AIRPORT DEVELOPMENT PLAN

Monticello, Iowa

MONTICELLO MUNICIPAL AIRPORT

AIRPORT DEVELOPMENT PLAN

Prepared for
City of Monticello, Iowa
Airport Board

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1990

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CHAPTER ONE

COMMUNITY AND AIRPