	113	62	37,480
Gates Learjet 55	C-I	128	44	21,500

Source: FAA AC 150/5300-13 "Airport Design" & Delta Airport Consultants, Inc.

B. AIRFIELD CONFIGURATION

The existing runway and taxiway system at Montgomery County Airpark is shown in **Exhibit 1-3**.

1. Runway System

The Montgomery County Airpark has one runway (14-32), which has a northwest/southeast orientation. Runway 14-32 is 4,201 feet long by 75 feet wide. **Table 1-3** presents an inventory of the runway system.

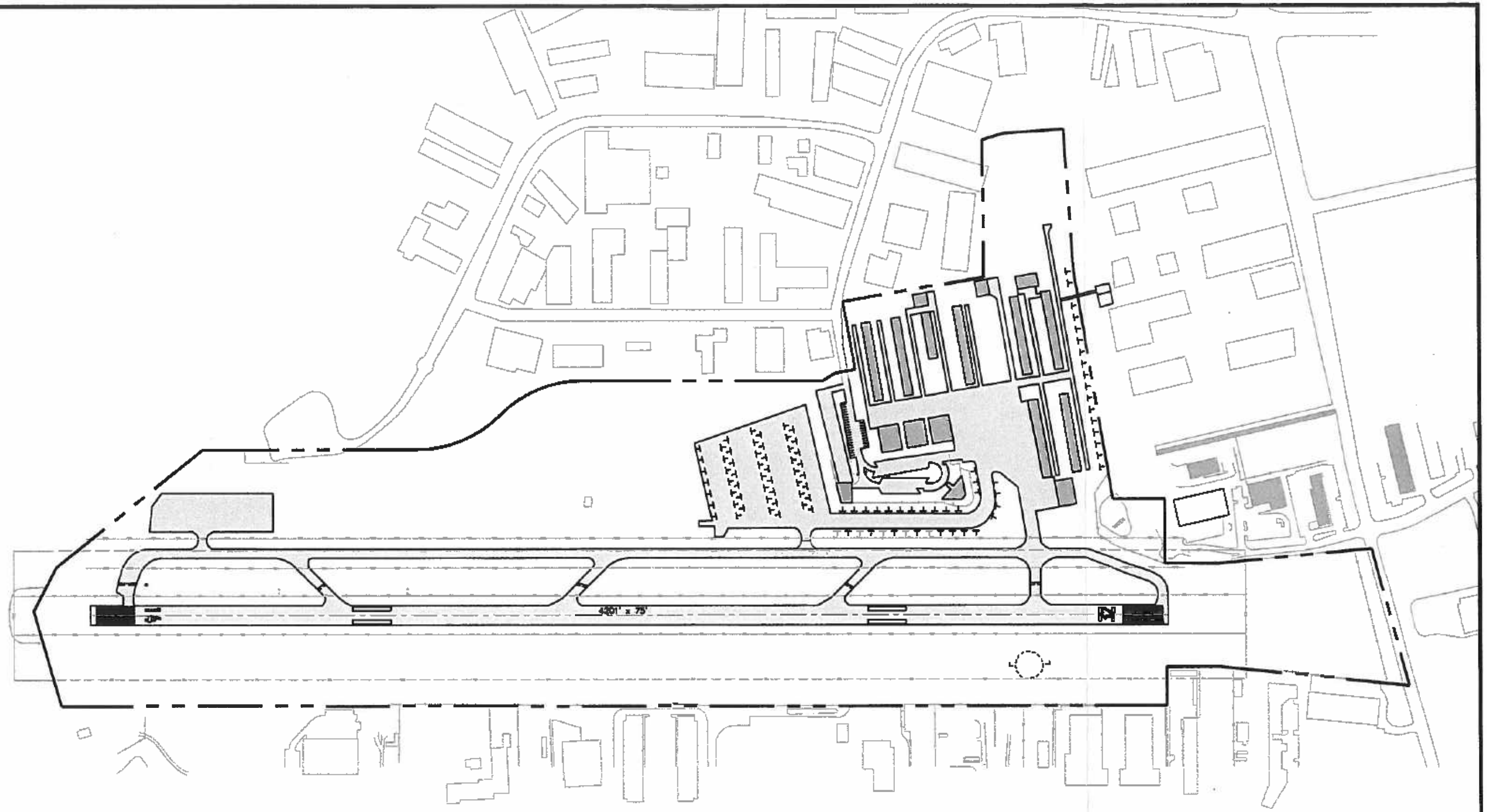
Table 1-3
Montgomery County Airpark
Runway Data

	Runway 14-32
Length	4,201'
Width	75'
Displaced Threshold	None
Field Elevation	539' MSL
Lighting	MIRL
Marking	nonprecision instrument (NPI)
Instrumentation	VASI, REIL
ARC	B-II

Source: Delta Airport Consultants, Inc.

2. Wind Analysis

The orientation of the runway to the prevailing wind direction is critical to the safe operation of aircraft, especially small, single engine aircraft which are more susceptible to crosswinds. When prevailing winds are consistently from one direction, runways are best oriented in that direction. In many cases however, a high degree of consistency of wind direction is not found, and thus the crosswind component is also evaluated to ensure acceptable wind coverage. Crosswinds are winds which tend to be perpendicular to the runway or path of an aircraft while landing or taking off. At an airport with a single runway, that runway should be oriented with respect to the prevailing winds so that at least 95 percent of the time the crosswind component does not exceed a velocity of 12 m.p.h. Where a single runway does not provide at least 95 percent coverage, a combined system of runways or a widened runway should be considered that will meet the 95 percent criteria.



MONTGOMERY COUNTY AIRPARK
AIRPORT LAYOUT

EXHIBIT
1-3

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

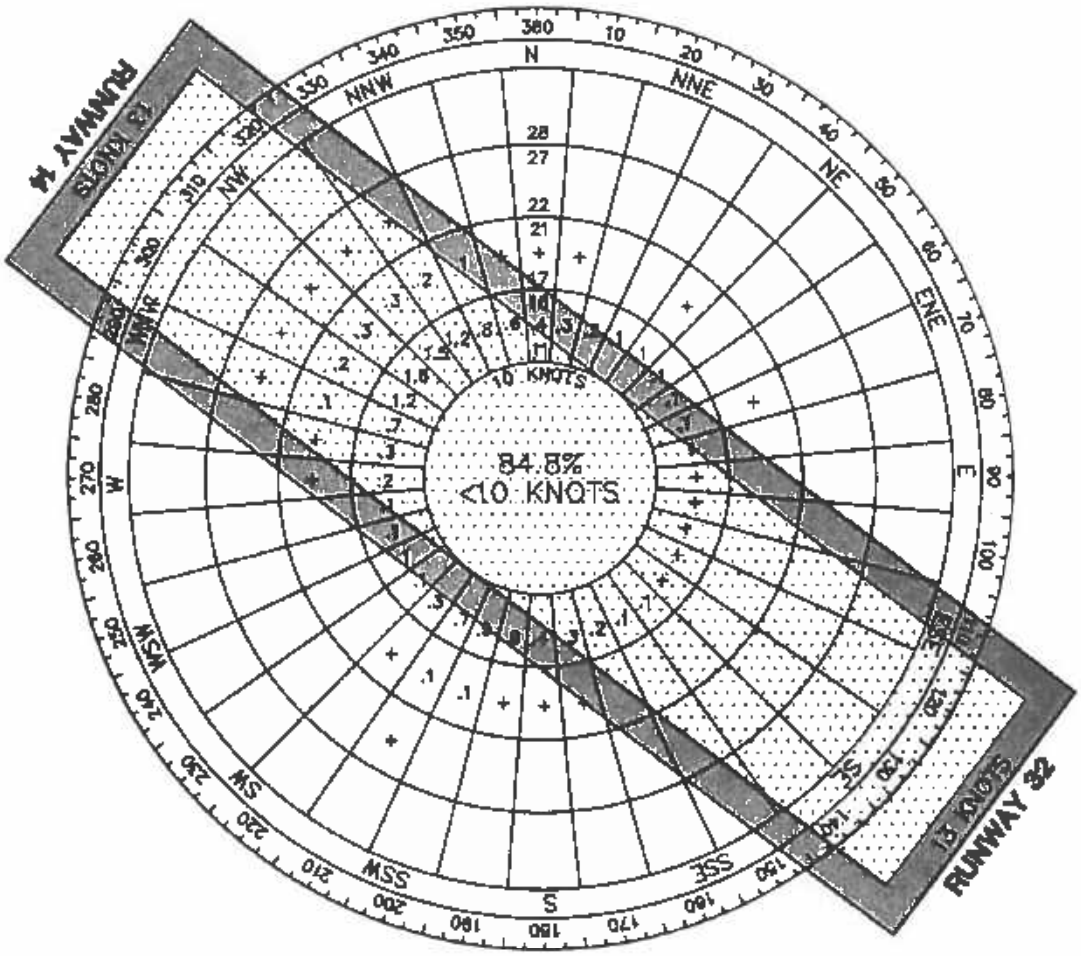
The existing and ultimate ARC classification for Montgomery County Airpark is B-II. Using the above referenced criteria, wind coverage would be computed for a 13 knot crosswind component. Although the wind coverage criteria recommends coverage based on the ARC of the runway, the runways have also been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

The primary method of analyzing wind conditions at an airport is by using a wind rose. This is shown in **Exhibits 1-4** and **1-5**. Wind data is represented on the wind rose in terms of the percentage of time winds of different velocities blow from various compass directions. The concentric circles on the wind rose indicate wind velocity in miles per hour. The radial lines on the wind rose define the compass directions from the which the winds originate. The numbers within the segments are the percentages of time and velocity the wind blows from that direction. For this Master Plan Update, wind data for the period of 1991 to 2000 was obtained from the National Climatic Data Center in Asheville, North Carolina for the Washington Dulles D.C. station. Dulles is the nearest reporting center, as wind data specific for Gaithersburg was not available in the format required for the wind analysis. This wind rose indicates that Runway 14-32 has greater than 95 percent coverage, and thus there is adequate wind coverage for the single runway.

Table 1-4
Montgomery County Airpark
All Weather Wind Coverage

Runway 14-32	10.5 Knots	13 Knots
ALLWEATHER	95.1	97.0
IMC*	94.4	97.1

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

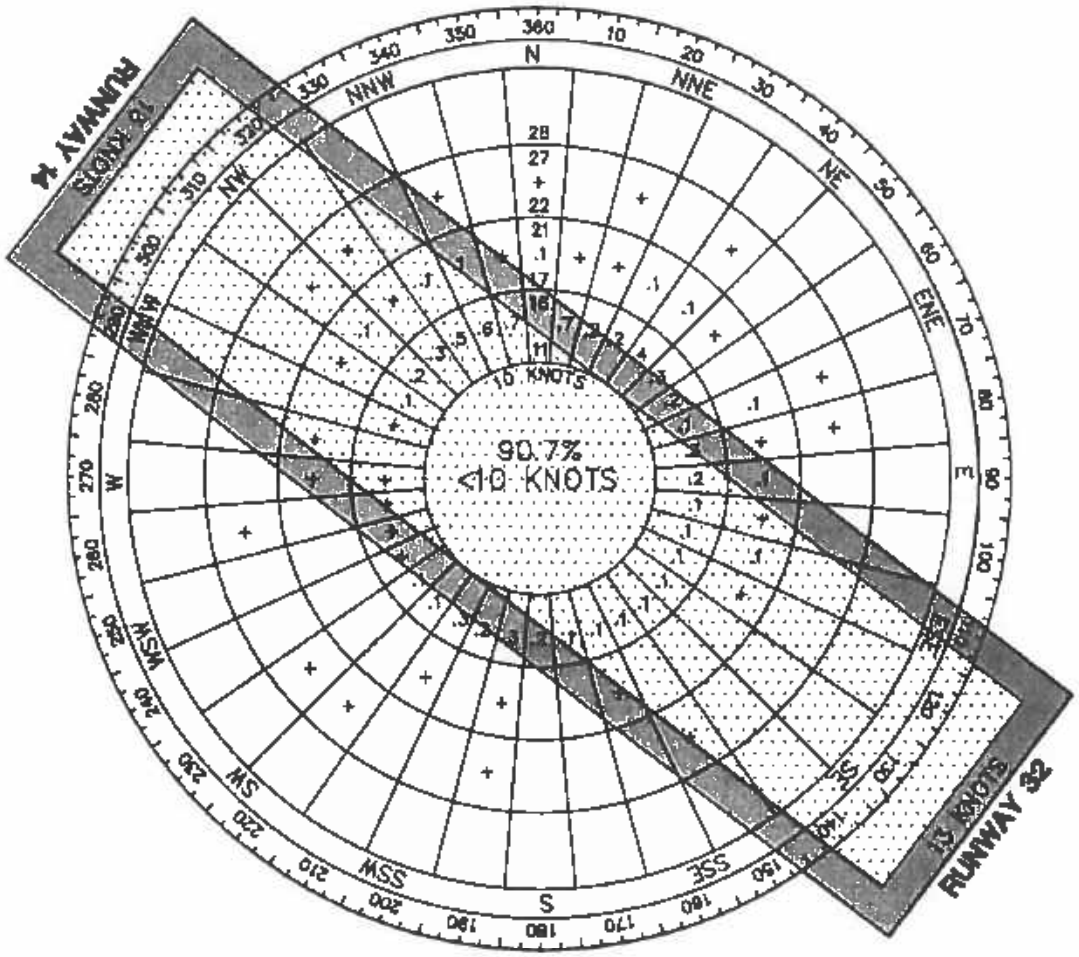


RUNWAY	0-3 KNOTS	10.5 KNOTS	13 KNOTS
14-32	24.1	95.1	97.0

WIND DATA PERIOD: 1991-2000
SOURCE: NATIONAL CLIMATIC DATA CENTER
STATION: DULLES, WASHINGTON D.C.

00184-EX1-1-4.DWG

	MONTGOMERY COUNTY AIRPARK **ALL WEATHER WIND ROSE**	**EXHIBIT** **1-4**



RUNWAY	0-3 KNOTS	10.5 KNOTS	13 KNOTS
14-32	20.4	94.4	97.1

WIND DATA PERIOD: 1991-2000
SOURCE: NATIONAL CLIMATIC DATA CENTER
STATION: DULLES, WASHINGTON D.C.

00164-EX01-1-5.DWG

	MONTGOMERY COUNTY AIRPARK **IMC WIND ROSE**	EXHIBIT 1-5

3. Runway Designations

Runway numerals for each runway end are determined from the approach direction to the runway end and should be equal to one-tenth of the magnetic azimuth of the runway centerline, measured in the clockwise direction from magnetic north. Although the true bearing of the runways will not change over time, the magnetic bearing will change as the location of magnetic north shifts. **Table 1-5** provides a summary of bearing information for Montgomery County Airpark. Based on this analysis, the designations for Runway 14-32 remain unchanged.

Table 1-5
Montgomery County Airpark
Runway Bearings

	Runway 14-32
True Bearing	127°23'17.16"
Magnetic Declination	10°7' W
Magnetic Bearing	137°30'17.16"

Source: Delta Airport Consultants, Inc.

4. Taxiway System

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

Parallel to Runway 14-32 is a 35 foot wide lighted taxiway. The taxiway has medium-intensity edge lighting. Also, located along the length of Runway 14-32 are four exit taxiways.

5. Land Use

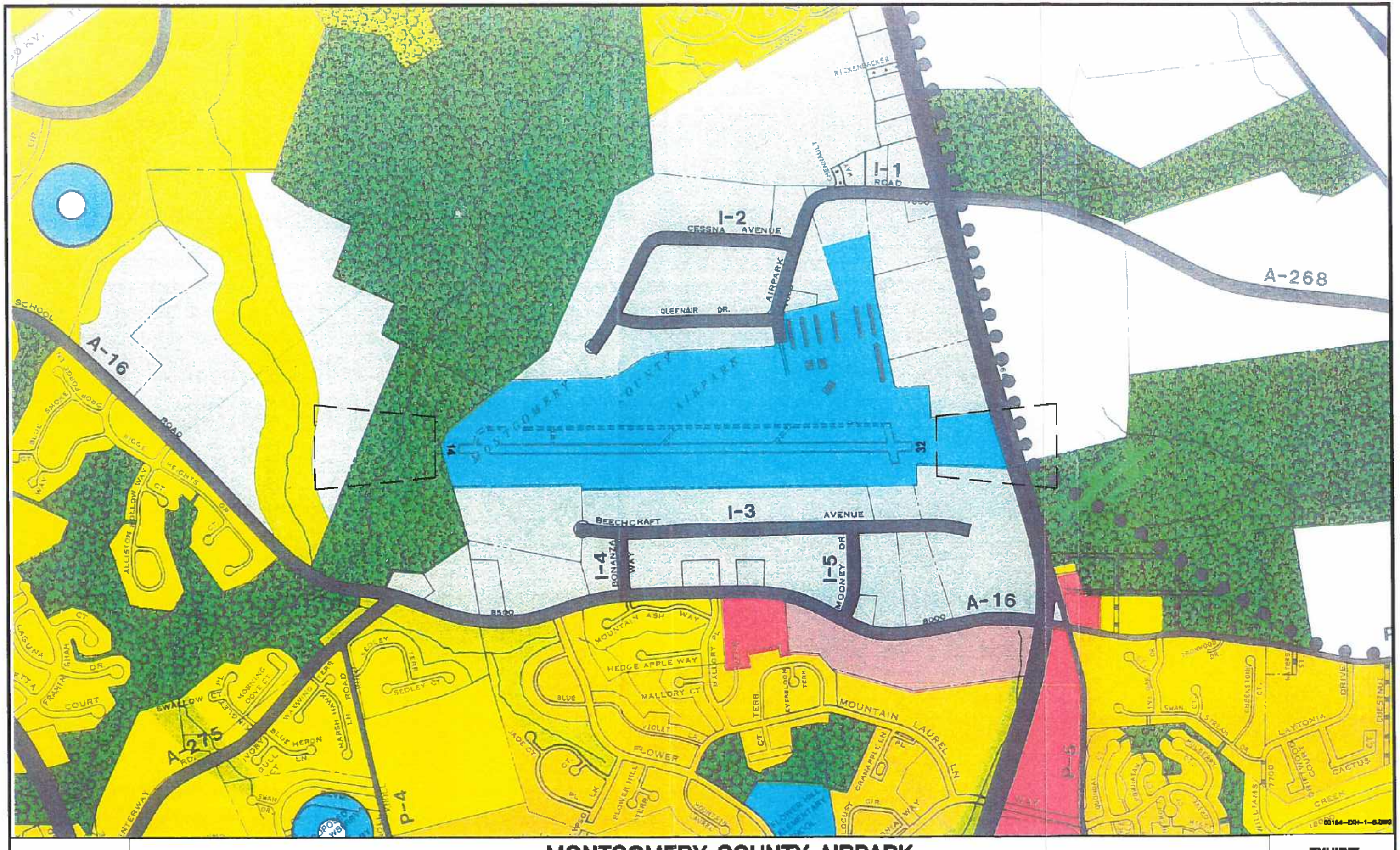
Montgomery County Airpark is located within a triangular-shaped industrial area that is located approximately three miles from the northeast portion of the City of Gaithersburg. The current Airport property includes approximately 130 acres. The Airpark is contiguous to industrial land use to the east. This area, which has direct access provided via Airpark Road, is a mixture of various manufacturing and warehouse facilities. The main access roads in this area are Cessna Avenue and Queenair Drive.

The northwest portion of the Airpark is adjacent to the Green Farm Conservation Park. This park will eventually serve as a historic interpretive conservation center for Montgomery County. The land west of the Airpark is used for industrial purposes, similar to that along the eastern boundary. Upper Rock Creek Park, which is directly southeast of the Airpark, is a large, local park adjacent to Maryland State Route 124. Southwest of the Airpark is Beechcraft Avenue, which provides access to the industrial area. The land use scenario separates the Airpark from the existing and future residential communities that comprise various densities and housing units. Existing land use in the vicinity of the Airpark is presented in **Exhibit 1-6**.

The Montgomery County Planning Commission advises and assists the County council in planning and zoning matters. The Commission also plans, acquires, maintains and operates the parks system of the County.

The Airpark is located in the Gaithersburg Vicinity Master Plan area. The Gaithersburg Vicinity Master Plan intent is to establish a light industrial character for the land zoned land industrial along the north side of Snouffer School Road and Woodfield Road.

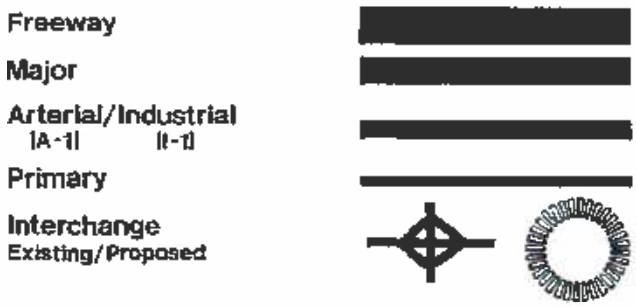
Gaithersburg and Montgomery County are projected to develop with a continued systematic level of control. The closest residential use in the vicinity of the Airpark is located southwest of the Technology and Business Park area. This area consists of Mountain Ash Way and



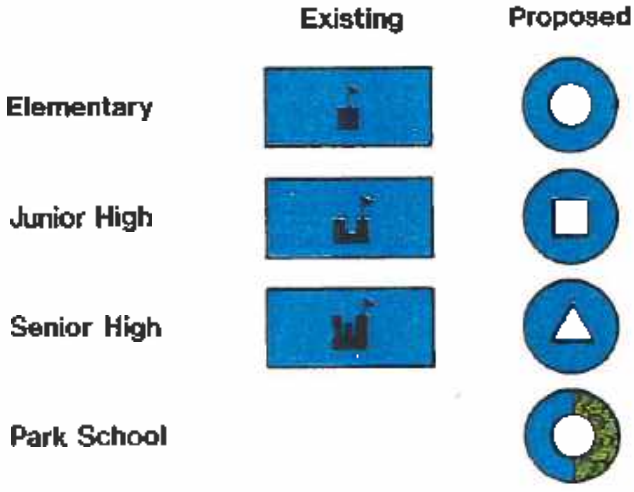
MONTGOMERY COUNTY AIRPARK
LAND USE MAP

EXHIBIT
1-6

HIGHWAY CLASSIFICATION



SCHOOL CLASSIFICATION



Transit Easement

M — Metro Station

C — Commuter Rail Station

Stormwater Management Facility

SOURCE: THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION, GAITHERSBURG VICINITY MASTER PLAN LAND USE PLAN, JANUARY 1985.

MONTGOMERY COUNTY AIRPARK
LAND USE LEGEND

EXHIBIT 1-6

Hedge Apple Way. This area, which is not in the flight path of aircraft arriving or departing the Airpark, is located approximately 1,000 feet from the southern boundary of the Airpark. Although there are existing residences in the immediate vicinity of the Airpark, the cooperative planning efforts of the City of Gaithersburg, Montgomery County and the Maryland-National Capital Park and Planning Commission (MNCPPC), has created a scenario that encourages land use and zoning that is compatible with Airpark activities. **Exhibit 1-7** illustrates zoning surrounding the Airpark.

C. TERMINAL AREA DEVELOPMENT

The terminal area for Montgomery County Airpark is located in the southeast Fixed Based Operator (FBO) area. The existing terminal area development consists of T-hangars, tie down apron, terminal facilities, fueling facilities and auto parking.

1. Building and Facility Inventory

An inventory of existing Airport buildings and facilities is presented on **Exhibit 1-8**. It should be noted that the Willard and Rickman properties are privately owned corporate hangars located off-airport property, requiring the aircraft to be taxied through a gate in the Airpark's perimeter fencing. "Through-the-fence" operations such as these require FAA approval. A request for approval of the Rickman property has been submitted to the FAA for review. No such request has yet been submitted for the Willard property.

The existing two-story terminal building was constructed in 1960 during the initial airfield development. The facility offers approximately 3,500-4,000 square feet of useable space on each floor. The first floor and approximately one-half of the second floor space is used primarily for private office space. The remaining space includes a small lobby on the first floor and a restaurant on the second floor. Representatives of the Revenue Authority and the FBO operator have noted the need for a new or improved facility that would offer more user friendly and attractive public waiting rooms, meeting rooms and corporate pilot operational

MASTER PLAN ZONING & HIGHWAY PLAN, JANUARY 1985

MONTGOMERY COUNTY AIRPARK
ZONING MAP

EXHIBIT
1-7

RE-2 — Residential Estate, 2 Acre. Two Acres Per Dwelling Unit

RE-2C — Residential Estate 2 Acre Cluster. Fifty Acres Minimum Area, 25,000 Sq. Ft. Per Dwelling Unit

R-200 — One-Family Detached, Large Lot. 20,000 Sq. Ft. Per Dwelling Unit

R-90 — One-Family Detached Restricted Residential. 9,000 Sq. Ft. Per Dwelling Unit

R-60 — One-Family Detached Residential. 6,000 Sq. Ft. Per Dwelling Unit

R-10 — Multiple-Family High-Density Residential. 1,000 Sq. Ft. Per Dwelling Unit

P.N.Z. — Planned Neighborhood Zone. Maximum Density of 15 Persons Per Acre

T-S — Town Sector. 1,500 Acres Minimum Area; Maximum Density of 15 Persons Per Acre

M.X.P.D. — Mixed Use Planned Development Zone. 20 Acres Minimum Area

R-MH — Mobile Home Development. 15 Acres Minimum Area; Maximum Density 7 Units Per Acre

C-4 — Limited-Intensity, Highway Commercial Zone

I-1 — Light Industrial

I-3 — Industrial Park

I-4 — Low Intensity, Light Industrial Zone

TDR 3to10 — Transferable Development

R-T — Town Houses

RT-6 — Town Houses. 6 Dwelling Units Per Acre

RT-10 — Town Houses. 10 Dwelling Units Per Acre

R-30 — Multiple-Family Low-Density Residential. 3,000 Sq. Ft. Per Dwelling Unit

R-20 — Multiple-Family Medium-Density Residential. 2,000 Sq. Ft. Per Dwelling Unit

O-M — Office Building-Moderate Intensity. Floor Area Ratio of 1.5

C-P — Commercial Office Park

C-1 — Local Commercial

C-2 — General Commercial

C-3 — Highway Commercial

HIGHWAY CLASSIFICATION

Freeway

Major

Arterial/Industrial (A-1) (I-1)

Primary

Interchange
Existing/Proposed

M — Metro Station

C — Commuter Rail Station

Transit Easement

00184-EXH-1-7
LEGEND

MONTGOMERY COUNTY AIRPARK
ZONING LEGEND

EXHIBIT
1-7

FACILITIES INDEX

EXISTING

1	TERMINAL BUILDING
2	SOUTHERN AIRCRAFT
3	MONTGOMERY AVIATION
4	CONGRESSIONAL AIR
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6	HANGER B (AVIATION FACILITIES CORP.)
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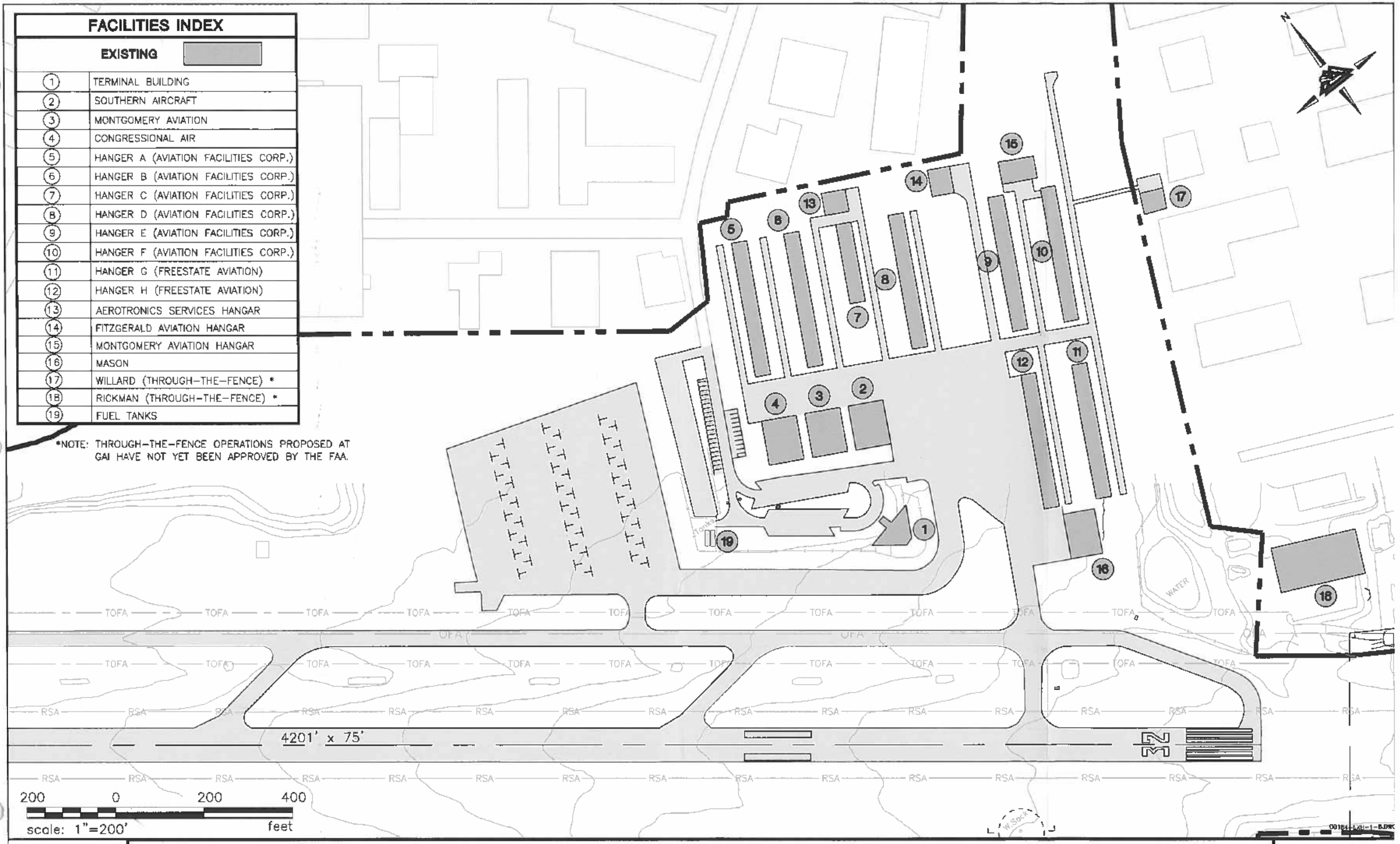
15	MONTGOMERY AVIATION HANGAR
16	MASON
17	WILLARD (THROUGH-THE-FENCE) *
18	RICKMAN (THROUGH-THE-FENCE) *
19	FUEL TANKS

*NOTE: THROUGH-THE-FENCE OPERATIONS PROPOSED AT GAI HAVE NOT YET BEEN APPROVED BY THE FAA.



MONTGOMERY COUNTY AIRPARK
BUILDING & FACILITIES INVENTORY

EXHIBIT
1-8

space. Airpark management has expressed the dire need for space that will adequately accommodate pilot's flight planning, weather briefings and a rest area.

2. Aircraft Hangars

Conventional hangars typically provide storage for multiple aircraft of various sizes and types. There are seven (7) conventional hangars at Montgomery County Airpark ranging in size from 50' x 50' to 80' x 100', and totaling 40,500 square feet. T-hangars are individually nested structures that are capable of accommodating one aircraft per space. T-hangars are capable of accommodating single engine and small twin aircraft only, while larger aircraft are generally stored in corporate hangars. Currently, there are 75 T-hangars at the Airpark which are located in the southeast FBO area.

3. Aircraft Aprons and Tie-downs

Another method of aircraft storage is aircraft tie-downs. All existing aircraft tie-downs for Montgomery County Airpark are located in the northwest FBO area. Currently, there are a total of 157 aircraft tie-downs at the Airpark of which 17 are grass tie-downs and 140 are pavement tie-downs. The pavement tie-downs are located on two paved aprons totaling 21,700 square yards and on paved tie-downs along the parallel taxiway and perimeter fence that are estimated at 6,900 square yards total parking area. An additional 7,200 square yards of paved apron is located in the northwest FBO area, but is not currently in use. The total existing apron area for aircraft parking is therefore 35,800 square yards.

The Airpark currently has no designated helipad, nor any based rotor aircraft, but the Sponsor and Operator have requested recommendations on the safest and most efficient routing and parking of transient helicopters.

4. Airfield Pavements

All airfield pavement is asphalt. The runway, taxiway, and north apron pavements are all in good condition (PCI 55-70) based on inspection by Delta Airport Consultants, Inc. and the

Operator. The PCI (Pavement Condition Index) is accepted by the FAA to determine the present condition of pavement in terms of apparent structural integrity and operational surface condition as well as to compare the condition and performance of pavements at all airports, as detailed in AC 150/5380-6, *Guidelines and Procedures for Maintenance of Airport Pavements*.

Runway 14-32 was rehabilitated in 1995 and has a pavement strength of 20,000 SW (single wheel). The Airpark operator reports the pavement strength of the parallel taxiway to be equal to the runway. Currently, all apron and taxilane pavements within the south FBO lease area are in good condition and maintained by the lessee. Markings for Runway 14-32 are in faded/poor condition and are in need of painting in the near future, with the exception of the markings at the Runway 32 end that were repainted Fall 2000 during threshold relocation.

D. SUPPORT FACILITIES AND SERVICES

As noted previously, Montgomery County Airpark, Inc. is a primary lessee to the Montgomery County Revenue Authority with rights granted to conduct and engage in the usual and customary activities of a general airport facility. Montgomery County Airpark, Inc. (renamed to Montgomery County Airpark One, LLP) granted a sublease of the approximately 38 acre leasehold to Freestate Aviation (a management branch of Montgomery County Airpark One, LLP) for a term that expires during 2010. Freestate Aviation has in turn subleased certain land and facilities to both full service FBO operators and specialty service providers. Details of the services provided by the sub-tenants are offered in the following.

1. Fixed Base Operators (FBOs)

General aviation activities at Montgomery County Airpark are accommodated by one full service Fixed Base Operator (FBO), Montgomery Aviation. The FBO offers aeronautical services, and specifically fuel sales, to the flying public.

The potential and interest exists for a second FBO. Mr. Thomas L. Blair (Southern Aircraft) leased 18+ acres of Airport property in February 2000 for such a purpose, however no firm development plan has been established. Mr. Blair's leasehold area, at the northwest corner of the airfield, includes prime development area adjacent to the Revenue Authority's aircraft parking apron and shares common boundaries with the leasehold area of Montgomery County Airpark, Inc.

Property descriptions for both FBO leaseholds were reviewed during inventory data collection for this report. The reviews identified several areas of restricted use within the leaseholds, such as for an FAA control tower, an NDB installation and a taxiway object free area. A further review, and possible realignment through lease negotiation, of the restricted areas and the common boundaries between the leaseholds could offer improved development options for this area. It is recommended that the Revenue Authority have the leaseholds surveyed and corners marked appropriately to clearly define the specific lease and use areas on the airfield.

2. Specialized Aviation Service Operations (SASO)

Currently, there are two SASOs located at the Airpark:

a. Aerotronic Services

b. Congressional Air Charters

Table 1-6 lists the services rendered by the FBO and the SASOs.

Table 1-6
Montgomery County Airpark
FBO & SASO Services

Services	Aerotronic Services	Congressional Air Charters	Montgomery Aviation	Southern Aircraft
Flight School	----	Yes	Yes	----
Aircraft Rental	----	Yes	Yes	----
Charters	----	Yes	Yes	----
Aircraft Repair	----	Yes	Yes	----
Fuel	----	----	Yes	----
Parking	----	----	Yes	----
Building Dimensions (sq. ft.)	50x55	80x100	80x100 50x80	----
Leased Acreage	Sub	Sub	18.125	38.1821

Source: Delta Airport Consultants, Inc.

Freestate Aviation	1-301-963-7100
Montgomery Aviation	1-301-977-5200
Congressional Air Charters	1-301-840-0880
Aerotronic Services	1-301-948-2510

3. Aviation Organizations Based at the Airpark

Several aviation organizations are based on the Airpark to provide services to the flying public:

a. TSS Flying Club
b. Octopus Flying Club
d. Congressional Flying Club
e. Civil Air Patrol (CAP)
f. Coast Guard Auxiliary

4. Aircraft Fueling

There are two above ground fuel tanks at Montgomery County Airpark. The tanks are owned by Montgomery County Revenue Authority (MCRA) but are operated by Montgomery Aviation under provisions of the lease. The fuel farm is located in close proximity to the terminal area. The fuel farm consists of two separate tanks that each hold 12,000 gallons of fuel. Three different trucks are used to aid in the fueling process.

The tanks include:

a. 100 Low Lead tank (1)
b. Jet-A tank (1)

5. Ground Support Equipment (GSE) Storage

Montgomery Aviation and Congressional Air own and operate the equipment used for aircraft maintenance at the Airpark. Currently the tugs are stowed in large storage hangars and the fuel trucks are parked in a designated area of the apron. The current ground support equipment includes:

1. 3 Fuel Tender Trucks
2. Tow Tractor
3. 2 Tugs

6. Fire Protection

Fire protection is provided by the Montgomery County Fire Rescue Station 28, which is located approximately two miles from the Airpark.

7. Utilities and Services

Electrical power to the Airpark is provided by Pepco. Mr. Jack Chu, Pepco Department of Engineering, reported via telephone conversation, on November 30, 2001 that the existing and proposed demand for electrical power at the Airpark is within the capacity currently provided. However if the capacity becomes insufficient, it will be the responsibility of PEPCO, as a public utility, to supply the additional capacity necessary to support the development.

Natural gas is supplied by Washington Gas. Mr. Mike Howdyshell, of Washington Gas, advised via telephone conversation on December 21, 2001 that all existing service needs are being met and that the company would expand services as necessary to meet future demand.

Telephone service is provided by Verizon. Mr. Mike Burke, Verizon Engineering / Mid-Atlantic Region, advised by telephone on December 21, 2001 that existing service is adequate and that as a public utility, Verizon would accommodate future demand as needed.

Water and sewage services are provided by the Washington Suburban Sanitary Commission. Commission representatives have verified that the existing and proposed capacity will be sufficient for the 20-year planning period.

Solid waste disposal at Montgomery County Airpark is provided by Waste Management Company. Mr. Bruce MacLaren, of the Waste Management Company, verified via telephone conversation on November 29, 2001, that all needs are currently being met and, if necessary during the 20-year planning period, the Waste Management Company will expand service to meet additional demand.

E. AIRPORT LIGHTING AIDS

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

1. Visual Approach Slope Indicators (VASIs)

VASIs are a system of lights that provide visual descent guidance information during the approach to a runway. This system provides a visual glide path that allows for safe obstruction clearance from the start of descent to the threshold. Currently, Montgomery County Airpark has a bar VASI to assist with the approach to Runway 14. The basic VASI unit is a panel type system with no internal lighting; the current aiming angle is reported by the operator to be three degrees. Although the unit is approximately 25 years old, it is in good condition and an analysis of the aiming angle identified no obstructions. The Runway 14 VASI is a federal installation and is maintained by FAA Airways Facilities (AF) staff, which conducts a routine inspection on the unit monthly. The AF staff reports the aiming angle of the unit at three degrees. Runway 32 does not have a VASI.

2. Runway End Identifier Lights (REILs)

REILs provide a rapid and positive identification of the approach end of a particular runway. These lights consist of a pair of synchronized flashing lights located on each side of the runway threshold facing the approach area. REILs may be either omnidirectional or unidirectional. Currently unidirectional REILs provide approaching aircraft with assistance (identifying end of useable runway pavement and provides visual guidance for the slope of the approach) for approaching and landing operations on both Runway 14 and 32. The REILs are in good condition.

3. Runway Edge Lights

Runway edge lights are used to outline the edges of runways during periods of darkness or restricted visibility conditions. These light systems are classified according to the intensity or brightness they are capable of producing, and are identified as High Intensity Runway Lights (HIRL), Medium Intensity Runway Lights (MIRL) or Low Intensity Runway Lights (LIRL). Runway 14-32 at Montgomery County Airpark is equipped with MIRLs that were installed in 1995 and are currently in good condition.

4. Taxiway Edge Lights

Taxiway edge lights are used to outline the edges of taxiways. Similar to runway edge lights, these light systems are classified according to the intensity of light they emit. The taxiway is equipped with Medium Intensity Taxiway Lights (MITLs). The MITLs are in poor condition.

5. Control of Airport Lighting Systems

Radio control lighting is available at the Airpark to provide pilot control of lights by keying the aircraft's microphone to the airport's designated frequency.

F. AIRPORT COMMUNICATIONS AND WEATHER SERVICES

Weather is a factor which significantly affects the airfield operational scenario. In relation to aircraft operational conditions and the associated aircraft approach activity, weather conditions are comprised of two categories. Instrument Meteorological Conditions (IMC) exist when the pilot operating the aircraft must use all available navigational aids and FAA Instrument Flight Rules (IFR) to land an aircraft under less than adequate (reduced visibility, fog, rain, snow, etc.) weather conditions. Visual Meteorological Conditions (VMC) exist when the pilot operating the aircraft must establish visual contact with the runway and rely on this view to prepare for initial and final

approach procedures under FAA Visual Flight Rules (VFR), which includes alignment with the runway before landing the aircraft. Montgomery County Airpark operates under VMC conditions the majority of the time. According to the NCDC weather data obtained from the Washington Dulles D.C. station (nearest reporting center), the Airpark operates at 91.3 percent VMC conditions and 8.7 percent IMC.

The Airpark does not have a FAA Air Traffic Control Tower (ATCT). However, the Baltimore-Washington International Airport (BWI) provides radar separation via Baltimore Approach Control on all IFR aircraft within the Air Route Surveillance Area (ARSA). All radar facilities are located at BWI. Ground control of aircraft at Montgomery County Airpark (GAI) is performed by the individual pilot. All separation of VFR aircraft are also performed by the pilot.

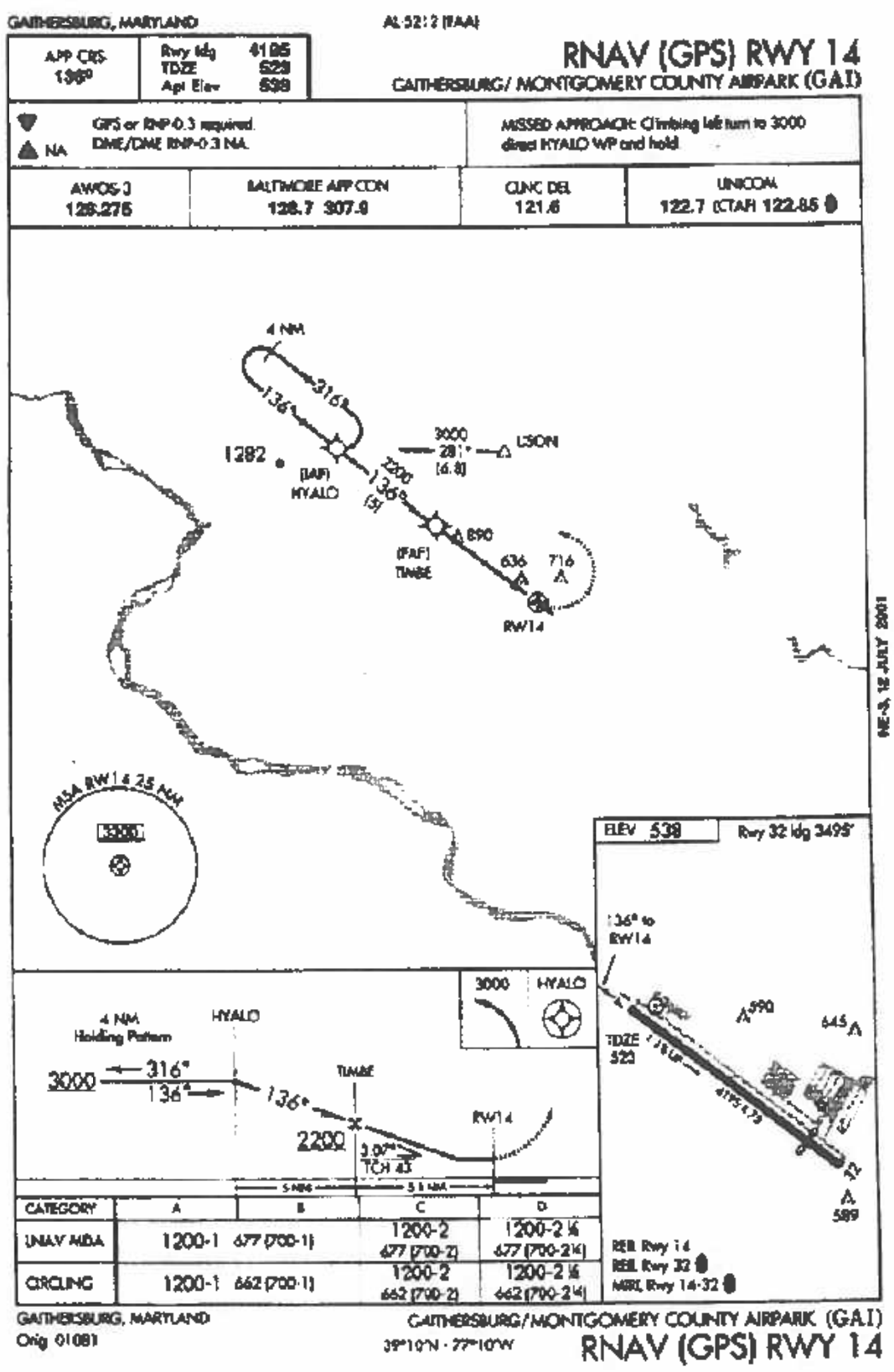
G. NAVAIDs AND INSTRUMENT APPROACH PROCEDURES

This section discusses both visual and electronic Navigational Aids (NAVAIDS) as related to Montgomery County Airpark. There are various types of electronic NAVAIDS that provide a special purpose to the system of air navigation. GAI has three published instrument approach procedures to Runway 14 at the Airpark. The non-precision approaches include the RNAV (GPS) (radio navigation or global positioning system) approach, the VOR (very high frequency omni-directional range approach and the NDB (non-directional radio beacon) approach. Each instrument approach procedure includes a minimum descent altitude (MDA) and minimum visibility, beyond which point the pilot must execute a missed approach and re-attempt the landing effort, or divert to another airport. The altitude references are expressed in both MSL (Mean Sea Level) and AGL (Above Ground Level). The visibility minimums for the GAI published approaches vary depending on the approach category of the given aircraft. The following is a brief description of each NAVAID, and the related procedure, available to support instrument approaches to the Montgomery County Airpark.

1. RNAV (GPS)

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

The RNAV (GPS) approach is initiated approximately eight nautical miles northwest of the airfield at the HYALO waypoint. As published, the minimums for the RNAV or circling approach are an MDA of 1,200 feet MSL (approximately 700 feet AGL) and one mile visibility for an aircraft within approach category B (**Exhibit 1-9**).



	MONTGOMERY COUNTY AIRPARK RNAV (GPS) RUNWAY 14	EXHIBIT 1-9

2. VOR

A VOR is a navigational aid that transmits a radio signal in all directions. Aircraft equipped with the appropriate receiver may use this signal to navigate. A VOR is used for en route navigation of VFR and IFR aircraft as well as for non-precision instrument approaches. The VOR approach at Montgomery County is initiated at the Frederick VOR station which is located approximately 17 miles north-northwest of the Airpark. As published, the minimums for the straight-in or circling approach are an MDA of 1,200 feet MSL (approximately 700 feet AGL) and one mile visibility for an aircraft within approach category B (**Exhibit 1-10**).

3. NDB

An NDB is a navigational aid that sends out a broad signal which can be received by any aircraft equipped with an ADF (automatic direction finder). The NDB station is a single 35 foot pole with ground radials extending underground 100 feet out from the center pole. NDB units have typically been used in areas of high terrain, but are being gradually overlaid with GPS approaches and will eventually be phased out of service. As published, the minimums for the straight-in or circling approach are an MDA of 1,300 feet MSL (approximately 800 feet AGL) and 1-1/4 mile visibility for an aircraft within approach category B (**Exhibit 1-11**).

4. Airport Beacon

The airport beacon is a visual navigational aid used to help pilots locate the airport using a rotating light with green and white lenses to produce a flashing effect. The airport beacon located at Montgomery County Airpark is mounted atop a corporate hangar and is located approximately 1,150 feet northeast of the Runway 32 end. The beacon is currently in good condition.

GAITHERSBURG, MARYLAND

AL-5212 (FAA)

VOR FDK	APP CRS	Rwy ldg 4195
109.0	155°	TDZE 523
		Apt Elev 538

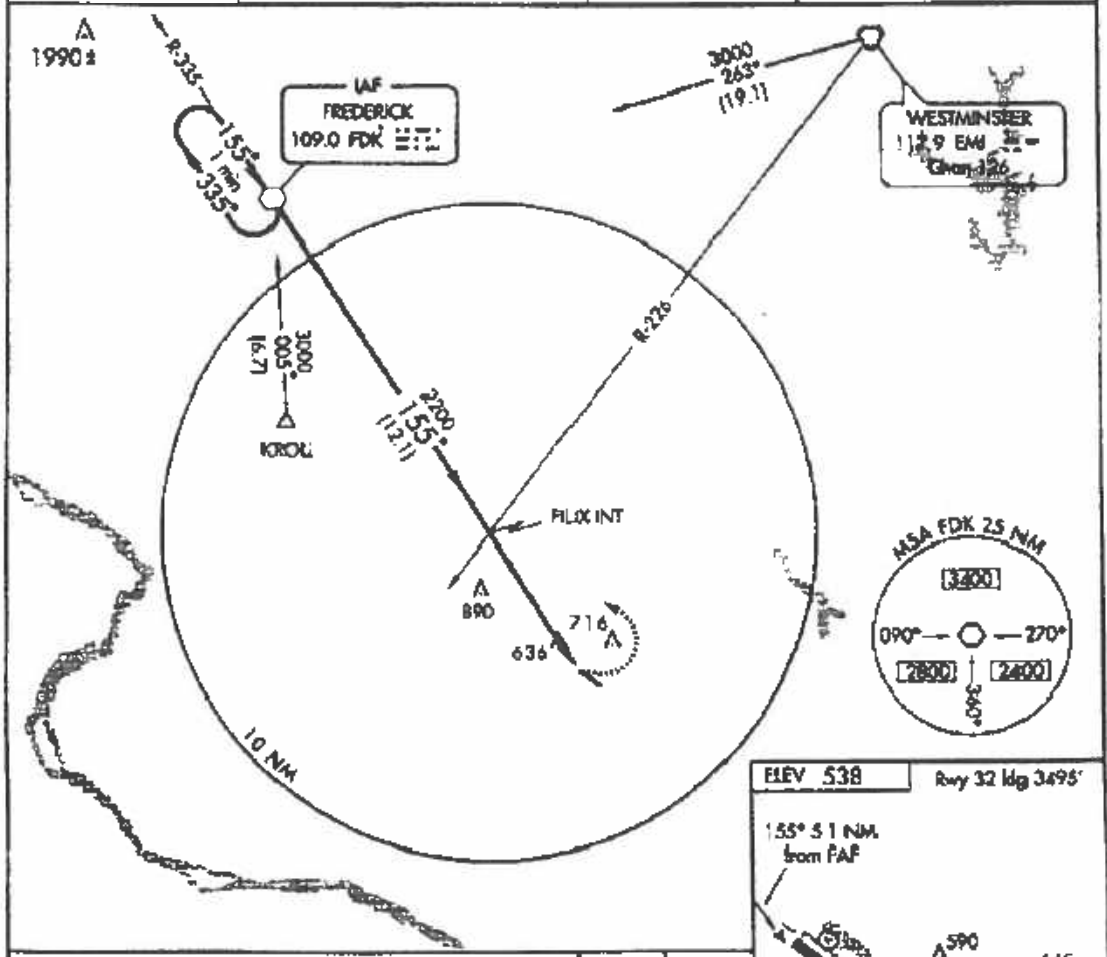
VOR RWY 14

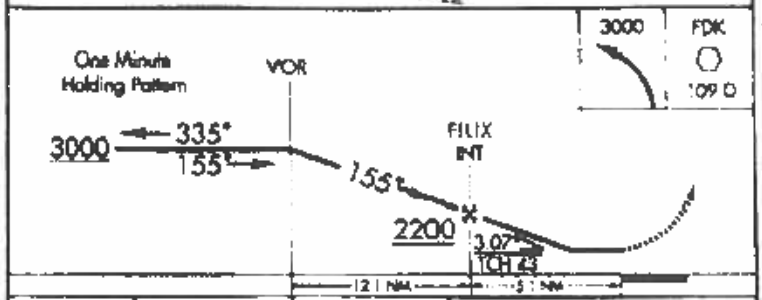
GAITHERSBURG/ MONTGOMERY COUNTY AIRPARK (GAI)

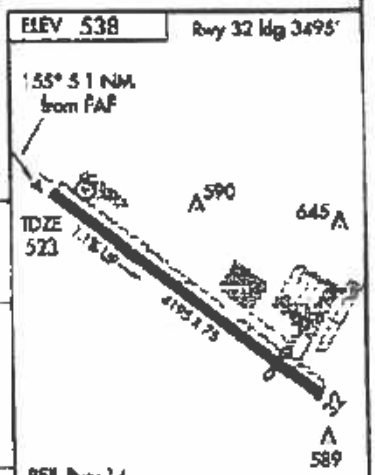
▼ NA

MISSED APPROACH: Climbing left turn to 3000 direct FDK VOR and hold.

AWOS-3	BALTIMORE APP CON	CLNC DEL	UNICOM
126.275	126.7 307.9	121.6	122.7 (CTAF) 122.85







CATEGORY	A	B	C	D
S-14	1200-1	677 (700-1)	1200-2 677 (700-2)	1200-2¼ 677 (700-2¼)
CIRCLING	1200-1	662 (700-1)	1200-2 662 (700-2)	1200-2¼ 662 (700-2¼)

FAF to MAP 5.1 NM					
Knots	60	90	120	150	180
Min Sec	5:06	3:24	2:33	2:02	1:42

GAITHERSBURG, MARYLAND
Amdt 3 01081

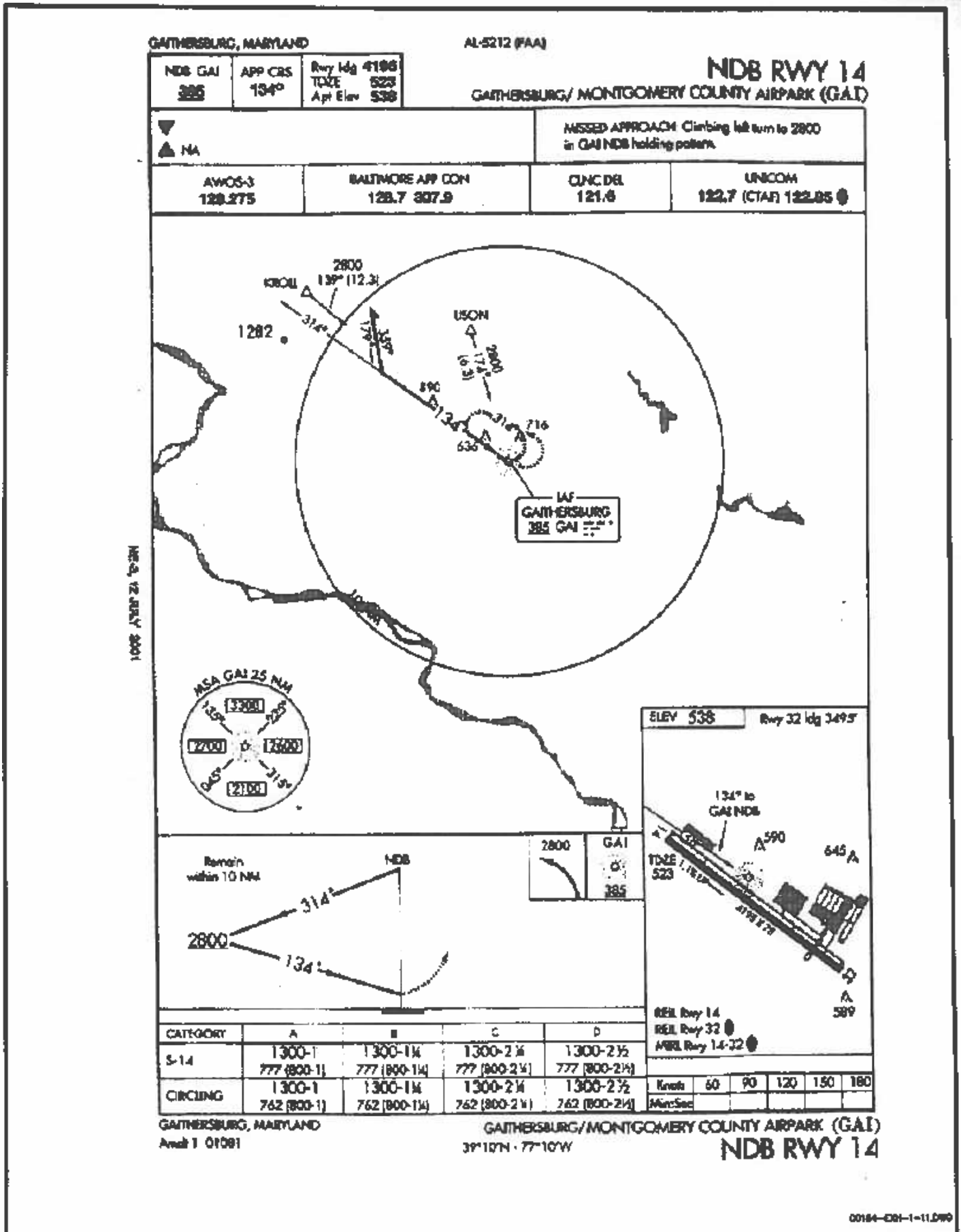
GAITHERSBURG/MONTGOMERY COUNTY AIRPARK (GAI)
39°10'N - 77°10'W

VOR RWY 14

00184-FDK-1-10.DWG

MONTGOMERY COUNTY AIRPARK
VOR RUNWAY 14

EXHIBIT
1-10



	MONTGOMERY COUNTY AIRPARK **NDB RUNWAY 14**	**EXHIBIT** **1-11**

5. Automated Weather Observation System (AWOS)

There are several levels of an AWOS that report a variety of weather statistics. Montgomery County Airpark has an AWOS-III This system reports altimeter settings, wind data, temperature, dew point, density altitude, visibility and cloud/ceiling data. The antenna for this system is located approximately 1,900 feet from the Runway 14 end and about 450 feet northeast from the runway centerline.

6. Wind Cone and Segmented Circle

The segmented circle airport marker system is a series of objects on the ground designed to give visual traffic pattern and wind information to pilots in the air. A landing strip indicator extends from the segmented circle for each runway. As is the case with Montgomery County Airpark, a traffic pattern indicator extends from the landing strip indicator when a right-handed traffic pattern exists.

The segmented circle is located off the traffic area with a wind indicator located at its center. Segmentation of the circle is necessary so that it can be readily distinguished from a solid circle which is sometimes used to mark the center of a landing area.

Wind indicators pivot in the wind and may be either a tetrahedron, windcone, windsock or combination thereof. A windcone is a tapered, tubular cloth vane, open at both ends and having at the larger end a fixed ring pivoted to swing freely. Wind cones are installed at airports to aid pilots in determining wind direction and approximate intensity which in turn yields takeoff and landing information. The lighted wind cone and segmented circle for the Montgomery County Airpark is located on the west side of Runway 32 approximately 550 feet from the Runway end. Both components are in good condition.

H. AIRSPACE

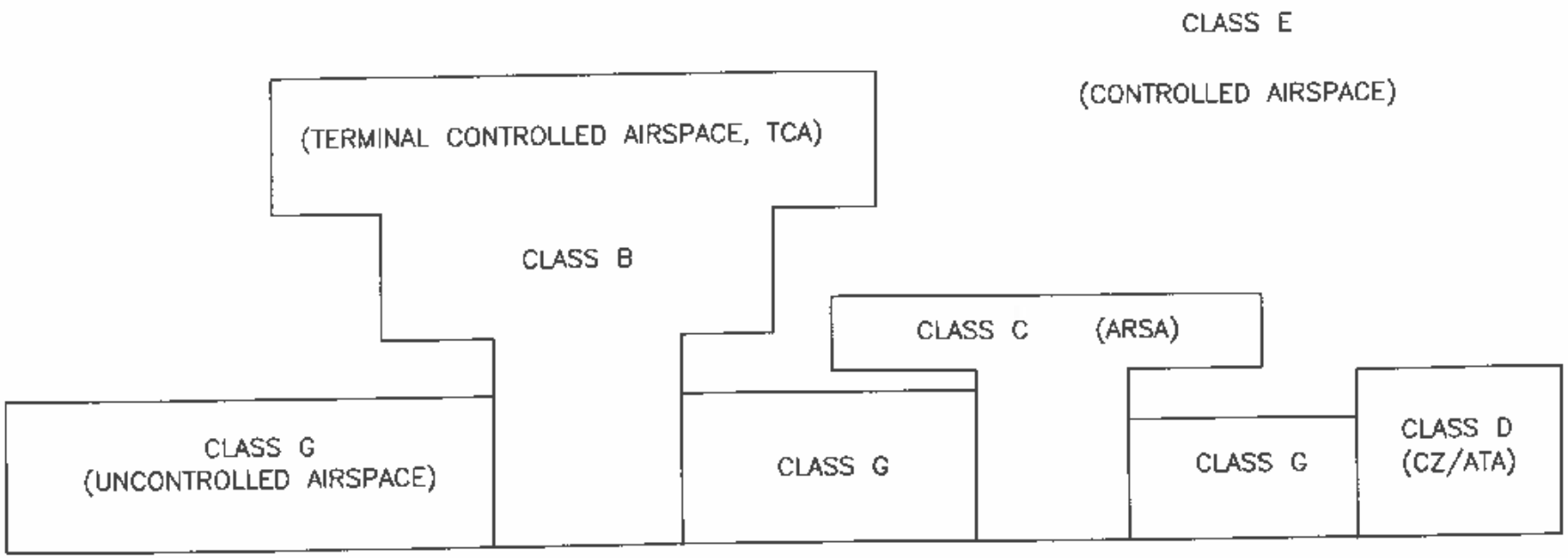
Montgomery County Airpark (GAI) is located in an area of very busy airspace. Three major air carrier airports and a major military airfield are located within 25 miles of GAI, as shown in **Exhibit 1-12;** Baltimore-Washington International Airport (BWI) to the east, Reagan National Airport (DCA) to the south-southeast, Dulles International Airport (IAD) to the southwest and Andrews Air Force Base to the southeast. In addition, three smaller general aviation airports are located within 20 miles of GAI; Davis Airport (W50) to the north, Leesburg Municipal Airport (JYO) to the west-southwest and Frederick Municipal Airport (FDK) to the north-northwest.

The Airpark is surrounded by Class G, Class E and Class B airspace. Class G airspace is uncontrolled airspace. The Class E controlled airspace around the Airpark starts at 700 feet Above Ground Level (AGL) and extends vertically to 3,500 feet Mean Sea Level (MSL). Class E airspace are controlled areas which are airs`pace corridors identified as federal airways, or which accommodate jet traffic at low altitudes. The Class B controlled airspace starts at 3,500 feet and extends vertically to 10,000 feet MSL. Class B airspace surrounds the busiest airports in the United States, and subjects all pilots to special operating rules and the requirement for all aircraft to have specialized equipment. In order to fly inside the Class B airspace, an aircraft must be equipped with a Mode C transponder (to allow the aircraft to be tracked on radar by FAA Air Traffic Control - ATC) and be in radio contact with ATC. GAI is subjected to Class B airspace due to the overlap of airspace control areas from Baltimore-Washington International Airport (BWI), Reagan National Airport (DCA) and Dulles International Airport (IAD), also known as the Washington Tri-Area Terminal Area. **Exhibit 1-13** illustrates the different classes of airspace.

There are numerous military facilities in the Washington, D.C. area, as well as sensitive historical and political areas. Therefore, GAI has numerous restricted, prohibited, warning or military operating areas within the general operating area, the closest being within approximately 15 miles of the Airpark.

The terrorist attacks of September 11, 2001 resulted in the FAA expanding Class B airspace and implementing additional flight restrictions. The newly defined 'Enhanced Class B' space included all Class B airspace, all airspace directly under Class B and that airspace above it up to flight level (FL) 180 (approximately 18,000 feet MSL). Enhanced Class B restrictions, implemented for a 25 nautical mile radius from Ronald Reagan Washington National Airport (DCA), initially prohibited, and later severely limited, general aviation operations for GA airports in the region. The Montgomery County Airpark received initial relief from the restrictions on October 6, 2001 when the FAA reduced the restricted flight area to an 18 nautical mile radius, but activity remained limited as only pilots certified as instrument rated, and filing an instrument flight plan, and student pilots taking lessons were allowed to operate in the seven mile perimeter area that was opened. As a result of the Aviation and Transportation Security Act of 2001, the FAA announced December 19, 2001 that VFR restrictions were lifted beyond an again reduced 15 mile radius of DCA. It is anticipated that GAI will continue its recovery from the operational restrictions and may benefit from the closings of other GA airports in the region should aircraft owners decide to move their aircraft to a base outside of the restricted area.

CLASS A (POSITIVE CONTROLLED AIRSPACE, PCA)



FAA AIRSPACE DESIGNATION
MONTGOMERY COUNTY AIRPARK

EXHIBIT
1-13

I. AIRPORT COMMUNICATIONS AND WEATHER SOURCES

Radio communications available at Montgomery County Airpark and within the Airpark area are listed in **Table 1-7**.

The Airpark may be reached by calling Montgomery Aviation at (301) 963-7100 for general information or operational requests. The Airpark also has an on-site AWOS-III that provides up-to-date local weather reporting.

Table 1-7
Montgomery County Airpark
Radio Frequencies

Source	Frequency
CTAF	122.7
Unicom	122.7
WX AWOS-III	128.275 (301)977-2971
Pilot Controlled Lighting	122.825
Baltimore Approach	128.7
Baltimore Departure	128.7
Clearance Delivery	121.6

Source: Delta Airport Consultants, Inc.

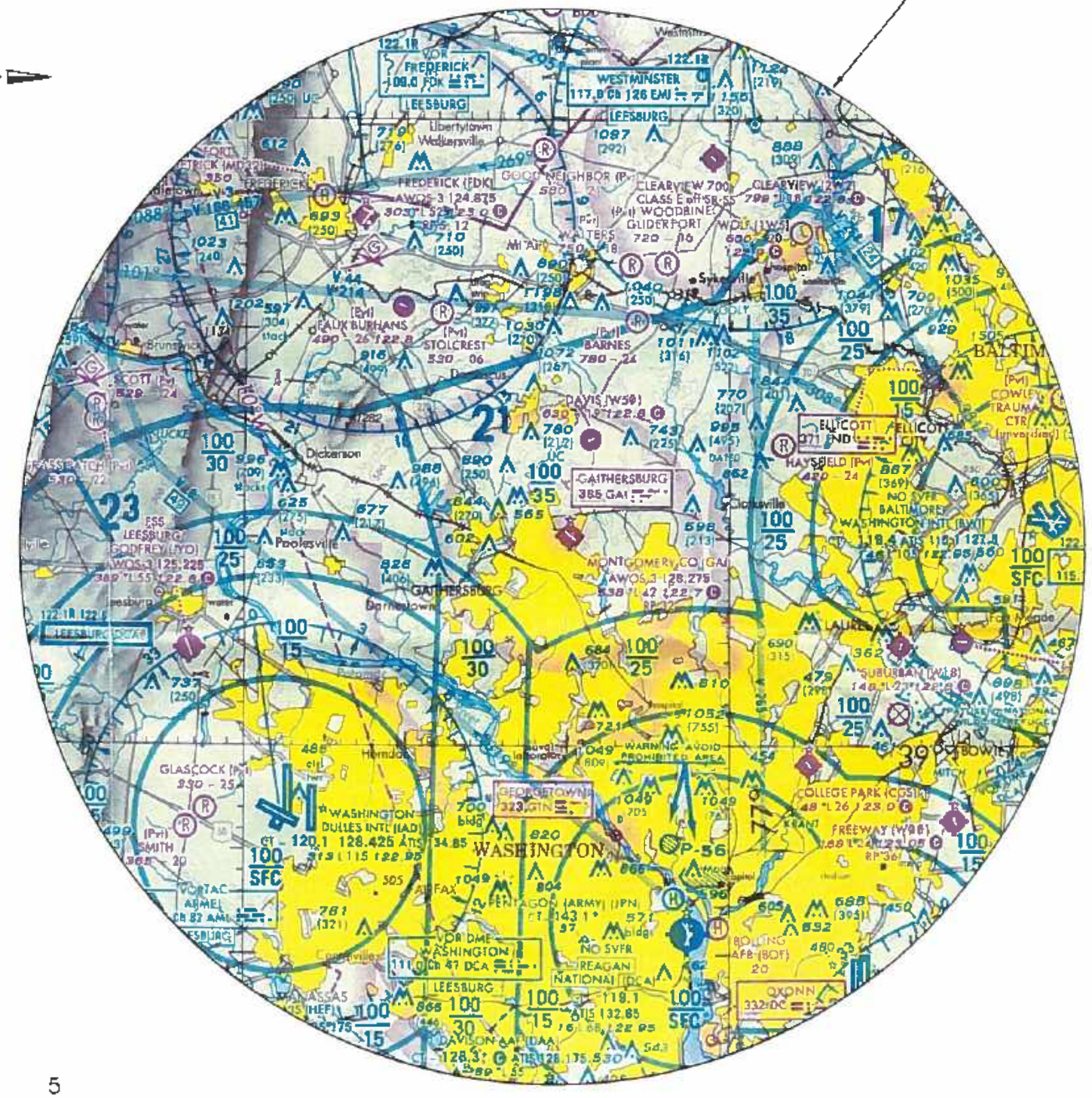
J. SUMMARY

The Maryland State Aviation System Plan refers to the Montgomery County Airpark as one of Maryland's busiest Airports, serving the public in a key general aviation reliever capacity. The existing and ultimate service role of the Airpark is to serve category B-II aircraft, similar to the Cessna Citation II. The Airpark owner and local governmental agencies encourage compatible land use near the Airpark, evidenced by the substantial industrial development in the area.

Runway 14-32, with a length of 4,201 feet, is adequate to meet the needs of aircraft operating to and from the airport throughout the 20-year planning period. The runway pavement is in good condition but the markings are in need of repainting. Airfield lighting is a concern due to the age and condition of the taxiway lights and by the nearby industrial developments. Pilots on roll-out after landing on runway 14, or while taxiing to the east, have reported "light pollution" from industrial lighting to the east of the airfield, making the airfield lighting difficult to distinguish from other light sources. There are three non-precision instrument approach procedures to the airfield, but all are specifically for Runway 14 and obstructions exist within the critical airspace required for both instrument and visual approaches.

N

25 NAUTICAL MILE RADIUS FROM
MONTGOMERY COUNTY AIRPARK



5 4 3 2 1 0 5
NAUTICAL MILES

LEGEND

AIRPORTS

Other than hard-surfaced runways — Seaplane Base

Hard-surfaced runways 1500 ft. to 8099 ft. in length.

Hard-surfaced runways greater than 8099 ft. or some multiple runways less than 8099 ft.

Open dot within hard-surfaced runway configuration indicates approximate VOR, VOR-DME, or VORTAC location.

All recognizable hard-surfaced runways, including those closed, are shown for visual identification. Airports may be public or private.

ADDITIONAL AIRPORT INFORMATION

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

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

H Heliport Selected — U Unverified — Abandoned - paved having landmark value, 3000 ft. or greater — F Ultralight Flight Park Selected

Services-fuel available and field tended during normal working hours depicted by use of ticks around basic airport symbol. (Normal working hours are Mon thru Fri 1300 A.M. to 4:00 P.M. local time.) Consult AFD for service availability at airports with hard-surfaced runways greater than 8099 ft.

☆ Rotating airport beacon in operation Sunset to Sunrise.

AIRPORT TRAFFIC SERVICE AND AIRSPACE INFORMATION

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

Class B Airspace

Class C Airspace (Mode C See F.A.R. 91.215(a)(4))

Class D Airspace

(40) Ceiling of Class D Airspace in hundreds of feet. (A minus ceiling value indicates surface up to but not including that value.)

Class E (dfc) Airspace

Class E Airspace with floor 700 ft. above surface.

Class E Airspace with floor 1200 ft. or greater above surface (not shown Class G Airspace.)

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

Class E Airspace exists at 1200' AGL unless otherwise designated as shown above.

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

Intersection - Arrows are directed towards facilities which establish intersection.

132° → V 69 / 109

Total mileage between NAVAIDs on direct Airways.

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

MOA - Military Operations Area

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

MODE C (See F.A.R. 91.215(a)(4))

National Security Area

Terminal Radar Service Area (TRSA)

IR244 MTR - Military Training Routes

OBSTRUCTIONS

1000 ft. and higher AGL — below 1000 ft. AGL

or — Group Obstruction

Obstruction with high-intensity lights. May operate part-time

2049 (1148) UC — Elevation of the top above mean sea level / Height above ground / Under construction or reported, position and elevation unverified

NOTICE: Guy wires may extend outward from structures.

MISCELLANEOUS

1° E — Isogonic Line (1995 VALUE)

U Ultralight Activity — H Hang Glider Activity — G Glider Operations — Flashing Light — Marine Light

Parachute Jumping Area (See Airport/Facility Directory.)

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

VHF OMNI RANGE (VOR)

VORTAC

VOR-DME

Non-Directional Radiobeacon (NDB)

NDB - DME

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

SOURCE: Washington Sectional Chart, February 2000

DOI 84-EXH-AIR DWG

MONTGOMERY COUNTY AIRPARK
AIRSPACE & AIR TRAFFIC CONTROL

EXHIBIT
1-12

A. DESCRIPTION OF FORECAST ELEMENTS

The description of aviation demand for Montgomery County Airpark has been organized into a logical process where each forecast element is related to the next. The basis for the forecast data is the FAA Form 5010-1, Airport Master Record, as filed for GAI May 31, 2001. Discussion with the FAA and MAA has confirmed this data to be the most current approved figures for the Airpark. The forecasts are used in the next chapter to determine facility requirements and will be formulated for the short (2001-2005), intermediate (2006-2010), and long range (2011-2020) planning periods. As this ALP Update presents a planning period with planning horizons, annual growth projections for the future years are drawn from FAA Aerospace Forecasts, 2001-2012. The stated growth figures are also used to develop the 2020 forecast, as this is the most reliable data available at the time of forecast preparation. The major forecast elements addressed in this chapter include:

General Aviation Forecast - The general aviation forecast provides projections of general aviation activity for based aircraft by type; local, itinerant and total operations; operations by aircraft type; and estimates of pilots and passengers.

Peak Period Demand - This forecast element provides peak month, peak hour, average day peak month of enplaned passengers and aircraft operations. These measures are critical to the sizing of future airport facilities.

Other Airport Activity Forecasts - Other airport activity forecasts include identifying the existing and future critical aircraft which use the airport on a regular basis. The critical aircraft is used to determine the airport reference code (ARC). In addition, the annual volume of instrument approaches will be forecast.

B. GENERAL AVIATION FORECAST

This section will project future growth. The general aviation forecasts to be determined in this section include:

1. Based Aircraft by Type
2. Annual Operations
3. Local/Itinerant Operations
4. Operations by Aircraft Mix
5. Pilots and Passengers

1. Based Aircraft by Type

The projected mix of based aircraft was generated to reflect national trends for general aviation, see **Tables 2-1a and 2-1b.** FAA forecasts (most recently reported in the GAO Report to Congress on General Aviation, August 2001) expect the general aviation aircraft fleet to increase at an average annual rate of 0.9 percent through 2012. The fleet of turbine aircraft is expected to increase at a greater rate that piston aircraft as a result of the dramatic growth in fractional ownership. The FAA forecast also expects total hours flown in the turbojet segments to increase at an annual rate of seven percent.

Montgomery County Airpark's role as a GA reliever has already made it an airport of choice for turbojet operators, and its location and service role ensure that it will meet or exceed average industry growth projections. Activity and intensity in the airport have increased as a result of increased restrictions on GA aircraft in the Washington, D.C. area. Concerns and delays associated with commercial flying will continue to push many business travelers and corporations to GA travel and/or fractional ownership.

As noted above, the FAA forecast projects an average annual growth rate of 0.9 percent for the GA aircraft fleet. Based aircraft forecasts for Montgomery County Airpark average 0.8 percent during the planning period. The rate of growth for the period 2000-2005 is planned at 0.8 percent, and 0.7 percent for the remainder of the planning period.

The growth rate is slightly less than the national average due to the fleet mix based and forecast to be based at GAI.

TABLE 2-1a
MONTGOMERY COUNTY AIRPARK
FORECAST OF BASED AIRCRAFT BY TYPE

YEAR	SINGLE ENGINE PISTON	MULTI-ENGINE PISTON	MULTI-ENGINE TURBO-PROP	BUSINESS JET	ROTOR CRAFT	TOTAL
2000	210	26	9	3	0	248
2005	217	26	10	4	1	258
2010	225	26	10	5	1	267
2020	241	26	12	7	1	287

Source: FAA Form 5010-1
FAA Aerospace Forecast 2001-2012
Delta Airport Consultants, Inc. Analysis

TABLE 2-1b
MONTGOMERY COUNTY AIRPARK
BASED AIRCRAFT BY TYPE (AVERAGE ANNUAL GROWTH RATE PERCENT)

PERIOD	SINGLE ENGINE PISTON	MULTI-ENGINE PISTON	MULTI-ENGINE TURBO-PROP	BUSINESS JET	ROTOR CRAFT	TOTAL
2000 - 2005	0.7	0.0	1.2	4.30	----	0.8
2006 - 2010	0.7	0.0	1.2	4.3	1.9	0.7
2011 - 2020	0.7	0.0	1.2	4.3	1.9	0.7

Source: FAA Form 5010-1
FAA Aerospace Forecast 2001-2012
Delta Airport Consultants, Inc. Analysis

2. Annual Operations

An aircraft operation is defined as either a take-off or landing. A touch and go (landing and take-off without a full stop) is counted as two operations. This section will initially quantify total general aviation operations. The next subsection identifies the share of total operations attributed to local and itinerant operations.

The forecast of general aviation operations was derived using a ratio of operations per based aircraft (OPBA). The OPBA per year for Montgomery County Airpark of 567 is based on the FAA Form 5010 filed for the Airpark in May 2001. This figure was used to develop the operations forecast. **Table 2-2** presents the forecast of general aviation operations for the planning period.

TABLE 2-2
MONTGOMERY COUNTY AIRPARK
FORECAST OF GENERAL AVIATION OPERATIONS

	2000	2005	2010	2020
Based Aircraft	248	258	267	287
Operations per Based Aircraft (OPBA)	567	567	567	567
Operations	140,616	146,286	151,389	162,729

Source: FAA Form 5010-1
FAA Aerospace Forecast 2001-2012
Delta Airport Consultants, Inc. Analysis

3. Local/Itinerant Operations

Aircraft operations are classified into two broad types: local and itinerant. A local operation is defined as a take-off or landing performed by an aircraft that:

(a) operates in the local traffic pattern or within sight of the airport;

(b) is known to be departing for, or arriving from, flights in a local practice area located within a 20-mile radius of the airport; or

(c) executes simulated instrument approaches or low passes at the airport.

Itinerant operations are defined as all aircraft operations other than local operations. The local/itinerant split is useful as one indicator in evaluating an airport's overall capacity. For instance, if there is a large percentage of local operations, this would indicate that the airport is used for training purposes.

The local/itinerant division of operations for the Montgomery County Airpark is a 57 percent (local)/35 percent (itinerant) ratio (the remaining eight percent is attributed to Air Taxi service) . This local ratio is consistent with the most recent FAA Form 5010. The figure is expected to remain constant throughout the planning period. **Table 2-3** presents the local/itinerant split for the planning period.

TABLE 2-3
MONTGOMERY COUNTY AIRPARK
LOCAL/ITINERANT OPERATIONS

	2000	2005	2010	2020
Total Operations	140,616	146,256	151,389	162,729
Local Operations	80,151	83,383	86,292	92,756
Itinerant Operations	49,216	51,200	52,986	56,955

Source: FAA Form 5010-1
FAA Aerospace Forecast 2001-2012
Delta Airport Consultants, Inc. Analysis

4. Operations by Aircraft Mix

The FAA Aerospace Forecast indicates a projected trend in operations toward a heavier, more sophisticated aircraft fleet. It is anticipated that during the planning period this trend will continue. It is expected that future operations by aircraft type will generally reflect the based aircraft forecast, but reflect an increasing number of jet operations. A breakdown of future operations by aircraft type is presented in **Table 2-4a** and **2-4b**.

TABLE 2-4a
MONTGOMERY COUNTY AIRPARK
OPERATIONS BY AIRCRAFT TYPE

YEAR	SINGLE ENGINE PISTON	MULTI-ENGINE PISTON	MULTI-ENGINE TURBO-PROP	BUSINESS JET	ROTOR CRAFT	TOTAL
2000	119,070	14,742	5,103	1,701	0	140,616
2005	123,039	14,742	5,670	2,268	567	146,286
2010	127,575	14,742	5,670	2,835	567	151,389
2020	136,647	14,742	6,804	3,969	567	162,729

Source: FAA Form 5010-1
FAA Aerospace Forecast 2001-2012
Delta Airport Consultants, Inc. Analysis

TABLE 2-4b
MONTGOMERY COUNTY AIRPARK
OPERATIONS BY AIRCRAFT TYPE (Average Annual Growth Rate Percent)

PERIOD	SINGLE ENGINE PISTON	MULTI-ENGINE PISTON	MULTI-ENGINE TURBO-PROP	BUSINESS JET	ROTOR-CRAFT	TOTAL
2000 - 2005	0.7	0.0	2.2	6.7	---	0.8
2006 - 2010	0.7	0.0	0.0	5.0	0.0	0.7
2011 - 2020	0.7	0:0	2.0	4.0	0.0	0.7

Source: Delta Airport Consultants, Inc. Analysis

5. Pilots and Passengers

General aviation pilots and passengers include those traveling for corporate/business, charter, air taxi, and other transient departures except for any regularly scheduled commercial airline departures.

Various general aviation load factor studies indicate a typical general aviation load factor of 2.5 occupants per departure. This figure reflects a reasonable assumption for travel patterns at general aviation airports taken over the past several years at the airport. **Table 2-5** presents the total number of pilots and passengers for the planning period.

TABLE 2-5
MONTGOMERY COUNTY AIRPARK
PILOTS AND PASSENGERS FORECAST

YEAR	PERSONS/ G. A. FLIGHT	TOTAL DEPARTURES	ANNUAL PILOTS AND PASSENGERS
2000	2.5	70,308	175,770
2005	2.5	73,143	182,858
2010	2.5	75,695	189,238
2020	2.5	81,365	203,413

Source: Delta Airport Consultants, Inc. Analysis

C. PEAK PERIOD DEMAND

Peak period operations are a key element in evaluating facility requirements during periods of high demand. Peak operations drive the space and facility requirements required to meet forecasted demand. General aviation facility needs are related to peak period activity, and the most common and useful peaking characteristic of an airport is peak hour activity. The following characteristics were used to determine peak period operations:

- Peak Month - Peak month operations were calculated assuming that the peak month is 10 percent busier than the average month (annual operations/12 x 110%).

- Average Peak Day - Average peak day operations is defined as the average day during the peak month. It is calculated by dividing the peak month by 30.

- Peak Hour - Peak hour operations represent the highest number of operations during the busiest hour of an average day during a peak month. Peak hour operations are assumed to be 15 percent of the average peak day.

Table 2-6 presents peak period general aviation operations during the planning period.

TABLE 2-6
MONTGOMERY COUNTY AIRPARK
GENERAL AVIATION OPERATIONS PEAK PERIOD FORECAST

YEAR	ANNUAL	PEAK MONTH	PEAK DAY	PEAK HOUR
2000	140,616	12,890	430	65
2005	146,286	13,410	447	67
2010	151,389	13,877	463	69
2020	162,729	14,917	497	75

Source: FAA Form 5010-1
FAA Aerospace Forecast 2001-2012
Delta Airport Consultants, Inc. Analysis

D. OTHER AIRPORT ACTIVITY FORECASTS

Other airport activity forecasts not previously described are presented in this section. Activity evaluated in this section includes defining the future critical aircraft utilizing the airport and projecting future annual instrument approaches.

1. Critical Aircraft

The determination of the future critical aircraft at Montgomery County Airpark will be useful to establish the airport reference code (ARC) for the airport. The critical aircraft is defined as the aircraft or family of aircraft with the largest wingspan and highest approach to landing speed that uses the airport on a regular basis. Regular basis is defined as more than 500 itinerant operations a year. In some cases, the critical aircraft can be two different aircraft where one aircraft is used for the largest wingspan and one is used for the highest approach to landing speed. As mentioned in Chapter One, the critical family of aircraft are the small business jets, similar to the Citation family. The Citation II is representative of this group and is considered the critical aircraft for the Airpark.

2. Instrument Approaches

An instrument approach is an approach to an airport utilizing aircraft instrumentation and navigational facilities when actual instrument meteorological conditions exist. The volume of instrument approaches at Montgomery County Airpark have been difficult to measure since the airport has no air traffic control tower that would typically record the approaches. The demand for instrument approaches has been estimated based on historical averages at other airports and similar conditions. It is estimated that instrument approaches will average 2.5 percent of annual operations. The forecast of instrument approaches are presented in **Table 2-7** for the planning period.

TABLE 2-7
MONTGOMERY COUNTY AIRPARK
INSTRUMENT APPROACHES

	2000	2005	2010	2020
Annual Operations	140,616	146,286	151,389	162,729
Instrument Approaches (2.5%)	3,515	3,657	3,785	4,068

Source: Delta Airport Consultants, Inc. Analysis

E. FORECAST SUMMARY

Table 2-8 presents a summary of the forecasts for Montgomery County Airpark over the 20-year planning period. These forecasts indicate that all aspects of aviation demand at the airport will continue to grow during the planning period. Therefore, ongoing development of facilities will enable the airport to continue to accommodate the growth in aviation demand and contribute to the economic vitality of the service area.

TABLE 2-8
MONTGOMERY COUNTY AIRPARK
FORECAST SUMMARY

	YEAR			
FORECAST ELEMENT	**2000**	**2005**	**2010**	**2020**
Total Based Aircraft	248	258	267	287
Single Engine	210	217	225	241
Multi-Piston	26	26	26	26
Multi-Turbine	9	10	10	12
Business Jet	3	4	5	7
Rotorcraft	0	1	1	1
Operations	**140,616**	**146,286**	**151,389**	**162,729**
G. A. Operations by Aircraft Type				
Single Engine	119,070	123,039	127,575	136,647
Multi-Piston	14,742	14,742	14,742	14,742
Multi-Turbine	5,103	5,670	5,670	6,804
Business Jet	1,701	2,268	2,835	3,969
Rotorcraft	0	567	567	567
Total Peak Hour Operations	**65**	**67**	**69**	**75**
Total Instrument Approaches	**3,515**	**3,657**	**3,785**	**4,068**

Source: FAA Form 5010-1
FAA Aerospace Forecast 2001-2012
Delta Airport Consultants, Inc. Analysis

Chapter Three
AIRFIELD CAPACITY/FACILITY REQUIREMENTS

A. GENERAL

The purpose of this chapter is to determine the airport's capacity in relation to the forecast of aviation demand presented in Chapter Two. This section will also identify the facility requirements to accommodate the 20-year forecasted demand. An analysis of the forecasts presented in Chapter Two indicates an ongoing increase of aviation activity at Montgomery County Airpark. To accommodate this increase, airport improvements and/or facility development will be necessary to meet the area's general aviation needs.

The methodology used to determine facility requirements begins with an examination of the airport system's major components: airspace, airfield, buildings and surface access. It is important to note that each of these system components must be balanced to achieve system optimization. The Montgomery County Airpark has an existing airport reference code (ARC) of B-II. Since the ARC is projected to remain the same throughout the planning period, any deficiencies in the airport's facilities will be identified based on the standards presented in FAA AC 150/5300-13 "Airport Design." Recommended improvements to facilities will be noted as required.

B. RUNWAYS

In addition to analyzing the runway capacity, length and width requirements, this section includes an examination of Runway Safety Area (RSA) and Runway Object Free Area (ROFA) requirements. The RSA and ROFA are described later in this chapter.

1. RUNWAY CAPACITY

Runway capacity is defined as a measure of the maximum number of aircraft operations which can be accommodated at the airport on an hourly and/or annual basis. This estimate

accounts for differences in runway use, aircraft mix and weather that may be encountered over the span of a typical year.

A runway's ability to accommodate aircraft is largely determined by the critical aircraft's approach-to-landing speed and maximum gross landing weight. General aviation aircraft typically have lower approach-to-landing speeds which equates to a lower runway occupancy time where adequate exit taxiways are provided. Conversely, larger and heavier commercial aviation aircraft typically operate at higher approach-to-landing speeds which require more deceleration time. This increased deceleration time results in a longer runway occupancy time.

Another factor which affects a runways capacity is wake turbulence generated by large aircraft operations. The term wake turbulence includes vortices, thrust stream turbulence, jet blast and propeller wash. Wake turbulence generated from aircraft can greatly affect the safe operation of a subsequent smaller aircraft. The effect of wake turbulence is increased aircraft separation distances on the ground and in the air.

Runway capacity enhancements are typically triggered for consideration when operations reach a level of 30 per hour. This level of activity is not projected to occur during the planning period and as such, no capacity enhancement projects are anticipated at the Montgomery County Airpark during the planning period.

2. RUNWAY LENGTH AND WIDTH

The determination of length required for an airport is based on standards presented in FAA AC 150/5300-13, Chapter 3 and FAA AC 150/5325-4, Runway Length Requirements for Airport Design. The recommended length for a primary runway at an airport is determined by considering either the family of airplanes having similar performance characteristics or a specific aircraft requiring the longest runway. As noted in Chapter Two, this need is based on the aircraft or family of aircraft that use the airport on a regular basis, where regular basis

is typically defined as a minimum 500 operations per year. Additional factors considered include critical aircraft approach speed, its maximum certificated takeoff weight, useful load and length of haul, the airport's field elevation above sea level, the mean daily maximum temperature at the airfield, and typical runway surface conditions, such as wet and slippery.

The single runway existing at Montgomery County Airpark is designated Runway 14-32. The Cessna Citation II represents the critical aircraft for GAI and is used for analyzing the runway length requirement at the Airpark. A runway length of 4,238 feet is required to serve a Citation II given the Airpark's mean daily maximum temperature, field elevation and assuming the aircraft is operating at 75 percent useful load capacity. The runway length calculation also includes a 15 percent increase (3685' x 1.15 = 4238') for the potential of a wet and slippery surface serving turbojet powered aircraft (reference AC 150/5325-4A). **Exhibit 3-1** provides further information and flight planning detail for the Cessna Citation II. The existing runway is adequate to serve the Airpark's critical aircraft during the planning period.

The required runway width for a category B-II aircraft such as the Citation II is 75 feet, therefore the existing runway width is adequate.

3. RUNWAY SAFETY AREA (RSA)

FAA AC 150/5300-13 "Airport Design" designates a minimum runway safety area based on the airport reference code of the runway. As discussed previously, Runway 14-32 is expected to remain as B-II. A runway safety area is defined as a surface surrounding the runway which is suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot or excursion from the runway.

The standard design for a B-II runway safety area with approach visibility minimums not lower than three-quarter-statute mile is 150 feet wide centered on the runway centerline and extended 300 feet beyond each end of the runway. The RSA for Montgomery County

Airpark meets the current standards however the MCRA does not currently own the northwest end of the RSA, an area with dimensions of approximately 100 feet by 150 feet. An agreement with the adjacent land owner allowed for grading of the RSA and relocation of the perimeter fence beyond the RSA limits.

4. RUNWAY OBJECT FREE AREA (ROFA)

The runway object free area (ROFA) is an area on the ground centered on the runway centerline. It is provided to enhance the safety of aircraft operations by having the area free of objects except for those that need to be located in the ROFA for air navigation or aircraft ground maneuvering purposes. Object free areas are illustrated on **Exhibit 3-2**. The standard design dimensions for a category B-II runway object free area with approach visibility minimums not lower than three-quarter-statute mile is 500 feet in width, centered on the runway, with extensions 300 feet beyond each runway end. The ROFA for Montgomery County Airpark currently has objects that require mitigation. The objects are highlighted in the Obstruction Study which accompanies this narrative (see **Appendix I**).

5. RUNWAY PROTECTION ZONE (RPZ)

The RPZ's function is to enhance the protection of people and property on the ground. This is achieved through airport owner control over RPZs. Such control includes clearing RPZ areas (and maintaining them clear) of incompatible objects and activities. Control is preferably exercised through the acquisition of sufficient property interest in the RPZ.

While the FAA prefers that all objects be cleared from the RPZ, some uses are permitted, provided they do not attract wildlife. FAA AC 150/5300-13, Paragraph 212 expressly prohibits land uses within the RPZ such as residences and places of public assembly, and notes that fuel storage facilities should not be located in the RPZ.

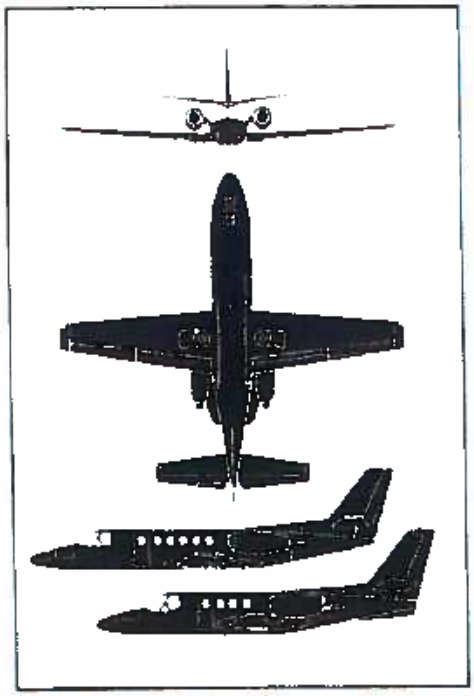
The Revenue Authority does not hold sufficient property interest in the RPZ areas at the Montgomery County Airpark and it is recommended that such interest be acquired to achieve compliance with FAA regulations and recommendations.

Cessna 550 Citation II USA

SOURCE: JANE'S AIRCRAFT RECOGNITION GUIDE

Type: medium-range executive transport

Accommodation: two pilots; six to 10 passengers



Dimensions:
Length: 47 ft 2 in (14.4 m)
Wingspan: 52 ft 2 in (15.9 m)
Height: 15 ft (4.6 m)

Weights:
Empty: 7725 lb (3504 kg)
Max T/O: 14 100 lb (6398 kg)
Payload: 3100 lb (1406 kg)

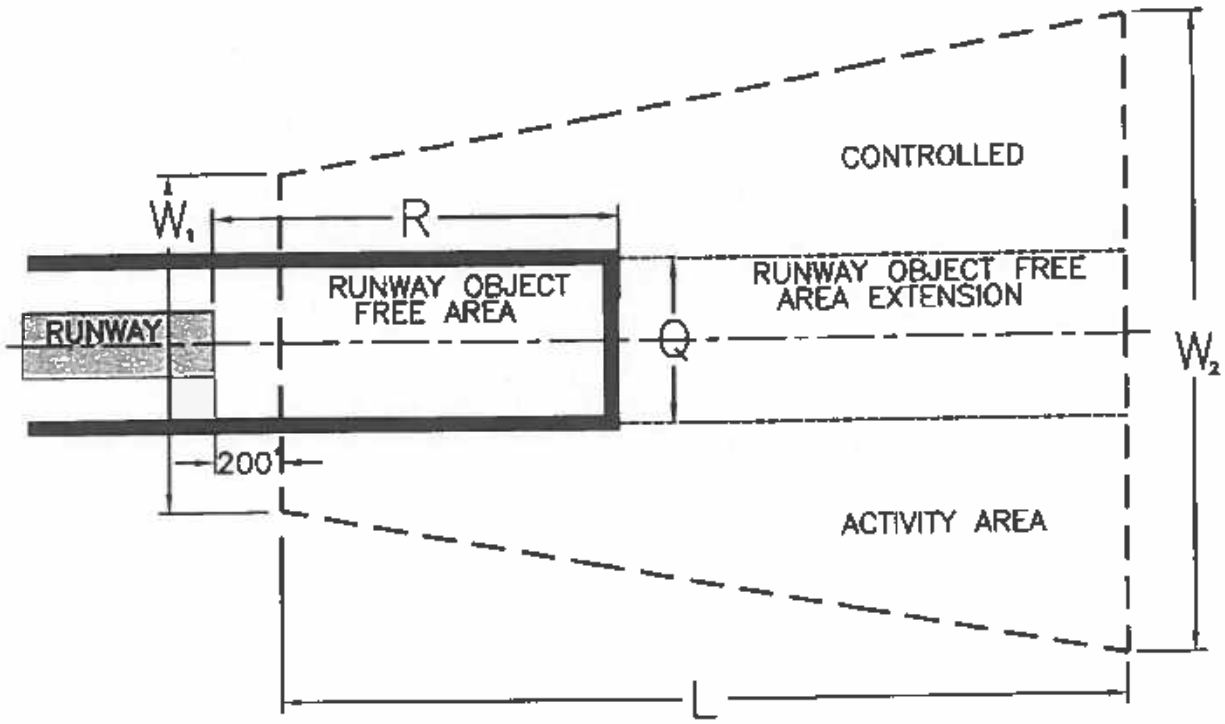
Performance:
Max speed: 443 mph (713 kmh)
Range: 1760 nm (3260 km)

Power plant: two Pratt & Whitney Canada JT15D-4B turbofans
Thrust: 5000 lb (22.2 kN)

Variants:
Citation I earlier version

Notes: Stretched development of original Citation I with new wing aerofoil and engines flew in 1977. Production ended in 1984 in favour of Citation S/II, but brought back into production in 1985. Over 670 examples built.

SOURCE: CITATION II OPERATING HANDBOOK, SIMUFLITE FLIGHT PLANNING



RUNWAY	W_1	W_2	L	R	Q
14	500 ft	700 ft	1000 ft	300 ft	500 ft
32	500 ft	700 ft	1000 ft	300 ft	500 ft

W_1 = RUNWAY PROTECTION ZONE – INNER WIDTH
W_2 = RUNWAY PROTECTION ZONE – OUTER WIDTH
L = RUNWAY PROTECTION ZONE – LENGTH
R = OBJECT FREE AREA – LENGTH
Q = OBJECT FREE AREA – WIDTH

SOURCE: FAA ADVISORY CIRCULAR 150/5300 – 13

OBJECT FREE AREAS
RUNWAY PROTECTION ZONE (RPZ)

EXHIBIT
3-2

6. RUNWAY WIND ANALYSIS

The FAA requires 95 percent wind coverage for various crosswind components of an airfield's runways based on specific airport reference codes (ARC). Due to the volume of operations and size of the aircraft using the Airpark, the 10.5 and 13 knot crosswind components were considered. As **Table 1-4** illustrates, the runway meets the FAA requirement for 95 percent wind coverage.

C. TAXIWAYS AND TAXILANES

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

1. TAXIWAYS

The taxiway safety area (TSA) is defined as a defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway.

The taxiway object free area (TOFA) is a two-dimensional ground area adjacent to taxiways and taxilanes. The TOFA clearing criteria standards precludes service vehicle roads, parked airplanes and objects that are not fixed by function. It is important to note that any new taxiway should be designed to FAA standards for safety area and object free criteria.

The location of the exit taxiways can also affect the overall capacity of an airport and contribute to the overall efficiency of aircraft circulation. The location of exit taxiways, depends upon the mix of aircraft, approach and touchdown speeds, point of touchdown, exit speeds, rate of deceleration, condition of the pavement surface (i.e., wet or dry) and the number of exits.

Montgomery County Airpark has two entrance taxiways and four exit taxiways. The taxiways are placed at intervals along the runway ranging from 500 feet to 1,000 feet. Three of the four exit taxiways are constructed at an acute angle to the runway providing a 'high speed exit' path for improved runway efficiency. Runway 14-32 has a sufficient number of exit taxiways, however the relocation of the second exit taxiway from the Runway 32 end could improve the free flow of aircraft to the south FBO apron area. Improved traffic flow may also result from bypass taxiways or holding bays, near the runway thresholds. (see discussion in Chapter 4, Airport Alternatives).

To meet Group II design standards, taxiways should be 35 feet wide with safety areas 75 feet wide and object free areas 131 feet wide. The safety area and object free area widths are centered on the taxiway centerlines.

All existing taxiways meet the standard design and separation criteria for the critical aircraft and any future taxiways should also be designed and constructed to meet the standards. It is recommended that the existing taxiways be maintained throughout the 20-year planning period, and consideration be given to relocation of the one exit taxiway as noted above.

A taxiway connector is proposed to provide access to the airfield by an adjacent property owner upon FAA approval of a through-the-fence agreement. Rickman Construction owns an adjacent parcel east of the runway 32 threshold and holds an easement across airport property to the runway. The MCRA has negotiated an agreement that provides for temporary access pending construction of a holding bay adjacent to the parallel taxiway.

2. TAXILANES

Taxilanes have less restrictive object free area standards than taxiways. For Group II aircraft, the standard taxilane object free area width is 115 feet. However, for both safety area and object free areas, the width can also be calculated based on the wingspan of the aircraft expected to utilize the taxilane. Existing taxilanes at the Montgomery County Airpark are

located primarily within the FBO active leasehold area and are not compliant with FAA standards for Group II aircraft. Only minimal compliance with Group I standards exists in main entrance areas of the FBO hangar complex. Any future taxilanes should be constructed with standard or modified safety and object free area dimensions.

D. TERMINAL AREA DEVELOPMENT

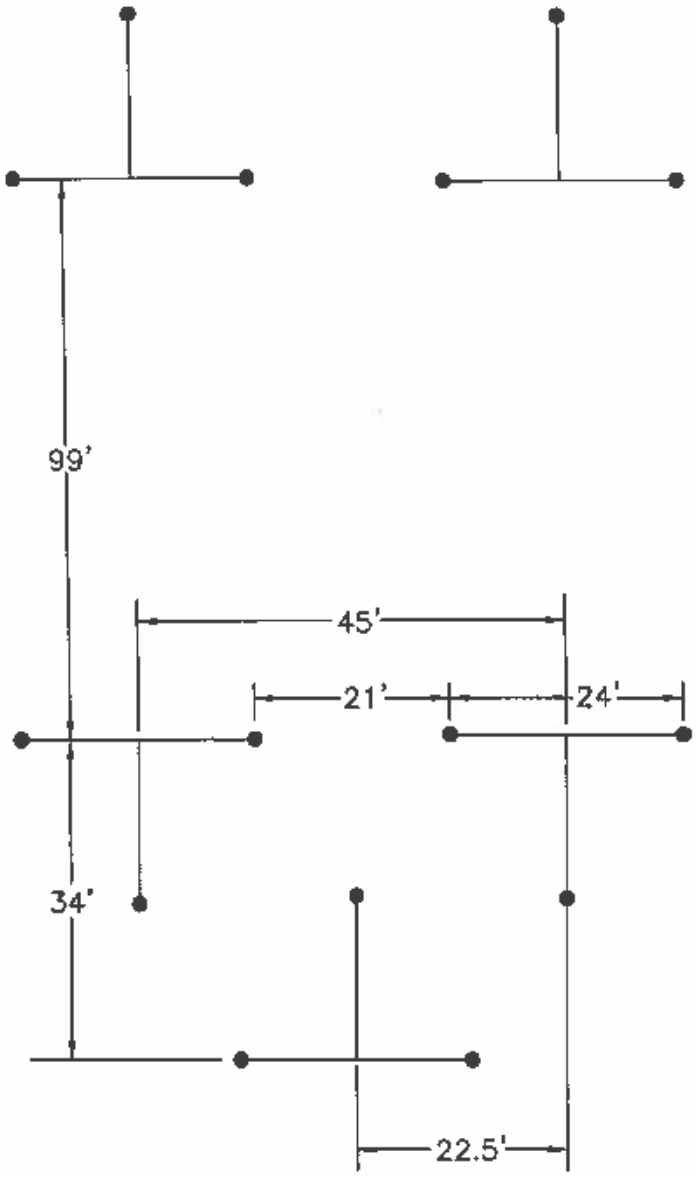
The terminal area for Montgomery County Airpark is located at the south end of the airfield and is flanked to the north and south by Fixed Based Operator (FBO) leasehold areas. The existing terminal area development and adjacent FBO facilities include T-hangars, tie down apron, terminal facilities, fueling facilities and auto parking. Currently, the vast majority of aircraft based at Montgomery County Airpark are stored either in T-hangars or at apron tie downs. The majority of these are located around or near the terminal building.

1. AIRCRAFT APRON

There are three aircraft parking aprons located at the Airpark. Two of the aprons are located in the south FBO area and the third in the north FBO area. One each of the north and south aprons are designated for based aircraft with the remaining south apron for transient aircraft. GAI apron areas are all currently located within FBO leasehold areas and are configured to primarily accommodate Group I aircraft. A typical apron tie-down spacing is illustrated in **Exhibit 3-3**.

2. TAXIWAYS AND TAXILANES

The terminal area is accessed by arriving aircraft via the parallel taxiway and the series of entrance and exit taxiways that connect the parallel taxiway to the runway. From the parallel taxiway, aircraft may approach the terminal area via either of two connecting taxiways to the aircraft parking apron or terminal area taxilanes. One taxilane runs parallel to the parallel taxiway adjacent to the terminal building and auto parking area. The other taxilane intersects



MONTGOMERY COUNTY AIRPARK
TYPICAL TIE DOWN SPACING DETAIL

EXHIBIT
3-3

the parallel taxiway near its south end and provides primary direct access to the FBO hangar and apron facilities.

All existing taxiways at the Montgomery County Airpark meet the standard design and separation criteria for the Airpark's critical aircraft. Any future taxiways should also be designed and constructed to meet the standards.

Existing taxilanes at the Airpark are located primarily within the FBO leasehold areas and are not compliant with FAA standards for Group II taxilane object free areas, and only minimally compliant with Group I standards.

3. TRANSIENT AIRCRAFT PARKING REQUIREMENTS

Transient aircraft are defined as those aircraft not based at the facility. For the purpose of the analysis, peak day transient operations were used to determine apron space requirements. **Table 3-1** presents the average daily transient traffic and the aircraft types.

TABLE 3-1
MONTGOMERY COUNTY AIRPARK
TRANSIENT AIRCRAFT ACTIVITY

	Airplane Design Group	2000	2005	2010	2020
Total OPS/Average Peak Day		**430**	**447**	**463**	**497**
Transient OPS/Average Peak Day (35%)		**151**	**156**	**162**	**174**
Transient Aircraft/Average Peak Day		75	78	81	87
Single Engine	I	63	65	67	72
Multi- Engine (piston)	I	8	8	8	8
Multi-Engine (turbo-prop)	II	3	3	3	4
Business Jet	II	1	1	2	2
Rotorcraft		0	1	1	1

Source: Delta Airport Consultants, Inc. Analysis

Apron plan space allocations for the typical aircraft types operating at Montgomery County Airpark are 360 square yards for single engine aircraft as stated in FAA AC 150/5300-13, Appendix 5, relating to airplane parking and tiedowns. Consultant analysis of larger aircraft parking space requirements resulted in apron space allocations of 550 square yards for multi-engine (piston)/multi-

engine (turbine) aircraft, 700 square yards for turbo-jet aircraft and business jets and 200 square yards for other aircraft (Business and Rotorcraft). Transient apron requirements include both Group I and Group II aircraft. Group II aircraft would typically include business jets and large multi-engine, turbo-prop aircraft such as the Beechcraft King Air C-90 and B-200. **Table 3-2** presents the apron requirements for the transient aircraft for the planning horizons throughout the 20-year planning period.

As noted in Chapter One, the Airpark owner and operator requested recommendations regarding routing and parking transient helicopters. Discussions related to this subject indicated the rotorcraft traffic to be irregular and primarily corporate pickup and drop off, with a few large helicopters landing for fuel or temporary basing while working in the area.

The operator is currently allowing helicopters to land on grass near the Mason Hangar. Until further study, it is recommended this site continue to be used and that notes be published in the Airport/Facility Directory indicating the airport is PPR (Prior Permission Required) for helicopters in excess of 20,000 pounds. Large rotorcraft might be parked in the grass area north of the paved apron. Should rotor traffic increase substantially, a paved landing/parking area may be considered through further study.

TABLE 3-2
MONTGOMERY COUNTY AIRPARK
TRANSIENT AIRCRAFT APRON REQUIREMENTS (GROUP I & II)

Aircraft Types	Airplane Design Group	2000 (SY)	2005 (SY)	2010 (SY)	2020 (SY)
Single Engine	I	22,680	23,400	24,120	25,920
Multi-Engine (piston)	I	4,400	4,400	4,400	4,400
Multi-Engine (turbo-prop)	II	1,650	1,650	1,650	2,200
Business Jet	II	700	700	1,400	1,400
Rotorcraft		0	200	200	200
Total Requirements (SY)		29,430	30,350	31,770	34,120

(0)=Number of aircraft spaces
Source: Delta Airport Consultants, Inc. Analysis

4. BASED AIRCRAFT APRON REQUIREMENTS

The airport owner/operator should ensure adequate aircraft apron storage is available to meet existing demand and ensure a growth plan to accommodate future demand. Based aircraft, as opposed to transient aircraft are permanently stored at the airport. For those owners not requiring hangar storage, adequate space for parking and storage of these aircraft on the apron should be provided. These based aircraft storage spaces are part of the total apron tie-down area. Historically, aircraft types which are routinely stored, or parked on the apron are less expensive single engine aircraft types. The larger and more expensive aircraft, such as the multi-engine aircraft types, are normally stored in hangars.

The Airpark currently has approximately 125 based aircraft on apron tie-downs or on paved tie-down pads directly adjacent to the apron. All other aircraft based at Montgomery County Airpark are either stored in T-hangars or conventional hangars. It is estimated that the number of single engine piston aircraft will grow throughout the planning period. The percentage of any other types of aircraft typically stored on the apron is expected to remain constant at zero for the planning period.

The square yardage (SY) per based aircraft is the same as the transient aircraft formula, However only Group I aircraft are considered as requiring apron at their base airfield. As noted previously, larger and more expensive aircraft that would be categorized as Group II are typically stored in hangars. **Table 3-3** presents the forecasted based aircraft apron area requirement for the 20-year planning period.

TABLE 3-3
MONTGOMERY COUNTY AIRPARK
BASED AIRCRAFT APRON REQUIREMENTS (GROUP I ONLY)

Aircraft Types	2000 (SY)	2005 (SY)	2010 (SY)	2020 (SY)
Single Engine	63	65	68	72
Total Requirements (SY)	22,680	23,436	24,300	26,028

Source: Delta Airport Consultants, Inc. Analysis

5. TOTAL APRON REQUIREMENTS

The preceding discussions have identified the total demand for apron space for the planning period. Apron size requirements have been established for transient aircraft. Planning allocations for these aircraft types were 360 square yards for single engine aircraft, 550 square yards for multi-engine (piston)/multi-engine (turbine) aircraft, 700 square yards for turbo-jet aircraft and business jets and 200 square yards for other aircraft (Business and Rotorcraft). **Table 3-4** presents the area of apron requirements for the planning period. There is not sufficient apron space to accommodate current parking demand and by the end of the 20-year planning period, it is anticipated that the existing apron space deficit will be more than 30,000 square yards. The below assumptions were made to determine apron space requirements for based aircraft at Montgomery County Airpark. The assumptions are based on conversations with the airport manager, and recognition of the apron tenants expressing a desire to move into hangar facilities.

- 30% of all single engine aircraft will require apron space through the planning period,
- 0% of all multi-engine aircraft will require apron space,
- 0% of all business aircraft will require apron space, and
- 0% of all others (i.e. Rotorcraft) will require apron space.

As **Table 3-4** indicates, there is not sufficient transient or based apron parking to adequately handle the demands placed on the Airpark. It is recommended that the transient and based aprons be enlarged and that the existing tie-down pad areas located along the south perimeter fenceline be paved. The reason for the high amount of based aircraft using the aprons is due to the lack of existing hangar facilities as discussed in the next section.

TABLE 3-4
MONTGOMERY COUNTY AIRPARK
AIRCRAFT APRON REQUIREMENTS

Aircraft Types	Airplane Design Group	2000 (SY)	2005 (SY)	2010 (SY)	2020 (SY)
Transient Aircraft					
Single Engine	I	22,680	23,400	24,120	25,920
Multi-Engine (piston)	I	4,400	4,400	4,400	4,400
Multi-Engine (turbo-prop)	II	1,650	1,650	1,650	2,200
Business Jet	II	700	700	1,400	1,400
Rotorcraft		0	200	200	200
Total Transient Apron Required		29,430	30,350	31,770	34,120
Existing Pavement (SY)		21,480	21,480	21,480	21,480
Loss of Existing Apron to Proporsed Development		3,440	3,440	3,440	3,440
Deficiencies (-) / Capacity (+)		-11,390	-12,310	-13,730	-16,080
Based Aircraft					
Single engine		22,680	23,436	24,300	26,028
Total Based Apron Required		22,680	23,436	24,300	26,028
Existing Pavement (SY)		14,320	14,320	14,320	14,320
Loss of Existing to Proposed Development		2,300	2,300	2,300	2,300
Deficiencies (-) / Capacity (+)		-10,660	-11,416	-12,280	-14,008
Total Deficiency (Based& Transient)		22,050	23,726	26,010	30,088

Source: Delta Airport Consultants, Inc. Analysis

6. HANGAR FACILITIES

Hangar space requirements include demand generated by based aircraft, normal fixed base operations and conventional use. The demand for hangars versus apron tie-down space at general aviation airports is often price sensitive and market specific. The primary FBO at GAI, Freestate Aviation, reports 100 percent occupancy of both T-Hangars and conventional hangars at the Airpark currently. Waiting lists on file with the FBO and one of the SASO's, Aerotronic Services, documents in excess of 75 aircraft owners desiring hangar space. The lack of vacancies and turnover with the existing hangars, and the strong demand for additional units indicate that aircraft owners with based aircraft (or wishing to base their aircraft) at the facility are willing to pay the premium (typically 2-4 times apron tie-down cost) associated with hangar space to better secure their aircraft. The following assumptions were made to determine hangar space requirements for based aircraft at Montgomery County Airpark:

- 70% of all single engine aircraft will require hangar space through the planning period
- 100% of all multi-engine aircraft will require hangar space
- 100% of all business aircraft will require hangar space
- 100% of all others (i.e. Rotorcraft) will require hangar space.

Currently, Montgomery County Airpark has eight T-hangars and nine conventional hangars. The planning ratios established for this hangar needs analysis are shown in **Table 3-5.**

TABLE 3-5
MONTGOMERY COUNTY AIRPARK
HANGAR PLANNING RATIOS

Aircraft Types	T-Hangars	Conventional Hangars
Single Engine	95%	5%
Multi-Engine (piston)	30%	70%
Multi-Engine (Turbo-prop)	0%	100%
Business Jet	0%	100%
Rotorcraft	0%	100%

Source: Delta Airport Consultants, Inc. Analysis

For planning purposes, the hangar space standards that were used for each of the aircraft types to determine approximately how much hangar space is required are shown in **Table 3-6**. These dimensions represent the optimum space required to provide ample hangar space for aircraft to maneuver in and out. They do not include additional spacing required for hangar access taxilanes, ramps or general spacing and circulation.

TABLE 3-6
MONTGOMERY COUNTY AIRPARK
CONVENTIONAL HANGAR SPACE REQUIREMENTS

Aircraft Types	Conventional Hangars
Single Engine	1,200 sq. feet
Multi-Engine (piston)	1,400 sq. feet
Multi-Engine (turbo-prop)	3,000 sq. feet
Business Jet	3,000 sq. feet
Rotorcraft	1,200 sq. feet

Source: Delta Airport Consultants, Inc. Analysis

As the number of based aircraft increases, the percentage of aircraft owners who desire hangar space is expected to increase. As shown in **Table 3-7**, there are insufficient T-hangar spaces and conventional hangar spaces.

TABLE 3-7
MONTGOMERY COUNTY AIRPARK
BASED AIRCRAFT HANGAR REQUIREMENTS

Aircraft Types	2000	2005	2010	2020
T-hangar Spaces (Units)				
Single Engine	140	144	148	161
Multi-Engine (piston)	8	8	8	8
Total T-hangars	147	149	158	165
Existing T-hangars	75	75	75	75
Deficiencies (-) / Capacity (+)	-72	-74	-81	-89
Conventional Hangar Space (Square Feet)				
Single Engine	8,400	9,600	9,600	9,600
Multi-Engine (piston)	25,200	25,200	25,200	25,200
Multi-Engine (Turbo-prop)	27,000	30,000	30,000	36,000
Business Jet	9,000	12,000	15,000	21,000
Rotorcraft	0	1,200	1,200	1,200
Total SF Required	69,600	78,000	81,000	93,000
Existing Space (SF)	40,500	40,500	40,500	40,500
Deficiencies (-) / Capacity (+)	29,500	37,500	40,500	52,500

(0)=Number of aircraft spaces
Source: Delta Airport Consultants, Inc. Analysis

7. GENERAL AVIATION TERMINAL / FIXED BASE OPERATORS

Montgomery Aviation is the only full service FBO (offering fuel sales to the general public) at Montgomery County Airpark. Several Specialized Aviation Service Operations, or SASOs, operate from the facility offering a variety of services. These include Aerotronics Services and Congressional Air Charters. The airfield layout is such that another full service FBO could be accommodated at the Runway 14 end of the Airpark. This is an area which the MCRA has previously initiated development with the construction of an aircraft parking apron. Introduction of a second FBO offering new facilities and expanded or improved services could provide incentives for additional aircraft owners to base their aircraft at Montgomery County Airpark. It is recommended that the MCRA continue its pursuit of a

second FBO to operate at the north end of the airfield.

The Airpark is a designated reliever airport with substantial demands placed on their access infrastructure, public auto parking and terminal facilities. The existing terminal facility was constructed in 1960 during initial airfield development and is not adequate to meet the needs of the flying public that use Montgomery County Airpark. The two-story facility offers approximately 3,500-4,000 square feet of useable space on each floor. The first floor and approximately one-half of the second floor space is used primarily for private office space. The remaining space includes a small lobby on the first floor and a restaurant on the second floor. Representatives of the Revenue Authority and the FBO operator have noted the need for a new or improved facility that would offer more user friendly and attractive public waiting rooms, meeting rooms and corporate pilot operational space. Airpark management has expressed the dire need for space that will adequately accommodate pilot's flight planning, weather briefings and a rest area. It is recommended that a new terminal building ultimately be considered to better serve the business travelers at the airport and to accommodate on-site operational and administrative offices for the MCRA.

8. AIRPORT ACCESS / AUTO PARKING

The Montgomery County Airpark is accessed by Airpark Road. It is recommended that this road be maintained throughout the duration of the planning period and continue to serve as the primary entrance to the Airpark. The existing auto parking in the terminal area has approximately 160 spaces. In this analysis, it is estimated that there are 100 employees (full and part time) at the Airpark and that this number will increase to 135 by the end of the 20-year planning period.

As **Table 3-8** indicates, there are not sufficient parking spaces to adequately supply the demand. It is recommended that additional parking be made available to support the current users of the Airpark and future growth.

TABLE 3-8
MONTGOMERY COUNTY AIRPARK
AIRPORT PARKING REQUIREMENTS

Year	Peak Hour Pilots & Passengers	Airport Employees	Total Parking Spaces	Existing Spaces	Capacity(+)/ Deficiency(-)
2000	80	100	180	160	-20
2005	83	105	188	160	-28
2010	87	115	202	160	-42
2020	93	135	228	160	-68

Source: Delta Airport Consultants, Inc. Analysis

E. SUPPORT FACILITIES AND SERVICES

1. FUEL FACILITIES

The fuel facilities at Montgomery County Airpark are adequate for the 20-year planning period. The relocation of the existing fuel farm will be examined in Chapter Four, Airport Alternatives, to determine if it is in the optimal location with respect to the Airport's future development needs.

2. ELECTRICAL VAULT

There is no electrical vault located at Montgomery County Airpark. All electrical systems and regulators that should be located in an electrical vault are located in the terminal building. It is recommended that an electrical vault be constructed in the field area of the Airpark.

3. PERIMETER FENCING

The Airpark currently has a fence along the perimeter of the Airpark property. It is recommended that the fence be maintained throughout the 20-year planning period and relocated as appropriate when the perimeter boundary is expanded through land acquisition.

4. GROUND SUPPORT EQUIPMENT AND RELATED STORAGE

The ground support equipment in service at the Airpark is owned and operated by Montgomery Aviation and Congressional Air. The tugs are stowed in hangars and the fuel trucks are parked on the apron area. It is recommended that the existing equipment and storage be maintained throughout the 20-year planning period.

F. AIRPORT LIGHTING AND VISUAL AIDS

Airport lighting and visual aids assist the pilot in locating the landing environment and airport facilities during night operations and adverse weather conditions. Montgomery County Airpark has a variety of such aids as presented below.

1. VISUAL APPROACH SLOPE INDICATORS (VASIs)

Visual Approach Slope Indicators (VASIs) are a system of light bars that provide visual descent guidance information during approach to a runway. This system provides a visual glide path that allows for safe obstruction clearance from the start of descent to the runway threshold. The Montgomery County Airpark currently has obstructions along the approach path to Runways 14 and 32. As a part of the ALP Update, a comprehensive obstruction study was conducted and is provided as **Appendix I** to this report. The appropriate removal of obstructions must be coordinated with the FAA and completed prior to installation and implementation of additional descent guidance systems.

It is recommended that the existing bar VASI for the Runway 14 approach be maintained until the installation of a Precision Approach Path Indicator (PAPI) system. The PAPI system would significantly improve the visual approach assistance provided to pilots landing at the Airpark and installation should be considered for both Runway 14 and 32.

An analysis of the PAPI clearance plane has been conducted in accordance with FAA AC 150/5345-28D. The analysis identified no obstructions to the Runway 14 PAPI clearance plane, as shown on **Exhibit 3-4**. Two obstructions were identified within the PAPI clearance plane for Runway 32 as illustrated on **Exhibit 3-5** and detailed in **Appendix I**, Obstruction Study.

2. RUNWAY END IDENTIFIER LIGHTS / APPROACH LIGHTING SYSTEMS

Both Runway ends are equipped with Runway End Identifier Lights (REILs) to improve the visibility of the landing environment. It is recommended that the existing REILs be maintained throughout the planning period.

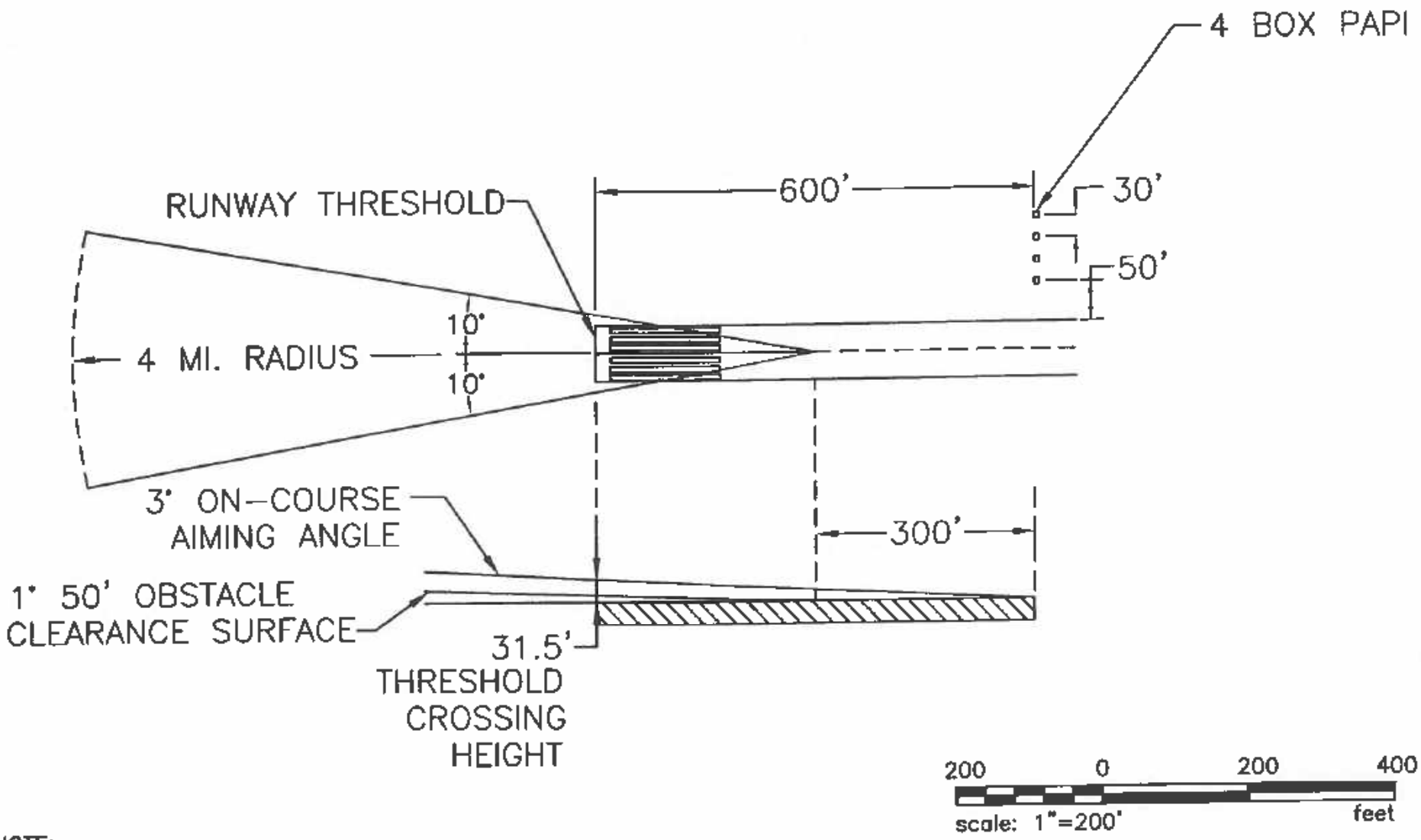
3. RUNWAY EDGE LIGHTS

Runway 14-32 is equipped with Medium Intensity Runway Lights (MIRLs). The lighting system is in good condition and should be sufficient if properly maintained during the planning period.

4. TAXIWAY / APRON LIGHTING

The taxiway system has medium-intensity edge lighting. The existing system is in poor condition and it is recommended that the MITLs be replaced as soon as practical.

The south aprons are lighted and it is recommended that this lighting be maintained throughout the 20-year planning period. The north apron area currently has no lighting and such improvement is recommended as the area is developed for use.



NOTE:
NO OBSTRUCTIONS INDENTIFIED

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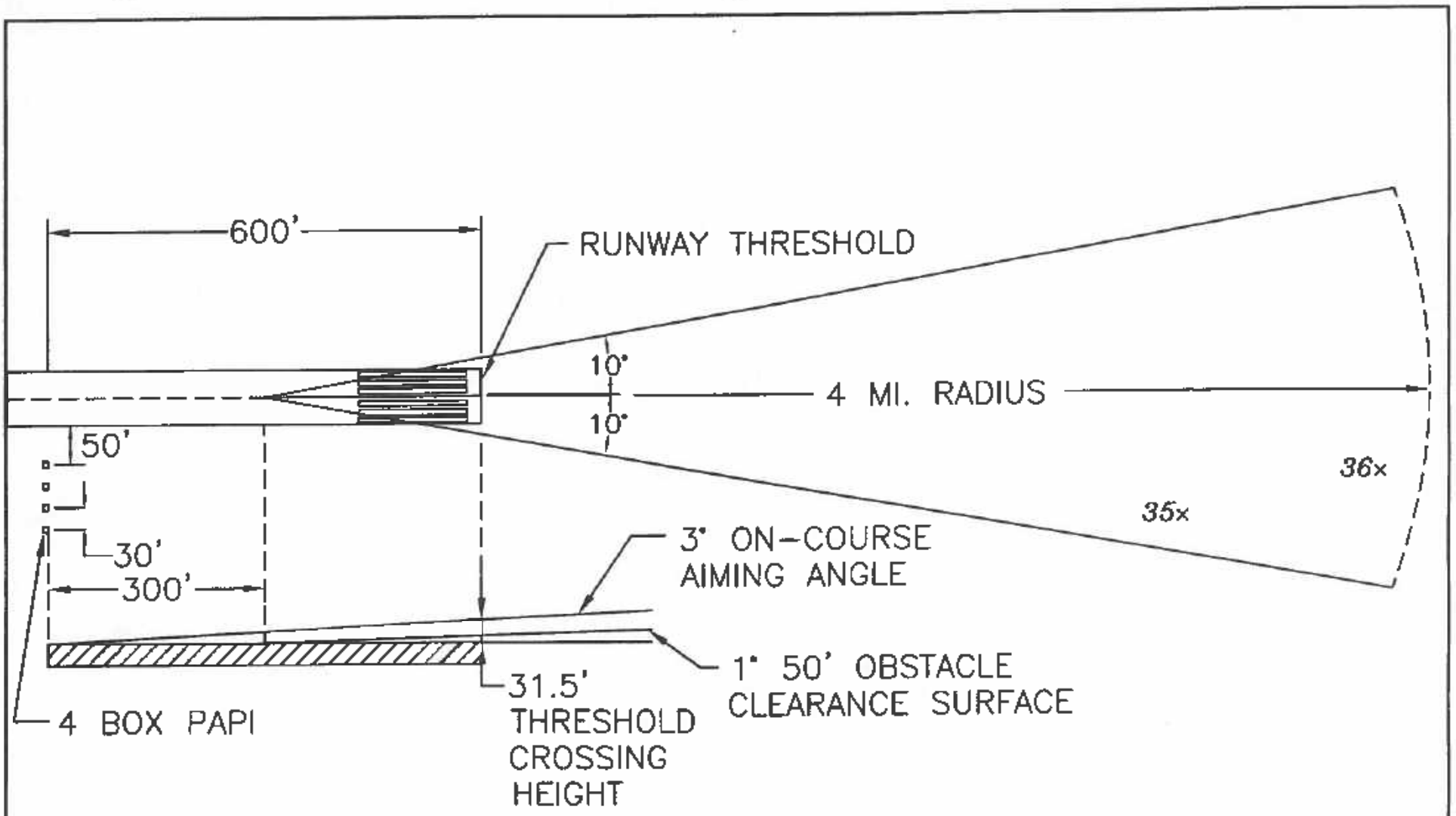
LY2

PAPI CLEARANCE SURFACE
RUNWAY 14

EXHIBIT
3-4



NOTE:
OBJECT PENETRATIONS ARE IDENTIFIED BY NUMBER ie:(35x).
SEE OBSTRUCTION ANALYSIS REPORT, APPENDIX I

PAPI CLEARANCE SURFACE
RUNWAY 32

EXHIBIT
3-5

5. AIRFIELD SIGNS

AC 150/5340-18c, "Standards for Airport Sign Systems," outlines the requirements for the types of signs that are typically found on airports. The Airpark does not currently have the mandatory "holding position signs" for the runway/taxiway intersections. It is recommended that signs be placed at these intersections.

6. NON-DIRECTIONAL BEACON (NDB)

It is recommended that the existing beacon, a single 35 foot pole with underground radials extending 100 feet out from the center pole, be maintained throughout the 20-year planning period.

7. AUTOMATED WEATHER OBSERVATION SYSTEM (AWOS)

It is recommended that the existing AWOS III be relocated to accommodate the south FBO apron expansion.

8. WIND CONE AND SEGMENTED CIRCLE

It is recommended that the wind cone and the segmented circle be maintained throughout the 20-year planning period. However, should the localizer be installed, the wind cone and segmented circle would be relocated to remove it from the localizer critical area.

G. AIRPORT COMMUNICATIONS AND WEATHER SOURCES

It is recommended that the AWOS III and the Ground Communication Outlet be maintained throughout the planning period. In addition, the Airpark should keep abreast of any new weather information technologies, flight data link systems, etc. and should continually evaluate the system to ensure that the capabilities at Montgomery County Airpark are comparable to other general airports in the system.

H. INSTRUMENT APPROACH PROCEDURES

Currently there are three published instrument approach procedures for Montgomery County Airpark, including RNAV (GPS)-RWY 14, VOR-RWY 14 and NDB-RWY 14. A Localizer is proposed for Runway 14 to aid approach and landings. The FAA is currently reviewing an environmental assessment for the Localizer project that may be funded through FAA Airways Facilities, the Maryland Aviation Administration, or a combination thereof. It is recommended that the Revenue Authority continue diligent pursuit of the localizer installation.

All three instrument approaches noted above have a minimum descent altitude (MDA) of 677 feet to 777 feet above the runway threshold (HAT - height above threshold). This level of service is poor given the type aircraft and level of activity that GAI receives. An evaluation of the existing approaches was conducted to identify how each could be improved. Seven recommendations to effect improvements were identified and are listed below.

1. Field verify a critical obstruction. Field verifying, by licensed surveyor, the top elevation of the 890 MSL tower located approximately 4.5 nautical miles from the Runway 14 threshold near the extended runway centerline. Currently, the accuracy code for the tower is "D" or +/- 50 feet. By field verification of the antenna top, the approach minimums on all three procedures could be reduced by as much as 60 feet.

2. Update the air-to-ground pilot control lighting system to match the common traffic advisory frequency, as required by FAA guidelines. Currently the UNICOM and CTAF are on 122.7 MHz and the air-to-ground pilot lighting system is on 122.85 MHz. This action will enhance pilot safety by reducing cockpit workload during the final approach.

3. Install PAPIs on Runways 14 and 32. The installation of PAPIs on Runways 14 and 32 would aid in the completion of circling to land approaches by providing vertical guidance during reduced visibility conditions.

4. Currently the RNAV (GPS) approach for Runway 14 has the final approach fix set at 5.1 nautical miles from the runway threshold, with a descent gradient of 329 feet per nautical mile. It is recommended that the final approach fix be shifted to approximately 4.5 nautical miles to mitigate the impacts of the existing 890 MSL (250 AGL) tower located in the final approach area. The final approach segment could be reduced to as short as 4.2 nautical miles and still meet the TERPS guidelines of a maximum descent gradient of 400 feet per nautical mile.

5. Install DME on the Frederick (FDK) VOR. Installation of DME on the Frederick VOR could aid as an alternate means of establishing the final approach fix at FILIX intersection and provide a step down fix inside the 890 MSL (250 AGL) tower. In addition, DME would provide the pilot with additional situation awareness information.

6. Install a fan marker at or near the 890 tower located approximately 4.5 nautical miles from the airport to serve as a final approach fix or step down fix for the NDB approach.

7. Upon installation of the localizer approach to Runway 14, consider relocating the NDB to the final approach fix, to serve as a Locator Outer Marker (LOM).

It is also recommended that the MCRA pursue two new instrument approach procedures in accordance with AC 150/5300-13, Appendix 16 as follows.

LOC Runway 14

It is recommended that a straight in non-precision instrument localizer approach be developed for Runway 14. Based upon a preliminary analysis, a straight in localizer approach with a DME step down fix may support minimums as low as 900 feet MSL (377 HAT) and one mile visibility. This would be a significant enhancement compared to the minimum descent altitude of 1200 MSL (677 HAT).

A DME step down fix should be considered inside the existing 890 MSL (250 AGL) tower, located approximately 4.5 miles from the airport near the extended runway centerline.

The localizer approach would provide significant enhancements in course guidance accuracy while at the same time, lowering the minimum descent altitude.

VOR-A Circling to Land Approach

It is also recommended that a circling-to-land approach be developed from the southeast towards Frederick (FDK) VOR. The circling to land approach would be an in-bound course of approximately 335 degrees. Although still a circling-to-land approach, the VOR-A procedure would significantly reduce the amount of maneuvering and low level turning operations required to circle and land on Runway 32. In addition, it would facilitate more efficient operations from the east and south.

Airspace issues with Potomac Approach Control would need to be closely coordinated during the development of the procedure. It is recommended that the VOR-A approach include a GPS overlay or the development of a stand alone GPS circling-to-land approach from the southeast.

I. FACILITY REQUIREMENTS SUMMARY

This chapter has presented the facility requirements for the continued development of Montgomery County Airpark. Facility requirements were predicted based on the existing and forecasted aviation demand, and applicable federal aviation regulations and advisory circulars. The facilities are needed to satisfy the short and long term needs of the aviation community. Recommendations contained herein are intended to optimize the operational efficiency, flexibility, and safety of the Airpark. See **Table 3-9** for a summary of the projected development horizons.

Table 3-9
Montgomery County Airpark
Projected Development Horizons for Facility Requirements

PROJECT DESCRIPTION	2001-2005	2006-2010	2011-2020	Beyond 2020
Construct Thru-the-Fence Taxiway Connector (temporary)	✓			
Install Localizer/Relocate Segmented Circle	✓			
Repaint Runway 14-32 Markings	✓			
Replace Taxiway Lighting (MITLs)	✓			
Establish New Approach Procedure	✓			
Install Holding Position Signage	✓			
Install NAVAIDS (PAPIs)	✓			
Install Electrical Vault	✓			
Relocate South End Angled Exit Taxiway & Runway 14 Connector Taxiway	✓			
Construct Holding Bay/Relocate SE Detention Pond		✓		
Relocate RW 32 Entrance Taxiway		✓		
Construct Bypass Taxiway		✓		
Reconstruct Stormwater Detention Area		✓		
Construct T-hangars (North FBO)		✓		
Construct Vehicle Service Road		✓		
Construct Conventional Hangars (North FBO)		✓		
Construct Conventional Hangar (North FBO)		✓		
Construct Maintenance Hangars (South FBO)		✓		
Expand South FBO Apron		✓		
Modify Terminal Area Auto Parking		✓		
Construct North FBO Terminal Building		✓		
Construct North FBO Parking Lot		✓		
Construct T-hangars (South FBO)		✓		
Construct thru-the-fence Taxiway Connector (permanent)		✓		
Relocate AWOS			✓	
Expand North FBO apron & assoc. lighting			✓	
Relocate Fuel Farm & Construct Truck Turnaround			✓	
Expand South FBO Apron			✓	
Expand Terminal Area Auto Parking				✓
Construct Terminal Building				✓
Construct Access Road				✓

Source: Delta Airport Consultants, Inc.

Chapter Four -
AIRPORT DEVELOPMENT ALTERNATIVES

A. Introduction

This chapter deals with the description and evaluation of alternative plans leading to the selection of the recommended plan for the Montgomery County Airpark. The facility requirements of the Airpark to handle the forecast demand were discussed in the previous chapter. The overall objective of this chapter is to evaluate airport development concepts in a straight forward and logical manner. The alternatives provide the MCRA with a basis to plan Airpark development in the most safe and efficient manner. Each alternative was evaluated for facility requirements, aircraft operational needs public access and future development capability. These solutions are illustrated in the following exhibits assist in comparison of the alternatives.

B. Development Alternatives

A "No Build" Alternative and three "Build" alternatives were considered during the evaluation phase to reflect some of the feasible concepts of future development. Alternative 2 represents a modified and updated adaptation of the 1991 Master Plan Proposed Development. Alternatives 3 and 4 were developed specifically for this Airport Layout Plan Update. Estimated project costs associated with the alternatives are summarized within each alternative and detailed in Chapter 6 of this report. Each alternative is presented below.

1. Alternative 1 - "No Build"

Alternative 1 represents a scenario where Montgomery County Airpark, a general aviation reliever airport, remains at its current developmental state during the 20-year planning period, with exception to correcting all non-standard FAA design criteria. **Exhibit 4-1** illustrates this alternative.

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LEGEND

FIX SIMPLE

HOLDING POSITION

500 0 500 1000

scale: 1"=500" feet

MONTGOMERY COUNTY AIRPARK
ALTERNATIVE 1 - NO BUILD

EXHIBIT
4-1

The following non-standard conditions would be rectified to meet all FAA design standards:

- The MCRA does not currently own the northwest end of the RSA, an area with dimensions of approximately 100 feet by 150 feet.

- The ROFA has obstructions that require mitigation. The obstructions are highlighted in the Obstruction Study which accompanies this narrative **(Appendix I)**.

- The current perimeter fence partially penetrates the northwest end of the primary surface area and also penetrates the non-precision approach surface. The fence will be relocated to clear the RSA, ROFA and all Part 77 surfaces once the necessary land is acquired.

- The Airpark currently has obstructions along the approach path to Runways 14 and 32.

- The Airpark does not currently have the mandatory "holding position signs" for the runway/taxiway intersections.

The alternative can be developed at an estimated cost of approximately $20 million, see **Table 4-1** for details.

Advantages:

- Addresses all non-standard FAA design criteria.

Disadvantages:

- No further airfield development occurs and the Airpark fails to achieve the facility requirements detailed in Chapter Three.

Table 4-1
Montgomery County Airpark
Alternative 1 Development Costs

NO.	PROJECT	TOTAL ESTIMATED COSTS
1	Obstruction Removal (includes tree cutting, clearing and grubbing, terrain grading, obstruction marking and lighting)	$1,672,000
2	Fee Simple Land Acquisition (includes existing building acquisition and demolition and relocation of businesses)	$18,336,000
3	Installation of Holding Position Signage	$45,000
	TOTAL ALTERNATIVE 1	**$20,053,000**

Source: Delta Airport Consultants, Inc.

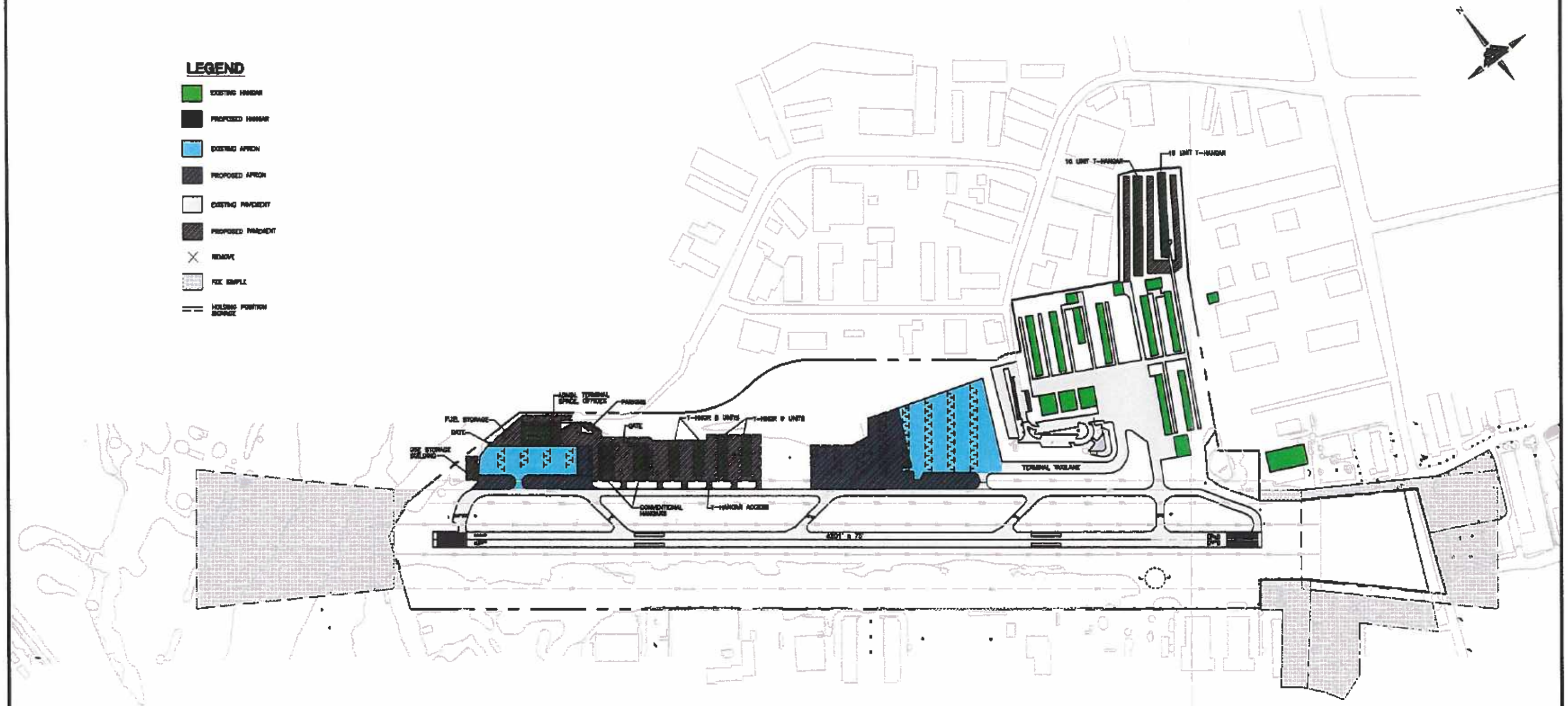
2. Alternative 2

Alternative 2 is designed to bring the airfield compliant with all FAA design standards and meet Montgomery County's present general aviation needs, with opportunities to expand to meet future needs at the Airpark, as demand grows. Runway 14-32 will remain at its current length throughout all developmental phases as it meets critical aircraft operational demands. The critical features of this plan are obstruction removal (includes tree cutting, clearing and grubbing, terrain grading, obstruction marking and lighting), fee simple land acquisition (includes existing building acquisition and demolition and relocation of existing businesses), install holding position signage, increase apron space (tie-downs), T-hangar and conventional hangar space and to develop the north FBO area. This alternative is shown in **Exhibit 4-2**.

The proposed developments in the south FBO area include apron expansion for 42 additional tie-downs and 31 T-hangars. The proposed north FBO development consists of three conventional hangars, 31 T-hangars, a GSE storage building, FBO aircraft hangar, administrative building, fuel storage and apron expansion (10-15 additional tie-downs). The alternative can be developed at an estimated cost of approximately $30 million, see **Table 4-2** for details.

LEGEND

- EXISTING HANGAR
- PROPOSED HANGAR
- EXISTING APRON
- PROPOSED APRON
- EXISTING PAVEMENT
- PROPOSED PAVEMENT
- REMOVE
- FIX EMPLX
- HOLDING POSITION SIGNAGE



MONTGOMERY COUNTY AIRPARK
ALTERNATIVE 2

EXHIBIT
4-2

Advantages:

- Addresses all non-standard FAA design criteria.
- Significant expansion of north and south FBO aprons to provide additional tie-downs.
- Provides significant increase in T-hangar capacity.
- Strong foundation established for north FBO area through large hangar construction, terminal facilities and accommodation of auto parking.

Disadvantages:

- No proposed increase in south FBO conventional hangar space.
- No proposed increase in south FBO auto parking.
- Fails to achieve facility requirements detailed in Chapter Three.

Table 4-2
Montgomery County Airpark
Alternative 2 Development Costs

NO.	PROJECT	TOTAL ESTIMATED COSTS
1	Obstruction Removal (includes tree cutting, clearing and grubbing, terrain grading, obstruction marking and lighting)	$1,672,000
2	Fee Simple Land Acquisition (includes existing building acquisition and demolition and relocation of businesses)	$18,336,000
3	Installation of Holding Position Signage	$45,000
4	Construct T-Hangars	$2,640,000
5	Conventional Hangars	$2,610,000
6	GSE Storage Building	$870,000
7	Construct/Expand Apron (North & South FBO)	$1,136,000
8	North FBO Parking	$220,000
9	FBO Hangar/Admin. Space, Terminal Offices	$2,188,000
	TOTAL ALTERNATIVE 2	**$29,717,000**

Source: Delta Airport Consultants, Inc.

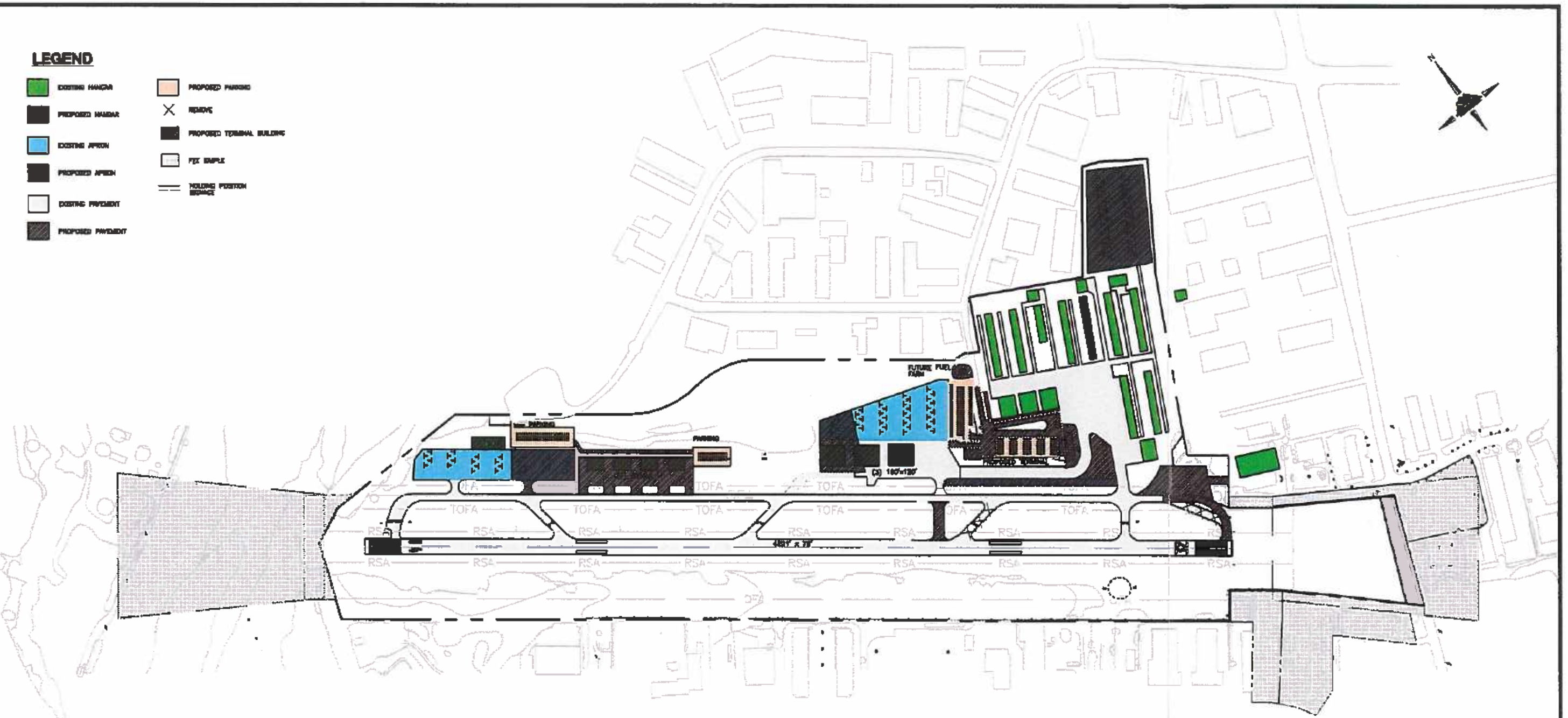
3. Alternative 3

This alternative is designed to bring the airfield compliant with all FAA design standards and meet the County's present general aviation needs, with opportunities to expand to meet future needs at the Airpark. Runway 14-32 will remain at its current length throughout all developmental phases as it meets critical aircraft operational demands. The significant elements of this alternative are obstruction removal (includes tree cutting, clearing and grubbing, terrain grading, obstruction marking and lighting), fee simple land acquisition (includes existing building acquisition and demolition and relocation of existing businesses), install holding position signage, build a new 8,000 square foot terminal building, reconstruct the existing terminal parking area, reconstruct the south FBO apron area to accommodate an increase in conventional hangar space, reconstruct the south entrance taxiway, construct a Group II aircraft holding bay and develop the north FBO area. This alternative is shown in **Exhibit 4-3**.

The location of the new terminal building would permit the terminal area parking to be reconstructed thus, improving the flow of traffic through the terminal area and increasing the number of parking spaces available. This plan proposes additional apron in the south FBO area (36 tie downs). The original south FBO apron would be reconstructed to allow for the construction of three conventional hangars. Land would be acquired for Primary surface, Runway Safety Area (RSA) and Runway Protection Zone (RPZ) control at both runway ends. The alternative can be developed at an estimated cost of approximately $34 million, see **Table 4-3** for details.

LEGEND

- EXISTING HANGAR
- PROPOSED HANGAR
- EXISTING APRON
- PROPOSED APRON
- EXISTING PAVEMENT
- PROPOSED PAVEMENT
- PROPOSED PARKING
- REMOVE
- PROPOSED TERMINAL BUILDING
- FIX SIMPLE
- HOLDING POSITION SIGNAGE



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scale: 1"=500" feet

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MONTGOMERY COUNTY AIRPARK
ALTERNATIVE 3

EXHIBIT
4-3

Table 4-3
Montgomery County Airpark
Alternative 3 Development Costs

NO.	PROJECT	TOTAL ESTIMATED COSTS
1	Obstruction Removal (includes tree cutting, clearing and grubbing, terrain grading, obstruction marking and lighting)	$1,672,000
2	Fee Simple Land Acquisition (includes existing building acquisition and demolition and relocation of businesses)	$18,336,000
3	Installation of Holding Position Signage	$45,000
4	Construct T-Hangars	$511,000
5	Conventional hangars	$6,480,000
6	Relocate Fuel Farm	$350,000
7	Construct New Terminal Building	$1,750,000
8	Expand South FBO Apron	$93,000
9	Construct South FBO Apron	$687,000
10	Expand North FBO Apron	$212,000
11	Reconstruct Terminal Parking Area	$624,000
12	Transient Apron Pavement	$465,000
13	North FBO Terminal Building	$1,995,000
14	North FBO Parking Area	$413,000
15	Construct Holding Bay/Relocate Detention Pond	$555,000
16	Taxiway Connector	$33,000
17	Relocate Exit Taxiway	$100,000
	TOTAL ALTERNATIVE 3	**$34,321,000**

Source: Delta Airport Consultants, Inc.

Advantages:

- Addresses all non-standard FAA design criteria.
- Expands north and south FBO apron to provide additional tie-downs.
- Offers substantial increase in conventional hangar space and locates all proposed facilities adjacent to the parallel taxiway.
- Substantial increase in auto parking capacity proposed for both the north and south FBO areas.
- Recommends land acquisition at southwest corner of airport property to facilitate an airport maintenance access road.
- Recommends fee simple land acquisition of property to ensure the airport owner gains control of the entire Primary surface, RSA and RPZ.

Disadvantages:

- Offers no T-hangar development in the north FBO.
- Offers minimal T-hangar development in the south FBO area.
- Reconfigures tie-down apron space for corporate use thereby limiting transient apron space near the terminal building.
- Fails to achieve the facility requirements detailed in Chapter Three.

4. Alternative 4

This alternative is designed to bring the airfield compliant with all FAA design standards and meet the County's present general aviation needs, with opportunities to expand to meet future needs at the Airpark. Runway 14-32 will remain at its current length throughout all developmental phases as it meets critical aircraft operational demands. The significant elements of this alternative are obstruction removal (includes tree cutting, clearing and grubbing, terrain grading, obstruction marking and lighting), fee simple land acquisition (includes existing building acquisition and demolition and relocation of existing businesses),

install holding position signage, increase hangar space (conventional and T-hangar), increase apron space (tie downs), reconstruct terminal area parking, construct a Group II aircraft holding bay at the Runway 32 end, construct a bypass taxiway at the Runway 14 end, install an electrical vault, relocate the fuel facility relocation and develop the north FBO area. This alternative is shown in **Exhibit 4-4**.

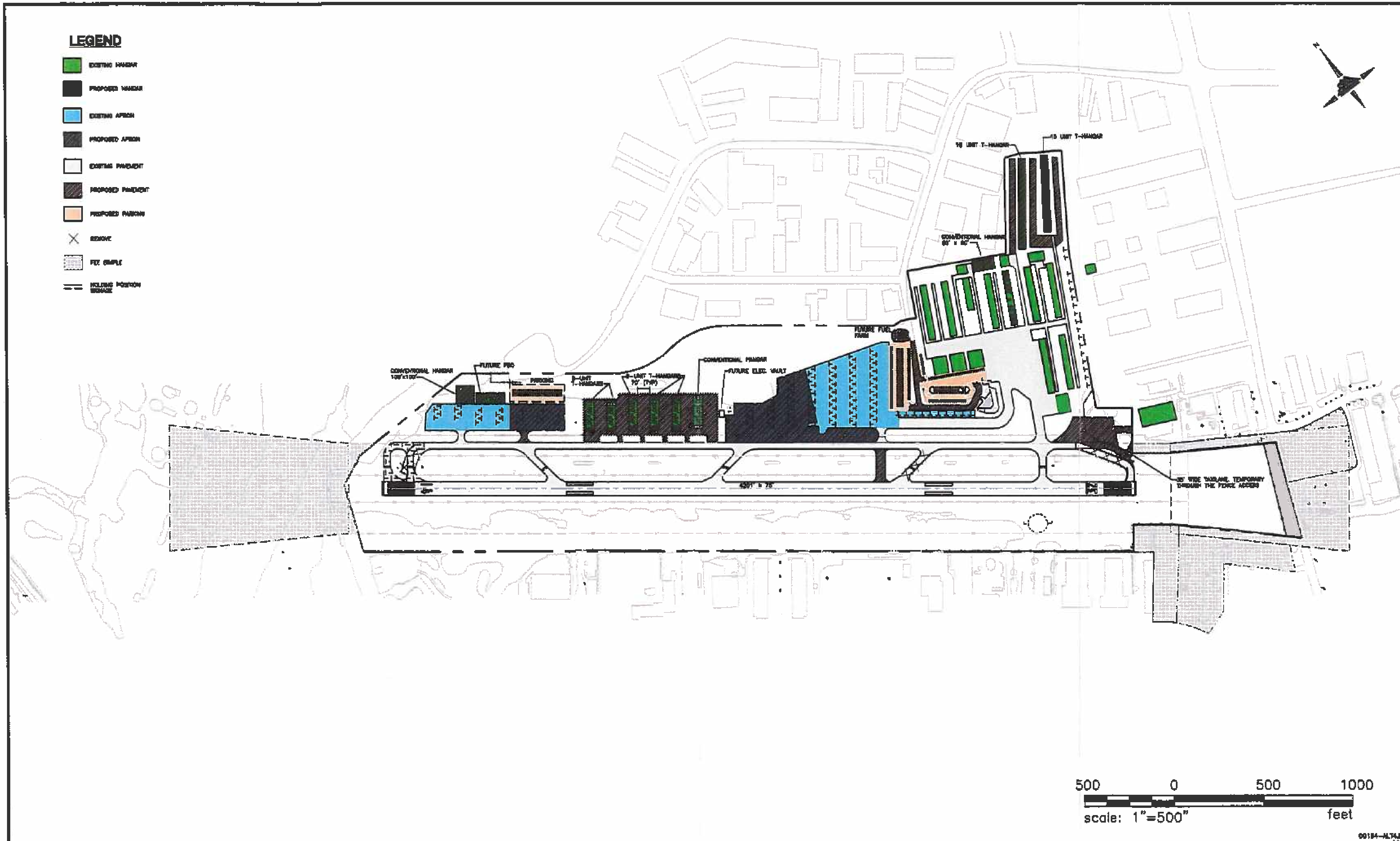
Additional land will be acquired for Primary surface, RSA and RPZ control at both runway ends. Alternative 4 can be developed at an estimated cost of approximately $33 million, see **Table 4-4** for details.

Advantages:

- Addresses all non-standard FAA design criteria.
- Expands north and south FBO aprons to provide additional tie-downs.
- Offers a blend of T-hangars and conventional hangars most representative of the forecasted based aircraft demand detailed in Chapter Three.
- Substantial increase in auto parking proposed for both the north and south FBO areas.
- Recommends land acquisition at southwest corner of airport property to facilitate an airport maintenance access road.
- Recommends fee simple land acquisition of property to ensure the airport owner gains control of the entire Primary surface, RSA and RPZ.

Disadvantages:

- Requires substantial investment.



MONTGOMERY COUNTY AIRPARK
ALTERNATIVE 4

EXHIBIT 4-4

Table 4-4
Montgomery County Airpark
Alternative 4 Development Costs

NO.	PROJECT	TOTAL ESTIMATED COSTS
1	Obstruction Removal (includes tree cutting, clearing and grubbing, terrain grading, obstruction marking and lighting)	$1,672,000
2	Fee Simple Land Acquisition (includes existing building acquisition and demolition and relocation of businesses)	$18,336,000
3	Installation of Holding Position Signage	$45,000
4	Construct T-Hangars	$4,120,000
5	Conventional hangars	$3,000,000
6	Relocate Fuel Farm & Construct Truck Turnaround	$425,000
7	Construct Apron	$350,000
8	Modify Terminal Parking Area	$198,000
9	North FBO Terminal Building	$1,995,000
10	North FBO Parking Area	$170,000
11	Install Electrical Vault	$105,000
12	Construct Holding Bay /Relocate Detention Pond	$994,000
13	Construct Bypass Taxiway	$140,000
14	Taxiway Connector	$33,000
15	Relocate Exit Taxiway	$100,000
16	Construct Conventional Hangar (North FBO)	$1,585,000
	TOTAL ALTERNATIVE 4	**$33,268,000**

Source: Delta Airport Consultants, Inc.

C. Conclusions and Recommendations

After reviewing and evaluating the four alternatives, Alternative 4 is recommended as the preferred alternative. Alternative 4 offers a development plan most representative of the forecasted demand as set forth in Chapter Three, and it addresses all non-standard design criteria existing at the Airpark.

The remaining three alternatives did not meet all necessary facility requirements evaluated in Chapter Three. The Airpark currently has waiting lists for both T-hangar and conventional hangar space, which Alternative 4 addresses. The other three alternatives do not maximize the amount of both types of hangar space which can be constructed at the Airpark. It was also determined that Alternative 4 best utilized the Airpark's limited space to expand apron pavement, automobile parking and to accommodate a new FBO on the north side of the airfield, see **Table 4-5** for alternative comparison. As noted in Chapter One, certain use restrictions apply to the FBO leaseholds that were reserved in the FBO lease agreements. A revision or removal of these restrictions and possible renegotiation of FBO lease boundaries as a result, would significantly improve development options for the northwest portion of the airfield and allow the forecast demand for apron and hangar space to be fully achieved.

Alternative 4 has been modified to incorporate the new 8,000 square foot terminal building from Alternative 3. It is also recommended that several other facility improvements be incorporated with the proposed alternative as follows: installation of PAPIs, replacement of MITLs, installation of holding position signage and repaint certain Runway 14-32 markings. The preferred alternative can be developed at an estimated cost of approximately $38 million, see **Table 4-6** for details.

Table 4-5
Montgomery County Airpark
Alternative Comparison
2000 - 2020 Planning Period

Alternative	Apron (SY)	T-hangars (units)	Conventional Hangars (SF)	Auto Parking (Spaces)	Estimated Cost ($ millions)
#1 "No Build"	0	0	0	0	20
#2	16,800	65	36,800	120	30
#3	22,800	10	57,800	245	34
#4	18,600	84	19,700	235	33
Forecast Requirements	30,088	89	52,500	68	N/A

Table 4-6
Montgomery County Airpark
Preferred Alternative Development Cost

NO.	PROJECT	TOTAL ESTIMATED COSTS
1	Obstruction Removal (includes tree cutting, clearing and grubbing, terrain grading, obstruction marking and lighting)	$1,672,000
2	Fee Simple Land Acquisition (includes existing building acquisition and demolition and relocation of businesses)	$18,336,000
3	Installation of Holding Position Signage	$45,000
4	Reconstruct Stormwater Detention Area	$250,000
5	Construct T-Hangars	$2,985,000
6	Conventional hangars	$3,892,100
7	Relocate Fuel Farm & Construct Truck Turnaround	$425,000
8	Construct Conventional Hangar (north FBO)	$1,585,000
9	Construct Vehicle Service Road	$245,000
10	Construct Apron	$2,213,000
11	Modify Terminal Parking Area	$198,000
12	Construct South FBO Terminal Building	$1,750,000
13	Construct North FBO Terminal Building	$1,995,000
14	North FBO Parking Areas	$335,000
15	Install Electrical Vault	$105,000
16	Construct Holding Bay /Relocate Detention Pond	$994,000
17	Constrict Bypass Taxiway	$140,000
18	Taxiway Connector	$33,000
19	Relocate Exit Taxiway	$100,000
20	Installation of PAPIs	$84,000
21	Replacement of MITLs	$280,000
22	Repaint Runway 14-32 markings	$23,000
23	North FBO Access Road	$300,000
24	Relocate AWOS	$20,000
	TOTAL PREFERRED DEVELOPMENT	**$38,005,100**

Source: Delta Airport Consultants, Inc.

Chapter Five
AIRPORT LAYOUT PLAN

A. INTRODUCTION

In presentation of the final Airport Layout Plan (ALP), it is useful to reflect on the alternative concepts considered in Chapter Four and the solutions offered from each. After examining the various advantages and disadvantages of each alternative, the MCRA and the consultant reached the conclusion that the layout plan for the airport should include a significant increase in both T-hangar and corporate hangar space, construction of a holding bay, relocation of taxiways (exit and entrance), development of the north FBO area and expansion of the apron space in the north and south FBO areas. The plan should also ultimately include a new general aviation terminal building and expansion of the terminal area auto parking. Alternative 4, described in Chapter Four as the preferred alternative, became the basis for the final plan. The ALP drawing presents a blended solution that incorporates key elements of other alternatives with Alternative 4, as well as additional recommendations developed during the final analysis.

The Airport Layout Plan Update must achieve several specific goals, among them are the items listed below:

- Achieve FAA design standards,
- Evaluate obstructions to FAR Part 77 surfaces and present an obstruction removal plan,
- Recommend actions to improve operational control of the airfield over the 20-year planning period, and
- Recommend NAVAID improvements to include the replacement of the bar VASI with PAPIs for Runway 14 and the addition of PAPIs to Runway 32. This recommendation is subject to a field survey of the PAPI clearance plane to confirm no surface penetrations.

These items, as well as others, will be necessary for the Airpark's long-term development and operation as a safe, dependable facility for Montgomery County and the surrounding area.

The Airport Layout Plan (ALP) is a graphic representation of the existing and future development at Montgomery County Airpark. As a 'federally obligated' airport that accepts federal funding for development and, in exchange, commits to a series of grant assurances related to the operation of the airport, the Revenue Authority must maintain a current and approved ALP. All proposed development, regardless of funding source, must be identified on an approved ALP prior to implementation. The following is a summary description of the Airpark's development as it relates to the complete ALP drawing set. A reduced size copy of each of the drawings addressed in this narrative is included at the end of this chapter.

The **Cover Sheet** (sheet 1 of 9) is an index of each drawing in the Airport Layout Plan Set. In addition, a location and vicinity map are shown to aid in identifying the location of the Airpark.

The **Airport Layout Plan (ALP) Drawing** (sheet 2 of 9) is a graphic representation of existing airport facilities and proposed improvements during the planning period. The ALP drawing indicates all pertinent clearance and dimensional information required to show conformance with applicable FAA standards. The drawing depicts the recommended location and configuration of facilities required to meet the needs during the 20-year planning period (2001 - 2020). It is important to note that the ALP drawing serves as a guide for proposed development and is a key document that should be kept current. When formally approved by the FAA, the ALP drawing serves as a public document that is a record of aeronautical requirements, both present and future. An approved ALP drawing is also required for any funding consideration by the FAA.

The **Terminal Area Plan (TAP)** sheet graphically projects the existing and proposed layout of terminal facilities such as aprons, buildings and hangars. The TAP (sheet 3 of 9) depicts the general aviation hangars, tie-down area and terminal areas.

The **Airspace Drawing** (sheet 4 of 9) is the plan view of all Part 77 surfaces based on the ultimate runway length. The Montgomery County Airpark runway length of 4,201 feet is not recommended to change over the 20-year planning period as the current length meets the operational demands of the critical aircraft. The current USGS 7.5 minute Quad sheet was used for the base map.

The **Inner Portion of the Approach Surface Drawing** (sheets 5 and 6 of 9) for Runway 14 and 32 are projected as plan and profile views for each runway end to a point where the Part 77 approach surface reaches a height of 100 feet above the runway end elevation. The drawings include obstruction tables for the existing and ultimate inner portion of the approach area for each runway end.

The existing **2001 Land Use Plan and future 2020 Land Use Plan** (sheet 7 of 9 and 8 of 9) present off-airport land uses surrounding Montgomery County Airpark. Noise exposure contours for the 65, 70 and 75 DNL are also shown for the existing (2001) and future (2020) planning horizons.

The **Airport Property Map** (formerly Exhibit "A") (sheet 9 of 9) depicts the boundaries of the existing airport property and identifies owners of each adjacent property. The sheet also contains tables providing historical transaction data and preliminary data for proposed land acquisitions.

B. AIRPORT LAYOUT AND TERMINAL AREA PLAN

This section discusses details concerning the development of the ALP drawing and the TAP. The ALP drawing and TAP are discussed interchangeably, since both represent existing and future airport development for Montgomery County Airpark. The following narrative briefly describes future development and phasing for the 20-year planning period (2001 - 2020).

1. Runways

As identified in the forecast chapter (Chapter Three), Runway 14-32 will remain as an Airport Reference Code (ARC) category B-II throughout the 20-year planning period. The

demand/capacity and facility requirements chapter evaluated Runway 14-32 with respect to length, width, strength, safety area and object free area for existing and future aircraft. This section discusses the runway geometrics and respective runway safety and object free areas.

a. Runway 14-32

Runway 14-32 serves as the primary runway for Montgomery County Airpark. The runway is 4,201 feet long and 75 feet wide, and is projected to be adequate for the duration of the 20-year planning period. Runway lighting, MIRLs, are in good condition and will remain adequate for the planning period. The pavement is also in good condition, however the runway markings currently do not meet standards and require repainting during Phase I (2001 - 2005).

b. Runway Safety Area

The standard design for a B-II runway safety area (RSA) is 150 feet wide centered on the runway centerline and extended 300 feet beyond the end of the runway. The RSA for Runway 14-32 at Montgomery County Airpark meets the standard for a B-II runway. It should be noted however, that the northeast end of the RSA, approximately 0.5 acres, is currently owned by Montgomery County. It is recommended that the Airpark acquire this land in fee during Phase I of the development period.

c. Runway Object Free Area

The required Runway Object Free Area (ROFA) for a B-II runway is 500 feet in width, centered on the runway, with extensions 300 feet beyond each runway end. The ROFA for Montgomery County Airpark currently has obstructions that require mitigation. It is recommended that all obstructions be removed in Phase I of the development period. A detailed discussion of the obstructions is located in **Appendix I**.

2. Taxiways

Chapter 3 presented an evaluation of the existing taxiway system for circulation, width, distance from runway centerline, taxiway safety area and taxiway object free areas. Runway 14-32 has a 35 foot wide parallel taxiway with medium-intensity taxiway lights (MITLs), two entrance taxiways and four exit taxiways. The MITLs are in poor condition, and thus are recommended for replacement during Phase I (2001 - 2005). It is also recommended the second exit taxiway from the Runway 32 end be relocated in Phase I to improve the free flow of aircraft to the south FBO apron. Lastly, the proposed holding bays require the reconstruction of the Runway 14 and 32 entrance taxiways in Phase I.

3. NAVAIDS

Navigation aids (NAVAIDS) are a system of electronic and visual aids that assist pilots in navigating their aircraft in a safe and orderly manner during take-off, approach and landings. There are currently three published non-precision instrument approach procedures to Runway 14 at Montgomery County Airpark. The procedures include an RNAV (GPS), VOR and NDB approach. A localizer is proposed for Runway 14 to aid approaches and landings. Chapter 1 discusses, in detail, the three non-precision approaches to Runway 14. Currently, Runway 32 does not have an instrument approach procedure.

It is also recommended that the MCRA pursue two new instrument approach procedures in accordance with AC 150/5300-13, Appendix 16 as follows.

<u>LOC Runway 14</u>

It is recommended that a straight in non-precision instrument localizer approach be developed for Runway 14. Based upon a preliminary analysis, a straight in localizer approach with a DME step down fix may support minimums as low as 900 feet MSL (377 HAT) and one mile visibility. This would be a significant enhancement compared to the minimum descent altitude of 1200 MSL (677 HAT).

A DME step down fix should be considered inside the existing 870 MSL (250 AGL) tower, located approximately 4.5 miles from the airport near the extended runway centerline.

The localizer approach would provide significant enhancements in course guidance accuracy while at the same time, lowering the minimum descent altitude.

VOR-A Circling to Land Approach

It is also recommended that a circling-to-land approach be developed from the southeast towards Frederick (FDK) VOR. The circling to land approach would be an in-bound course of approximately 335 degrees. Although still a circling-to-land approach, the VOR-A procedure would significantly reduce the amount of maneuvering and low level turning operations required to circle and land on Runway 32. In addition, it would facilitate more efficient operations from the east and south.

Airspace issues with Potomac Approach Control would need to be closely coordinated during the development of the procedure. It is recommended that the VOR-A approach include a GPS overlay or the development of a stand alone GPS circling-to-land approach from the southeast.

4. General Aviation / FBO Areas

a. Terminal Development

As discussed in Chapter 3, Facility Requirements, the existing general aviation terminal building located in the southeast FBO area. It is recommended that a new terminal building be constructed to better serve corporate pilots and business travelers using the Airpark. An airport survey in accordance with FAA AC 150/5300-13, Appendix 5 is recommended to ensure needs such as pilot lounges and rest areas, navigation and flight plan filing rooms are adequately provided. The facility would also provide administrative offices for the MCRA. It is recommended

that temporary offices for the MCRA airport manager be established on airport property as soon as possible.

The recommended site for the new terminal building is depicted on the ALP drawing and is phased for ultimate development, pending further needs assessment from the airport survey recommended above.

b. Hangar Development

It is important to note that the timing of hangar development is subject to demand. Hangar development built on speculation is quite risky, therefore actual documented demand should be demonstrated prior to construction. The construction of suitable T-hangars will aid the Airport in attracting additional aircraft. The proposed dimensions for corporate hangars are approximate and will vary according to the particular needs of each tenant.

- **Conventional Hangars**

The Airpark currently has seven conventional hangars. It is recommended that six conventional hangars (3 - 60' x 60', 1 - 80' x 100', and 1 - 100' x 100') be constructed in the north FBO area, and one additional in the south FBO area. Both areas of development will require apron paving and associated lighting. The development is recommended in Phase II (2006-2010) to coincide with the proposed north FBO development.

- **T-hangars**

Montgomery County Airpark currently has 75 T-hangar spaces available for the storage of small general aviation aircraft. It is recommended that the north FBO area be developed in Phase II, which would include construction of one ten unit T-hangar, one eight unit T-hangar and one five unit T-hangar. Development at the south FBO includes a proposal to construct a 16 unit T-

hangar, 15 unit T-hangar, 10 unit T-hangar and to reconstruct a portion of an existing T-hangar destroyed by fire. The development is recommended in Phase II (2006 - 2010) based on the forecast and the current waiting list for T-hangars at Montgomery County Airpark.

c. Auto Parking

The existing auto parking in the terminal area has approximately 160 spaces. The forecast indicates insufficient parking for future demand at the Airpark. It is recommended the Airpark reconstruct the existing terminal area parking thus improving the flow of traffic through the terminal area and increasing the number of spaces available (Phase II). It will also be necessary to construct a north FBO auto parking lot to accommodate proposed development in that area during Phase II. It is recommended that the terminal area auto parking be expanded to meet forecast requirements in the ultimate development phase. Reconstruction of some existing parking areas will also be required in Phase III to facilitate construction of the new terminal building and relocation of the fuel farm.

5. Ancillary Facilities and Development

This section describes the ancillary facilities and developmental items shown on the Airport Layout Plan and Terminal Area Plan. These facilities support overall airport operations.

a. Fuel Farm

The fuel facilities at Montgomery County Airpark are adequate for the planning period. The relocation of the existing fuel farm and construction of a fuel truck turn-around is recommended in Phase III to accommodate the ultimate construction of the new general aviation terminal building.

b. Electrical Vault

Currently, the Airpark does not have an electrical vault. All electrical systems and regulators are located in the terminal building. It is recommended that an electrical vault be constructed during Phase I.

c. Fencing

The Airpark currently has a fence along the perimeter of the property boundary. The fence is in good condition. However, due to the MCRA not owning portions of the primary surface, Runway Safety Area and Runway Object Free Area, the fence will require relocation as the non-standard conditions are resolved. It is recommended that the fence be maintained throughout the 20-year planning period and relocated along the new property boundary as adjacent land is acquired.

d. GSE Storage Building

Currently, Montgomery County Airpark does not have a building specifically for storage. The ground support equipment in service at the Airpark is owned and operated by Montgomery Aviation and Congressional Air. The tugs are stored in hangars and the fuel trucks are parked on the apron area. It is recommended that the existing equipment and storage be maintained throughout the 20-year planning period.

6. Airport Access and Parking

Primary vehicular access to Montgomery County Airpark is via Airpark Road. It is recommended that this road be maintained throughout the duration of the planning period and continue to serve as the primary entrance to the Airpark. Auto parking at the Airpark is

insufficient for the planning period. It is recommended that the terminal area auto parking be reconstructed in Phase II to increase the number of spaces and to ultimately expand the lot. Also, the construction of a new auto parking lot in the north FBO is required to accommodate the recommended development.

C. AIRPORT PROPERTY MAP

The Airport Property Map (sheet 9 of 9) depicts the existing boundaries of the airport property. Future property acquisitions, both in fee simple and avigation easement, are also shown on the property map. Like the ALP drawing, it is critical to keep this document current. As property is acquired the Airport Property Map should be revised accordingly.

Montgomery County Airpark currently owns 130 ± acres of land and the Airport Layout Plan and Airport Property Map identify an additional 29 ± acres to be acquired. The land is recommended for acquisition to improve control of the airfield by protecting the Primary surface, RSA and RPZ at both runway ends. Sufficient property interest in the RPZs at Montgomery County Airpark should be gained to ensure the MCRA is empowered to control the area. Fee simple acquisition is the preferred method of control, but compatible land use criteria are specified in FAA AC 150/5300-13, Chapter 2, where it is determined to be impractical for the airport owner to acquire and plan the land uses within the entire RPZ. Discussions with the FAA Washington Airports District Office have resulted in a determination that acquisition of the RPZ's at the Airpark are practible and such action is to be pursued with support of the FAA. As recommended in paragraph 1(b) of this chapter, the MCRA should own all primary surface and RSA property in fee. The RPZs' function is to enhance the protection of people and property on the ground, an effort that is achieved through airport owner control of the RPZ area.

MONTGOMERY COUNTY AIRPARK

GAITHERSBURG, MARYLAND

AIRPORT LAYOUT PLAN

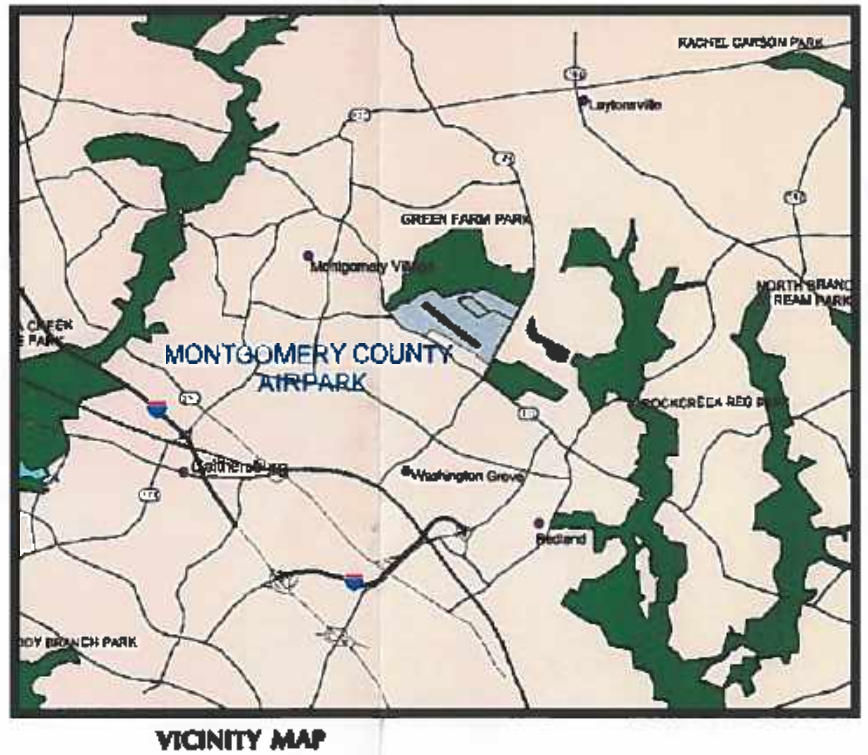
DELTA PROJECT NO. MD 00184
FAA AIP No. 3-24-0018-10

JUNE 2002

LOCATION MAP

INDEX OF DRAWINGS

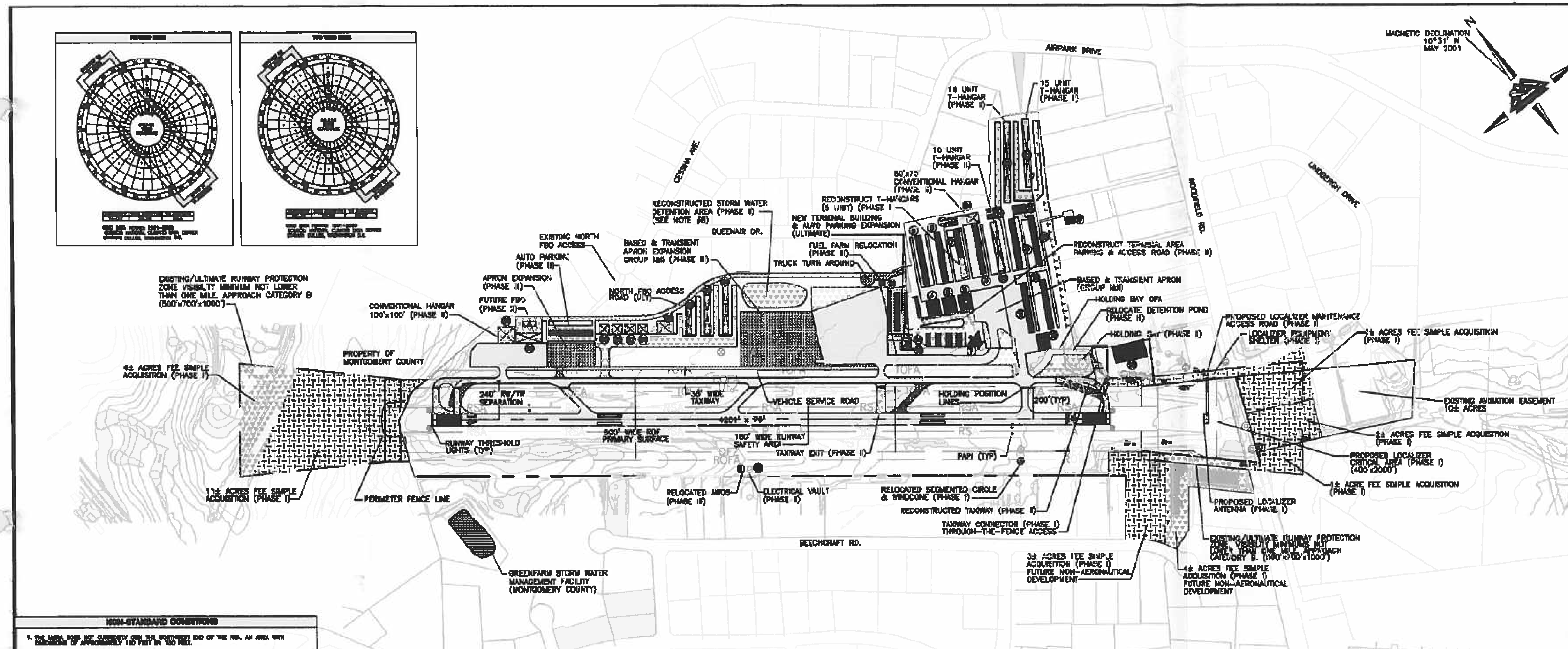
1. COVER SHEET
2. AIRPORT LAYOUT PLAN (ALP)
3. TERMINAL AREA PLAN (TAP)
4. AIRPORT AIRSPACE DRAWING
5. RUNWAY 14 INNER APPROACH SURFACE
6. RUNWAY 32 INNER APPROACH SURFACE
7. LAND USE - 2001 NOISE CONTOURS
8. LAND USE - 2020 NOISE CONTOURS
9. AIRPORT PROPERTY MAP



VICINITY MAP

DELTA AIRPORT CONSULTANTS, INC.
Richmond, Virginia
Charlotte, North Carolina
Austin, Texas
Harrisburg, Pennsylvania

1338 Hundred Oaks Dr., Suite G Charlotte, North Carolina 28217 704-521-9101



NON-STANDARD CONDITIONS

[illegible]

NOTES

[illegible]

MODIFICATION OF STANDARDS

[illegible]

FACILITIES INDEX	
NO.	EXISTING
1	TERMINAL BUILDING
2	SOURDOUGH AIRCRAFT HANGAR (5,000 S.F.)
3	MONTGOMERY AVIATION HANGAR (5,000 S.F.)
4	CONVENTIONAL AIR HANGAR (5,000 S.F.)
5	T-HANGAR A (10 UNIT)
6	T-HANGAR B (10 UNIT)
7	T-HANGAR C (10 UNIT)
8	T-HANGAR D (10 UNIT)
9	T-HANGAR E (10 UNIT)
10	T-HANGAR F (10 UNIT)
11	T-HANGAR G (10 UNIT)
12	T-HANGAR H (10 UNIT)
13	AEROTRONIC SERVICES HANGAR (3,750 S.F.)
14	FREDERICK HANGAR (5,000 S.F.)
15	[illegible] HANGAR-[illegible] (4,000 S.F.)
16	[illegible] HANGAR (7,000 S.F.)
17	[illegible] (THROUGH THE FENCE) (2,400 S.F.)
18	[illegible] (THROUGH THE FENCE) (19,075 S.F.)
19	FUEL TANKS

FACILITIES INDEX		
NO.	PROPOSED	PHASE
20	ELECTRICAL VAULT	I
21	RELOCATED FUEL FARM	II
22	15 UNIT T-HANGAR (15,077 S.F.)	I
23	18 UNIT T-HANGAR (20,000 S.F.)	II
24	CORPORATE HANGAR (4,000 S.F.)	II
25	CORPORATE HANGAR (3,600 S.F.)	II
26	CORPORATE HANGAR (3,600 S.F.)	II
27	CORPORATE HANGAR (3,600 S.F.)	II
28	CORPORATE HANGAR (3,600 S.F.)	II
29	5 UNIT T-HANGAR (5,300 S.F.)	I
30	5 UNIT T-HANGAR (5,400 S.F.)	II
31	10 UNIT T-HANGAR (10,500 S.F.)	II
32	10 UNIT T-HANGAR (10,500 S.F.)	II
33	FUTURE FBO (5,000 S.F.)	II
34	TERMINAL BUILDING (5,000 S.F.)	ULTIMATE
35	MAINTENANCE HANGAR (10,000 S.F.)	II
36	CORPORATE HANGAR (5,000 S.F.)	II

RUNWAY DATA	EXISTING		ULTIMATE	
	RW 14	RW 32	RW 14	RW 32
APPROACH VISIBILITY MINIMUMS	1 MILE	VISUAL	SAME	SAME
FAR PART 77 APPROACH SLOPE	34:1	20:1	SAME	SAME
MARKING	NPI	NPI	NPI	NPI
VISUAL APPROACH AIDS	REIL/VASI-2	REIL	REIL/PAPI	REIL/PAPI
INSTRUMENT APPROACH AIDS	VOR/NDB	NONE	VOR/NDB/LOC	SAME
RUNWAY END COORDINATES (NAD 83)	[illegible]	[illegible]	SAME	SAME
RUNWAY THRESHOLD COORDINATES	[illegible]	[illegible]	SAME	SAME
RUNWAY END ELEVATION	463.5'	539.1'	SAME	SAME
RUNWAY HIGH POINT/LOW POINT ELEVATION	463.5'	539.1'	SAME	SAME
AIRPORT REFERENCE CODE (ARC)	B-I	B-I	SAME	SAME
TRUE BEARING	167°33' 17.16"		SAME	
DIMENSIONS (LENGTH x WIDTH)	4,201' x 75'		SAME	
PAVEMENT TYPE	BITUMINOUS ASPHALT		SAME	
PAVEMENT DESIGN STRENGTH	30,000 - SW		SAME	
LIGHTING / SIGNAGE	MIRL		SAME	
PERCENT GRADIENT	1.79		SAME	
MAXIMUM GRADE	1.8%		SAME	
ROFA DIMENSIONS	[illegible]		SAME	
OFZ	[illegible]		SAME	
RSA DIMENSIONS	[illegible]		SAME	
CRITICAL AIRCRAFT	CITATION II		SAME	
WIND COVERAGE (VFR)	94.4		SAME	
WIND COVERAGE (ALL WEATHER)	95.1		SAME	

LEGEND	EXISTING	ULTIMATE
RUNWAY OBJECT FREE AREA	ROFA	SAME
RUNWAY SAFETY AREA	RSA	SAME
TAXIWAY OBJECT FREE AREA	TOFA	SAME
BUILDING RESTRICTION LINE	BRL	SAME
AIRPORT PROPERTY LINE		SAME
SECURITY FENCE		
BUILDINGS		
PAVEMENT EDGES		
DEMOLITION/RELOCATION	NA	
ROTATING BEACON		SAME
GLIDESLOPE/LOCALIZER CRITICAL AREA	NA	
RW END IDENTIFIER LIGHTS (REIL)		SAME
AIRPORT REFERENCE POINT		SAME
WIND CONE & SEGMENTED CIRCLE		
AWOS (LIGHTED)		
AVIATION EASEMENT		NA
NON-DIRECTIONAL BEACON (LIGHTED)		
OBSTRUCTION LIGHT		
PAPI	NA	

DEVELOPMENT PROGRAM	
EXISTING	
PHASE I DEVELOPMENT (2001-2005)	
PHASE II DEVELOPMENT (2006-2010)	
PHASE III DEVELOPMENT (2011-2020)	
ULTIMATE DEVELOPMENT (BEYOND 2020)	

NO.	REVISIONS	BY/DATE	FAA/DATE	APPROVALS MAA/DATE	MCRA/DATE

FEDERAL AVIATION ADMINISTRATION	
APPROVED	DATE

MONTGOMERY COUNTY REVENUE AUTHORITY	
APPROVED	DATE

MARYLAND AVIATION ADMINISTRATION	
APPROVED	DATE

AIRPORT DATA	EXISTING	ULTIMATE
AIRPORT ELEVATION	539.1'	SAME
ARP LAT/LONG (NAD 83)	[illegible]	SAME
MEAN DAILY MAX TEMPERATURE	88.3° F	SAME
NPIAS SERVICE LEVEL	[illegible]	SAME
MAA SERVICE ROLE	[illegible]	SAME
TAXIWAY LIGHTING	[illegible]	SAME
TAXIWAY MARKING	[illegible]	SAME
AIRPORT NAVAIDS	[illegible]	SAME
TERMINAL NAVAIDS	NONE	NONE
AIRPORT REFERENCE CODE (ARC)	B-I	SAME

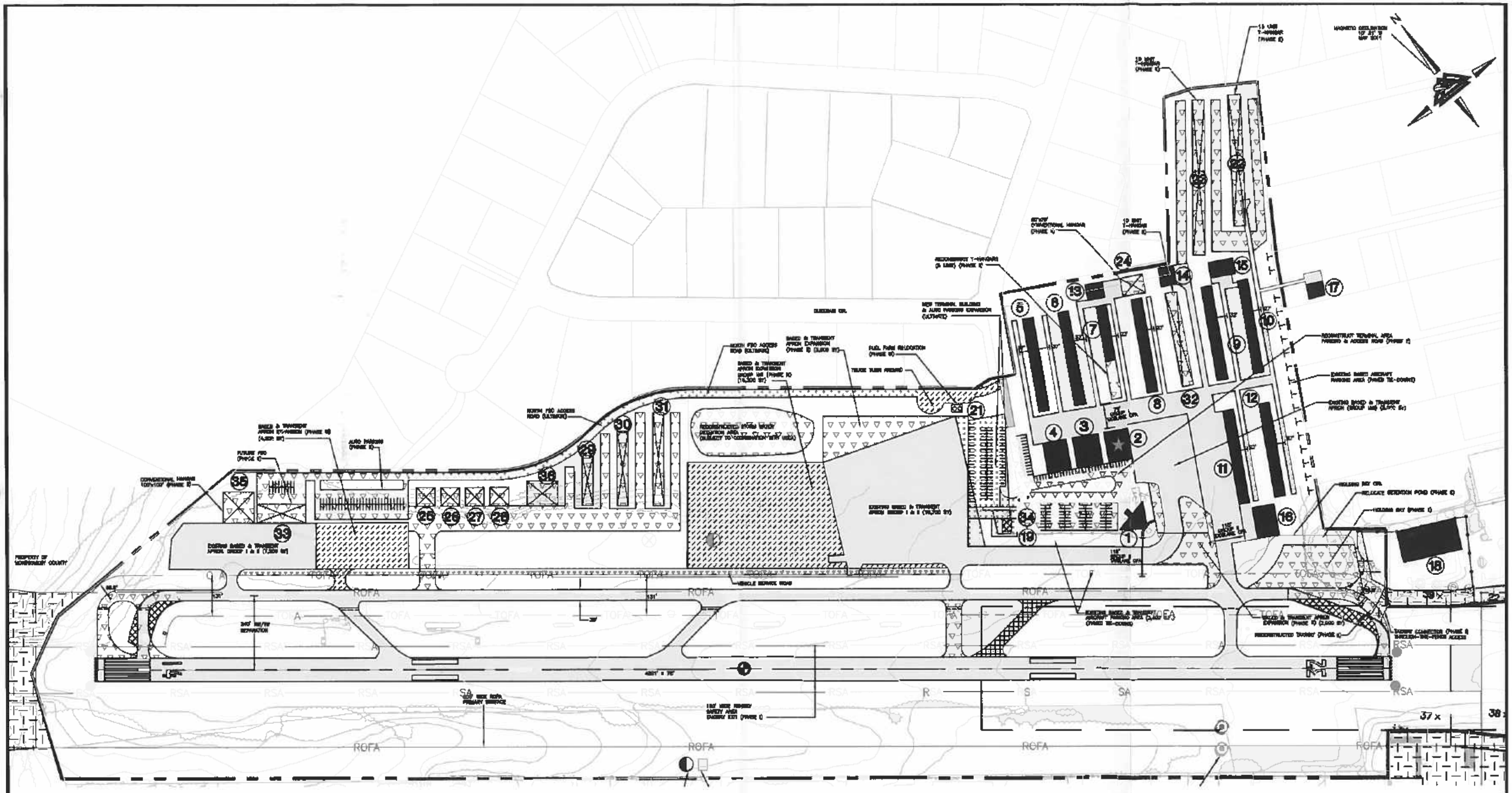
GAI-ALP-01.DWG
ALP-11x17

AIRPORT LAYOUT PLAN

MONTGOMERY COUNTY AIRPARK
GAITHERSBURG, MARYLAND

DELTA AIRPORT CONSULTANTS, INC.
Charlotte, NC | Austin, TX
Harrisburg, PA | Richmond, VA

DRAWN BY: MEE	SCALE: 1" = 600'	EXHIBIT 2 OF 9
CHECKED BY: CMA/RCL	DATE: JUNE 2002	



FACILITIES INDEX															
NO.	DESCRIPTION	TOP ELEV. ⊕	NO.	DESCRIPTION	TOP ELEV. ⊕	NO.	DESCRIPTION	TOP ELEV. ⊕	NO.	DESCRIPTION	TOP ELEV. ⊕	NO.	DESCRIPTION	TOP ELEV. ⊕
①	TERMINAL BUILDING	535	⑪	T-HANGAR E	540	⑰	WILLARD (THROUGH-THE-FENCE)	540	㉓	CORP. HANGAR	528	㉙	TERMINAL BLDG.(ULT.)	535
②	SOUTHERN AIRCRAFT	535	⑫	T-HANGAR F	540	⑱	NEWMAN (THROUGH-THE-FENCE)	542	㉔	CORP. HANGAR	529	㉚	MAINT. HANGAR	533
③	MONTGOMERY AVIATION	535	⑬	T-HANGAR G	542	⑲	FUEL FARM	535	㉕	CORP. HANGAR	529	㉛	CORP. HANGAR	530
④	CONGRESSIONAL AIR	535	⑭	T-HANGAR H	542	⑳	RELOCATED FUEL FARM	534	㉖	T-HANGAR	530			
⑤	T-HANGAR A	530	⑮	(PROPOSED) SCHWEIZER HANGAR	540	㉑	T-HANGAR	540	㉗	T-HANGAR	530			
⑥	T-HANGAR B	530	⑯	FITZGERALD	540	㉒	T-HANGAR	540	㉘	T-HANGAR	532			
⑦	T-HANGAR C	538	⑰	MONTGOMERY AVIATION	540	㉓	CORP. HANGAR	540	㉙	T-HANGAR	538			
⑧	T-HANGAR D	538	⑱	MASON	542	㉔	CORP. HANGAR	528	㉚	FUTURE FBO	600			

DEVELOPMENT PROGRAM	
EXISTING	
PHASE I DEVELOPMENT (2001-2005)	
PHASE II DEVELOPMENT (2006-2010)	
PHASE III DEVELOPMENT (2011-2020)	
ULTIMATE DEVELOPMENT (BEYOND 2020)	

NO.	REVISIONS	BY/DATE	APPROVALS FAA/DATE	MAA/DATE	MDRA/DATE

LEGEND	EXISTING	ULTIMATE
RUNWAY OBJECT FREE AREA		SAME
RUNWAY SAFETY AREA		SAME
TAXIWAY OBJECT FREE AREA		SAME
AIRPORT PROPERTY LINE		SAME
SECURITY FENCE		
BUILDINGS		
PAVEMENT EDGES		
DEMOLITION/RELOCATION	NA	
ROTATING BEACON		SAME
AWOS (LIGHTED)		
NON-DIRECTIONAL BEACON (LIGHTED)		
OBSTRUCTION LIGHT		
RW END IDENTIFIER LIGHTS (REIL)		SAME

GAI-TAP-01.DWG
TAP-11x17

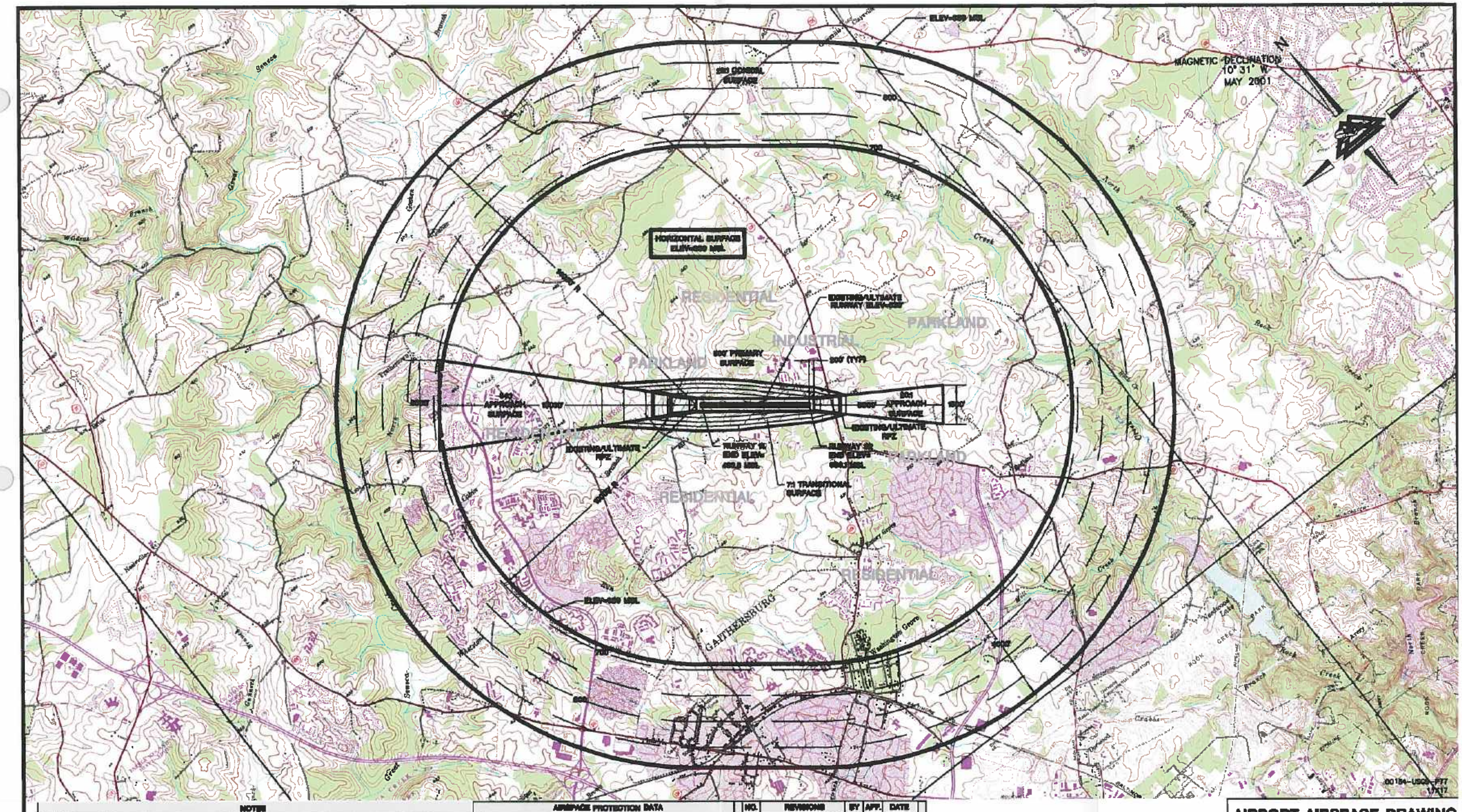
TERMINAL AREA PLAN

MONTGOMERY COUNTY AIRPARK
GAITHERSBURG, MARYLAND

DELTA AIRPORT CONSULTANTS, INC.
Charlotte, NC ♦ Austin, TX
Harrisburg PA ♦ Richmond, VA

EXHIBIT 3 OF 9

DRAWN BY: MEB | SCALE: 1" = 300'
CHECKED BY: CMA/RGL | DATE: JUNE 2002



NOTES

1. THIS DRAWING DEPICTS OBJECTS AFFECTING NAVIGABLE AIRSPACE AS DEFINED IN FEDERAL AVIATION REGULATIONS PART 77, SECTION 77.25, CIVIL AIRPORT IMAGINARY SURFACES.
2. USC GEOLOGICAL SURVEY 7.5 MINUTE SERIES QUADRANGLE MAPS: ROCKVILLE, MD. - PHOTOREVISED 1970
   GAITHERSBURG, MD. - PHOTOREVISED 1970
   DAMASCUS, MD. - PHOTOREVISED 1965
3. ALL ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL.
4. RUNWAY END ELEVATIONS ARE BASED ON PRELIMINARY SITE ANALYSIS BY DELTA AIRPORT CONSULTANTS, INC.
5. ALL ELEVATIONS DEPICTED ARE GROUND HEIGHTS AND DO NOT ACCOUNT FOR VEGETATION GROWTH.
6. REFER TO INNER PORTION OF APPROACH SURFACE DRAWINGS FOR ADDITIONAL DETAILS ON CLOSE-IN APPROACH CONSIDERATIONS, PROFILE VIEWS OF APPROACH SLOPES, AND RUNWAY PROTECTION ZONE.
7. REFER TO MARYLAND REGULATIONS (COMAR) 11.03.01, OBSTRUCTION EVALUATION, PROVIDES THE GUIDELINES FROM WHICH TO CONDUCT AN OBJECT REVIEW ANALYSIS IN RELATION TO AN AIRPORT.

AIRSPACE PROTECTION DATA

AIRPORT ELEVATION (FT): 459 MSL | TOPO CONTOUR INTERVAL (FT): 10

RUNWAY END ELEVATIONS (FT)

RUNWAY 14 = 459.0 MSL | RUNWAY 32 = 454.3 MSL

INSTRUMENT PROCEDURES

RUNWAY 32: NON-PRECISION 2:1 SLOPE, RUNWAY LARGER THAN UTILITY | RUNWAY 14: VISUAL ONLY

NO.	REVISIONS	BY	APP.	DATE

1"=2000' SCALE — 2000 0 2000 4000 FEET

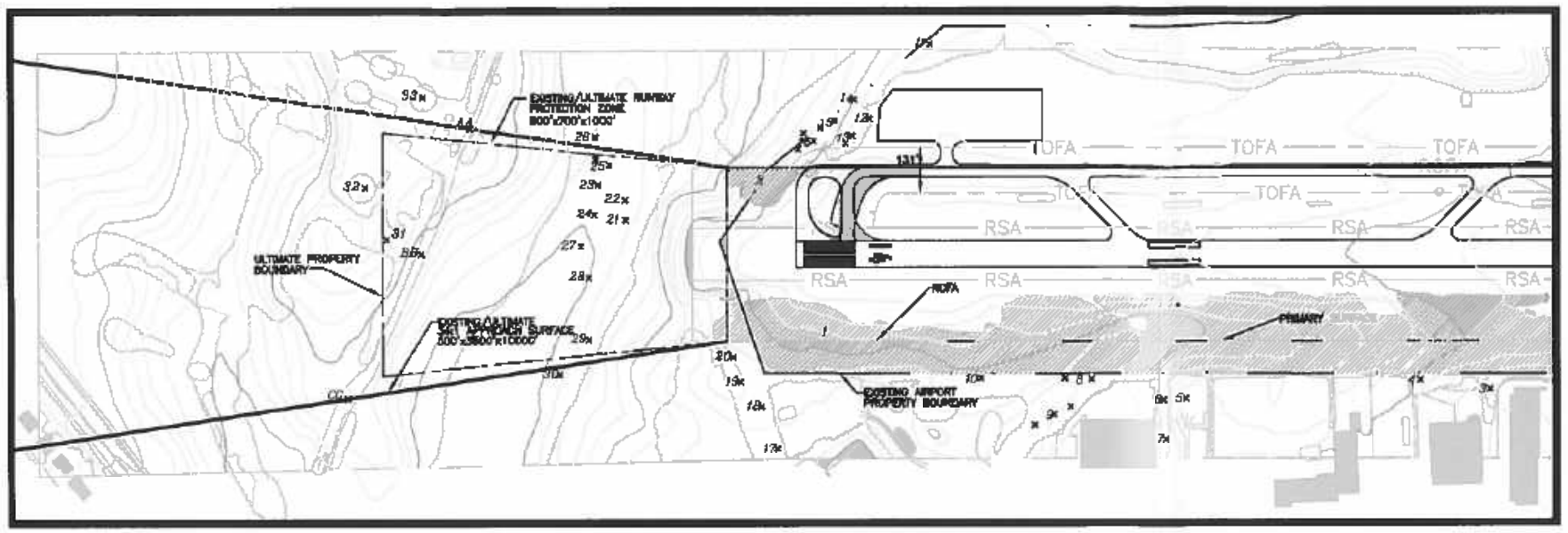
AIRPORT AIRSPACE DRAWING

MONTGOMERY COUNTY AIRPARK
GAITHERSBURG, MARYLAND

DELTA AIRPORT CONSULTANTS, INC.
Charlotte, NC • Fort Worth, TX
Harrisburg PA • Richmond, VA

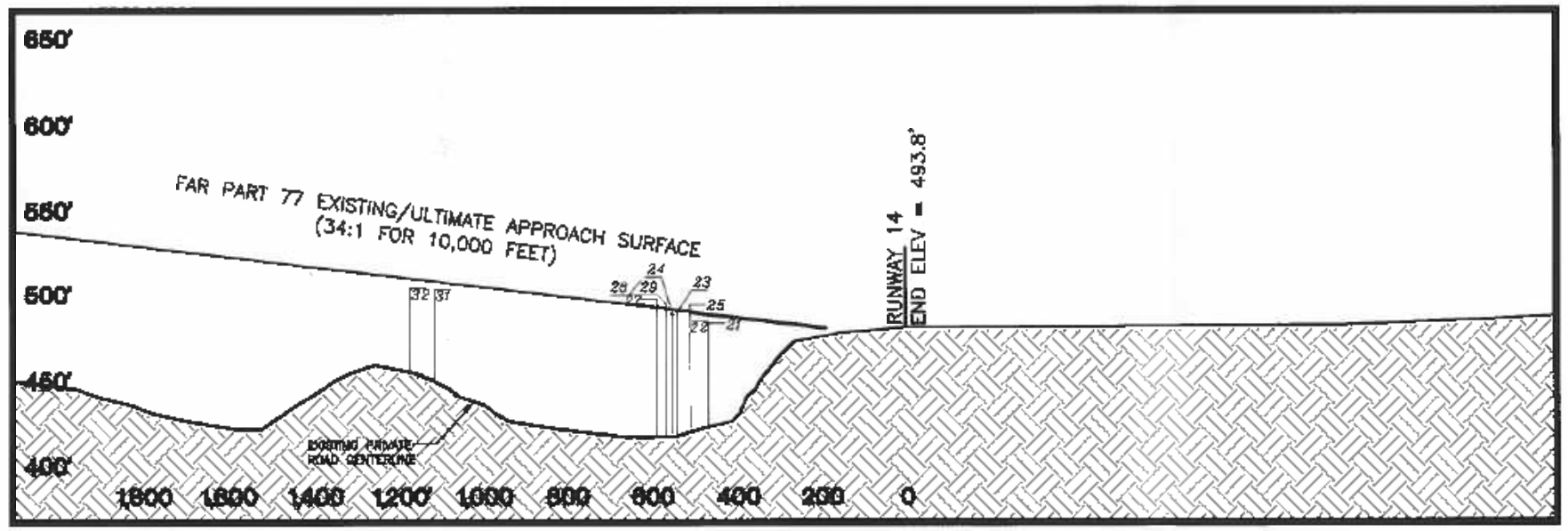
EXHIBIT 4 OF 9

DRAWN BY:	MEB	SCALE:	1"=2000'
CHECKED BY:	CMA	DATE:	AUGUST 2001



RUNWAY PROTECTION ZONE
PLAN VIEW RUNWAY 14

NTS



FAR PART 77 APPROACH SURFACE
PROFILE RUNWAY 14

NTS

RUNWAY 14 OBSTRUCTION CHART

NO.	OBJECT DESCRIPTION	ELEV. '	PART 77 SURFACE	SURFACE ELEVATION EXISTING	SURFACE ELEVATION FUTURE	PENETRATION EXISTING	PENETRATION FUTURE	ACTION
1	GROUP OF TREES	647'	PRIMARY	605'	SAME	42'	0'	REMOVE
2	GROUP OF TREES	640'	PRIMARY	484'	SAME	28'	0'	REMOVE
3	TREE	599'	7:1 TRANSITIONAL	535'	SAME	36'	0'	REMOVE
4	TREE	552'	7:1 TRANSITIONAL	532'	SAME	20'	0'	REMOVE
5	TREE	518'	7:1 TRANSITIONAL	580'	SAME	-4'	0'	REMOVE
6	TREE	536'	7:1 TRANSITIONAL	527'	SAME	9'	0'	REMOVE
7	TREE	634'	7:1 TRANSITIONAL	638'	SAME	-1'	0'	REMOVE
8	GROUP OF TREES	638'	7:1 TRANSITIONAL	570'	SAME	68'	0'	REMOVE
9	GROUP OF TREES	648'	7:1 TRANSITIONAL	628'	SAME	20'	0'	REMOVE
10	TREE	632'	7:1 TRANSITIONAL	628'	SAME	10'	0'	REMOVE
11	TREE	647'	7:1 TRANSITIONAL	643'	SAME	4'	0'	REMOVE
12	TREE	591'	7:1 TRANSITIONAL	592'	SAME	-1'	0'	REMOVE
13	GROUP OF TREES	670'	7:1 TRANSITIONAL	658'	SAME	12'	0'	REMOVE
14	TREE	634'	7:1 TRANSITIONAL	631'	SAME	3'	0'	REMOVE
15	GROUP OF TREES	670'	7:1 TRANSITIONAL	670'	SAME	0'	0'	REMOVE
16	GROUP OF TREES	627'	7:1 TRANSITIONAL	604'	SAME	23'	0'	REMOVE
17	TREE	636'	7:1 TRANSITIONAL	635'	SAME	1'	0'	REMOVE

RUNWAY 14 OBSTRUCTION CHART

NO.	OBJECT DESCRIPTION	ELEV. '	PART 77 SURFACE	SURFACE ELEVATION EXISTING	SURFACE ELEVATION FUTURE	PENETRATION EXISTING	PENETRATION FUTURE	ACTION
18	TREE	634'	7:1 TRANSITIONAL	635'	SAME	39'	0'	REMOVE
19	TREE	624'	7:1 TRANSITIONAL	626'	SAME	-2'	0'	REMOVE
20	TREE	608'	7:1 TRANSITIONAL	608'	SAME	2'	0'	REMOVE
21	TREE	487'	34:1 APPROACH	602'	SAME	-8'	0'	REMOVE
22	TREE	498'	34:1 APPROACH	602'	SAME	-4'	0'	REMOVE
23	TREE	624'	34:1 APPROACH	623'	SAME	1'	0'	REMOVE
24	TREE	601'	34:1 APPROACH	604'	SAME	-3'	0'	REMOVE
25	GROUP OF TREES	608'	34:1 APPROACH	603'	SAME	5'	0'	REMOVE
26	TREE	607'	7:1 TRANSITIONAL	604'	SAME	3'	0'	REMOVE
27	TREE	614'	34:1 APPROACH	604'	SAME	7'	0'	REMOVE
28	TREE	628'	34:1 APPROACH	604'	SAME	5'	0'	REMOVE
29	TREE	498'	34:1 APPROACH	604'	SAME	-6'	0'	REMOVE
30	TREE	608'	7:1 TRANSITIONAL	607'	SAME	-1'	0'	REMOVE
31	TREE	617'	34:1 APPROACH	621'	SAME	-4'	0'	REMOVE
32	TREE	598'	34:1 APPROACH	625'	SAME	-8'	0'	REMOVE
33	TREE	624'	7:1 TRANSITIONAL	626'	SAME	-2'	0'	REMOVE

RUNWAY 14 VERTICAL ROAD CLEARANCE

NO.	OBJECT DESCRIPTION	ELEV. '	PART 77 SURFACE	SURFACE ELEVATION EXISTING	SURFACE ELEVATION FUTURE	PENETRATION EXISTING	PENETRATION FUTURE	ACTION
AA	PRIVATE ROAD	478'	50:1 APPROACH	614'	SAME	-36'	SAME	N/A
BB	PRIVATE ROAD	481'	35:1 APPROACH	618'	SAME	-64'	SAME	N/A
CC	PRIVATE ROAD	484'	20:1 APPROACH	624'	SAME	-88'	SAME	N/A

LEGEND

- AA. VERTICAL ROAD CLEARANCE
- 1. OBSTRUCTION
- PRIMARY SURFACE
- EXISTING AIRPORT PROPERTY LINE
- ULTIMATE PROPERTY LINE
- EXISTING FENCE

NOTES

1. NUMBER DENOTES SINGLE OBSTRUCTION.
2. ALL ELEVATIONS ARE IN ACCORDANCE WITH NATIONAL MAP ACCURACY STANDARDS. SPOT ELEVATIONS AND GROUND CONTOURS ARE DERIVED FROM AERIAL PHOTOGRAMMETRY AND ARE APPROXIMATE. GROUND SURVEYS ARE REQUIRED TO VERIFY ACCURACY OF OBSTRUCTIONS.
3. ALL ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL.
4. GROUND CONTOURS, RUNWAY END AND OBSTRUCTION ELEVATIONS ARE BASED UPON AERIAL PHOTOGRAPHY PREPARED BY: POTOMAC AERIAL SURVEYS, INC.
   FREDERICK COUNTY AIRPORT
   1819 BUCHEIMER ROAD
   FREDERICK, MARYLAND 21701
5. ALL POTENTIAL OBSTRUCTIONS ARE WITHIN 5 FEET OF FAR PART 77 SURFACE AND SHOULD BE FIELD VERIFIED.
6. FAR PART 77 REQUIRES THE FOLLOWING CLEARANCES:
   10 FEET ABOVE PRIVATE ROADS
   15 FEET ABOVE PUBLIC ROADS
   17 FEET ABOVE INTERSTATE HIGHWAYS
   23 FEET ABOVE RAILROADS
   ELEVATION = ACTUAL ROADWAY ELEVATION + FAR PART 77 CLEARANCE.
7. CODE OF MARYLAND REGULATIONS (COMAR) 11.03.05, OBSTRUCTION EVALUATION, PROVIDE THE GUIDELINES FROM WHICH TO CONDUCT AN OBJECT HEIGHT ANALYSIS IN RELATION TO AN AIRPORT

00184RPZ.DWG
RW14(11X17)

NO.	REVISIONS	BY	APP.	DATE

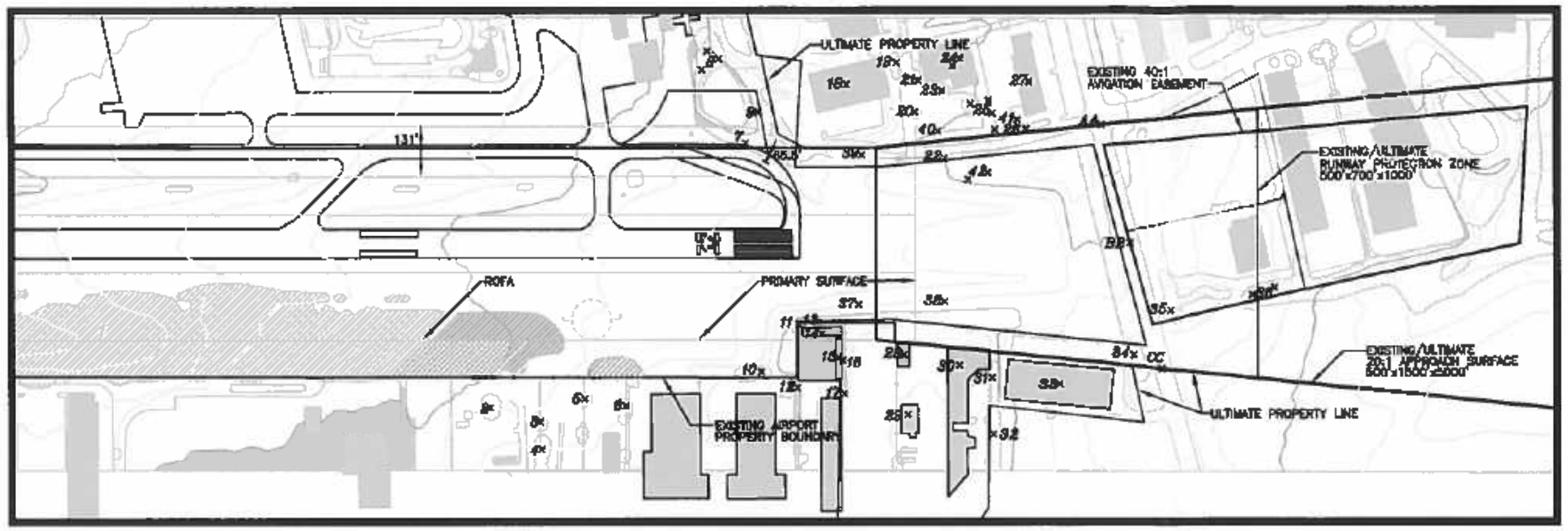
RUNWAY 14 INNER PORTION OF APPROACH SURFACE

MONTGOMERY COUNTY AIRPARK
GAITHERSBURG, MARYLAND

DELTA AIRPORT CONSULTANTS, INC.
Charlotte, NC • Austin, TX
Harrisburg, PA • Richmond, VA

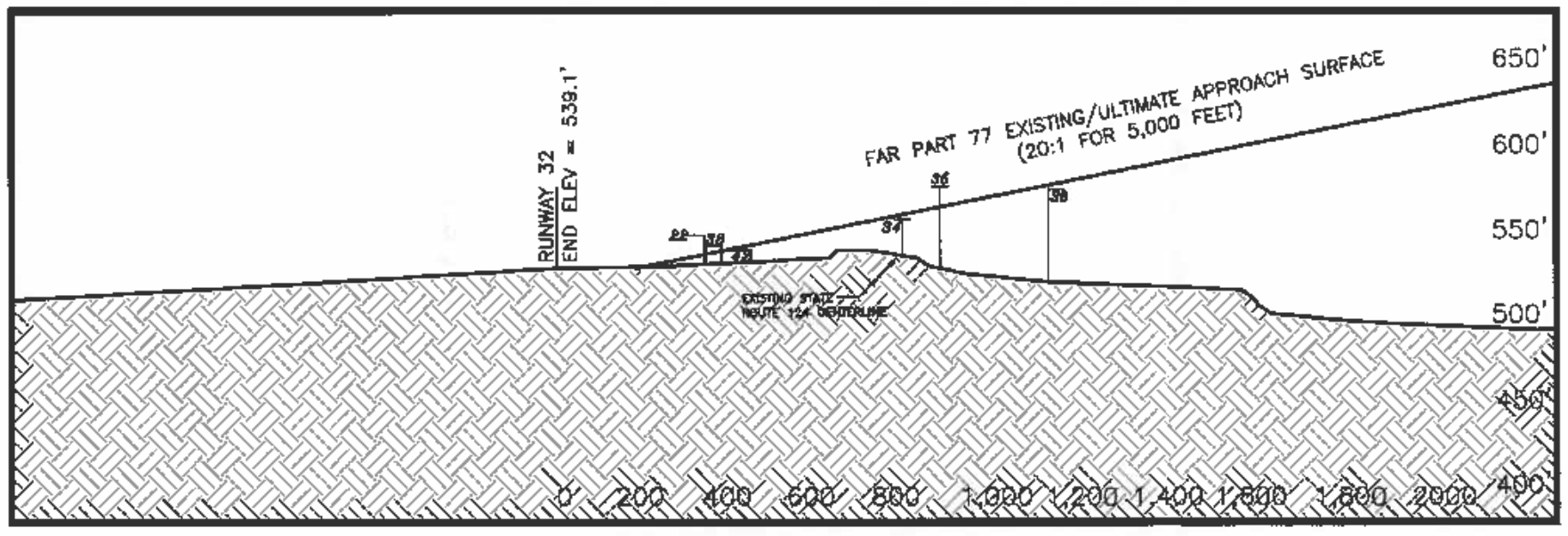
EXHIBIT 5 OF 9

DRAWN BY:	JMM/MEB	SCALE:	NONE
CHECKED BY:	CMA/RGL	DATE:	AUGUST 2001



RUNWAY PROTECTION ZONE
PLAN VIEW RUNWAY 32

NTS



FAR PART 77 APPROACH SURFACE
PROFILE RUNWAY 32

NTS

RUNWAY 32 OBSTRUCTION CHART

NO.	OBJECT DESCRIPTION	ELEV. ▲	PART 77 SURFACE	SURFACE ELEVATION EXISTING	SURFACE ELEVATION FUTURE	PENETRATION EXISTING	PENETRATION FUTURE	ACTION
1	GROUP OF TREES	600'	PRIMARY	539'	SAME	25'	0'	REMOVE
2	TREE	575'	7:1 TRANSITIONAL	582'	SAME	24'	0'	REMOVE
3	TREE	558'	7:1 TRANSITIONAL	566'	SAME	1'	0'	REMOVE
4	TREE	568'	7:1 TRANSITIONAL	566'	SAME	0'	0'	REMOVE
5	TREE	585'	7:1 TRANSITIONAL	582'	SAME	3'	0'	REMOVE
6	TREE	567'	7:1 TRANSITIONAL	556'	SAME	11'	0'	REMOVE
7	TREE	548'	7:1 TRANSITIONAL	538'	SAME	10'	0'	REMOVE
8	GROUP OF TREES	570'	7:1 TRANSITIONAL	564'	SAME	6'	0'	REMOVE
9	TREE	555'	7:1 TRANSITIONAL	550'	SAME	5'	0'	REMOVE
10	TREE	580'	7:1 TRANSITIONAL	548'	SAME	32'	0'	REMOVE
11	TREE	579'	PRIMARY	539'	SAME	38'	0'	REMOVE
12	TREE	568'	7:1 TRANSITIONAL	556'	SAME	12'	0'	REMOVE
13	TREE	567'	PRIMARY	539'	SAME	28'	0'	REMOVE
14	BUILDING	564'	PRIMARY	539'	SAME	25'	0'	REMOVE
15	BUILDING	564'	PRIMARY	539'	SAME	25'	0'	REMOVE
16	TREE	571'	7:1 TRANSITIONAL	547'	SAME	24'	0'	REMOVE
17	TREE	570'	7:1 TRANSITIONAL	556'	SAME	12'	0'	REMOVE

RUNWAY 32 OBSTRUCTION CHART

NO.	OBJECT DESCRIPTION	ELEV. ▲	PART 77 SURFACE	SURFACE ELEVATION EXISTING	SURFACE ELEVATION FUTURE	PENETRATION EXISTING	PENETRATION FUTURE	ACTION
18	BUILDING	565'	7:1 TRANSITIONAL	563'	SAME	2'	2'	LIGHT
19	TREE	572'	7:1 TRANSITIONAL	573'	SAME	–1'	0'	REMOVE
20	TREE	577'	7:1 TRANSITIONAL	556'	SAME	16'	0'	REMOVE
21	TREE	542'	7:1 TRANSITIONAL	547'	SAME	–5'	0'	REMOVE
22	TREE	560'	20:1 APPROACH	547'	SAME	13'	0'	REMOVE
23	TREE	575'	7:1 TRANSITIONAL	561'	SAME	14'	0'	REMOVE
24	BUILDING	578'	7:1 TRANSITIONAL	579'	SAME	–1'	–1'	LIGHT
25	GROUP OF TREES	575'	7:1 TRANSITIONAL	564'	SAME	8'	0'	REMOVE
26	GROUP OF TREES	564'	7:1 TRANSITIONAL	557'	SAME	7'	0'	REMOVE
27	BUILDING	572'	7:1 TRANSITIONAL	576'	SAME	–4'	–4'	LIGHT
28	BUILDING	563'	7:1 TRANSITIONAL	540'	SAME	23'	23'	REMOVE
29	BUILDING	589'	7:1 TRANSITIONAL	567'	SAME	22'	22'	REMOVE
30	BUILDING	563'	7:1 TRANSITIONAL	536'	SAME	27'	27'	REMOVE
31	TREE	562'	7:1 TRANSITIONAL	534'	SAME	28'	0'	REMOVE
32	TREE	560'	7:1 TRANSITIONAL	563'	SAME	5'	0'	REMOVE
33	BUILDING	565'	7:1 TRANSITIONAL	559'	SAME	6'	6'	REMOVE
34	TREE	566'	20:1 APPROACH	573'	SAME	–4'	0'	REMOVE

RUNWAY 32 OBSTRUCTION CHART

NO.	OBJECT DESCRIPTION	ELEV. ▲	PART 77 SURFACE	SURFACE ELEVATION EXISTING	SURFACE ELEVATION FUTURE	PENETRATION EXISTING	PENETRATION FUTURE	ACTION
35	TREE	560'	20:1 APPROACH	577'	SAME	13'	0'	REMOVE
36	GROUP OF TREES	588'	20:1 APPROACH	590'	SAME	–2'	0'	REMOVE
37	TERRAIN	550'	PRIMARY	539'	SAME	11'	0'	REMOVE
38	TERRAIN	553'	20:1 APPROACH	545'	SAME	8'	0'	REMOVE
40	PARKING LOT	550'	7:1 TRANSITIONAL	545'	SAME	5'	0'	LOWER
41	ACCESS ROAD	550'	7:1 TRANSITIONAL	550'	SAME	15'	0'	LOWER
42	TERRAIN	550'	20:1 APPROACH	548'	SAME	2'	0'	REMOVE

RUNWAY 32 VERTICAL ROAD CLEARANCE

AA	STATE ROUTE 124	540'	20:1 APPROACH	588'	SAME	–1'	SAME	N/A
BB	STATE ROUTE 124	561'	20:1 APPROACH	573'	SAME	–12'	SAME	N/A
CC	STATE ROUTE 124	552'	20:1 APPROACH	577'	SAME	–25'	SAME	N/A

LEGEND

- AA, VERTICAL ROAD CLEARANCE
- 1, OBSTRUCTION
- PRIMARY SURFACE
- EXISTING AIRPORT PROPERTY LINE
- ULTIMATE PROPERTY LINE
- EXISTING FENCE

NOTES

1. NUMBER DENOTES SINGLE OBSTRUCTION.
2. ALL ELEVATIONS ARE IN ACCORDANCE WITH NATIONAL MAP ACCURACY STANDARDS. SPOT ELEVATIONS AND GROUND CONTOURS ARE DERIVED FROM AERIAL PHOTOGRAMMETRY AND ARE APPROXIMATE. GROUND SURVEYS ARE REQUIRED TO VERIFY ACCURACY OF OBSTRUCTIONS.
3. ALL ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL.
4. GROUND CONTOURS, RUNWAY END AND OBSTRUCTION ELEVATIONS ARE BASED UPON AERIAL PHOTOGRAPHY PREPARED BY: POTOMAC AERIAL SURVEYS, INC.
   FREDERICK COUNTY AIRPORT
   1519 BUCHELMER ROAD
   FREDERICK, MARYLAND 21701
5. ALL POTENTIAL OBSTRUCTIONS ARE WITHIN 5 FEET OF FAR PART 77 SURFACE AND SHOULD BE FIELD VERIFIED.
6. FAR PART 77 REQUIRES THE FOLLOWING CLEARANCES:
   10 FEET ABOVE PRIVATE ROADS
   15 FEET ABOVE PUBLIC ROADS
   17 FEET ABOVE INTERSTATE HIGHWAYS
   23 FEET ABOVE RAILROADS
   ELEVATION = ACTUAL ROADWAY ELEVATION + FAR PART 77 CLEARANCE.
7. CODE OF MARYLAND REGULATIONS (COMAR) 11.03.05, OBSTRUCTION EVALUATION, PROVIDE THE GUIDELINES FROM WHICH TO CONDUCT AN OBJECT HEIGHT ANALYSIS IN RELATION TO AN AIRPORT.

D0184RPZ.DWG
RW32(11X17)

NO.	REVISIONS	BY	APP.	DATE

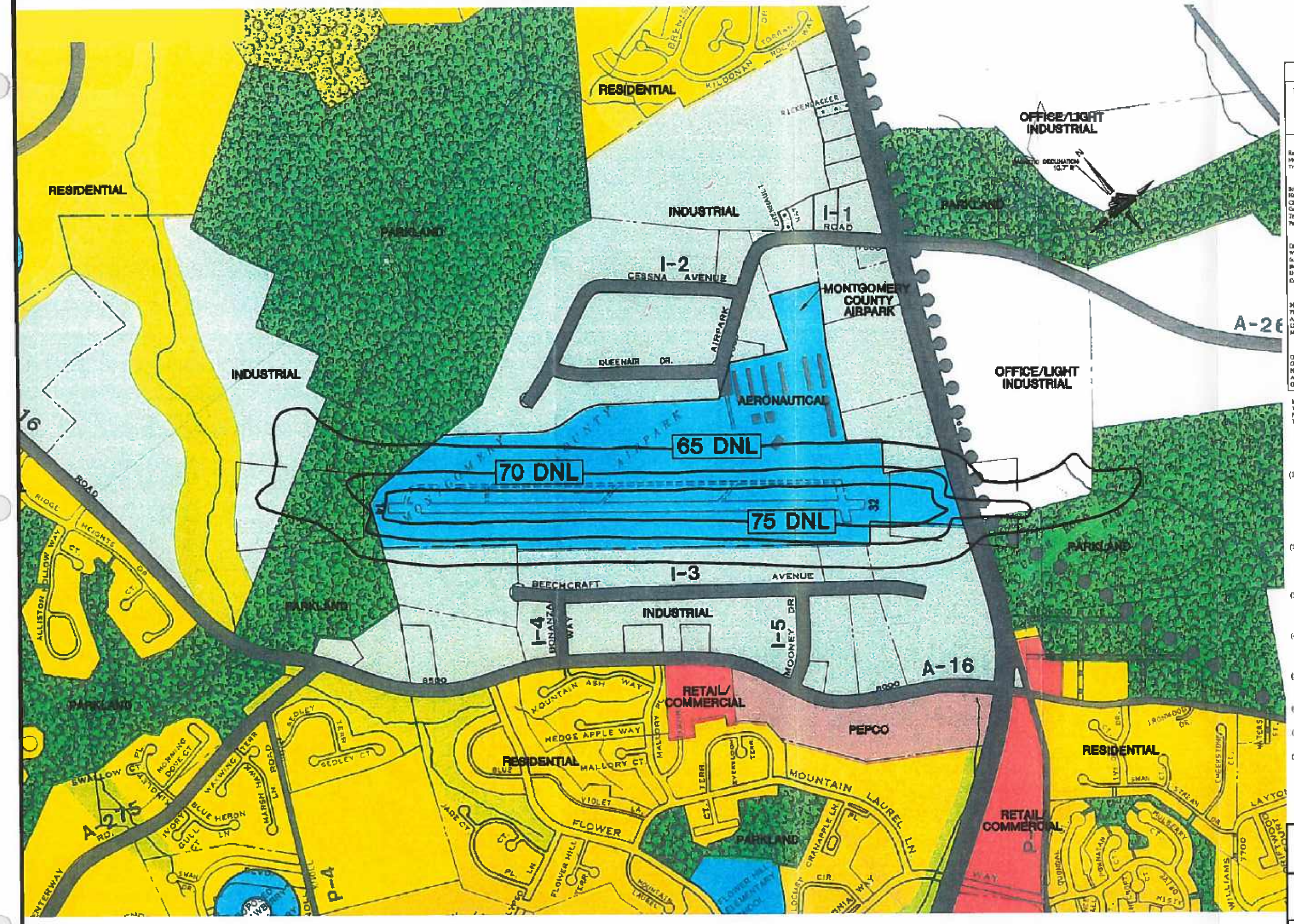
RUNWAY 32 INNER PORTION OF APPROACH SURFACE

MONTGOMERY COUNTY AIRPARK
GAITHERSBURG, MARYLAND

DELTA AIRPORT CONSULTANTS, INC.
Charlotte, NC ♦ Austin, TX
Harrisburg, PA ♦ Richmond, VA

EXHIBIT 6 OF 9

DRAWN BY:	MEB	SCALE:	NONE
CHECKED BY:	CMA/RGL	DATE:	AUGUST 2001



FEDERAL AVIATION REGULATION PART 150

AIRPORT NOISE COMPATIBILITY PLANNING

LAND USE COMPATIBILITY WITH YEARLY DAY-NIGHT AVERAGE SOUND LEVELS

Land Use	Yearly Day-Night Average Sound Level (Ldn) in Decibels					
	Below 65	65-70	70-75	75-80	80-85	OVER 85
RESIDENTIAL USE						
Residential other than mobile homes and transient lodgings	Y	N (5)	N (1)	N	N	N
Mobile home park	Y	N	N	N	N	N
Transient lodgings	Y	N (5)	N (1)	N (1)	N	N
PUBLIC USE						
Schools	Y	N (1)	N (1)	N	N	N
Hospitals and nursing homes	Y	N	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y (2)	Y (3)	Y (4)	Y (4)
Parking	Y	Y	Y (2)	Y (3)	Y (4)	N
COMMERCIAL USE						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail - building materials, hardware and farm equipment	Y	Y	Y (2)	Y (3)	Y (4)	N
Retail trade - general	Y	Y	25	30	N	N
Utilities	Y	Y	Y (2)	Y (3)	Y (4)	N
Communication	Y	Y	25	30	N	N
MANUFACTURING & PRODUCTION						
Manufacturing general	Y	Y	Y (2)	Y (3)	Y (4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y (6)	Y (7)	Y (8)	Y (8)	Y (8)
Livestock farming and breeding	Y	Y (6)	Y (7)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
RECREATIONAL						
Outdoor sports arenas and spectator sports	Y	Y (5)	Y (5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts and camps	Y	Y	Y	Y	Y	Y
Golf courses, riding stables and water recreation	Y	Y	25	30	N	N

Key to table VIII-5

Y (yes)	=	Land use and related structures compatible without restrictions
N (no)	=	Land use and related structures are not compatible and should be prohibited.
25, 30, or 35	=	Land use and related structures generally compatible; measures to achieve outdoor to indoor Noise Level Reduction of 25, 30, or 35 dB must be incorporated into design and construction of structure.

(1) WHERE THE COMMUNITY DETERMINES THAT RESIDENTIAL USES MUST BE ALLOWED, MEASURES TO ACHIEVE OUTDOOR TO INDOOR NOISE LEVEL REDUCTION (NLR) OF AT LEAST 25 dB AND 30 dB SHOULD BE INCORPORATED INTO BUILDING CODES AND BE CONSIDERED IN INDIVIDUAL APPROVALS. NORMAL CONSTRUCTION CAN BE EXPECTED TO PROVIDE A NLR OF 20 dB OVER STANDARD CONSTRUCTION AND NORMALLY ASSUMES MECHANICAL VENTILATION AND CLOSED WINDOWS YEAR ROUND. HOWEVER, THE USE OF NLR CRITERIA WILL NOT ELIMINATE OUTDOOR NOISE PROBLEMS.

(2) MEASURES TO ACHIEVE NLR OF 25 MUST BE INCORPORATED INTO THE DESIGN AND CONSTRUCTION OF PORTIONS OF THESE BUILDINGS AND CONSTRUCTION OF PORTIONS OF THESE BUILDINGS WHERE THE PUBLIC IS RECEIVED, OFFICE AREAS, NOISE SENSITIVE AREAS OR WHERE THE NORMAL NOISE LEVEL IS LOW.

(3) MEASURES TO ACHIEVE NLR OF 30 MUST BE INCORPORATED INTO THE DESIGN AND CONSTRUCTION OF PORTIONS OF THESE BUILDINGS WHERE THE PUBLIC IS RECEIVED, OFFICE AREAS, NOISE SENSITIVE AREAS OR WHERE THE NORMAL NOISE LEVEL IS LOW.

(4) MEASURES TO ACHIEVE NLR OF 35 MUST BE INCORPORATED INTO THE DESIGN AND CONSTRUCTION OF PORTIONS OF THESE BUILDINGS WHERE THE PUBLIC IS RECEIVED, OFFICE AREAS, NOISE SENSITIVE AREAS OR WHERE THE NORMAL NOISE LEVEL IS LOW.

(5) LAND USE COMPATIBLE PROVIDED SPECIAL SOUND REINFORCEMENT SYSTEMS ARE INSTALLED.

(6) RESIDENTIAL BUILDINGS REQUIRE AN NLR OF 25.

(7) RESIDENTIAL BUILDINGS REQUIRE AN NLR OF 30.

(8) RESIDENTIAL BUILDINGS ARE NOT PERMITTED.

00184-NOISE.DWG
EXISTING

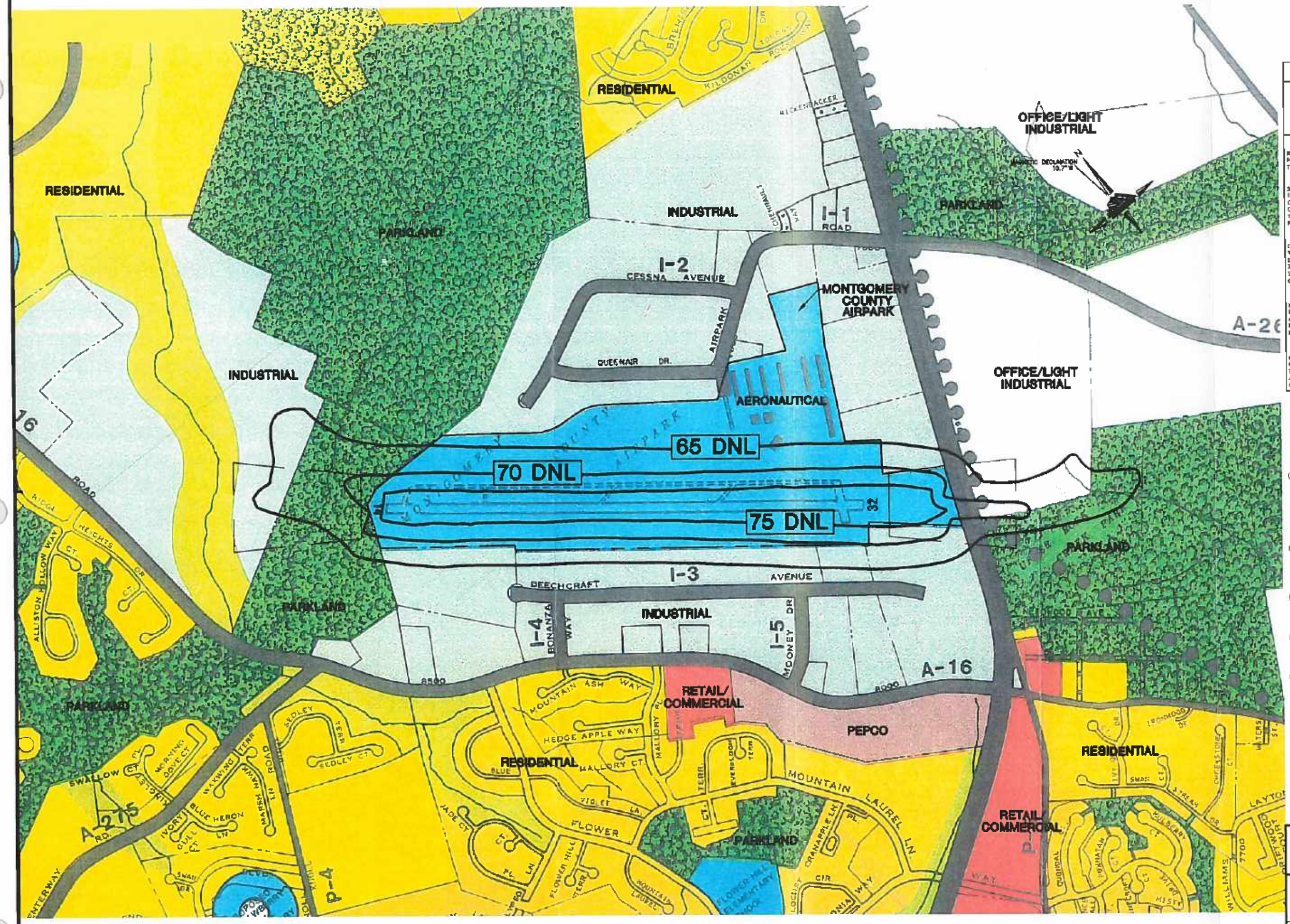
LAND USE
(2001 NOISE SPACE CONTOURS)

MONTGOMERY COUNTY AIRPARK
GAITHERSBURG, MARYLAND

DELTA AIRPORT CONSULTANTS, INC.
Charlotte, NC ♦ Austin, TX
Harrisburg, PA ♦ Richmond, VA

DRAWN BY:	MEB	SCALE:	NOT TO SCALE
CHECKED BY:	RGL	DATE:	FEBRUARY 2002

SHEET 7 OF 9



FEDERAL AVIATION REGULATION PART 150

AIRPORT NOISE COMPATIBILITY PLANNING

LAND USE COMPATIBILITY WITH YEARLY DAY-NIGHT AVERAGE SOUND LEVELS

Land Use	Yearly Day Night Average Sound Level (Ldn) in Decibels					
	Below 65	65-70	70-75	75-80	80-85	OVER 85
RESIDENTIAL USE						
Residential other than mobile homes and transient lodgings	Y	N(1)	N (2)	N	N	N
Mobile home park	Y	N	N	N	N	N
Transient lodgings	Y	N(1)	N (2)	N (8)	N	N
PUBLIC USE						
Schools	Y	N (3)	N (3)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y (2)	Y (3)	Y (4)	Y (4)
Parking	Y	Y	Y (2)	Y (3)	Y (4)	N
COMMERCIAL USE						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail - building materials, hardware and farm equipment	Y	Y	Y (5)	Y (5)	Y (6)	N
Retail trade - general	Y	Y	25	30	N	N
Utilities	Y	Y	Y (2)	Y (3)	Y (4)	N
Communication	Y	Y	25	30	N	N
MANUFACTURING & PRODUCTION						
Manufacturing general	Y	Y	Y (2)	Y (3)	Y (4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y (6)	Y (7)	Y (8)	Y (8)	Y (8)
Livestock farming and breeding	Y	Y (6)	Y (7)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
RECREATIONAL						
Outdoor sports arenas and spectator sports	Y	Y (6)	Y (6)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	Y	N	N	N
Amusements, parks resorts and water recreation	Y	Y	Y	Y	Y	Y
Golf courses, riding stables and water recreation	Y	Y	25	30	N	N

Key to table VIII 3

Y (yes)	=	Land use and related structures compatible without restrictions
N (no)	=	Land use and related structures are not compatible and should be prohibited
25, 30, or 35	=	Land use and related structures generally compatible; measures to achieve Noise Level Reduction of 25, 30, or 35 dB must be incorporated into design and construction of structure.

(1) WHERE THE COMMUNITY DETERMINES THAT RESIDENTIAL USES MUST BE ALLOWED, MEASURES TO ACHIEVE OUTDOOR TO INDOOR NOISE LEVEL REDUCTION (NLR) OF AT LEAST 25 dB AND 30 dB SHOULD BE INCORPORATED INTO BUILDING CODES AND BE CONSIDERED IN INDIVIDUAL APPROVALS. NORMAL CONSTRUCTION CAN BE EXPECTED TO PROVIDE A NLR OF 20 dB OVER STANDARD CONSTRUCTION AND NORMALLY ASSUME MECHANICAL VENTILATION AND CLOSED WINDOWS YEAR ROUND. HOWEVER, THE USE OF NLR CRITERIA WILL NOT ELIMINATE OUTDOOR NOISE PROBLEMS.

(2) MEASURES TO ACHIEVE NLR OF 25 MUST BE INCORPORATED INTO THE DESIGN AND CONSTRUCTION OR PORTIONS OF THESE BUILDINGS AND CONSTRUCTION OF PORTIONS OF THESE BUILDINGS WHERE THE PUBLIC IS RECEIVED, OFFICE AREAS, NOISE SENSITIV AREAS OR WHERE THE NORMAL NOISE LEVEL IS LOW.

(3) MEASURES TO ACHIEVE NLR OF 30 MUST BE INCORPORATED INTO THE DESIGN AND CONSTRUCTION OF PORTIONS OF THESE BUILDINGS WHERE THE PUBLIC IS RECEIVED, OFFICE AREAS, NOISE SENSITIVE AREAS OR WHERE THE NORMAL NOISE LEVEL IS LOW.

(4) MEASURES TO ACHIEVE NLR OF 35 MUST BE INCORPORATED INTO THE DESIGN AND CONSTRUCTION OF PORTIONS OF THESE BUILDINGS WHERE THE PUBLIC IS RECEIVED, OFFICE AREAS, NOISE SENSITIVE AREAS OR WHERE THE NORMAL NOISE LEVEL IS LOW.

(5) LAND USE COMPATIBLE PROVIDED SPECIAL SOUND REINFORCEMENT SYSTEMS ARE INSTALLED.

(6) RESIDENTIAL BUILDINGS REQUIRE AN NLR OF 25.

(7) RESIDENTIAL BUILDINGS REQUIRE AN NLR OF 30.

(8) RESIDENTIAL BUILDINGS ARE NOT PERMITTED.

00184-NOISE.DWG
FUTURE

LAND USE
(2020 NOISE SPACE CONTOURS)

MONTGOMERY COUNTY AIRPARK
GAITHERSBURG, MARYLAND

DELTA
AIRPORT CONSULTANTS, INC.
Charlotte, NC • Austin, TX
Harrisburg, PA • Richmond, VA

DRAWN BY:	MEB	SCALE:	NOT TO SCALE
CHECKED BY:	RGL	DATE:	FEBRUARY 2002

PRELIMINARY ACQUISITION DATA

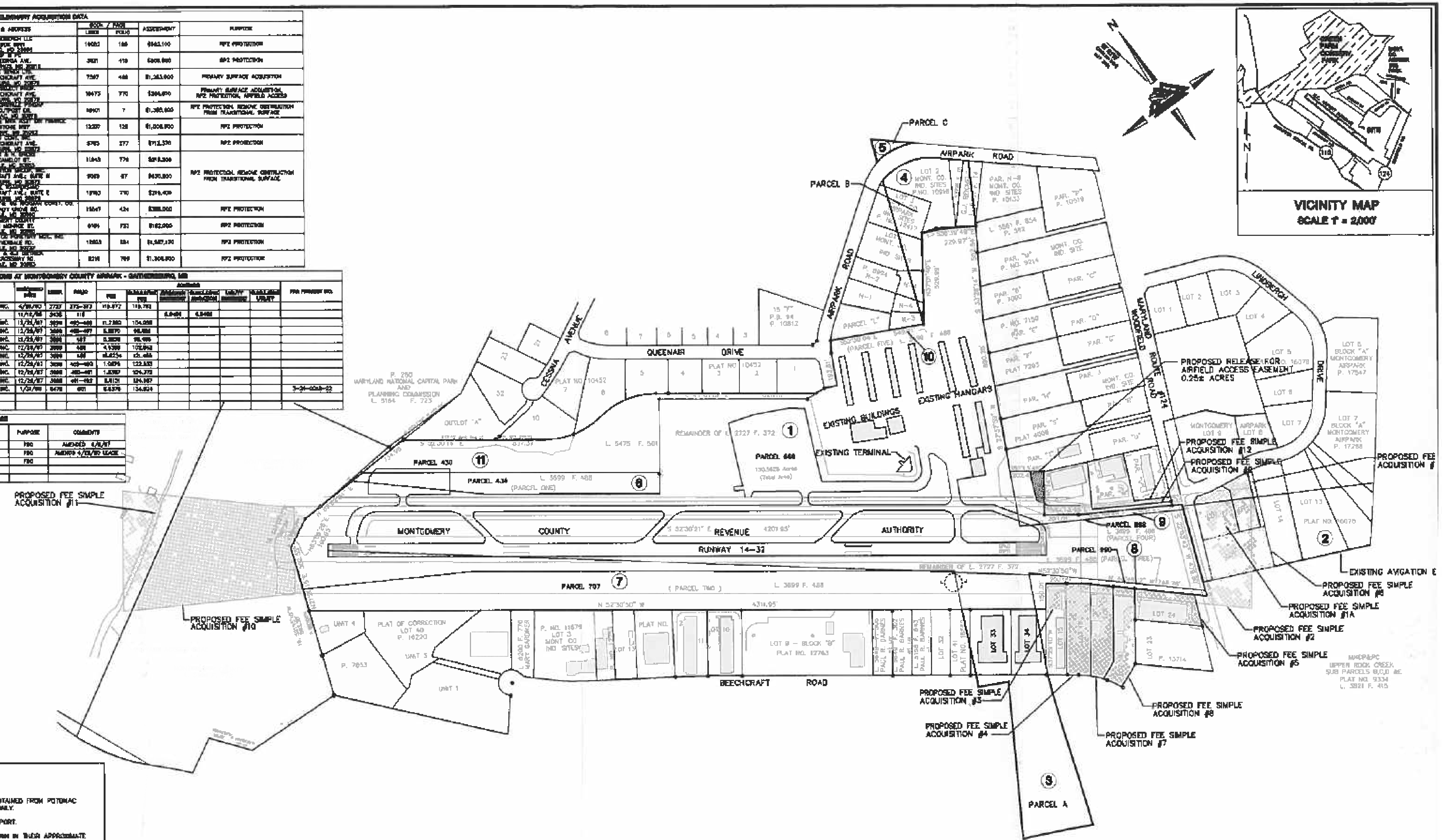
REF. #	PARCEL	ZONING	TOTAL AREA (ACRES)	AFFECTED AREA (AC)	OWNER & ADDRESS	BOOK / PAGE LIBER	BOOK / PAGE FOLIO	ASSESSMENT	PURPOSE
1	PLAT # 18079 BLK A LOT 15	11	2.43	2.0	[illegible]	16082	186	$842,100	RPZ PROTECTION
2	PLAT # 9334	EXEMPT	28.33	.40	[illegible] GEORGIA AVE. [illegible]	3821	415	$208,800	RPZ PROTECTION
3	PLAT # 18097 BLK B LOT 19	14	1.33	.40	[illegible] 7901 BEECHCRAFT AVE. GAITHERSBURG, MD 20879	7597	468	$1,243,000	PRIMARY SURFACE ACQUISITION
4	PLAT # 18097 BLK B LOT 18	14	1.69	1.69	[illegible] BEECHCRAFT AVE. GAITHERSBURG, MD 20879	16475	770	$396,870	PRIMARY SURFACE ACQUISITION, RPZ PROTECTION, AIRFIELD ACCESS
5	PLAT # 13714 BLK B LOT 34	14	1.36	1.06	[illegible] OUTPOST CR. POTOMAC, MD [illegible]	16401	7	$1,380,000	RPZ PROTECTION, REMOVE OBSTRUCTION FROM TRANSITIONAL SURFACE
6	PLAT # 18078 BLK A LOT 14	11	2.03	1.5	STATE OF MARYLAND [illegible]	13220	128	$1,008,800	RPZ PROTECTION
7	PLAT # 13714 BLK B LOT 17	14	1.60	0.6	[illegible] BEECHCRAFT AVE. GAITHERSBURG, MD 20879	5785	277	$712,330	RPZ PROTECTION
8	PLAT # 13714 BLK B LOT 16	14	1.84	0.5	[illegible] 4805 CAMELOT ST. ROCKVILLE, MD [illegible]	11043	776	$218,300	RPZ PROTECTION, REMOVE OBSTRUCTION FROM TRANSITIONAL SURFACE
					[illegible] BEECHCRAFT AVE.; SUITE H GAITHERSBURG, MD [illegible]	9589	87	$430,300	
					[illegible] BEECHCRAFT AVE.; SUITE E GAITHERSBURG, MD [illegible]	15793	710	$210,400	
9	PLAT # 14008 PARCEL "A"	14	1.68	0.4	[illegible]	15647	424	$388,000	RPZ PROTECTION
10	PARCEL P280	EXEMPT	48.0	11.6	MONTGOMERY COUNTY [illegible] MONROE ST. ROCKVILLE, MD [illegible]	6194	723	$182,000	RPZ PROTECTION
11	PARCEL 888	14	133.61	3.12	[illegible] RIVERDALE RD. RIVERDALE, MD [illegible]	18083	584	$4,587,130	RPZ PROTECTION
12	PLAT # 14008 PARCEL "B"	14	1.66	0.3	RICHARD L. & [illegible] 14727 CROSSWAY RD. ROCKVILLE, MD [illegible]	8216	789	$1,308,800	RPZ PROTECTION

PROPERTY TRANSACTIONS AT MONTGOMERY COUNTY AIRPARK - GAITHERSBURG, MD

PARCEL NO. NO.	PARCEL NO. P&M	ACQUISITION EASEMENT	UTILITY EASEMENT	TO / FROM	NAME	RECORDED DATE	LIBER	FOLIO	ACREAGE FEE	RELEASED FEE	AVIGATION EASEMENT	RELEASED AVIGATION	UTILITY EASEMENT	RELEASED UTILITY	FAA PROJECT NO.
1	888			FROM	MONTGOMERY COUNTY AIRPARK, INC.	4/28/80	2727	372-373	119.872	119.782					
2		NA		FROM	M.G. & M.M. RAJAS	11/12/[illegible]	3436	118			4.8484	4.8486			
3	A			TO	MONTGOMERY COUNTY AIRPARK, INC.	12/29/87	3696	[illegible]	11.7360	104.066					
4	B			TO	MONTGOMERY COUNTY AIRPARK, INC.	12/29/87	3696	[illegible]	5.5870	98.[illegible]					
5	C			TO	MONTGOMERY COUNTY AIRPARK, INC.	12/29/87	3696	487	0.3628	98.[illegible]					
6	434			FROM	MONTGOMERY COUNTY AIRPARK, INC.	12/29/87	3696	486	4.1300	102.[illegible]					
7	707			FROM	MONTGOMERY COUNTY AIRPARK, INC.	12/29/87	3696	486	[illegible]	[illegible]					
8	990			FROM	MONTGOMERY COUNTY AIRPARK, INC.	12/29/87	3696	[illegible]	1.0876	122.[illegible]					
9	888			FROM	MONTGOMERY COUNTY AIRPARK, INC.	12/29/87	3696	[illegible]	1.[illegible]	124.[illegible]					
10	880			FROM	MONTGOMERY COUNTY AIRPARK, INC.	12/29/87	3696	[illegible]	[illegible]	126.[illegible]					
11	430			FROM	MONTGOMERY COUNTY AIRPARK, INC.	1/[illegible]	[illegible]	[illegible]	[illegible]	134.[illegible]					3-24-[illegible]-02

PROPERTY ENCUMBRANCE BY LEASE

LESSEE	AREA (ACRES)	EFFECTIVE DATE	TERM (YEARS)	PURPOSE	COMMENTS
MONTGOMERY COUNTY AIRPARK, INC.	113.782	4/[illegible]/[illegible]	[illegible]	FBO	AMENDED 4/[illegible]/87
MONTGOMERY COUNTY AIRPARK, INC.	38.[illegible]	[illegible]	[illegible]	FBO	AMENDS 4/[illegible] LEASE
THOMAS L. BLAIR	18.[illegible]	4/[illegible]	20	FBO	



GENERAL NOTES

1. PROPERTY IS ZONED I-1 (LIGHT INDUSTRIAL)
2. BUILDING LOCATIONS WERE TAKEN FROM TOPOGRAPHIC MAP OBTAINED FROM POTOMAC AERIAL SURVEYS AND ARE SHOWN FOR GENERAL REFERENCE ONLY.
3. THIS SURVEY WAS PREPARED WITHOUT BENEFIT OF A TITLE REPORT.
4. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN THEIR APPROXIMATE LOCATIONS AS PER AVAILABLE UTILITY COMPANY RECORDS. THE EXACT LOCATION OF ALL UNDERGROUND UTILITIES SHOULD BE VERIFIED BY "MISS UTILITY" PRIOR TO EXCAVATION. MACRIS, HENDRICKS AND GLASCOCK, P.A. DOES NOT EXPRESS OR IMPLY ANY GUARANTEE OR WARRANTY AS TO THE LOCATION OR EXISTANCE OF ANY UNDERGROUND UTILITY.
5. COORDINATES SHOWN HEREON ARE BASED ON THE MARYLAND STATE NAD 83/91 DATUM AS PROJECTED BY WSSC. STATIONS USED ARE NO. 20333 WITH THE COORDINATES OF NORTH 560046.774 FEET AND EAST 1281585.8570 FEET AND NO. 20335 WITH COORDINATES OF NORTH 550482.629 FEET AND EAST 1269808.3880 FEET. THE COMBINED SCALE FACTOR IS 0.999943881.
6. CERTIFICATION DEFINED — THE USED OF THE WORD CERTIFY OR CERTIFICATION BY A PROFESSIONAL LAND SURVEYOR IN THE PRACTICE OF LAND SURVEYING CONSTITUTES AN EXPRESSION OF PROFESSIONAL OPINION REGARDING THOSE FACTS OF FINDINGS WHICH ARE THE SUBJECT OF THE CERTIFICATION AND DOES NOT CONSTITUTE A WARRANTY OR GUARANTEE, EITHER EXPRESSED OR IMPLIED.
7. BOUNDARY SURVEY & PROPERTY OWNERSHIP INFORMATION PREPARED BY MACRIS, HENDRICKS & GLASCOCK, P.A., MONTGOMERY VILLAGE, MARYLAND. SURVEY DATED MAY 2001.
8. THIS SURVEY WAS PREPARED WITHOUT BENEFIT OF A TITLE REPORT AND THEREFORE MAY NOT REFLECT ALL ENCUMBRANCES ON THE PROPERTY.
9. MONTGOMERY COUNTY TAX ASSESSMENT RECORDS INDICATE A TRACT OF 93.41 ACRES REMAINED AFTER THE RELEASE OF PARCELS A, B AND C. THIS REPRESENTS A NEGATIVE VARIANCE OF 2.069 ACRES WHEN COMPARED TO LAND RECORDS OF MONTGOMERY COUNTY, MARYLAND.
10. BOUNDARY SURVEY CONDUCTED MAY 2001 CERTIFIES TOTAL BOUNDARY AREA AS 130.5826 ACRES. THIS REPRESENTS A NEGATIVE VARIANCE OF APPROXIMATELEY 4.3813 ACRES WHEN COMPARED TO LAND RECORDS OF MONTGOMERY COUNTY, MARYLAND.
11. PARCELS A, B AND C WERE RELEASED FOR INDUSTRIAL PARK DEVELOPMENT IN 1987. SURVEY FOR EXHIBIT "A" PRODUCED IN 1991 DEPICTS PARCELS A, B AND C.

LEGEND

- BUILDING HATCH
- PROPOSED LAND ACQUISITION HATCH
- EXISTING BUILDING RESTRICTION LINE
- EXISTING FENCE
- EXISTING PROPERTY LINE
- EXISTING RUNWAY OBJECT FREE AREA
- EXISTING RUNWAY SAFETY AREA
- EXISTING RUNWAY PROTECTION ZONE
- EXISTING TAXIWAY OBJECT FREE AREA
- EXISTING TAXIWAY SAFETY AREA

600 0 600 1200

scale: 1"=600'

LINE TABLE

LINE	BEARING	DISTANCE
L1	S 82° 03' 35" E	53.17'
L2	S 62° 30' 21" E	80.00'
L3	S 66° 10' 31" E	66.24'
L4	N 24° 21' 08" E	38.07'
L5	N 22° 27' 44" E	32.56'

CURVE TABLE

CURVE	RADIUS	LENGTH	DELTA	TANGENT	CHORD BEARING	CHORD
C1	315.00'	71.90'	13° 04' 37"	36.10'	N 34° 12' 05" E	71.74'
C2	455.75'	360.36'	45° 00' 01"	187.94'	S 75° 00' 05" E	347.27'
C3	455.75'	360.36'	45° 00' 01"	187.94'	S 75° 00' 21" E	347.27'

GAI-EXA-01.DWG
11X17

NO.	REVISIONS	BY	APP.	DATE

AIRPORT PROPERTY MAP

MONTGOMERY COUNTY AIRPARK
GAITHERSBURG, MARYLAND

DELTA AIRPORT CONSULTANTS, INC.
Charlotte, NC ♦ Austin, TX
Harrisburg, PA ♦ Richmond, VA

EXHIBIT 9 OF 9

DRAWN BY:	MEB/CLB	SCALE:	1" = 600'
CHECKED BY:	CMA/RGL	DATE:	AUGUST 2001

Chapter Six
COST ESTIMATES AND FUNDING

A. GENERAL

This chapter details the various projects required for the continued improvement and operation of Montgomery County Airpark for a 20-year planning period (2001-2020). These projects, by phase (time period), include estimates of probable construction costs in constant 2001 dollars. More detailed project definitions and associated estimates must be developed prior to the implementation of any project. The 20-year airport development program is presented in three development phases:

- **Phase I** **2001-2005**
- **Phase II** **2006-2010**
- **Phase III** **2011-2020**

Major project categories are offered for each development phase in section F of this chapter. Each phased development item is detailed in Chapter 5 and is depicted on the Airport Layout Plan Drawing. The phasing of the project implementation are recommendations, and changes in demand, local priorities, economy or funding may alter the timing of the proposed development. Section F also presents the potential costs for equipment, construction and development items scheduled for each phase. The estimated costs that are provided should be periodically reviewed and updated to reflect annuall inflation and other changing conditions.

Each figure represents an order of magnitude estimate of the total project cost, including construction and additional expenses such as engineering, administration, surveying and testing. Also, as these are preliminary estimates for planning purposes, a contingency amount has been added to each item to address unforeseen miscellaneous costs. These preliminary planning estimates, purposely conservative, should reduce the likelihood of significant budget variances when detailed design is completed and bids are received.

This chapter also identifies the typical funding sources for airport development. Four primary funding sources are anticipated for the development projects proposed at Montgomery County Airpark. These sources include the Federal Aviation Administration (FAA), Maryland Aviation Administration (MAA), Montgomery County Revenue Authority (MCRA) and private investment. Each governmental source, Federal, State and local, may have specific eligibility criteria and application guidelines that require diligent planning and administration to ensure the maximum funds available are received.

B. FAA FUNDING

To promote the development of airports to meet the nation's needs, the Federal Government embarked on a Grants-In-Aid Program to State and local governments after the end of World War II. Prior to that time, it had been the responsibility of the local community and the airlines to fund capital investment for non-military airports. The Federal Aid to Airport Programs (FAAP) was authorized by the Federal Airport Act of 1946 and funded from the general treasury.

The growth of commercial jet service during the 1960's prompted a need for large capital investment for navigational aids and the extension and strengthening of runways, taxiways and parking aprons. A more comprehensive program was established with the passage of the Airport and Airway Development Act of 1970. This Act provided grants for airport planning under the Planning Grant Program (PGP) and for airport development under the Airport Development Aid Program (ADAP). These programs were funded from a newly established Airport and Airway Trust Fund which received income from taxes on airline tickets, air freight and aviation fuel. The Act was amended in 1976, but expired in 1980 resulting in two years of congressional debate over a new program.

The Airport Improvement Program (AIP) was established by the Airport and Airway Improvement Act of 1982, and reauthorized by the Airport and Airway Safety and Capacity Enhancement Act of 1987. Since then the AIP has been authorized and appropriated on a yearly basis. Funding for this program continues to be generated from on airline tickets, freight bills, international departure fees and fuel taxes. The Federal Government provides 90 percent funding at most airports for AIP

eligible projects. The Montgomery County Airpark has received development funding from both the ADAP and AIP programs.

Federal airport improvement funds must be spent on FAA eligible projects as defined in FAA Order 5100.38 "Airport Improvement Program (AIP) Handbook." In general, the handbook states that:

- An airport must be in the currently approved National Plan of Integrated Airport Systems (NPIAS);
- Most public use airport improvements are eligible for 90 percent Federal funding;
- General Aviation terminal buildings, T-hangars, conventional hangars and other private use facilities and NAVAIDS are not eligible for federal AIP funding;
- Revenue producing areas, such as automobile parking lots, are not eligible for federal funding and;
- Projects intended for AIP funding must be depicted on an FAA approved Airport Layout Plan (ALP).

The Montgomery County Airpark is listed in the NPIAS as a reliever airport, which qualifies it for 90 percent funding of AIP eligible projects assuming all other criteria are met. This percentage applies to all general aviation and most primary airports. This ALP update is being prepared in compliance with FAA guidelines to produce an approved ALP.

By state law, the MAA acts as a 'pass-through' agent for all Federal aviation funding to local jurisdictions. The MAA should be copied on all Federal applications and correspondence to ensure prompt and timely processing of funding requests.

C. MAA FUNDING

Funding for airport improvements in the state of Maryland is administered by the Maryland Aviation Administration (MAA). MAA contributions are derived from user fees, such as aviation fuel taxes and rental car concession fees. For AIP eligible projects, where the Federal contribution is 90

percent, the remaining 10 percent is typically split five percent each between the MAA and local contributions. For certain non-AIP eligible projects, such as general aviation terminal buildings, CFR (Crash-Fire-Rescue) facilities and fuel farms, the MAA offers a 50/50 cost sharing program to airport sponsors.

As noted in the previous section, the MAA serves as a 'pass-through' agent for Federal aviation funding. This process also triggers the MAA to provide the state's five percent share, thus providing the MAA a complete copy of all Federal documentation will ensure the matching funds are received in a timely manner.

D. LOCAL FUNDING

Local funding for Montgomery County Airpark is provided by the Montgomery County Revenue Authority from two local accounts. The two accounts are an Airport Operating Account funded from airport rental revenues, and a User Fee Account funded from a $0.03 per gallon fuel flowage fee $0.03 per pound MGTW (Maximum Gross Take-off Weight) for all based aircraft. The Airpark is currently self-sufficient in that it provides for local capital and ongoing operating and maintenance costs. No funding sources are subsidized by Montgomery County for the Airpark. Local funding provides the remaining match contribution after the FAA and MAA participation for the development project costs.

E. PRIVATE FUNDING

Another potential source of funds for airport improvements is private investment. Private investors may construct needed facilities as part of a lease agreement with the MCRA that will allow time to amortize their investments. This type of funding is particularly suitable for T-hangar and conventional hangar development since they are not typically eligible for FAA or MAA funding.

F. AIRPORT DEVELOPMENT PROGRAM

This section describes each airport improvement project by phase for the 20-year planning period (2001-2020). Planning estimates of probable construction cost, as well as breakdown of potential

FAA, State, local and private funding is also listed, as well as a funding summary.

1. Phase I Development (2001-2005)

The airport development program scheduled for Phase I of the planning period is focused on obstruction removal, improving operational control of the airfield and development of the Airpark's runway/taxiway system. Obstruction removal includes building demolition, tree cutting, clearing and grubbing, terrain grading, removal of structures and obstruction marking and lighting. These efforts are required to bring the Airpark into compliance with FAA standards. Fee simple land acquisition and/or additional avigation easements will improve operational control of the airfield. Land acquisition includes acquiring the property, existing building acquisition and relocation of existing businesses. Recommended improvements to the runway and taxiway system include installation of a localizer, installation of holding position signage, repainting Runway 14-32 markings, replacing the MITLs, installation of an electrical vault, installation of PAPIs, relocating a south end exit taxiway and construction of a temporary thru-the-fence taxiway connector. Also, included are estimated costs for two Form "C" Environmental Assessments and a Comprehensive Environmental Assessment are scheduled to be completed during Phase I. The total estimate of probable construction costs for Phase I development is $7.5 million. Phase I development estimates, complete with potential funding sources, are presented in **Table 6-1**. **Table 6-2** details the fee simple land acquisition, consistent with the property map in the drawing set.

Table 6-1
Montgomery County Airpark
Phase I Cost Estimates (rounded to nearest thousands)

PHASE/ YEAR[2]	PROJECT DESCRIPTION	TOTAL EST. COST	FAA ELIGIBLE FUNDING[1]	MAA ELIGIBLE FUNDING	MCRA REQUIRED FUNDING	PRIVATE OR OTHER INVESTMENT
I/2002	Construct thru-the-fence taxiway Connector (temporary)	$33,000	$0	$0	$0	$33,000
I/2002	Install Holding Position Signage; Repaint RW 14-32 Markings	$33,000	$30,000	$1,500	$1,500	$0
	Obstruction Removal[3]					
I/2002	Tree Clearing (primarily on Airport property)	$22,200	$20,000	$1,100	$1,100	$0
I/2002	Land Acquisition Coordination (Parcel #1B, Kramer)	$40,000	$36,000	$2,000	$2,000	$0
I/2003	Land Acquisition - Parcel #1B	$775,000	$697,500	$38,750	$38,750	$0
I/2003	Land Acquisition (Parcel #1A, Mardiosian)	$1,518,000	$1,366,200	$75,900	$75,900	$0
I/2003	Replace MITLs, Add Obstruction Lighting	$40,000	$36,000	$2,000	$2,000	$0
I/2003	Comprehensive Environmental Assessment	$400,000	$360,000	$20,000	$20,000	$0
I/2003	Form "C" Environmental Assessments (temporary taxiway connector & aircraft hangar)	$30,000	$0	$0	$0	$30,000
I/2004	Install Electrical Vault & PAPIs	$189,000	$170,000	$9,500	$9,500	$0
I / 2004	Acquire Land/Easement for RW 14 Approach	$2	$0	$0	$2	$0
I/2005	Construct Exit Taxiway & RW 14 Connector Taxiway	$300,000	$270,000	$15,000	$15,000	$0
I/2005	Land Acquisition (Parcel #6)	$1,798,500	$1,618,700	$89,900	$89,900	$0
I/2005	Land Acquisition (Parcel #9)	$200,000	$180,000	$10,000	$10,000	$0
I/2005	Land Acquisition (Parcel #11)	$1,560,000	$1,404,000	$78,000	$78,000	$0
I/2005	Land Acquisition (Parcel #12)	$150,000	$135,000	$7,500	$7,500	$0
I/2005	Install Localizer[5]	$370,000	$0	$0	$0	$370,000
	Phase I Totals	**$7,458,702**	**$6,323,130**	**$351,285**	**$351,287**	**$433,000**

[1] All Projects indicating FAA/MAA eligible funding are based on 90% FAA contribution and 5% MAA contribution.
[2] Phase/Year was determined by the FAA's yearly funding of approximately $3.5 million per planning year.
[3] Code of Maryland Regulations (COMAR) 11.03.05 requires property owners to remove or otherwise mitigate any obstructions to air navigation. Cost for the listed obstructions to be removed may be reduced through strict enforcement of this regulation.
[4] Parcels to be acquired are illustrated on the Property Map in the ALP drawing set by their tax map parcel numbers and detailed on the table.
[5] Localizer funding anticipated to be 100% from FAA Airways Facilities, MAA or combination thereof.
Source: Delta Airport Consultants, Inc.

Table 6-2
Montgomery County Airpark
Fee Simple Land Acquisition Details

REFERENCE NUMBER[1]	ESTIMATED COST[2]	PURPOSE
1	$1,500,000	RPZ Protection
2	$1[3]	RPZ Protection
3	$820,000	Primary Surface Acquisition
4[4]	$825,000	Primary Surface Acquisition, RPZ Protection, Airfield Access
5	$4,801,000	RPZ Protection, Remove Obstruction from Transitional Surface
6	$2,000,000	RPZ Protection
7	$1,045,000	RPZ Protection
8	$5,435,000	RPZ Protection, Remove Obstruction from Transitional Surface
9	$200,000	RPZ Protection / Obstruction Removal
10	$1[3]	RPZ Protection
11	$1,560,000	RPZ Protection
12	$150,000	RPZ Protection / Obstruction Removal
TOTAL	**18,336,000**	

[1] Reference number reflects the reference number within the property acquisition as detailed on the Airport Property Map.
[2] Estimate includes acquisition of land and demolition of existing buildings, and relocation of existing businesses.
[3] Assumes land acquired from Montgomery County or Maryland National Capital Park and Planning Commission will be released at a nominal fee for Airpark RPZ protection.
[4] Land acquisition currently underway, on this undeveloped parcel owned by Capital Select Properties (1.65 acres).

2. Phase II Development (2006-2010)

Phase II of the planning period is focused on items that would meet the current forecast demand for facility requirements, as well as obstruction removal and improving operational control of the airfield. The items proposed in this phase of development include the construction of conventional hangars, T-hangars, construct vehicle service road, construct north FBO terminal building, reconstruct stormwater detention area, expansion of auto parking, reconstructing Runway 14 taxiway with a taxiway bypass, reconstructing Runway 32 taxiway with the addition of a holding bay and constructing the permanent taxiway connector, and apron pavement. Obstruction removal includes building demolition tree cutting, clearing and grubbing, terrain grading, reconstruct off-airport access road and auto parking lot, removal of structures and obstruction marking and lighting. Fee simple land

acquisition will improve operational control of the airfield. Land acquisition includes acquiring the property, existing building acquisition and relocation of existing businesses. The total estimate of probable construction costs for Phase II development is $22.4 million. Phase II development estimates, along with a breakdown of potential funding sources is presented in **Table 6-3**.

Table 6-3
Montgomery County Airpark
Phase II Cost Estimates

PHASE	PROJECT DESCRIPTION	TOTAL EST. COST	FAA ELIGIBLE FUNDING[1]	MAA ELIGIBLE FUNDING	MCRA REQUIRED FUNDING	PRIVATE OR OTHER INVESTMENT
II-1	Non-Compatible Land Use-Bldg. Removal (Parcel #6)	$200,000	$180,000	$10,000	$10,000	$0
II-2	Non-Compatible Land Use-Bldg. Removal (Parcel #11)	$200,000	$180,000	$10,000	$10,000	$0
II-3	Obstruction Removal - Lower access road (Parcels #9 & #12)	$1,400,000	$1,260,000	$70,000	$70,000	$0
II-4	Acquire Land for Part 77 Surfaces - RW 32 (Parcel #3)	$700,000	$630,000	$35,000	$35,000	$0
II-5	Acquire Land for Part 77 Surfaces - RW 32 (Parcel #7)	$945,000	$850,500	$47,250	$47,250	$0
II-6	Obstruction Removal (Parcel #7)	$120,000	$108,000	$6,000	$6,000	$0
II-7	Obstruction Removal (Parcel #3)	$100,000	$90,000	$5,000	$5,000	$0
II-8	Acquire Land for Part 77 Surfaces - RW 32 - (Parcel #8)	$2,700,000	$2,430,000	$135,000	$135,000	$0
II-9	Relocate S. End Exit TW; Relocate RW 32 Entrance TW; Construct Holding Bay; Relocate Detention Pond	$1,094,000	$984,600	$54,700	$54,700	$0
II-10	Acquire Land for Part 77 Surfaces - RW 32 (Parcel #2)	$1	$0	$0	$1	$0
II-11	Acquire Land for Part 77 Surfaces - RW 32 (Parcel #5)	$4,000,000	$3,600,000	$200,000	$200,000	$0
II-12	Non-Compatible Land Use-Bldg. Removal (Parcel #8)	$750,000	$675,000	$37,500	$37,500	$0
II-13	Non-Compatible Land Use-Bldg. Removal (Parcel #5)	$800,000	$720,000	$40,000	$40,000	$0
II-14	Reconstruct Stormwater Detention Area	$250,000	$0	$0	$0	$250,000
II-15	Construct T-hangars (north FBO)	$1,035,000	$0	$0	$0	$1,035,000
II-16	Construct Vehicle Service Road	$245,000	$0	$0	$0	$245,000

[1] All Projects indicating FAA/MAA eligible funding are based on 90% FAA contribution and 5% MAA contribution.
[2] Assumes private development for exclusive use by new FBO. Potential for 50% MAA funding if developed and operated by MCRA for general public.

Source: Delta Airport Consultants, Inc.

Table 6-3 (Continued)
Montgomery County Airpark
Phase II Cost Estimates

PHASE	PROJECT DESCRIPTION	TOTAL EST. COST	FAA ELIGIBLE FUNDING[1]	MAA ELIGIBLE FUNDING	MCRA REQUIRED FUNDING	PRIVATE OR OTHER INVESTMENT
II-17	Construct Conventional Hangars (north FBO)	$3,179,500	$0	$0	$0	$3,179,500
II-18	Construct Conventional Hangar (north FBO)	$1,585,000	$0	$0	$0	$1,585,000
II-19	South FBO Apron Pavement	$313,000	$0	$0	$0	$313,000
II-20	Construct Conventional Hangar (south FBO)	$712,600	$0	$0	$0	$712,600
II-21	Modify Terminal Area Parking (south FBO)	$198,000	$0	$0	$0	$198,000
II-22	Construct North FBO Terminal Building	$1,995,000	$0	$0	$0	$1,995,000[2]
II-23	Construct North FBO Parking Lot	$335,000	$0	$0	$0	$170,000
II-24	Construct T-hangars (south FBO)	$1,950,000	$0	$0	$0	$1,950,000
II-25	Construct Thru-the-Fence Taxiway Connector (permanent)	$33,000	$0	$0	$0	$33,000
II-26	Construct Bypass Taxiway	$140,000	$126,000	$7,000	$7,000	$0
	Phase II Totals	**$22,480,101**	**$9,584,100**	**$532,450**	**$532,450**	**$11,831,100**

[1] All Projects indicating FAA/MAA eligible funding are based on 90% FAA contribution and 5% MAA contribution.
[2] Assumes private development for exclusive use by new FBO. Potential for 50% MAA funding if developed and operated by MCRA for general public.
Source: Delta Airport Consultants, Inc.

3. Phase III Development (2011-2020)

Projects in Phase III include continued airport development, and are estimated to cost $2.3 million. Phase III development estimates, along with a breakdown of potential funding sources is presented in **Table 6-4**. Private or other investment will be the sole source of funding for these projects.

Table 6-4
Montgomery County Airpark
Phase III Cost Estimates

PHASE	PROJECT DESCRIPTION	TOTAL EST. COST	FAA ELIGIBLE FUNDING	MAA ELIGIBLE FUNDING	MCRA REQUIRED FUNDING	PRIVATE OR OTHER INVESTMENT
III-1	Expand Apron (South FBO)	$1,700,000	$0	$0	$0	$1,700,000
III-2	Expand Apron (North FBO)	$200,000	$0	$0	$0	$200,000
III-3	Relocate Fuel Farm* & Construct Truck Turnaround	$425,000	$0	$0	$0	$425,000
III-4	Relocate AWOS	$20,000	$18,000	$1,000	$1,000	$0
	Phase III Totals	**$2,345,000**	**$18,000**	**$1,000**	**$1,000**	**$2,325,000**

* Assumes private development for exclusive use by FBOs. Potential for 50% MAA funding if developed and operated by MCRA for general public.
Source: Delta Airport Consultants, Inc.

G. SUMMARY

Montgomery County Airpark, one of the busiest airports in Maryland, provides critical general aviation services to the local communities and the National Airport System. It is imperative for the Airpark to maintain modern facilities for long-term development and operation as a safe, dependable facility for Montgomery County and the surrounding area.

The ALP has identified approximately $32.3 million in future airport improvements required to accommodate the existing and future aviation demand for the 20-year planning period (2001-2020). Based on existing funding programs, the MCRA is eligible for approximately $16 million from the FAA and $1 million from the MAA. Combined with $14.6 million in private funding for hangar, apron and auto parking development Montgomery County Airpark has a realistic capital program to meet future development needs.

APPENDIX I

OBSTRUCTION STUDY

Obstruction Study

Montgomery County Airpark
Montgomery County, Maryland

December 2001

prepared for:
Montgomery County Revenue Authority

by:
Delta Airport Consultants, Inc.

I. INTRODUCTION

The Montgomery County Airpark has been serving the Montgomery County/Gaithersburg, Maryland general aviation community since 1960. The airport is located approximately three miles northeast of Gaithersburg, and is accessible from Maryland State Route 124, via Airpark Road. The airport is owned by the Montgomery County Revenue Authority (MCRA) and operated by the current fixed base operator (FBO), Freestate Aviation, Inc.

Montgomery County Airpark is one of the busiest airports in Maryland with business and corporate aircraft representing a significant amount of its estimated 140,000 annual operations in 2000. There are 248 aircraft based at the facility, which offers aircraft rental services, charter operations, hangars and tie-downs, maintenance and refueling. In addition to business and recreational aircraft, the airport is also used by the Civil Air Patrol, the U.S. Coast Guard, the Maryland state medivac team, local law enforcement agencies and airborne traffic reporters. The airport began operations in 1960 with a runway 3,150 feet in length, which has since been extended to 4,201 feet. Recent improvements to the airfield have included rehabilitation of the runway and construction of a second FBO apron. The 75 foot wide paved runway is equipped with medium intensity runway lighting (MIRL) and offers a variety of non-precision instrument approach procedures from the northwest (Runway 14), and a visual approach from the southeast (Runway 32).

Based on an FAA coding system used to relate airport design criteria to the operational and physical characteristics of the aircraft intended to operate at a given airport, each facility is assigned an Airport Reference Code (ARC). The ARC for Montgomery County Airpark is B-II, indicating that the largest aircraft routinely using the airfield will have an approach to landing speed of less than 121 knots (approx. 105 mph), and a wingspan of not greater than 79 feet (reference FAA Advisory Circular (AC) 150/5300-13). The ARC designation establishes a basis, consistent with FAA guidelines, for planning pavement load bearing capacity, physical dimensions and separation of the airfield's runways,

taxiways and taxilanes. The designation is also used to ensure compliance with Federal Aviation Regulations (FAR) governing the protection of airspace surrounding an airport.

Concerns regarding the potential and extent of obstructions near Runway 32 resulted in the MCRA requesting an opinion and alternative solutions from Delta Airport Consultants, Inc. in April 2000. A field survey indicated significant penetrations to the FAR Part 77 surfaces along the approach to Runway 32, as well as to the large aircraft, day/night, Threshold Siting surface as defined in FAA AC 150/5300-13, Appendix 2(5)(c). The MCRA initiated efforts to clear the most critical obstructions identified and solicited support from the FAA for a detailed obstruction study and a general update to the Airport Layout Plan (ALP). The MCRA also requested, and was granted, a temporary Modification of Standard (MOS) from the FAA to allow the Airpark to operate without a displaced threshold on Runway 32 pending development of a permanent solution to meet the Threshold Siting surface standard criteria noted above. The MCRA implemented certain actions required under the conditional MOS and has diligently pursued a permanent solution that will be met with favor from all parties involved.

Delta Airport Consultants, Inc. was retained by the MCRA during October 2000 to provide an update of the Airpark's Airport Layout Plan (ALP), a multi-component document which includes existing and future airport development, airport airspace and approach surfaces, terminal area ground access, airport property boundaries and surrounding land use plans with related noise contours. The ALP is a requirement for federally obligated airports and is to be kept current at all times. The airspace drawings included in the ALP are intended to show all 'imaginary' surfaces identified in FAR Part 77, Objects Affecting Navigable Airspace. Should the analysis conducted to prepare the airspace drawings identify obstructions, or potential obstructions, to the imaginary airspace surfaces, it is incumbent upon the airport owner to investigate the obstructions and take appropriate corrective action. Federal grant assurances require airport owners/operators to take the necessary action to protect the airspace from any hazards to safe flight.

An aerial survey of Montgomery County Airpark was performed during October 2000 to obtain obstruction heights as accurately as possible by aerial survey methods. This data has been compiled and is presented in this study report and associated exhibits. The obstruction survey has been overlaid onto the FAR Part 77 imaginary airspace surfaces for the identification of any penetrations (obstructions). Existing and potential obstructions have been identified for both runway approaches at the Montgomery County Airpark, and are presented in this study as an appendix to the ALP narrative report. This Obstruction Study identifies off-airport obstructions only as potential surface penetrations, and further detailed survey and design action will be required prior to removal or mitigation of such obstructions.

II. GENERAL AIRSPACE DESIGN CRITERIA

There are several Federal Aviation Administration (FAA) documents that are used when analyzing the impacts of obstructions in the airport environs. These include:

Federal Aviation Regulation (FAR) Part 77 -

"Objects Affecting Navigable Airspace"

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

AC 150/5300-13, Chapter 3

"Runway Design"

This chapter presents standards for runways and runway associated elements such as shoulders, blast pads, runway safety areas (RSA), obstacle free zones (OFZ), object free areas (OFA), clearways and stopways.

FAA Advisory Circular (AC) 150/5300-13, Airport Design, Appendix 2

"Threshold Siting Requirements"

This appendix contains guidance on locating runway thresholds to meet approach obstacle clearance requirements.

FAA Advisory Circular (AC) 70/7460-2

"Proposed Construction of Alteration of Objects that May Affect the Navigable Airspace"

Provides information to persons proposing to erect or alter an object that may affect the navigable airspace. Explains the need to notify the FAA before construction begins and the FAA's response to those notices as required by FAR Part 77.

III. MONTGOMERY COUNTY AIRPARK, AIRSPACE DESIGN

Federal Aviation Regulation (FAR) Part 77 -

"Objects Affecting Navigable Airspace"

For the purposes of the FAR Part 77 obstruction analysis, the Montgomery County Airport is considered a *public use* airport with one *larger than utility* runway. The airport is designated a class B-II airfield. It offers multiple non-precision instrument approaches (34:1 slope) to Runway 14 with approach visibility minimums greater than or equal to one mile, and a visual approach (20:1 slope) to Runway 32. Any existing fixed or mobile objects are, and future objects may be, obstructions to air navigation if they are of greater height than any of the heights or surfaces outlined in FAR Part 77.23. The determination of whether an 'obstruction' is actually a 'hazard' is accomplished through an aeronautical study conducted by the FAA. The standards apply to all objects, whether manufactured, objects of natural growth, or terrain.

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

Primary Surface
Approach Surface
Transitional Surface
Horizontal Surface
Conical Surface

The *Primary surface* is a surface longitudinally centered on a runway which extends 200 feet beyond each end of the runway. The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline. The width of the primary surface is 250 feet for utility runways having only visual approaches, and 500 feet for utility runways having non-precision instrument approaches. The width of the primary surface of a runway will be that width prescribed for the most precise approach existing or planned for either end of that runway. The Primary surface width at Montgomery County Airpark is 500 feet.

The *Approach surface* is a surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of each runway based upon the type of approach available or planned for that runway end.

The inner edge of the approach surface is the same width as the primary surface. For the Runway 14 non-precision instrument approach, the surface expands uniformly to a width of 3,500 feet and extends for a horizontal distance of 10,000 feet at a slope of 34 to 1. For the Runway 32 visual approach, the surface expands uniformly to a width of 1,500 feet and extends for a horizontal distance of 5,000 feet at a slope of 20 to 1.

The *Transitional surfaces* extend outward and upward at right angles to the runway centerline, and the extended runway centerline, at a slope of 7 to 1 from the sides of the primary surface and from the sides of the approach surfaces.

The *Horizontal surface* is a parallel plane 150 feet above the established airport elevation, the perimeter of which is constructed by swinging arcs of specified radii from the center of

each end of the primary surface and connecting each arc by lines tangent to those arcs. The elevation of the horizontal surface at the Montgomery County Airpark is 689 feet above mean sea level (MSL).

The *Conical surface* is a surface extending outward and upward from the periphery of the horizontal surface at a slope of 20 to 1 for a horizontal distance of 4,000 feet.

In order to fully protect the Montgomery County Airpark environs from potential hazards to air navigation, it is important that the obstruction analysis evaluate penetrations based on the Part 77 imaginary surfaces for this *non-precision instrument, larger than utility runway*. See Exhibit 1, Civil Airport Imaginary Surfaces.

AC 150/5300-13, Chapter 3

"Runway Design"

This chapter presents standards for runways and runway associated elements such as shoulders, blast pads, runway safety areas (RSA), obstacle free zones (OFZ), object free areas (OFA), clearways and stopways.

Specifically, the Runway Object Free Area (ROFA) is a two-dimensional surface with a clearing standard which requires clearing the ROFA of above ground objects protruding above the runway safety area edge elevation. Objects non-essential for air navigation or aircraft ground maneuvering purposes are not to be placed in the ROFA. This includes parked airplanes and agricultural operations.

AC 150/5300-13, Appendix 2

"Threshold Siting Requirements"

This appendix contains guidance on locating runway thresholds to meet approach obstacle clearance requirements.

Runway thresholds should be located at the beginning of the full-strength runway pavement or runway surface. However, displacement of the threshold may be required when an object that obstructs the airspace required for landing aircraft is beyond the airport owner's power to remove, relocate or lower. Thresholds may also be displaced for environmental considerations, such as noise abatement, or to provide the standard RSA and ROFA lengths.

The standard shape, dimensions and slope of the surface used for locating a threshold is dependent upon the type of aircraft operations currently conducted or forecasted, the landing visibility minimums desired, and the types of instrumentation available or planned for that runway end.

For the approach end of Runway 14 at Montgomery County Airpark, which is expected to support instrument straight-in night operations, no object should penetrate a surface that starts 200 feet out from the threshold and at the elevation of the runway centerline at the threshold and slopes upward at a slope 20 to 1. In the plan view, the centerline of this surface extends 10,000 feet along the extended runway centerline. This surface extends laterally 400 feet on each side of the centerline at the starting point and increases in width to 1,900 feet on each side of the extended centerline at the far end of the surface.

For the approach end of Runway 32, which is expected to serve large airplanes (day and night), no object should penetrate a surface that starts at the threshold and at the elevation of the runway centerline at the threshold and slopes upward at a slope 20 to 1. In the plan view, the centerline of this surface extends 10,000 feet along the extended runway centerline. This surface extends laterally 200 feet on each side of the centerline at the threshold and increases in width to 500 feet at a point 1,500 feet from the threshold; thereafter, it extends laterally 500 feet on each side of the extended centerline at the far end of the surface.

FAA Advisory Circular (AC) 70/7460-2

"Proposed Construction or Alteration of Objects that May Affect the Navigable Airspace"

This AC, in conjunction with Advisory Circular (AC) 70-7460-1, provides information to persons proposing to erect or alter an object that may affect the navigable airspace. It explains the need to notify the FAA before construction begins and the FAA's response to such notice as required by FAR Part 77.

Although FAR Part 77 is previously referenced in this document, specific note should be given to the requirement for notice of construction or alteration outlined in FAR Part 77.13, 77.15 and 77.17. This requirement applies to activities on, *and off,* airport property, for distances including, but not limited to, 20,000 feet from the nearest point of the Montgomery County Airpark runway. The airport owner/operator has the responsibility to ensure that the aerial approaches to the airfield are adequately cleared and protected, and that the use of land adjacent to or in the immediate vicinity of the airport is reasonably restricted to the extent possible. Generally, notice is required when any proposed construction or alteration falls within any of the following categories:

1. greater than 200 feet in height above ground level at its location,
2. be near a public use airport,
3. be a traverse way such as a highway or public/private road that exceeds standards,
4. be located on a public use airport,
5. when requested by the FAA.

IV. OBSTRUCTION CLEARING PRIORITIES

The exhibits associated with this Obstruction Study identify obstructions (penetrations) to the Threshold Siting surface, Primary surface, Runway Object Free Area, Approach

surfaces and Transitional surfaces for both Runways 14 and 32. In addition, natural growth obstacles within five feet of penetrating a surface have also been identified and should be included in any obstruction clearing plan to prevent a future penetration. Often the obstruction is noted as a group of trees and the elevation noted is the highest of the representative group.

Obstacles within a distance of approximately 10,000 feet from the runway ends were identified, however areas farther from the airport were not surveyed for obstructions. Analysis of the critical surfaces for both runway approaches indicate that existing structures and/or trees could present additional obstructions depending on their actual height.

It should be noted that many penetrations have been identified, and it is recognized that immediate mitigation of all obstructions may not be possible. Therefore, it is practical to evaluate a series of alternatives and establish a priority schedule for mitigating the identified obstructions. A recommended priority schedule for removal of the obstructions is outlined below. Those obstructions [illegible] arty should be mitigated immediately. The enforcement of exi[illegible]nd state regulations will facilitate clearing of many obstruction[illegible]rty.

Immediate

1. Runway Object Free Area

The Runway OFA (ROFA) for the Airpark has obstructions present that include trees, the Airport perimeter fence and temporary buildings. The ROFA is a two dimensional surface with a clearing standard which requires clearing the ROFA of above ground objects protruding above the runway safety area edge elevation. Objects non-essential for air navigation or aircraft ground maneuvering purposes are not to be placed in the ROFA. This includes parked airplanes and agricultural operations. The ROFA is located within portions of the Primary and Approach surfaces, and as such, obstructions to the ROFA may also represent penetrations to these surfaces. All obstacles in the ROFA should be removed immediately (See Exhibits 4, 5 and 6 for individual obstruction detail).

2. Part 77 Primary Surface

The Primary surface for the Airpark has obstructions that include trees, the Airport perimeter fence, temporary storage buildings and terrain. The elevation of the Primary surface is required to be the same as the elevation of the nearest point on the runway centerline. This surface is to be maintained free of all obstructions to ensure a clear field of view for pilots operating aircraft on, or approaching, the airfield. All Primary surface obstructions should be mitigated as soon as practical (See Exhibits 4, 5 and 6 for individual obstruction detail).

3. Part 77 Approach Surfaces

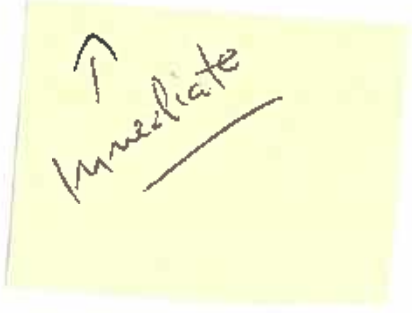
It is important to protect the Approach surface to ensure the approach "minimums" are maintained for safe and efficient use of the airfield. The obstructions penetrating the Approach surface, which include trees, an access roadway and terrain, are critical and should be mitigated as soon as practical (See Exhibits 4, 5 and 6 for individual obstruction detail).

4. Part 77 Transitional Surfaces

It is important to protect the Transitional surfaces to ensure the safe and efficient use of the airfield. It is recommended that obstructions penetrating the transitional surfaces, which include trees, an access roadway, auto parking lots, temporary buildings and permanent structures be mitigated as soon as practical (See Exhibits 4, 5 and 6 for individual obstruction detail).

5. Threshold Siting Surfaces

Obstructions were identified within the Threshold Siting surface for Runway 32 that include trees, terrain, perimeter fencing, a permanent building structure and an access roadway. These obstructions adversely affect the most critical airspace criteria of the runway approach. The Threshold Siting surface is located within portions of the Primary and Approach surfaces, and as such, penetrations to the Threshold Siting surface will typically



be penetrations to these surfaces as well. These obstructions should be mitigated as soon as practical (See Exhibits 3 and 6 for individual obstruction detail).

V. ALTERNATIVE ANALYSIS

Several alternatives were considered for the various obstruction categories identified with each runway approach. Each alternative is noted below with an explanation of how it may, or may not, assist in bringing the Airpark into compliance with FAR Part 77. One alternative has been selected as the recommended action for each obstruction category and is so noted below. The recommended alternative is also presented is greater detail in Section VI.

Typically a 'No Action' alternative is presented to provide the airport sponsor a risk level associated with taking no action. Due to the quantity and significance of the obstructions identified at the Montgomery County Airpark, the potential impact of choosing the 'no action' alternative is summarized below, rather than being presented for each obstruction category noted.

Most of the obstructions identified represent a significant penetration to one or more of the critical imaginary surfaces required to be protected under FAR Part 77. Failure by the airport owner/operator to provide such protection may jeopardize the operational integrity of the airfield, resulting in any one, or combination, of the following impacts:

- an increase of landing minimums for the non-precision instrument approach,
- complete loss of use for the published instrument approach,
- requirement for the runway threshold to be displaced, thereby reducing the size or type aircraft that may use the airfield,
- the withholding of federal funding to support future airport development,
- remedies as may be provided within the federal Grant Assurance agreement, or
- such other action as may be deemed appropriate by the FAA.

The 'no action' alternative is not a recommended course of action for any of the obstructions identified in this study. As such, Delta Airport Consultants offers the following review of alternatives which were considered, and presents the recommended action for review by the MCRA.

Runway 14 Approach

Tree Obstructions

The obstructions along, and near, the approach path to Runway 14 include trees and groups of trees that are within the ROFA and penetrate the Primary surface (See Exhibits 4 and 6 for obstruction details).

Alternative A: Clear or top all trees penetrating the Approach surface. This action represents a key initial step, but fails to achieve full compliance with Federal Aviation Regulations.

Alternative B: Clear or top all trees penetrating the Approach surface, enforce existing state regulations regarding object heights near airports and pursue an avigation easement agreement with the property owners below the RPZ to ensure that no future penetrations occur. This action represents greater commitment than 'A', but still fails to achieve full compliance with Federal Aviation Regulations.

Alternative C: Clear or top all trees penetrating all of the Part 77 protected surfaces, ensure airport neighbor's compliance with established state regulations regarding object height restrictions near the airport and acquire in fee simple all property within the RPZ. This is the recommended action and is discussed in further detail in Section VI of this report.

Runway 32 Approach

1. Tree Obstructions

   The obstructions along, and near, the approach path to Runway 32 include trees or groups of trees. These trees are within the ROFA and the Primary surface, and are penetrations to the Part 77 Approach surface (See Exhibits 5 and 6 for obstruction detail).

   Alternative A: Clear or top all trees penetrating the Approach surface. This action represents a key initial step, but fails to achieve full compliance with Federal Aviation Regulations.

   Alternative B: Clear or top all trees penetrating the Approach surface, enforce existing state regulations regarding object heights near airports and pursue an avigation easement agreement with the property owners below the RPZ to ensure that no future penetrations occur. This action represents greater commitment than alternative 'A', but fails to achieve full compliance with Federal Aviation Regulations.

   Alternative C: Clear or top all trees penetrating any of the protected surfaces, ensure airport neighbor's compliance with established state regulations regarding object height restrictions near the airport and acquire in fee simple all property within the RPZ. In addition, establish an Airport Overlay District through the Montgomery County Commission to provide a locally enforceable height restriction control tool. This is the recommended action and is discussed in further detail in Section VI of this report.

2. Fence and Temporary Building Obstructions

   A fence, temporary buildings and paved area to support vehicular traffic occupies the southwest corner of the ROFA and the Primary surface area, and some items also penetrate the Transitional surface. A tract of land with dimensions

approximately 50' x 220', (0.25 acres), within the Primary surface, is not currently owned by the MCRA. Multiple owners are involved as the tract consists of the eastern end of two lots along Beechcraft Road (See Exhibits 5 and 6 for obstruction detail).

Alternative A: Negotiate with the appropriate property owner to relocate the temporary buildings, and consult the FAA regarding a waiver on the location of the fence and use of the eastern end of the property. Although minimum cost is associated with this alternative, such action does not adequately protect the airfield operational area or FAR Part 77 surfaces and therefore is not recommended.

Alternative B: Negotiate with the appropriate property owners to relocate the temporary buildings and acquire the eastern most portion (minimum 50' strip) of each lot. Upon acquisition, all obstructions should be immediately removed. This is the recommended action and is discussed in further detail in Section VI of this report.

3. Terrain Related Obstructions

The terrain profile within and near the approach path to Runway 32 is a major contributing factor to the obstructions identified in this area . The ground elevation rises toward the southeast to produce approximately 100,000 sq.ft. of direct and indirect terrain related obstructions within the Primary, Approach and Transitional surfaces. The obstructions identified include elevated terrain within the Primary and Approach surfaces, as well as approximately 700 linear feet of an access road from Woodfield Road, and existing paved parking areas for three tenants along the access road (See Exhibits 5 and 6 for obstruction detail).

Alternative A: Acquire the land currently owned by others within the Primary surface to allow clearing and grading of the Primary surface to the elevations required by FAR Part 77. Consult the FAA regarding the potential for a permanent

Modification of Standards to allow the roadway and parking areas to remain in their existing location. This action fails to achieve FAA standards for all Part 77 surfaces as well as the RPZ and is therefore not recommended.

Alternative B: Acquire the land currently owned by others within the Primary surface and RPZ, and proceed with clearing and grading of the Primary and Approach surfaces to the elevations required by FAR Part 77. Close the access road to Woodfield Road to use by the two property owners closest to airport property and provide alternative access to their facilities (see Exhibit 7). This alternative represents the action necessary to achieve compliance with Federal Aviation Regulations but the potential cost, estimated at $1.9 million plus land acquisition, is significantly greater than Alternative C below and is recommended for consideration only if Alternative C is found not feasible.

Alternative C: Acquire the land currently owned by others within the Primary surface and RPZ, and proceed with clearing and grading of the Primary and Approach surfaces to the elevations required by FAR Part 77. Redesign and reconstruct the affected roadway and parking areas to provide the elevation and clearance as required by FAR Part 77. It should be noted that portions of the roadway may have to be lowered as much as 15 feet from its existing elevation and certain utilities, both above and below ground, will be impacted. This alternative represents the action necessary to achieve compliance with Federal Aviation Regulations and thus is the recommended course of action.

Alternative D: Displace the threshold of Runway 32 in accordance with AC 150/5300-13, Appendix 2(5)(c), Threshold Siting Requirements. Although minimum cost is associated with this alternative, it significantly reduces the useful runway length for aircraft landing to the northwest and is not a recommended alternative.

Alternative E: Extend Runway 14-32 up to 400 feet to the southeast, thereby relocating the RPZ and extending all related imaginary surfaces, to reduce the area of terrain interference. Although initially anticipated that this alternative would reduce the impact of terrain obstructions near the end of the existing runway, it actually increases certain penetrations to the Transitional surfaces and the corresponding movement of the imaginary surfaces results in the identification of new obstructions in the Approach and Transitional surfaces. The most significant of the new obstructions is the loss of adequate clearance over State Road 124. The roadway would need to be lowered in excess of 15 feet near the intersection with Lindbergh Drive resulting in reconstruction for more than 1500 linear feet of the four-lane roadway to achieve tie-in grades. The cost associated with the runway extension is estimated to be approximately $300,000 however an additional $2 million is anticipated for lowering the roadway as described previously. The impact to the access road from Woodfield Road and the auto parking areas described in Alternative C above is worsened, increasing the estimated $1.4 million for such work. The probable cost disqualified this alternative from further consideration.

Alternative F: Extend Runway 14-32 approximately 700 feet to the northwest, thereby allowing displacement of the Runway 32 threshold and relocation of the RPZ and all related imaginary surfaces to reduce the area of terrain interference. Although this alternative reduces the impact of terrain obstructions along the approach to Runway 32, the resulting impact to designated conservation areas to the northwest is considered unacceptable to the local jurisdiction and the community. This impact disqualified this alternative from further consideration, prior to any cost/benefit analysis.

4. Permanent Building Obstructions

Permanent building structures along the edges of the Runway 32 approach path penetrate the Transitional surfaces (See Exhibits 5 and 6 for obstruction detail). Certain of these structures also penetrate the Threshold Siting surface for large

aircraft, during day and night operations, as defined in FAA AC 150/5300-13, Appendix 2(5)(c). The penetrations are significant and mitigation to achieve compliance with FAR Part 77 will require relocation, reconstruction or demolition of the structures.

Alternative A: Displace the threshold of Runway 32 approximately 700 feet to ensure adequate clearance is achieved for the approach path. This alternative significantly reduces the useful runway for aircraft landing to the northwest and is not a recommended alternative.

Alternative B: Extend Runway 14-32 approximately 130 feet to the southeast, thereby relocating the RPZ and extending all related imaginary surfaces, with the intent of extending the Threshold Siting surface beyond the structures presenting an obstruction. Although this alternative reduces the impact of permanent building obstructions near the end of the existing runway, the corresponding movement of the imaginary surfaces increases certain penetrations to the Transitional surfaces and results in the identification of new obstructions in the Approach and Transitional surfaces. The most significant of the new obstructions is the loss of adequate clearance over State Road 124. This alternative would require the lowering of SR 124 by approximately six feet at the intersection with Lindbergh Drive, which would in turn require reconstruction of the road for approximately 800 linear feet of the four-lane roadway to achieve tie-in grades. The cost associated with the runway extension is estimated to be approximately $100,000 however an additional $1 million is anticipated for lowering the roadway as described. While not the preferred alternative due to cost and community concerns, this action should be further evaluated if Alternative C or D below are found not to be acceptable.

Alternative C: Request an Aeronautical Study be conducted by the FAA to determine if the permanent building obstructions are hazards to air navigation. If not, it should be possible for the buildings to be marked and/or lighted as required

and remain in place. Acquire in fee all land within the RPZ and negotiate additional avigation easements for any property that can not be acquired. In addition, ensure airport neighbor's compliance of established state regulations regarding object height restrictions near the airport. While this action would allow the Airpark to continue to operate Runway 32 as it currently does, this is not the preferred alternative and should only be considered if Alternative D below is found not acceptable.

Alternative D: With concurrence and support of the FAA, negotiate with the appropriate building owners to acquire their property and structures, relocate their businesses and demolish the existing structures. Approximately six permanent building structures penetrating the Part 77 imaginary surfaces. This alternative represents the action necessary to achieve compliance with standard Federal Aviation Regulations. The cost associated with this action is estimated to be approximately $ 16.7 million and includes demolition and relocation costs for each building occupant.

VI. RECOMMENDED ACTION

Runway 14 Approach

Tree Obstructions - Alternative C. All trees within the Primary surface and ROFA should be removed and any trees penetrating, or identified as potentially penetrating, the Approach or Transitional surfaces should be removed or topped appropriately. All property within the RPZ should be acquired in fee simple, and the necessary avigation easements should be negotiated with property owners for any such property that can not be acquired in this manner. A public awareness campaign should be initiated informing all airport neighbors of the Code of Maryland Regulations (COMAR 11.03.05) restricting the heights of objects near an airport and an Airport Overlay District should be established to provide a locally enforceable control tool for height restriction near the Airport. In addition, although

not directly along the approach path to either runway approach, the large buffer of trees within Parcel 707 (approximately 15 acres), located to the southwest of the runway, present numerous obstructions to the Primary and Transitional surfaces of the airfield. Mitigation of the off-airport obstructions within the Transitional surface will require coordination with numerous property owners along Beechcraft Road, however all such obstructions are in violation of COMAR 11.03.05 and the appropriate action to clear the objects should be taken.

Runway 32 Approach

1. Tree Obstructions - Alternative C. All trees within the Primary surface should be removed and any trees penetrating, or identified as potentially penetrating, the Approach or Transitional surfaces should be removed or topped appropriately. All property within the RPZ should be acquired in fee simple, and the necessary avigation easements should be negotiated with property owners for any such property that can not be acquired in this manner. A public awareness campaign should be initiated informing all airport neighbors of the Code of Maryland Regulations (COMAR 11.03.05) restricting the heights of objects near an airport, and an Airport Overlay District should be established to provide a locally enforceable control tool to restrict the height of objects near the Airport.

2. Fence and Temporary Buildings - Alternative B. It is recommended that the MCRA own in fee the entirety of the ROFA and Primary surface area, and remove or relocate all obstructions from the area to bring it into compliance with FAR Part 77 Approach surface criteria. The elevation of any point on the Primary surface is to be the same as the elevation of the nearest point on the runway centerline. The entire Primary surface should be clear of all objects. Sufficient property interest in the RPZ should be gained to ensure the MCRA is empowered to control the area. Fee simple acquisition is the preferred method of control, but avigation easements are acceptable when incorporated with the appropriate land use controls.

3. Terrain Related Obstructions - Alternative C. Portions of the property impacted by terrain related obstructions is currently owned by the MCRA and as such, the necessary grading to bring the Primary and Approach surfaces into compliance with FAR Part 77 should be accomplished as soon as practical. Additional land acquisition to complete this objective would be accomplished during implementation of Item 2 above. Redesign and reconstruct the affected roadway and parking areas to provide the elevation and clearance as required by FAR Part 77. It is recommended that any grading work accomplished near the end of Runway 32 be designed and constructed to accommodate future localizer critical area grading requirements.

4. Permanent Building Obstructions - Alternative D. One of the permanent building structures adjacent to the southeast corner of the airfield penetrates the Threshold Siting surface. Two of the permanent building structures along the edge of the runway approach path are immediately adjacent to, but do not appear to penetrate, the Approach surface. This should be confirmed by survey before any further action is taken. Several of the permanent structures penetrate the Transitional surface. The owner should request an Aeronautical Study be conducted by the FAA to determine if the permanent building obstructions penetrating the Transitional surfaces are hazards to air navigation, or if such a study has already been conducted, request verification that these structures do not present a hazard to air navigation. If the buildings do not represent a hazard, it should be possible for them to be marked and/or lighted as required and remain in place. A public awareness campaign should be initiated informing all airport neighbors of the Code of Maryland Regulations (COMAR 11.03.05) restricting the heights of objects near an airport. The MCRA should also initiate an effort to establish an Airport Overlay District that will include a locally enforceable ordinance that restricts the height of objects near the Airport.

VII. SUMMARY

This comprehensive Obstruction Study for Runway 14-32 at the Montgomery County Airpark was completed to identify the general locations and scope of obstructions present at the Airpark. During the course of this study an aerial survey was performed and the obstruction height information obtained was overlaid onto a depiction of the critical airspace surfaces for the Airpark. This information is presented in graphic form in the accompanying exhibits and the description of the most critical airspace surfaces for the Airpark are detailed within this report in Sections II and III. The potential mitigation of off-airport obstructions must be confirmed by a registered surveyor and legal access obtained prior to action.

It is significant to note that the state of Maryland has established regulations restricting the height of objects near an airport. The regulation, within Title 11 of the Code of Maryland Regulations, specifically COMAR 11.03.05, states that "a person may not build any structure, permit any structure to be built, maintain any personalty, or permit any object to grow to a height that ... constitutes a hazard to air navigation at or near any airport". The regulation closely mirrors FAR Part 77 regulations, but does provide the opportunity for political subdivisions to grant variances under specific guidelines. Enforcement and penalty clauses are included within the regulatory Title (See Appendix I). In addition, an avigation easement, executed in 1965, extends over approximately 10 acres of private property south of State Route 124 requiring the owners to prevent any object from penetrating specified Approach and Transition surfaces. The imaginary surface created by this easement initiates at the Airpark property boundary along the centerline of SR 124 at, or near, the current roadway elevation and continues to the southeast for approximately 1200 linear feet with a slope of 40 to 1. The MCRA should initiate an effort to establish an Airport Overlay District providing a locally enforceable control tool to restrict heights of objects near the Airport.

This study revealed 75 obstructions to the various imaginary surfaces that the airport owner/operator is required to protect under FAR Part 77. Seven of the obstructions identified for Runway 32 are permanent building structures, however the findings of this

study indicate none of the buildings penetrate the most critical of the Part 77 surfaces, the Approach surface. The terrain profile in the approach area to Runway 32 compounds the obstruction concerns for that runway. Mitigation of the obstructions will require a mix of tree removal, land clearing and grubbing, fee simple land acquisition and possibly additional avigation easements. Delta Airport Consultants, Inc. worked in conjunction with the owner and a local commercial real estate firm to develop the preliminary land and facility cost estimates presented in this report. The primary source of data, trend information and comparable sales values which formed the foundation for the cost estimates was The Suburban Maryland Industrial Market Year End 2000 report. Further evaluation and individual parcel appraisal is required prior to proceeding with FAA funding requests or actual acquisition.

In conjunction with the ALP Update, this study also identified the need to acquire, clear and control the Runway Protection Zone (RPZ) areas for both Runway14 and 32. The MCRA does not hold sufficient property interest in the Runway Protection Zone (RPZ) area. The FAA prefers the airport owner control the defined RPZ area to enhance protection of people and property on the ground. Such control includes the clearing and maintenance of incompatible objects and activities. While the FAA prefers that all objects be cleared from the RPZ, some uses are permitted, provided they do not attract wildlife. Land uses prohibited from the RPZ are residences and places of public assembly. Fuel storage facilities should not be located in the RPZ (Ref: FAA AC 150/5300-13, Paragraph 212).

Sufficient property interest in the RPZ should be gained to ensure the MCRA is empowered to control the RPZ areas. Fee simple acquisition is the preferred method of control, and is recommended, but avigation easements may be acceptable when incorporated with the appropriate land use controls. FAA AC 150/5300-13, Chapter 2 provides specific recommendations related to compatible land use within an RPZ.

Completion of this study is the first step in the mitigation of obstructions and establishes a priority system for achieving compliance with FAA safety requirements. While the extent of the recommended obstruction removal for the FAR Part 77 surfaces is substantial, the mitigation of the obstructions should be addressed as a priority project by the MCRA, in

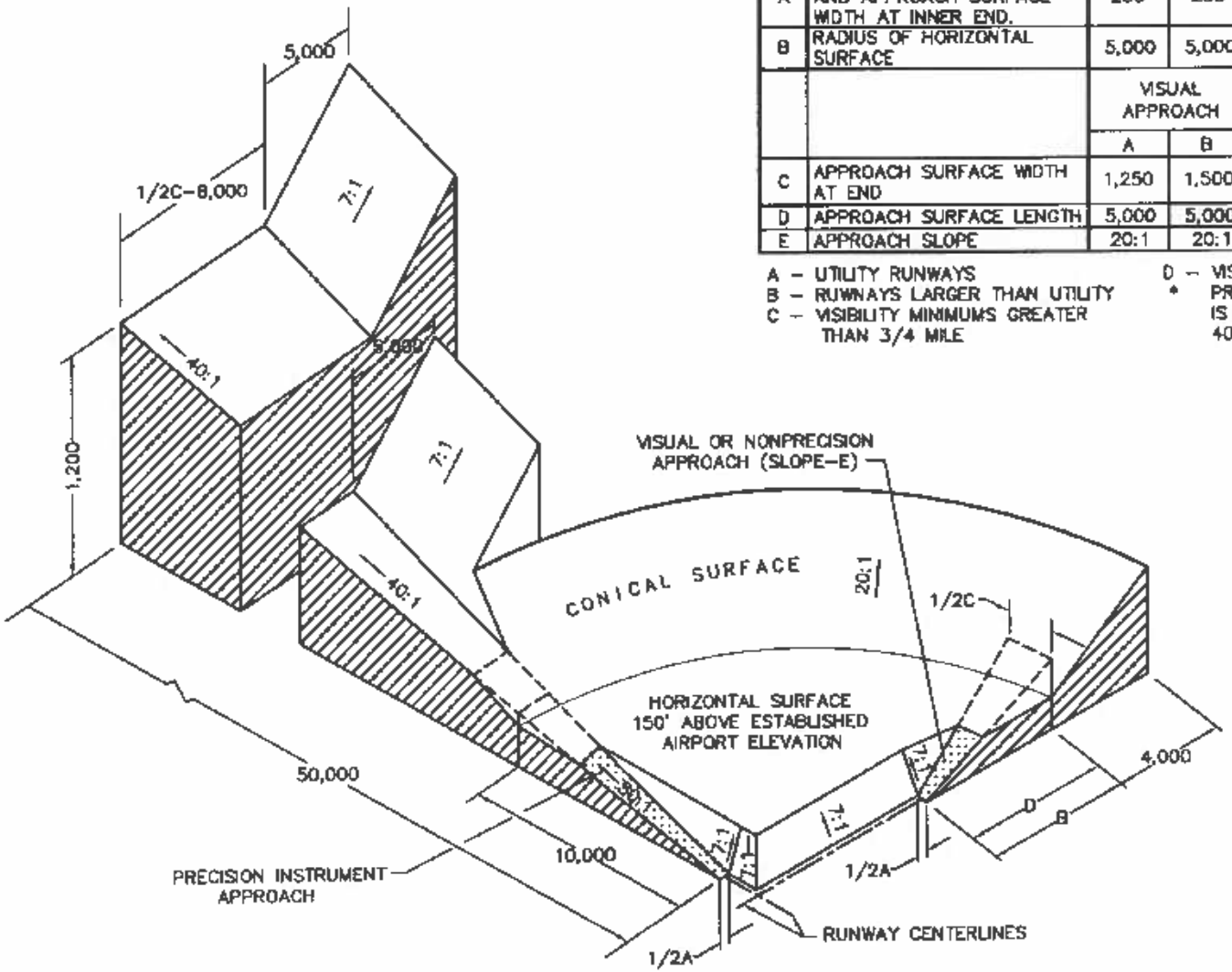
close coordination with the FAA. Given the specific properties involved and the process required to execute land acquisition and avigation easement efforts, costs of implementing the recommended action is estimated to be in excess of $19.9 million. The specific line items of this estimated expense is summarized below.

RECOMMENDED ACTION	ESTIMATED COST
Removal of Tree Obstructions - Runway 14 & 32	$230,000
Land Acquisition - Primary Surface & Runway 14-32 RPZs (includes existing building acquisition and demolition and relocation of businesses)	$18,336,000
Removal of Terrain Related Obstructions - Runway 32	$1,400,000
Obstruction Marking and Lighting	$42,000
TOTAL	$19,966,000

SOURCE: FEDERAL AVIATION ADMINISTRATION
FAR PART 77.25

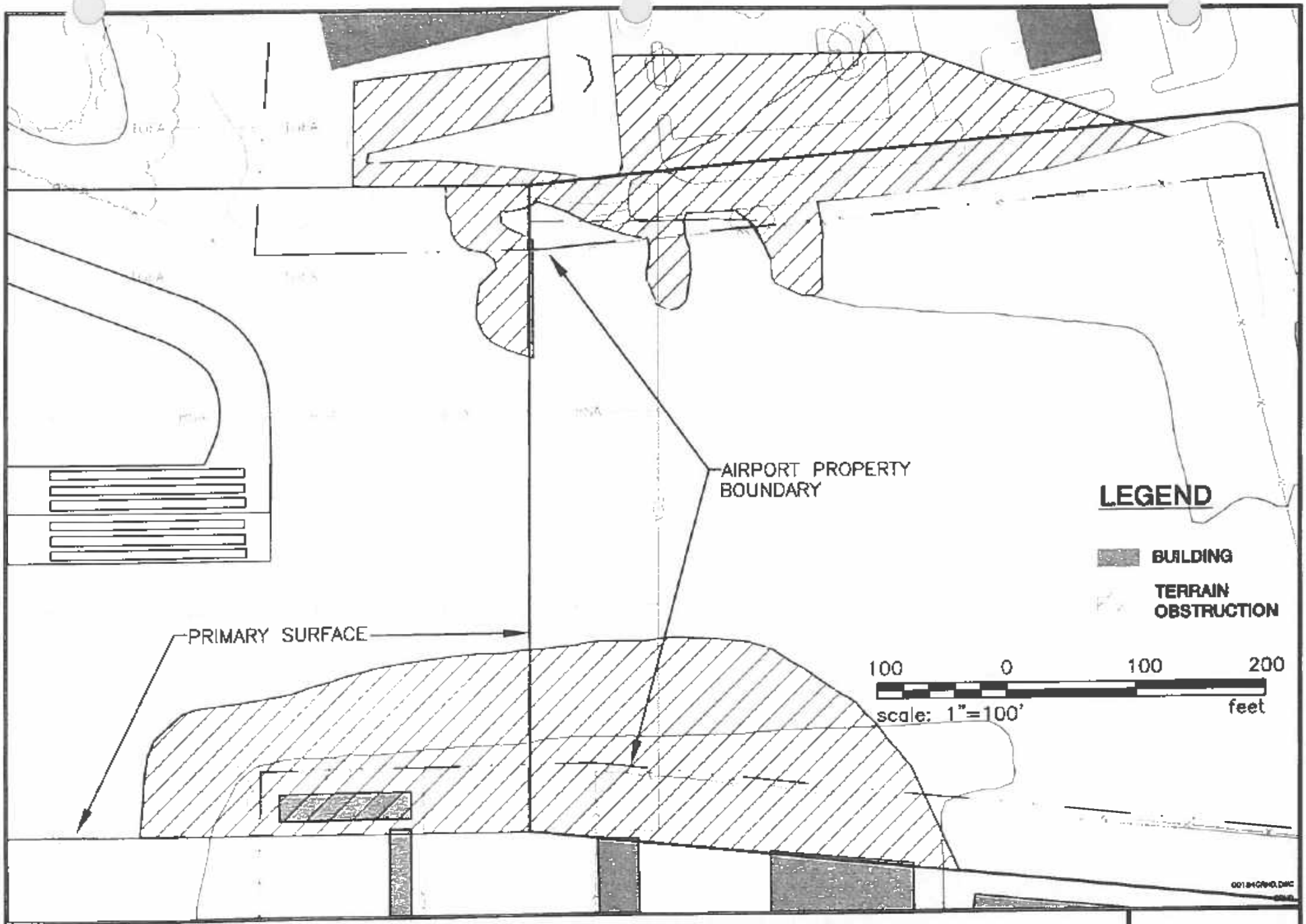
DIM	ITEM	DIMENSIONAL STANDARDS (FEET)					
		VISUAL RUNWAY		NONPRECISION INSTRUMENT RUNWAY			PRECISION INSTRUMENT RUNWAY
		A	B	A	B		
					C	D	
A	WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE WIDTH AT INNER END.	250	250	500	500	1,000	1,000
B	RADIUS OF HORIZONTAL SURFACE	5,000	5,000	5,000	10,000	10,000	10,000
		VISUAL APPROACH		NONPRECISION INSTRUMENT APPROACH			PRECISION INSTRUMENT RUNWAY
		A	B	A	B		
					C	D	
C	APPROACH SURFACE WIDTH AT END	1,250	1,500	2,000	3,500	4,000	16,000
D	APPROACH SURFACE LENGTH	5,000	5,000	5,000	10,000	10,000	*
E	APPROACH SLOPE	20:1	20:1	20:1	34:1	34:1	*

A – UTILITY RUNWAYS
B – RUNWAYS LARGER THAN UTILITY
C – VISIBILITY MINIMUMS GREATER THAN 3/4 MILE
D – VISIBILITY MINIMUMS AS LOW AS 3/4 MILE
* PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AND ADDITIONAL 40,000 FEET.



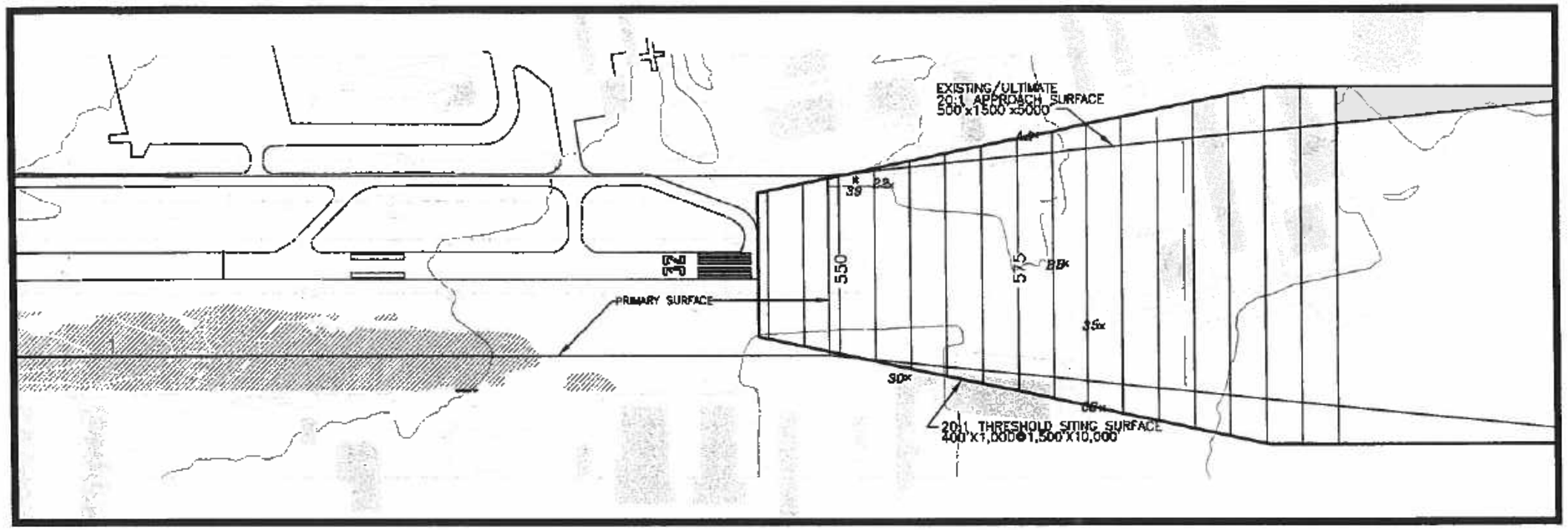
ISOMETRIC VIEW OF AIRPORT IMAGINARY SURFACES

EXHIBIT
1 OF 7



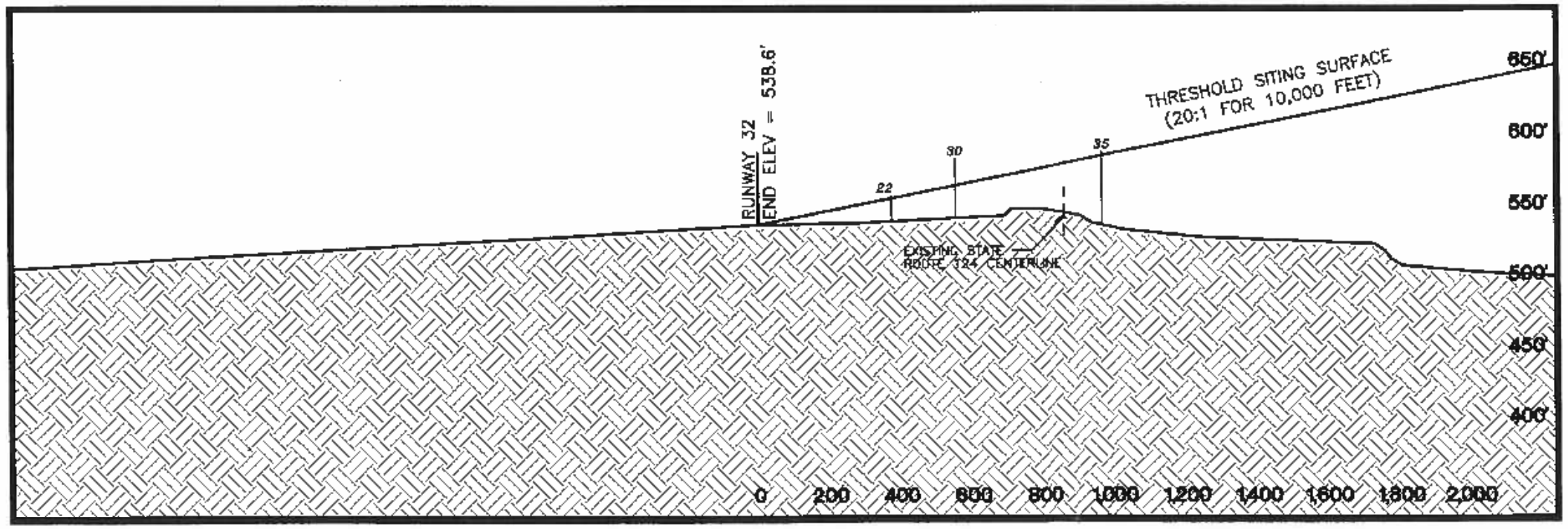
MONTGOMERY COUNTY AIRPARK
TERRAIN OBSTRUCTIONS

EXHIBIT
2 OF 7



THRESHOLD SITING SURFACE
PLAN VIEW RUNWAY 32

SCALE 1"=400'



THRESHOLD SITING SURFACE
PROFILE VIEW RUNWAY 32

SCALE: 1"=50' VERT.
1"=400' HORIZ.

N

LEGEND

AA	VERTICAL ROAD CLEARANCE
1 •	OBSTRUCTION
———	PRIMARY SURFACE
	EXISTING FENCE

NOTES

1. THRESHOLD SITING SURFACE FOR APPROACH END OF RUNWAY EXPECTED TO SERVE LARGE AIRPLANES (DAY AND NIGHT). AC 150/5300-13, APPENDIX 2(5)(c).
2. NUMBER DENOTES SINGLE OBSTRUCTION.
3. ALL ELEVATIONS ARE IN ACCORDANCE WITH NATIONAL MAP ACCURACY STANDARDS. SPOT ELEVATIONS AND GROUND CONTOURS ARE DERIVED FROM AERIAL PHOTOGRAMMETRY AND ARE APPROXIMATE. GROUND SURVEYS ARE REQUIRED TO VERIFY ACCURACY OF OBSTRUCTIONS.
4. ALL ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL.
5. GROUND CONTOURS, RUNWAY END AND OBSTRUCTION ELEVATIONS ARE BASED UPON AERIAL PHOTOGRAPHY PREPARED BY:
   POTOMAC AERIAL SURVEYS, INC.
   FREDERICK COUNTY AIRPORT
   1819 BUCHELMER ROAD
   FREDERICK, MARYLAND 21701
6. ALL POTENTIAL OBSTRUCTIONS ARE WITHIN 5 FEET OF FAR PART 77 SURFACE AND SHOULD BE FIELD VERIFIED.
7. FAR PART 77 REQUIRES THE FOLLOWING CLEARANCES:
   10 FEET ABOVE PRIVATE ROADS
   15 FEET ABOVE PUBLIC ROADS
   17 FEET ABOVE INTERSTATE HIGHWAYS
   23 FEET ABOVE RAILROADS
   ELEVATION = ACTUAL ROADWAY ELEVATION + FAR PART 77 CLEARANCE.
8. CODE OF MARYLAND REGULATIONS (COMAR) 11.03.05, OBSTRUCTION EVALUATION, PROVIDE THE GUIDELINES FROM WHICH TO CONDUCT AN OBJECT HEIGHT ANALYSIS IN RELATION TO AN AIRPORT.

00184THRESH2.DWG
THRESHOLD1

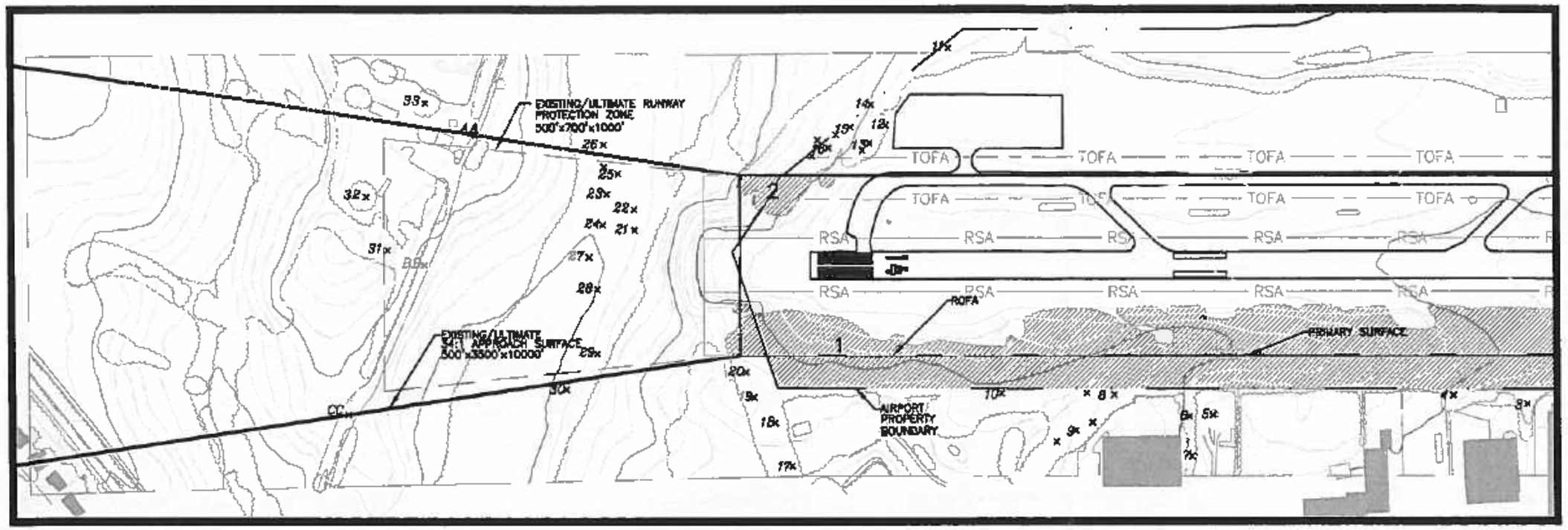
THRESHOLD SITING SURFACE
RUNWAY 32

MONTGOMERY COUNTY AIRPARK
GAITHERSBURG, MARYLAND

DELTA
AIRPORT CONSULTANTS, INC.

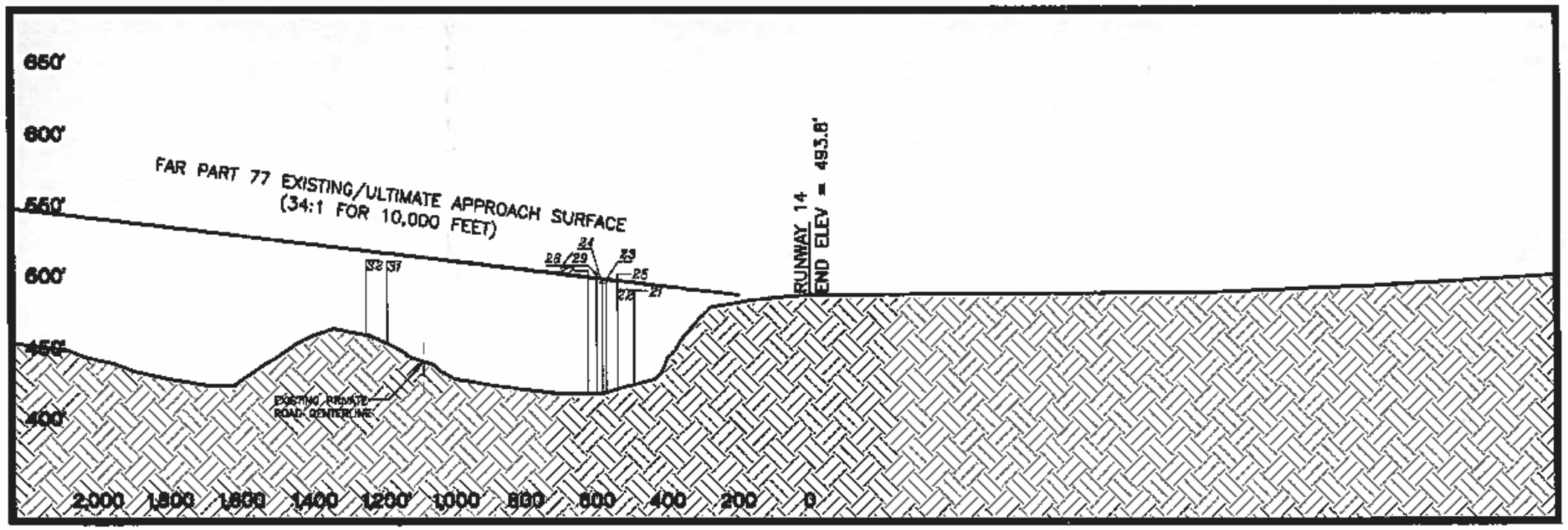
EXHIBIT 3 OF 7

DRAWN BY:	JMM	SCALE:	1" = 400'
CHECKED BY:	RGL	DATE:	AUGUST 2001



RUNWAY PROTECTION ZONE
PLAN VIEW RUNWAY 14

SCALE: 1"=400'



FAR PART 77 APPROACH SURFACE
PROFILE VIEW RUNWAY 14

SCALE: 1"=10' VERT.
1"=400' HORZ.

NOTE: INDIVIDUAL OBSTRUCTION DETAILS FOR RUNWAY 14 APPEAR ON EXHIBIT 6.

N

LEGEND

AA.	VERTICAL ROAD CLEARANCE
1 x	OBSTRUCTION
———	PRIMARY SURFACE
— — —	EXISTING AIRPORT PROPERTY LINE
—X—X—	EXISTING FENCE

NOTES

1. NUMBER DENOTES SINGLE OBSTRUCTION.
2. ALL ELEVATIONS ARE IN ACCORDANCE WITH NATIONAL MAP ACCURACY STANDARDS. SPOT ELEVATIONS AND GROUND CONTOURS ARE DERIVED FROM AERIAL PHOTOGRAMMETRY AND ARE APPROXIMATE. GROUND SURVEYS ARE REQUIRED TO VERIFY ACCURACY OF OBSTRUCTIONS.
3. ALL ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL.
4. GROUND CONTOURS, RUNWAY END AND OBSTRUCTION ELEVATIONS ARE BASED UPON AERIAL PHOTOGRAPHY PREPARED BY:
   POTOMAC AERIAL SURVEYS, INC.
   FREDERICK COUNTY AIRPORT
   1619 BUCHELMER ROAD
   FREDERICK, MARYLAND 21701
5. ALL POTENTIAL OBSTRUCTIONS ARE WITHIN 5 FEET OF FAR PART 77 SURFACE AND SHOULD BE FIELD VERIFIED.
6. FAR PART 77 REQUIRES THE FOLLOWING CLEARANCES:
   10 FEET ABOVE PRIVATE ROADS
   15 FEET ABOVE PUBLIC ROADS
   17 FEET ABOVE INTERSTATE HIGHWAYS
   23 FEET ABOVE RAILROADS
   ELEVATION = ACTUAL ROADWAY ELEVATION + FAR PART 77 CLEARANCE.
7. CODE OF MARYLAND REGULATIONS (COMAR) 11.03.05, OBSTRUCTION EVALUATION, PROVIDES THE GUIDELINES FROM WHICH TO CONDUCT AN OBJECT HEIGHT ANALYSIS IN RELATION TO AN AIRPORT.

00184RPZ.DWG
11X17 14

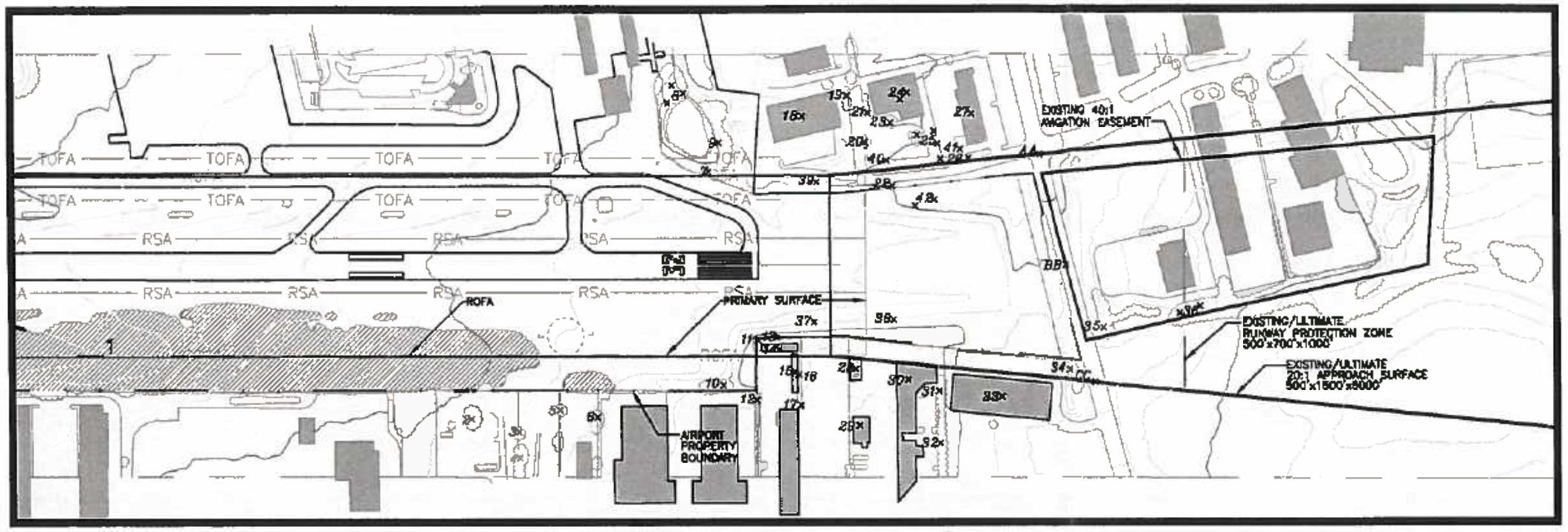
OBSTRUCTION ANALYSIS
RUNWAY 14

MONTGOMERY COUNTY AIRPARK
GAITHERSBURG, MARYLAND

DELTA AIRPORT CONSULTANTS, INC.
Charlotte, NC ♦ Austin, TX
Harrisburg, PA ♦ Richmond, VA

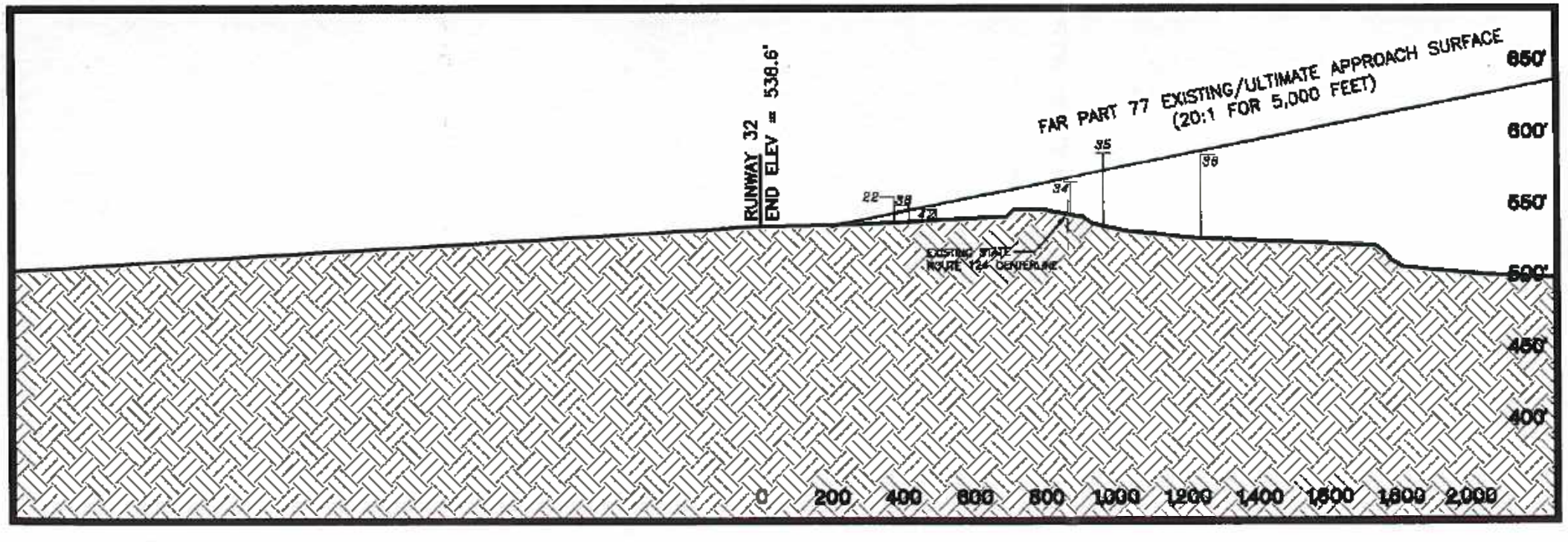
DRAWN BY:	JMM	SCALE:	1" = 400'
CHECKED BY:	RGL	DATE:	AUGUST 2001

EXHIBIT 4 OF 7



RUNWAY PROTECTION ZONE
PLAN VIEW RUNWAY 32

SCALE: 1"=400'



FAR PART 77 APPROACH SURFACE
PROFILE VIEW RUNWAY 32

SCALE: 1"=10' VERT.
1"=400' HORIZ.

NOTE: INDIVIDUAL OBSTRUCTION DETAILS FOR RUNWAY 32 APPEAR ON EXHIBIT 6.

N

LEGEND

AA.	VERTICAL ROAD CLEARANCE
1.	OBSTRUCTION
———	PRIMARY SURFACE
— — —	EXISTING AIRPORT PROPERTY LINE
—X—X—	EXISTING FENCE

NOTES

1. NUMBER DENOTES SINGLE OBSTRUCTION.
2. ALL ELEVATIONS ARE IN ACCORDANCE WITH NATIONAL MAP ACCURACY STANDARDS. SPOT ELEVATIONS AND GROUND CONTOURS ARE DERIVED FROM AERIAL PHOTOGRAMMETRY AND ARE APPROXIMATE. GROUND SURVEYS ARE REQUIRED TO VERIFY ACCURACY OF OBSTRUCTIONS.
3. ALL ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL.
4. GROUND CONTOURS, RUNWAY END AND OBSTRUCTION ELEVATIONS ARE BASED UPON AERIAL PHOTOGRAPHY PREPARED BY:
   POTOMAC AERIAL SURVEYS, INC.
   FREDERICK COUNTY AIRPORT
   1619 BUCHELMER ROAD
   FREDERICK, MARYLAND 21701
5. ALL POTENTIAL OBSTRUCTIONS ARE WITHIN 5 FEET OF FAR PART 77 SURFACE AND SHOULD BE FIELD VERIFIED.
6. FAR PART 77 REQUIRES THE FOLLOWING CLEARANCES:
   10 FEET ABOVE PRIVATE ROADS
   15 FEET ABOVE PUBLIC ROADS
   17 FEET ABOVE INTERSTATE HIGHWAYS
   23 FEET ABOVE RAILROADS
   ELEVATION = ACTUAL ROADWAY ELEVATION + FAR PART 77 CLEARANCE.
7. CODE OF MARYLAND REGULATIONS (COMAR) 11.03.05, OBSTRUCTION EVALUATION, PROVIDES THE GUIDELINES FROM WHICH TO CONDUCT AN OBJECT HEIGHT ANALYSIS IN RELATION TO AN AIRPORT.

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11X17 32

OBSTRUCTION ANALYSIS
RUNWAY 32

MONTGOMERY COUNTY AIRPARK
GAITHERSBURG, MARYLAND

DELTA AIRPORT CONSULTANTS, INC.
Charlotte, NC ♦ Austin, TX
Harrisburg, PA ♦ Richmond, VA

DRAWN BY:	JMM	SCALE:	1" = 400'
CHECKED BY:	RGL	DATE:	AUGUST 2001

EXHIBIT 5 OF 7

RUNWAY 14 OBSTRUCTION CHART – PART 77

OBJECT NO.	OBJECT DESCRIPTION	ELEV. *	PART 77 SURFACE	SURFACE ELEVATION EXISTING	SURFACE ELEVATION FUTURE	PENETRATION EXISTING	PENETRATION FUTURE	ACTION
1	GROUP OF TREES	547'	PRIMARY	505'	SAME	42'	0'	REMOVE
2	GROUP OF TREES	530'	PRIMARY	494'	SAME	36'	0'	REMOVE
3	TREE	563'	7:1 TRANSITIONAL	525'	SAME	38'	0'	REMOVE
4	TREE	552'	7:1 TRANSITIONAL	520'	SAME	32'	0'	REMOVE
5	TREE	516'	7:1 TRANSITIONAL	520'	SAME	-4'	0'	REMOVE
6	TREE	525'	7:1 TRANSITIONAL	520'	SAME	5'	0'	REMOVE
7	TREE	534'	7:1 TRANSITIONAL	536'	SAME	-2'	0'	REMOVE
8	GROUP OF TREES	535'	7:1 TRANSITIONAL	510'	SAME	25'	0'	REMOVE
9	GROUP OF TREES	548'	7:1 TRANSITIONAL	525'	SAME	23'	0'	REMOVE
10	TREE	522'	7:1 TRANSITIONAL	509'	SAME	13'	0'	REMOVE
11	TREE	547'	7:1 TRANSITIONAL	543'	SAME	4'	0'	REMOVE
12	TREE	511'	7:1 TRANSITIONAL	513'	SAME	-2	0'	REMOVE
13	GROUP OF TREES	517'	7:1 TRANSITIONAL	505'	SAME	12'	0'	REMOVE
14	TREE	524'	7:1 TRANSITIONAL	521'	SAME	3'	0'	REMOVE
15	GROUP OF TREES	519'	7:1 TRANSITIONAL	510'	SAME	9'	0'	REMOVE
16	GROUP OF TREES	521'	7:1 TRANSITIONAL	504'	SAME	17'	0'	REMOVE
17	TREE	536'	7:1 TRANSITIONAL	536'	SAME	2'	0'	REMOVE

RUNWAY 14 OBSTRUCTION CHART – PART 77

OBJECT NO.	OBJECT DESCRIPTION	ELEV. *	PART 77 SURFACE	SURFACE ELEVATION EXISTING	SURFACE ELEVATION FUTURE	PENETRATION EXISTING	PENETRATION FUTURE	ACTION
18	TREE	554'	7:1 TRANSITIONAL	519'	SAME	35'	0'	REMOVE
19	TREE	504'	7:1 TRANSITIONAL	508'	SAME	-4'	0'	REMOVE
20	TREE	506'	7:1 TRANSITIONAL	499'	SAME	7'	0'	REMOVE
21	TREE	497'	34:1 APPROACH	502'	SAME	-5'	0'	REMOVE
22	TREE	498'	34:1 APPROACH	502'	SAME	-4'	0'	REMOVE
23	TREE	504'	34:1 APPROACH	503'	SAME	1'	0'	REMOVE
24	TREE	502'	34:1 APPROACH	504'	SAME	-2'	0'	REMOVE
25	GROUP OF TREES	508'	34:1 APPROACH	503'	SAME	5'	0'	REMOVE
26	TREE	508'	7:1 TRANSITIONAL	506'	SAME	2'	0'	REMOVE
27	TREE	511'	34:1 APPROACH	504'	SAME	7'	0'	REMOVE
28	TREE	509'	34:1 APPROACH	504'	SAME	5'	0'	REMOVE
29	TREE	499'	34:1 APPROACH	504'	SAME	-5'	0'	REMOVE
30	TREE	506'	7:1 TRANSITIONAL	507'	SAME	-1'	0'	REMOVE
31	TREE	517'	34:1 APPROACH	521'	SAME	-4'	0'	REMOVE
32	TREE	518'	34:1 APPROACH	523'	SAME	-5'	0'	REMOVE
33	TREE	524'	7:1 TRANSITIONAL	526'	SAME	-2'	0'	REMOVE

RUNWAY 14 VERTICAL ROAD CLEARANCE – PART 77

AA	PRIVATE ROAD	473'	34:1 APPROACH	514'	SAME	-41	SAME	N/A
BB	PRIVATE ROAD	457'	34:1 APPROACH	518'	SAME	-61	SAME	N/A
CC	PRIVATE ROAD	454'	34:1 APPROACH	524'	SAME	-70	SAME	N/A

RUNWAY 32 OBSTRUCTION CHART – PART 77

OBJECT NO.	OBJECT DESCRIPTION	ELEV. *	PART 77 SURFACE	SURFACE ELEVATION EXISTING	SURFACE ELEVATION FUTURE	PENETRATION EXISTING	PENETRATION FUTURE	ACTION
1	GROUP OF TREES	600'	PRIMARY	535'	SAME	35'	0'	REMOVE
2	TREE	576'	7:1 TRANSITIONAL	552'	SAME	24'	0'	REMOVE
3	TREE	559'	7:1 TRANSITIONAL	558'	SAME	1'	0'	REMOVE
4	TREE	569'	7:1 TRANSITIONAL	569'	SAME	0'	0'	REMOVE
5	TREE	555'	7:1 TRANSITIONAL	552'	SAME	3'	0'	REMOVE
6	TREE	567'	7:1 TRANSITIONAL	556'	SAME	11'	0'	REMOVE
7	TREE	548'	7:1 TRANSITIONAL	538'	SAME	10'	0'	REMOVE
8	GROUP OF TREES	570'	7:1 TRANSITIONAL	564'	SAME	6'	0'	REMOVE
9	TREE	555'	7:1 TRANSITIONAL	550'	SAME	5'	0'	REMOVE
10	TREE	580'	7:1 TRANSITIONAL	548'	SAME	32'	0'	REMOVE
11	FENCE CORNER	558'	PRIMARY	539'	SAME	19'	0'	REMOVE
12	TREE	568'	7:1 TRANSITIONAL	556'	SAME	12'	0'	REMOVE
13	TREE	567'	PRIMARY	539'	SAME	28'	0'	REMOVE
14	BUILDING	564'	PRIMARY	539'	SAME	25'	0'	REMOVE
15	BUILDING	564'	PRIMARY	539'	SAME	25'	0'	REMOVE
16	TREE	571'	7:1 TRANSITIONAL	547'	SAME	24'	0'	REMOVE
17	TREE	570'	7:1 TRANSITIONAL	558'	SAME	12'	0'	REMOVE

RUNWAY 32 OBSTRUCTION CHART – PART 77

OBJECT NO.	OBJECT DESCRIPTION	ELEV. *	PART 77 SURFACE	SURFACE ELEVATION EXISTING	SURFACE ELEVATION FUTURE	PENETRATION EXISTING	PENETRATION FUTURE	ACTION
18	BUILDING	565'	7:1 TRANSITIONAL	563'	SAME	2'	SAME	LIGHT
19	TREE	572'	7:1 TRANSITIONAL	573'	SAME	-1'	0'	REMOVE
20	TREE	572'	7:1 TRANSITIONAL	556'	SAME	16'	0'	REMOVE
21	TREE	562'	7:1 TRANSITIONAL	567'	SAME	-5'	0'	REMOVE
22	TREE	560'	20:1 APPROACH	547'	SAME	13'	0'	REMOVE
23	TREE	575'	7:1 TRANSITIONAL	561'	SAME	14'	0'	REMOVE
24	BUILDING	578'	7:1 TRANSITIONAL	568'	SAME	10'	SAME	LIGHT
25	GROUP OF TREES	573'	7:1 TRANSITIONAL	564'	SAME	9'	0'	REMOVE
26	GROUP OF TREES	564'	7:1 TRANSITIONAL	557'	SAME	7'	0'	REMOVE
27	BUILDING	572'	7:1 TRANSITIONAL	565'	SAME	7'	SAME	LIGHT
28	BUILDING	583'	7:1 TRANSITIONAL	546'	SAME	37'	SAME	LIGHT
29	BUILDING	589'	7:1 TRANSITIONAL	567'	SAME	22'	SAME	LIGHT
30	BUILDING	583'	7:1 TRANSITIONAL	556'	SAME	27'	SAME	LIGHT
31	TREE	592'	7:1 TRANSITIONAL	564'	SAME	28'	0'	REMOVE
32	TREE	590'	7:1 TRANSITIONAL	585'	SAME	5'	0'	REMOVE
33	BUILDING	565'	7:1 TRANSITIONAL	559'	SAME	6'	SAME	LIGHT
34	TREE	569'	20:1 APPROACH	573'	SAME	-4'	0'	REMOVE

RUNWAY 32 OBSTRUCTION CHART – PART 77

OBJECT NO.	OBJECT DESCRIPTION	ELEV. *	PART 77 SURFACE	SURFACE ELEVATION EXISTING	SURFACE ELEVATION FUTURE	PENETRATION EXISTING	PENETRATION FUTURE	ACTION
35	TREE	590'	20:1 APPROACH	577'	SAME	13'	0'	REMOVE
36	GROUP OF TREES	588'	20:1 APPROACH	590'	SAME	-2'	0'	REMOVE
37	TERRAIN	550'	PRIMARY	539'	SAME	11'	0'	REMOVE
38	TERRAIN	553'	20:1 APPROACH	545'	SAME	8'	0'	REMOVE
39	ACCESS ROAD	542'	PRIMARY	539'	SAME	18'	0'	LOWER
40	PARKING LOT	550'	7:1 TRANSITIONAL	545'	SAME	5'	0'	LOWER
41	ACCESS ROAD	550'	7:1 TRANSITIONAL	550'	SAME	15'	0'	LOWER
42	TERRAIN	550'	20:1 APPROACH	548'	SAME	2'	0'	REMOVE

RUNWAY 32 VERTICAL ROAD CLEARANCE – PART 77

AA	STATE ROUTE 124	567'	20:1 APPROACH	568'	SAME	-1'	SAME	N/A
BB	STATE ROUTE 124	561'	20:1 APPROACH	573'	SAME	-12'	SAME	N/A
CC	STATE ROUTE 124	552'	20:1 APPROACH	577'	SAME	-25	SAME	N/A

RUNWAY 32 TSS OBSTRUCTION CHART

OBJECT NO.	OBJECT DESCRIPTION	ELEV. *	SURFACE	SURFACE ELEVATION EXISTING	SURFACE ELEVATION FUTURE	PENETRATION EXISTING	PENETRATION FUTURE	ACTION
11	FENCE CORNER	558'	TSS	539'	SAME	19'	0'	REMOVE
22	TREE	560'	TSS	547'	SAME	13'	0'	REMOVE
30	BUILDING	583'	TSS	558'	SAME	25'	0'	REMOVE
35	TREE	590'	TSS	577'	SAME	13'	0'	REMOVE
39	ACCESS ROAD	542'	TSS	552'	SAME	51'	0'	LOWER
AA	STATE ROUTE 124	567'	TSS	568'	SAME	-1'	SAME	N/A
BB	STATE ROUTE 124	561'	TSS	573'	SAME	-12'	SAME	N/A
CC	STATE ROUTE 124	552'	TSS	577'	SAME	-25'	SAME	N/A

TSS – THRESHOLD SITING SURFACE AS PER AC 150/5300-13, APPENDIX 2(5)(c).

NOTES:

1. ALL ELEVATIONS ARE IN ACCORDANCE WITH NATIONAL MAP ACCURACY STANDARDS. SPOT ELEVATIONS AND GROUND CONTOURS ARE DERIVED FROM AERIAL PHOTOGRAMMETRY AND ARE APPROXIMATE. GROUND SURVEYS ARE REQUIRED TO VERIFY ACCURACY OF OBSTRUCTIONS.
2. ALL ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL.
3. GROUND CONTOURS, RUNWAY END AND OBSTRUCTION ELEVATIONS ARE BASED UPON AERIAL PHOTOGRAPHY PREPARED BY:
   POTOMAC AERIAL SURVEYS, INC.
   FREDERICK COUNTY AIRPORT
   1819 BUCHELMER ROAD
   FREDERICK, MARYLAND 21701
4. ALL POTENTIAL OBSTRUCTIONS ARE WITHIN 5 FEET OF FAR PART 77 SURFACE AND SHOULD BE FIELD VERIFIED.
5. FAR PART 77 REQUIRES THE FOLLOWING CLEARANCES:
   10 FEET ABOVE PRIVATE ROADS
   15 FEET ABOVE PUBLIC ROADS
   17 FEET ABOVE INTERSTATE HIGHWAYS
   23 FEET ABOVE RAILROADS
   ELEVATION = ACTUAL ROADWAY ELEVATION + FAR PART 77 CLEARANCE.

001B4RPZ.DWG
OBST

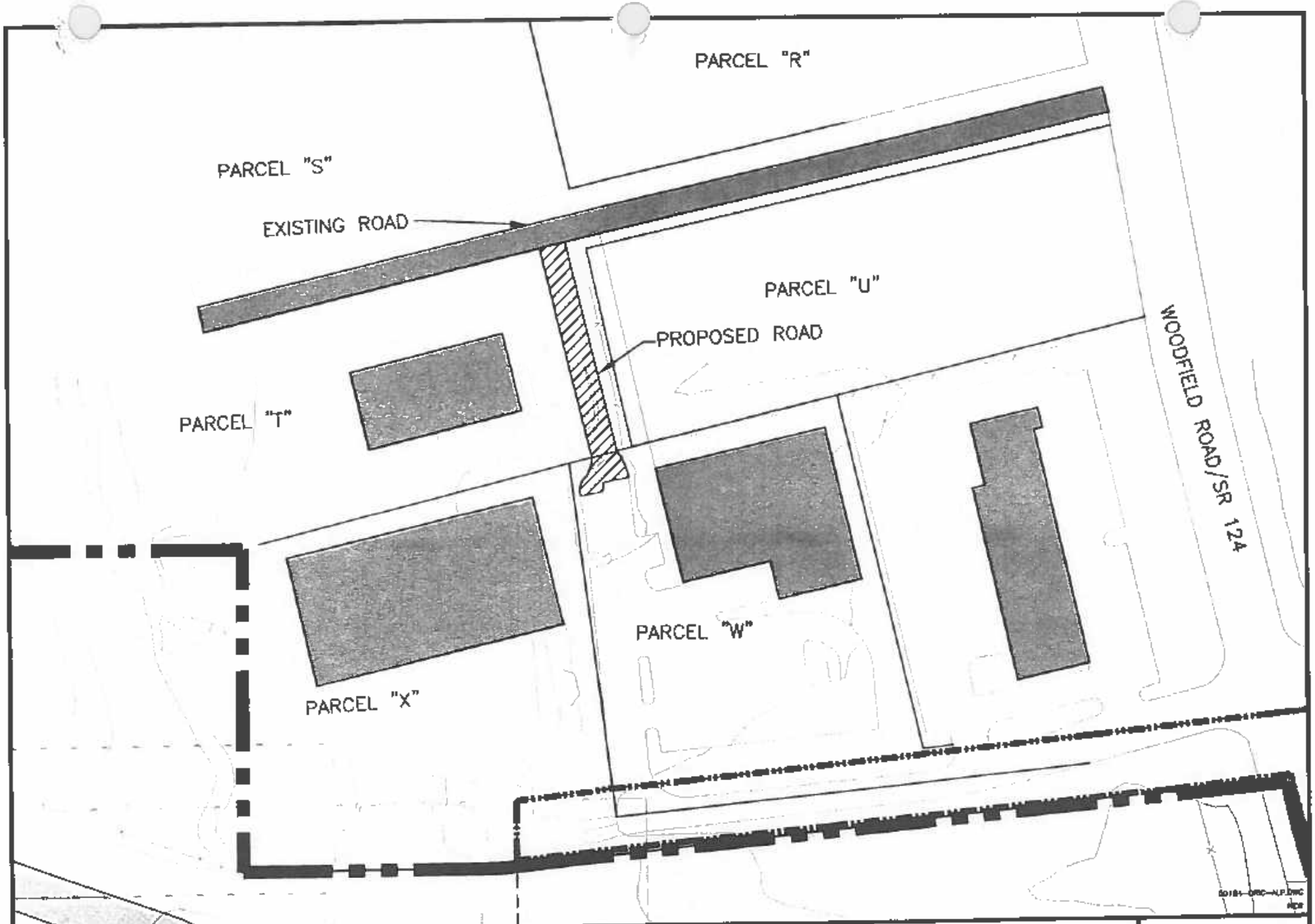
OBSTRUCTION DATA FOR RUNWAY 14 AND 32

MONTGOMERY COUNTY AIRPARK GAITHERSBURG, MARYLAND

DELTA AIRPORT CONSULTANTS, INC.
Charlotte, NC ♦ Austin, TX
Harrisburg, PA ♦ Richmond, VA

EXHIBIT 6 OF 7

DRAWN BY:	JMM	SCALE:	NONE
CHECKED BY:	RGL	DATE:	AUGUST 2001



MONTGOMERY COUNTY AIRPARK
ALTERNATIVE ACCESS PROPOSAL

EXHIBIT
7 OF 7

APPENDIX I

CODE OF MARYLAND REGULATIONS

TITLE 11.03.05

Title 11
DEPARTMENT OF TRANSPORTATION

Subtitle 03 MARYLAND AVIATION ADMINISTRATION

Chapter 05 Obstructions to Air Navigation

Authority: Transportation Article, §§5-204(d), 5-208, and 5-702, Annotated Code of Maryland

.01 Definitions.

A. As used in these regulations, the following terms have the meanings indicated unless the context requires otherwise. Words not specifically defined that relate to aeronautical practices, processes, and equipment shall be construed according to their general usage in the aviation industry.

B. Terms Defined.

(1) "Administration" means the Maryland Aviation Administration of the Maryland Department of Transportation, established pursuant to Transportation Article, §2-102(b)(2), Annotated Code of Maryland.

(2) "Administrator" means the Maryland Aviation Administrator, whose office is established pursuant to Transportation Article, §2-102(b)(2), Annotated Code of Maryland, or his duly authorized representative.

(3) "Airport" means a public use airport licensed by the Administration or owned or operated, or both, by a public entity of Maryland and used by fixed wing aircraft.

(4) "Airport obstruction zone" means all land within a 3 nautical mile radius of the established reference point of an airport.

(5) "Established airport elevation" means the highest point of an airport's usable runways measured in feet from mean sea level.

(6) "Established reference point" means the center of the longest runway existing or planned at the time of the initial adoption of an airport obstruction program, and if changed at a later date, means the center of the longest runway existing as a result of the change.

(7) "Hazard" means any object which affects the area available for landing, take-off, and maneuvering of aircraft, thus tending to impair or destroy the utility of an airport and present a potential danger to users of the airport and residents of the area.

(8) "Imaginary surfaces" means a series of planes or curved surfaces placed at various angles or arcs in relation to an airport's runways and based on a runway's classification and most precise available or planned aircraft approach path, more fully described in Regulation .04D of this chapter.

(9) "Nautical mile" means a distance of 6,076 consecutive linear feet.

(10) "Non-conforming use" means any preexisting object or use of land which is inconsistent with the provisions of the airport's obstruction standards described in Regulation .04 of this chapter.

(11) "Non-precision instrument approach" means an instrument approach procedure using air navigation facilities with horizontal guidance only.

(12) "Object" means tangible personal property or real property, including vegetation and terrain features.

(13) "Obstruction" means an object that penetrates any imaginary surface taking precedence as defined in these regulations.

(14) "Personalty" means any personal property.

(15) "Precision instrument approach" means an instrument approach procedure using an instrument landing system or a precision approach radar system which provides horizontal and vertical guidance for landing on a runway.

(16) "Public-use airport" means any airport, whether publicly or privately owned, at which the owner or persons having a right of access and control invite, encourage, or allow flight operations by the public without the need for prior permission.

(17) "Runway" means any existing or planned hard surface or turf covered area of an airport which is specifically designated and used or planned to be used for takeoff or landing of aircraft.

(18) "Slope" means an incline from the horizontal expressed in an arithmetic ratio or horizontal distance to vertical distance. For example:

Slope = 4:1
4 feet horizontal for each
vertical foot distance.

(19) "Statute mile" means a distance of 5,280 consecutive linear feet.

(20) "Substantial alteration" means any change in an object which results in a modification of the dimensions of that object.

(21) "Utility runway" means a runway constructed for or intended to be used by propeller-driven aircraft of 12,500 pounds or less (maximum gross weight).

(22) "Visual runway" means a runway intended solely for the operation of aircraft using visual approach procedures, as indicated on an airport layout plan (ALP).

.02 Purpose.

These regulations govern the erection and maintenance of any obstruction to air navigation that:

A. Interferes with the public right of freedom of transit in air commerce;

B. Endangers the lives and property of those using the air space for transportation; or

C. Endangers the lives and property of the occupants of land in this State. (Reference: Transportation Article, §§5-701 and 5-702, Annotated Code of Maryland)

.03 Prohibited Activity.

A. Except as permitted by Regulation .06 of this chapter, a person may not build any structure, permit any structure to be built, maintain any personalty, or permit any object to grow to a height that, in violation of any regulation adopted in this chapter, constitutes a hazard to air navigation at or near any airport.

B. As to any vegetation, a person may not:

(1) Plant, replant, or allow any vegetation to grow to such a height as to be an airport hazard; or

(2) Allow any vegetation that is an existing airport hazard to grow any higher.

.04 Obstruction Standards.

A. An obstruction is a hazard to air navigation if it:

(1) Is greater than 200 feet above ground level and within 3 nautical miles of the established reference point of any public-use airport licensed by the Administration; or

(2) Penetrates any imaginary surface specified in this regulation as applied to any airport.

B. For the purpose of this chapter, airport runways are classified as follows:

Table 1: Runway Classifications

Type of Runway	*Classification*
Utility Runway:	
Visual approaches only	I
With non-precision instrument approach	II
Runway with greater than utility capacity — visual approaches only	III
Runway with greater than utility capacity and a non-precision instrument approach with visibility minimum greater than ¾ statute mile	IV
Precision instrument approach or non-precision approach and visibility minimum of ¾ statute mile or less	V
Precision instrument runway using an Instrument Landing System (ILS) or a Precision Approach Radar (PAR)	VI

C. Imaginary Surfaces.

(1) Imaginary surfaces are various planes or curved surfaces constructed at specified angles or arcs in relation to an airport runway. They shall be determined separately for each airport and for each runway at that airport, depending on the classification of the runway and the most precise type of aircraft instrument approach available or planned for the runway.

(2) Because of the interrelationship of the imaginary surfaces, they shall be determined in the following sequence:

(a) Primary surface;

(b) Horizontal surface;

(c) Conical surface;

(d) Approach surface; and

(e) Transitional surface.

(3) When two surfaces overlap, the following apply:

(a) The primary surface takes precedence over any other surface;

(b) The approach surface takes precedence over the horizontal and conical surfaces to the extent the approach surface imposes a lower height limitation; and

(c) The transitional surface takes precedence over the horizontal surface.

D. Each imaginary surface shall be determined in the following manner:

(1) Primary Surface.

(a) The primary surface shall be longitudinally centered on the runway, at the runway elevation, and extend 200 feet beyond each end of the runway when the runway has a specifically prepared hard surface. In the absence of a hard surface, the ends of the primary surface shall coincide with the ends of the runway.

(b) The width of the primary surface shall be:

Runway Classification	*Width*
I	250 feet
II, III, IV	500 feet
V, VI	1,000 feet

(c) The width of the primary surface shall be that width prescribed in this subsection for the most precise approach existing or planned for either end of the runway.

(2) Horizontal Surface.

(a) The horizontal surface is a horizontal plane 150 feet above the established airport elevation, the perimeter of which is determined by arcs of specified radius centered at each end of the primary surface connected by lines tangent to those arcs.

(b) The perimeter of the horizontal surface shall be determined by the following radii:

Runway Classification	*Radius*
I, II, III	5,000 feet
IV, V, VI	10,000 feet

(c) When a 5,000-foot arc is encompassed by tangents connecting two adjacent 10,000-foot arcs, the 5,000-foot arc shall be disregarded in the construction of the perimeter of the horizontal surface.

(3) Conical Surface. The conical surface for all runway classifications extends outward and upward from the periphery of the horizontal surface at a slope of 20:1 for a horizontal distance of 4,000 feet.

(4) Approach Surface.

(a) The approach surface is longitudinally centered on the extended runway centerline and extends outward and upward from

each end of the primary surface. The approach surfaces pass through and take precedence over the horizontal and conical surfaces.

(b) The length, width, and slope angle of the approach surface is specified in Table 2 for each runway classification.

(c) The approach surface is applied to each end of each runway at an airport based upon the type of approach available or planned for that runway end.

(5) Transitional Surface.

(a) The transitional surface extends outward and upward at right angles to the runway centerline and the runway centerline extended, at a slope of 7 to 1 from the sides of the primary surface and from the sides of the approach surfaces, to an elevation of 150 feet above the established airport elevation.

(b) For those portions of a precision approach surface that extend through the conical surface, the transitional surface extends at right angles to the runway centerline extended for a horizontal distance of 5,000 feet, measured from the edge of the approach surface.

E. To provide clearance for mobile objects operating on traverse ways on or near a public-use airport that does not have an operative ground traffic control service coordinated with the air traffic control service, the actual height of the traverse way shall be adjusted upwards by the following amounts:

Type of Traverse Way	*Increase in Height*
Interstate highway	17 feet
Other public roadways	15 feet
Private roadways	The greater of 10 feet or the height of the highest mobile object that would normally use the roadway
Railroads	23 feet
Other traverse ways, including waterways	The height of the highest mobile object that would normally use the traverse way

(See following page)

*Table 2: Dimensions of Approach Surface**

Runway Class	*Description*	*Width of Inner Edge*	*Width of Outer Edge*	*Horizontal Length*	*Slope Angle*
I	Utility runway; visual approaches only	250 ft.	1,250 ft.	5,000 ft.	20 to 1
II	Utility runway; nonprecision approach	500 ft.	2,000 ft.	5,000 ft.	20 to 1
III	Runway with greater than utility capacity; visual approaches only	500 ft.	1,500 ft.	5,000 ft.	20 to 1
IV	Runway with greater than utility capacity; nonprecision approach with visibility minimums greater than ¾ statute mile	500 ft.	3,500 ft.	10,000 ft.	34 to 1
V	Runway with greater than utility capacity; nonprecision approach with visibility minimums as low as ¾ statute mile	1,000 ft.	4,000 ft.	10,000 ft.	34 to 1
VI	Precision instrument runway using either an Instrument Landing System (ILS) or Precision Radar Approach (PAR)	1,000 ft.	16,000 ft.	10,000 ft. plus 40,000 ft.	50 to 1 40 to 1

* The inner edge of the approach surface is equal to, and abuts the primary surface

.05 Notice of Construction or Alteration.

A. A person who proposes any of the following acts of construction, alteration, or placement of personalty, shall give written notice to the Administration at least 30 days before the start of construction, alteration, or placement. The notice shall be delivered or mailed to the Maryland Aviation Administration, Third Floor, Terminal Building, Box 8766, Baltimore/Washington International Airport, Maryland 21240. The acts include the following:

(1) Any construction or alteration of more than 200 feet above the ground level, or the placement of any personalty at this height, at any site within a 3 nautical mile radius of the center of the longest runway existing at any public-use airport licensed by the Administration;

(2) Any construction, alteration, or placement of personalty, at greater height than an imaginary surface extending outward and upward at one of the following slopes:

(a) 100 to 1 for a horizontal distance of 20,000 feet from the nearest point of the nearest runway of any airport with at least one runway more than 3,200 feet in actual length, or

(b) 50 to 1 for a horizontal distance of 10,000 feet from the nearest point of the nearest runway of any airport with its longest runway no more than 3,200 feet in actual length.

B. Notice of the proposed construction, alteration, or placement can be given to the Administration by providing a copy of the completed FAA Form 7460-1 required by Part 77 of the Federal Air Regulations, delivered or mailed as specified in §A, above.

.06 Variances.

A. Power of Political Subdivisions. Except as to the land area subject to jurisdiction of the Board of Airport Zoning Appeals, as established under the Transportation Article, Title 5, Subtitle 5, a political subdivision or a joint board established under the Transportation Article, Title 5, Subtitle 6, may grant a variance to any regulation adopted in this chapter if the variance does not endanger the public health, safety, and welfare.

B. Unless the legislative body of the political subdivision or the joint board provides otherwise, a person who desires a variance may apply for it in accordance with the local procedure for requesting a variance to the comprehensive zoning regulations of the political subdivision.

C. If an application for a variance is made, the political subdivision or joint board shall notify the Administration of the application at least 30 days before any hearing is held on it. The notice shall be delivered or mailed to Maryland Aviation Administration, Third Floor, Terminal Building, Box 8766, Baltimore/Washington International Airport, Maryland 21240.

.07 Obstruction Lighting and Marking.

The Administration, political subdivision, or joint board may require the owner of any structure or other object that is deemed a hazard to air navigation by the standards contained in this chapter to install, operate, and maintain at the owner's expense the markers and lights necessary to indicate to aircraft the presence of an obstruction.

.08 Conflict of Regulations.

If there is a conflict between any regulation adopted under this chapter and any other federal, State, or local regulation applicable to the same subject, the more stringent limitation or requirement shall govern.

.09 Existing Nonconforming Uses.

This chapter does not require any change in the height or location of any man-made structure in existence or under construction before the effective date of this chapter.

.10 Enforcement.

A. The Administration or appropriate local authorities, or both, may institute judicial action to restrain, prevent, correct, or abate any actions taken by persons in violation of these regulations.

B. The Administration reserves the right to waive any portion of these regulations.

.11 Penalties.

A. A person violating these regulations is guilty of a misdemeanor, and on conviction is subject to a fine of not more than $500 or imprisonment not exceeding 90 days, pursuant to the Transportation Article, §5-1105, Annotated Code of Maryland.

B. A person violating the airport obstruction regulations of any political subdivision is subject to such fine or imprisonment, or both, as provided for by the political subdivision. If a penalty is not specified, then the penalties of §A, above, shall apply.

Administrative History

Effective date:
COMAR 11.03.05 Registration of Aircraft adopted effective December 29, 1978 (5:26 Md. R. 1927); repealed effective March 20, 1981 (8:6 Md. R. 561)

COMAR 11.03.05 Obstructions to Air Navigation adopted effective July 1, 1985 (12:13 Md. R. 1280)
Regulation .01B amended effective December 15, 1986 (13:25 Md. R. 2662); November 13, 1989 (16:22 Md. R. 2365)
Regulation .05A amended effective November 13, 1989 (16:22 Md. R. 2365)
Regulation .05C amended effective November 13, 1989 (16:22 Md. R. 2365)
Regulation .10 amended effective December 15, 1986 (13:25 Md. R. 2662)

CHANGES TO REGULATIONS

Changes frequently occur to regulations published in the Code of Maryland Regulations (COMAR). These changes are always printed in the *Maryland Register*, COMAR's bi-weekly supplement. Consult the "Cumulative Table of COMAR Regulations Adopted, Amended, or Repealed" in the most recent issue of the *Maryland Register*.

APPENDIX II

ALP CHECKLIST

DRAFT
Airport Layout Plan Checklist

AIRPORT LAYOUT PLAN CHECKLIST
Washington Airports District Office
Federal Aviation Administration
November 28, 1997

This checklist is recommended for use by consultants, airport sponsors, and FAA Airports District Office (ADO) personnel to help insure that all pertinent information is reflected on the Airport Layout Plan (ALP) set of drawings. This checklist can be used for the small airports as well as for the larger, more complex ones and therefore every drawing or item in the checklist may not apply in all airport situations. However, certain drawings in the checklist are required in every case for FAA approval. These include (1) the Airport Layout Drawing, (2) the airport airspace drawing, and (3) the inner portion of the approach surface drawing. The need for the other drawings should be decided on a case-by-case basis. This decision as well as the determination as to which of the individual checklist items for each drawing apply to a given airport situation should be made at the time the workscope is prepared for the development of the new or updated ALP. This involves the ADO working closely with the airport sponsor and their consultant to evaluate and reach agreement on the use of the checklist in the ALP project. The individual checklist items as well as the case-by-case drawings that apply to a given airport situation depend on the nature and complexity of the facility and the evaluation during the ALP workscope determination process. Sound planning and understanding of local needs and conditions should be taken into account during this process. If during or after this process, the airport sponsor or their consultant disagrees with the ADO regarding the applicability of any element of the checklist to a given ALP project, they should provide the rationale for any such disagreement to the ADO. The ADO shall determine whether or not the rationale is acceptable and make the appropriate determination. In summary, this checklist can be used as part of the ALP Workscope process, during the preparation of the ALP, and in the draft and final ALP reviews.

AIRPORT: Montgomery Co. Airpark **LOCATION:** Gaithersburg, MD

SPONSOR: [signature] **DATE:** 12/20/01
Montgomery County Revenue Authority

CONSULTANT: Delta Airport Consult. Inc. **DATE:** December 21, 2001

DOAV/MAA: _____ **DATE:** _____

FAA PROJECT MGR: _____ **DATE:** _____

THIS CHECKLIST WAS COMPLETED FOR (check one):

( ) **ALP Workscope Purposes**
(X) **ALP Preparation Purposes**
( ) **ALP Review Purposes**

DRAFT
Airport Layout Plan Checklist

Note: The following information provides specific instructions on its use in terms of checking **YES** or **NO**, with or without **REMARKS**, for each of these purposes.

Specific Instructions:

1. If used for **ALP Workscope preparation purposes**, **YES** or **NO** should be checked for each checklist item to indicate whether or not it is required for the ALP drawings for the given airport. Or, to avoid having to check every single item and help facilitate the process, only check NO for items that are not required with the understanding that if an item is not checked YES or NO (i.e., left blank or unchecked), then it is required. This should be done as a joint effort by the airport sponsor (and their consultant) and the ADO in developing the ALP Workscope. Any item requiring explanations should be given as remarks.

2. If used for **ALP preparation purposes**, the preparer (airport sponsor and their consultant) should check **YES** or **NO** to indicate whether or not the appropriate checklist items are reflected on the ALP drawings. Any item requiring explanations should be given as remarks. The checklist completed by the preparer should (shall, if so stated in an agreed to ALP Workscope) be submitted to the ADO with the draft ALP drawings.

3. If used for **ALP review purposes**, the ADO reviewer should check **YES** or **NO** to indicate whether or not all appropriate checklist items were reflected on the ALP drawings in a satisfactory manner. Any item requiring explanations should be given as remarks. The checklist completed by the ADO should be submitted to the preparer with the marked-up draft ALP drawings.

References:

The ALP checklist below is based primarily on Appendix 7 of AC 150/5300-13, Airport Design, including changes 1 through 5. Change 5 is dated 2/14/97. Appendix 7 covers ALP components and preparation. The Airport Property Map (formerly Exhibit "A") component of the ALP checklist is based primarily on AC 150/5100-17, Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects, dated 3/29/96.

Use the space below for any detailed remarks.

DRAFT
Airport Layout Plan Checklist

I. The ALP Set of Drawings.	Yes	No	REMARKS
1. Required Drawings.			
a. Airport Layout Drawing.	(X)	( )	
b. Airport Airspace Drawing	(X)	( )	
c. Inner Portion of the Approach Surface Drawing.	(X)	( )	
2 Case-by-Case Drawings.			
a. Terminal Area Drawing.	(X)	( )	
b. Land Use Drawing.	(X)	( )	
c. Airport Property Map Drawing, (Formerly Exhibit. "A").	(X)	( )	

Note: Normally, the Airport Layout Drawing and the Airport Airspace Drawing should be presented on separate sheets. The Property Map (formerly Exhibit "A"), if done as part of a new or updated ALP set of drawings, should also be depicted on a separate sheet (or sheets for large airports). The other drawings do not necessarily need to be on separate sheets, depending on scale and size of the drawings.

II. AIRPORT LAYOUT DRAWING

	Yes	No	REMARKS
1. Features:			
a. Layout of existing and ultimate facilities and features.	(X)	( )	
b. Wind rose and coverage analysis.	(X)	( )	
c. Basic airport and runway data tables.	(X)	( )	
d. Legend and building tables.	(X)	( )	
e. Title and revision blocks.	(X)	( )	
f. Sponsor approval block.	(X)	( )	
g. List of approved modifications to FAA Airport Design Standards (with dates), including proposed and planned modification to Standards, i.e., use of declared distances for airport design, expected to approved as part of the ALP review and approval process.	(X)	( )	
h. List of non-std. conditions and proposed disposition.	(X)	( )	
2. Preparation Guidelines:			
a. Sheet Size, recommended 22"x34".	(X)	( )	
b. Scale, Determined by airport size 1"=200' to 1"=600'			
(1) Show graphic Scale.	(X)	( )	
(2) Metric conversion table, (opt.. per Appendix 6, AC 150/5300-13, Airport Design).	( )	(X)	NA
c. North Point:			
(1) True	(X)	( )	
(2) Magnetic and year of magnetic declination.	(X)	( )	
(3) North is to top left of drawing.	(X)	( )	
d. Wind Rose: Explain in Remarks for Data source if wind data not available for ALP wind rose.			
(1) Data source and time period covered (latest 10-yr period, using 36 point) Individual & Combined coverage.	(X)	( )	

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	Yes	No	REMARKS
(2) Individual and combined coverage, see paragraph 203b of AC 150/5300-13, Airport Design for information on wind conditions.			
(a). Runways with 10.5 knots crosswind	(X)	( )	
(b). Runways with 13 knots crosswind	(X)	( )	
(c). Runways with 16 knots crosswind	( )	(X)	NA
(d). Runways with 20 knots crosswind	( )	(X)	NA
(e). IFR Windrose.	(X)	( )	
e. Airport Reference Point (ARP)			
(1) Existing (nearest second NAD 83).	(X)	( )	
(2) Ultimate (nearest second NAD 83).	(X)	( )	
f. Topographic Information - Ground contours at intervals of 2 ' to 10', lightly drawn. Show any principal drainage features.	(X)	( )	
g. Elevations:			
(1). Runways - Indicate at existing and ultimate ends, displaced thresholds, touchdown zones, intersections, high and low points - accuracy to the nearest 1/10 ft..	(X)	( )	
(2). Structures on Airport - If no Terminal Area Plan Drawing., show top elevations on this sheet. Use table and numbering system.	(X)	( )	
h. Building Restriction Lines (BRL) and Runway Visibility Zone	(X)	( )	
i. Runway Details - (existing/ultimate).			
(1). Dimensions - Length and width.	(X)	( )	
(2). Orientation:			
(a). Show runway end numbers.	(X)	( )	
(b). True bearing nearest 1/10 degree	(X)	( )	
(3). Lighting,			
(a). Show threshold lights.	(X)	( )	
(b). No runway edge lights on drawing.	(X)	( )	
(4). Marking			
(5). Show stage lengths if new runway or if runway extensions will be developed in stages.	( )	(X)	NA
(a). Show interim stage lengths on stage development sketches in ALP Narrative Report.	( )	(X)	NA
(6). End Coordinates			
(a). Show surveyed existing runway end coordinates (nearest 1/10 second, NAD 83) and elevations (nearest 1/10 ft.).	(X)	( )	
(b). For interim stage runway development show end coordinates. (nearest 0.01 second, NAD 83) and elevation (nearest 1/10 ft).	(X)	( )	Nearest minute

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	Yes	No	REMARKS
(7). Monuments - (Show location of all survey monuments and reference markers. Note how monuments are protected).	(X)	( )	
(8). Declared Distances, for each runway direction. Identify any distances and clearway/stopway portions in the declared distances and any runway portions not included in the declared distances.	( )	(X)	NA
(9). Any displaced thresholds.	( )	(X)	NA
(10). Any clearways.	( )	(X)	NA
(11). Any stopways.	( )	(X)	NA
(12). Separation dimensions from BRL and any parallel runways.	(X)	( )	
(j). Object Free Area (OFA)	(X)	( )	
(k). Safety Areas.	(X)	( )	
(l). Obstacle Free Zone (OFZ). - Specify "NO OFZ PENETRATIONS" when no object other than frangible NAVAIDS penetrates the OFZ. Otherwise show the object penetration and indicate how they will be eliminated. The OFZ may be depicted on the drawing with dimensions to facilitate identifying object penetrations.	(X)	( )	
(m). Threshold Details - Depict the threshold with coordinates - accuracy to nearest 0.01 second, elevation, displacement from runway end, and print "No Threshold Siting Surface Object Penetrations" with no object penetrations". Otherwise show the object penetrations and indicate how they will be eliminated.	(X)	( )	
(n). RPZ details per paragraph 212, Table 2-4, and Fig. 2-3 of AC 150/5300-13, Airport Design.	(X)	( )	
(1). Show size with dim., (existing and ultimate)	(X)	( )	
(2). Airport interest in RPZ (fee or easement, or non-airport). NOTE: Boundary of existing property interest may, or may not, coincide with current RPZ boundary.	(X)	( )	
(3). For each RPZ, indicate in a note the approach visibility minimum and aircraft served (i.e., small aircraft, aircraft approach Cat A/B, Cat C/D, or all aircraft).	(X)	( )	
o. Holding position signs and markings. Depict the holding position signs and marking distance from runway centerline, with dimension lines.	(X)	( )	
p. Taxiway Details - Include the following:			
(1). Dimensions (width and length).	(X)	( )	
(2). Separation dimensions from parallel runways and taxilanes.	(X)	( )	
(3). Clearance dimensions to objects, including aircraft parking areas.	(X)	( )	
q. Apron details (existing/ultimate)			
(1). Dimensions (width and length).	(X)	( )	See TAP

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	Yes	No	REMARKS
(2). Aircraft parking arrangement.	( )	(X)	NA
(3). Any taxilanes.	(X)	( )	See TAP
r. Navaids and landing light systems (existing./ultimate).			
(1). Location and type.	(X)	( )	
(2). Critical area outlined and dimensioned.	(X)	( )	
s. Terminal area (existing/ultimate).			
(1). Show and identify all main structures. Also show and identify by using building table and numbering system if no terminal area drawing.	(X)	( )	
(2). Hangar areas and related taxiways.	(X)	( )	
(3). Auto parking and entrance road	(X)	( )	See TAP
t. Wind cone/tee and segmented circle.	(X)	( )	
u. Any weather equipment (e.g., AWOS, ASOS, etc., including related critical areas).	(X)	( )	
v. Airport service roads.	( )	(X)	See TAP
w. Airport fencing.	(X)	( )	
y. Airport Data Table	(X)	( )	
(1). Airport elevation (nearest 1/10 ft).	(X)	( )	
(2). ARP lat./long., nearest second/NAD-83.	(X)	( )	
(3). Mean daily max temperature.	(X)	( )	
(4). Combined wind coverage VFR/IFR (%).	(X)	( )	See windrose
(5). Airport magnetic variation and date.	(X)	( )	See north arrow
(6). ARC for most demanding aircraft accommodated at the airport for approach purposes.	(X)	( )	
(7). NPIAS service level, GA, RL, P, etc.	(X)	( )	
(8). DOAV/MAA/DC equivalent service role (local, community, regional, etc.)	(X)	( )	
(9). Taxiway lighting.	(X)	( )	
(10). Taxiway marking.	(X)	( )	
(11). Airport and Terminal Navaids.	(X)	( )	
(12). Others (indicate in remarks).	( )	(X)	None
z. Runway Data Table for each runway ends (existing/ultimate.)			
(1). Approach visibility minimums (include existing/ultimate, i.e.; V, 1 mile, 3/4 mile, 1/2 mile, CAT II/III.	(X)	( )	
(2). FAR Part 77 approach slope.	(X)	( )	
(3). Dimensions (width and length).	(X)	( )	
(4). Pavement type.	(X)	( )	
(5). Pavement design strength.	(X)	( )	
(6). Lighting.	(X)	( )	
(7). Marking.	(X)	( )	
(8). Percent gradient.	(X)	( )	
(9). Maximum grade within runway length.	(X)	( )	
(10). Line of sight requirements.	( )	(X)	
(11). Percent wind coverage.	(X)	( )	NA
(12). Visual approach aids (PAPI, REIL, etc.).	(X)	( )	
(13). Instrument approach aids (ILS, LOC, etc.).	(X)	( )	

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	Yes	No	REMARKS
(14). ARC for the runway.	(X)	( )	
(15) Identify the critical aircraft. If more than one aircraft involved, then identify further as follows:			
(a). Critical aircraft by wingspan.	(X)	( )	
(b). Critical aircraft by approach speed.	(X)	( )	
(c). Critical aircraft by weight.	(X)	( )	
(16). Length of haul if critical aircraft over 60Klb	(X)	( )	
(17). RSA dimensions.	(X)	( )	
(18). OFA dimensions.	(X)	( )	
(19). OFZ. Specify "No OFZ object penetrations" if no object other than frangible Navaids penetrates the OFZ.	(X)	( )	
(20). Surveyed end coordinates. (Nearest 0.01 second), NAD 83.	(X)	( )	Nearest second
(21). Runway elevations (nearest 0.01 ft.).			
(a). Existing end.	(X)	( )	
(b). Ultimate end.	(X)	( )	
(c). Displaced threshold.	( )	(X)	NA
(d). Touchdown zone.	( )	(X)	NA
(e). Runway intersection.	( )	(X)	NA
(f). High and low points.	(X)	( )	
(22). Declared distances for each Runway direction.			
(a). TORA.	( )	(X)	NA
(b). TODA.	( )	(X)	NA
(c). ASDA	( )	(X)	NA
(d). LDA.	( )	(X)	NA
(23). Others (indicate in Remarks).	( )	(X)	NA
(aa). Legend Table. Use standard symbols. (existing/ultimate).	(X)	( )	
(bb). Building Table, identify by number and description. Show top building elevation if no terminal area drawing (existing/ultimate)	(X)	( )	
(cc). Location and vicinity maps.	(X)	( )	See cover sheet
(dd). Title and Revision Blocks.	(X)	( )	
(ee). Approval Block.	(X)	( )	

III. AIRPORT AIRSPACE DRAWING

1. Includes:	Yes	No	REMARKS
a. Plan view of all Part 77 surfaces based on ultimate runway lengths.	(X)	( )	
b. Profile views of Part 77 approaches (exist./ultimate).	(X)	( )	See Inner approach
c. Obstruction Data Table, as appropriate.	(X)	( )	See Inner approach
2. Preparation Guidelines:			
a. Sheet Size, Same as ALP Drawing.	(X)	( )	

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	Yes	No	REMARKS
b. Scale, recommended; 1" = 2000' for plan view 1" = 1000' (horizontal) and 1" = 100' (vertical) for approach profiles.	(X)	( )	
c. Title and Revision Blocks, format sees ALP Drawing.	(X)	( )	
d. Plan view details.			
(1). Use current USGS 71/2 minute Quad for base map when available (latitude/longitude grid tick on map). Show area under all applicable. Part 77 airport imaginary surfaces.	(X)	( )	
(2). Show runway end numbers.	(X)	( )	
(3). 50-ft elevation contours on all sloping imaginary surfaces.	(X)	( )	
(4). When horizontal and/or conical surfaces overlap the approach surface, show the most demanding surfaces with solid lines and others with dashed lines.	(X)	( )	
(5). Show objects, by numbers and top elevation of any that are obstructions. Note and refer to inner portion of approach surface drawing for details on any close-in approach obstruction.	(X)	( )	
(6). For precision instrument approaches, show entire 50,000' approach surface, (may show outer approach on separate sheet)	( )	(X)	NA
(7). Include a note specifying any height restriction zoning ordinances/statutes in the airport environs.	(X)	( )	
(8). Identify land uses in the FAR Part 77 area, especially those incompatible with normal airport operations.	(X)	( )	
(9). RPZ based on ultimate runway lengths.	(X)	( )	
(10). Airport property lines and easements (exist./ultimate).	(X)	( )	See Inner approach
(e). Approach Profile Details			
(1). Ground profile use highest terrain across length and width of the approach surfaces.	(X)	( )	See inner approach
(2). Show top elev., by number, all significant objects within the approach surface; e.g., roadway, towers, etc.	(X)	( )	See inner approach
(3). Show existing and ultimate runway ends and Part 77 approach slopes.	(X)	( )	See inner approach
(4). Show threshold and slope based on threshold siting requirements per Appendix 2 of AC 159/5300-13, Airport Design, if applicable.	(X)	( )	See inner approach
(f). Show profile of entire runway if space available on sheet. As minimum, show end elev & high/low points (nearest 1/10 ft).	(X)	( )	

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	Yes	No	REMARKS
(g). Obstruction data table details.			
(1). List all obstructions shown in the plan and profile views.	(X)	( )	See Inner approach
(2). Identify obstructions by number in plan & profile, description and amount of Part 77 surface penetrations and proposed disposition of the obstruction including no action.	(X)	( )	See inner approach
(3). For any close-in obstructions in the approach areas, include note and refer to the obstruction tables on the inner portion of the approach surface drawing.	(X)	( )	

IV. INNER PORTION OF THE APPROACH SURFACE DRAWING

1. Includes:			
a. Show each runway end, large scale plan view of the inner portion of the approach (existing/ultimate.). Limit to area where Part 77-approach surface reaches a 100-foot height above the runway end.	(X)	( )	
b. Projected profile views of item a. above, for each runway end.	(X)	( )	
c. Obstruction tables for the existing and ultimate inner portion of the approach area for each runway end.	(X)	( )	
2. Preparation Guidelines:			
a. Sheet Size, Same as ALP Drawing.	(X)	( )	
b. Scale, recommend; horizontal 1" = 200', Vertical 1" = 20'	(X)	( )	
c. Title and Revision Blocks- Same format as ALP Drawing.	(X)	( )	
d. Plan View Details			
(1). Use aerial photos for base maps when available.	(X)	( )	
(2). Use numbering system to identify obstruction.	(X)	( )	
(3). Depict property line when it is located within the area.	(X)	( )	
(4). Show elevations and clearances for roads, railroads, waterways, etc., at the approach surface edges and extended runway centerline. Number these points and key to profile view and obstruction table, as appropriate.	(X)	( )	
(5). Depict ends of runways, stopways, clearways, safety areas, and object free areas (existing/ultimate).	( )	(X)	NA
(6). Show ground contours within the area.	(X)	( )	
(7). Show existing/ultimate approach and departure RPZ's.	(X)	( )	

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	Yes	No	REMARKS
(8). Indicate existing/ultimate Part 77 approach slopes.	(X)	( )	
(e). Profile View Details			
(1). Depict the ground along runway safety area and significant items such as fences, stream beds, roadways, etc., regardless of whether the items are obstructions	(X)	( )	
(2). Identify obstructions with number from plan.	(X)	( )	
(3). Depict cross- section of roads and railroads where they intersect outer edges of approach surface.	(X)	( )	
(f) Runway Centerline Profile			
(1) Scale (vertical sufficient to show line-of-sight requirements)	(X)	( )	
(2) Elevations (stations and elev. at runway ends and at all points of grade change)	(X)	( )	
(g) Obstruction Table Details			
(1). Prepare separate table for each approach surface (existing /ultimate) and specify type and slope of the Part 77 approach surface.	(X)	( )	
(2). List obstructions. by number in plan and amount of Part 77 surface penetrations and proposed disposition of obstructions, also no action.	(X)	( )	

V. TERMINAL AREA DRAWING

(The need for this plan will be decided on a case-by-case basis. For small airports, where the ALP Drawing is prepared to a fairly large scale, a separate drawing for the terminal area may not be needed.)

	Yes	No	REMARKS
1. Includes:			
a. Large scale plan view of the area (or areas) where the aprons, buildings, hangars, parking lots, etc., are located.	(X)	( )	
2. Preparation Guidelines:			
a. Sheet Size, Same as ALP Drawing.	(X)	( )	
b. Scale, 1" = 50' to 1" = 100'	(X)	( )	
c. Large-scale plan view of terminal area (or areas) showing details of aprons, buildings, hangars, parking lots, etc. (Existing/Ultimate.)	(X)	( )	
d. Building restriction line.	(X)	( )	
e. Depict separation between objects and taxiways, taxilanes, and tiedowns.	( )	(X)	NA
f. Title and Revision Blocks, Same as ALP Drawing.	(X)	( )	
g. Building Data Table			
(1). Structure identification number (identify structures on plan view with numbers instead of words.)	(X)	( )	

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	Yes	No	REMARKS
(2). Top elevation on structures.	(X)	( )	
(3). Obstruction marking (Existing/Ultimate).	( )	(X)	NA
h. Legend, Include symbol for planned removal, abandonment., etc.	(X)	( )	

VI. LAND USE DRAWING

1. Definition
   A drawing depicting existing and recommended use of all land within the ultimate airport property line (on airport) and in the vicinity of the airport (off airport) to at least 65 LDN.) Typical land use categories are; (e.g., agriculture, recreational, industrial, commercial, etc.).

2. Purposes
   Provide plan for leasing revenue producing areas on the airport, for guidance on compatible land uses in close proximity to runways, for line of sight between runway ends and within runway visibility zones, and for guidance to local authorities for establishing appropriate zoning in the vicinity of the airport.

3. Preparation Guidelines:

a. Sheet Size, Same as ALP Drawing.	(X)	( )	
b. Scale, Same as ALP Drawing.	(X)	( )	
c. Title and Revision Blocks, Same as ALP Drawing			
d. Base Map, Use aerial photos when available.	(X)	( )	
e. Legend, Use std. drafting symbols to show various parcels and/or areas on and off the airport (existing /ultimate). Show uses by general category.	(X)	( )	
f. Public Facilities			
(1). Depict the location of all public facilities (e.g., schools, hospitals, prisons, parks, etc.) in the vicinity of the airport.	(X)	( )	
(2). Show current noise contours, if available (date of data used).	(X)	( )	
g. Drawing Details			
(1). Normally limited to existing and ultimate features (i.e., runways, taxiways, RPZ's, terminal buildings and Navaids, etc.)	(X)	( )	
(2). Show details to determine aeronautical areas versus non-aeronautical areas.	(X)	( )	

VII. AIRPORT PROPERTY MAP (Formerly Exhibit "A")

Purposes:

1. The primary intent of the airport property map (formerly Exhibit "A") drawing, is to identify all land which is designated airport property and to provide an inventory of all parcels which make up the airport. It is a document that must be on file in the ADO as part of the development project process. If it is not on file, or needs updating, this drawing can be prepared as part of the ALP set of drawings.

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	Yes	No	REMARKS
Definition:			
2. As a minimum, the Property Map (formerly Exhibit "A") must show the current airport research, available mapping/surveys, and field verification, as required. Physical survey of boundaries is generally not required. In those instances where field survey may be considered necessary, the property line and runway should be tied to the State grid system. Standards for precision and accuracy would be part of this review			
a. Sheet Size, Same as ALP drawing.	(X)	( )	
b. Scale, Same as ALP drawing.	(X)	( )	
c. Title and Revision Blocks, See ALP Drawing. Clearly label as Airport Property Map (formerly Exhibit "A")	(X)	( )	
d. Legend, Use standard drafting symbols and legend table to indicate the type of acquisition involved with each tract or area.	(X)	( )	
4. Specific Property Map required items:			
a. Identify outside airport property boundary.	(X)	( )	
b. Each parcel making up the entire airport must be shown and numbered. In addition, parcels, which were once airport property, must also be shown.	(X)	( )	
c. Both fee and easement interest must be shown and separately designated.	(X)	( )	
d. Delineate runways, taxiways, RPZ's, TSA's, RSA's, OFA's, BRL's, Terminal Buildings, and Navaids (existing./ultimate).	(X)	( )	
e. Magnetic and true north arrows.	(X)	( )	
f. Show each line type that identifies airport boundary, parcel boundary, RPZ's, BRL's, easements, etc. clearly in the legend.	(X)	( )	
g. The plan view with related data table and/or notes must show an inventory of all parcels by number, including the grantor, grantee, and type of interest, acreage, deed book and page, and date of recording. They must also show FAA project number if acquired under a grant: PFC application number if acquired with PFC; Surplus Property Transfer or AP-4 Agreement if applicable; type of easement (clearing, avigation, utility, right-of-way, etc.); and if released, date of FAA approval.	(X)	( )	
h. The purpose of acquisition if acquired under a Federal grant (approach protection., aeronautical, noise compatibility, current or future development.) based on the grant description must be indicated, plus any special conditions.	(X)	( )	
I. If the Property Map is being prepared for submittal as part of a land acquisition project, parcels being acquired must be shown.	(X)	( )	

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	Yes	No	REMARKS
j. The Property Map must be drawn to scale, all information must be on one sheet if possible, and should be no larger than the ALP drawing sheet size and be legible. There should be an index sheet if the Property Map (formerly Exhibit "A") involves several sheets for larger airports.	(X)	( )	
k. The Property Map must be dated and amended whenever there is a change to any airport property.	(X)	( )	
l. There should be sufficient descriptive data (i.e., section, city, county, lot and block, metes and bounds, etc.) to enable accurate location of current and future parcels on the drawing.	(X)	( )	
m. Points of reference for tracing parcels from a deed description by scaling should be shown. As new parcels are acquired, the property map should add their associated bearings and lengths to enable quick confirmation of the parcel's location.	(X)	( )	
n. Fencing, if it does not obscure airport boundary lines.	(X)	( )	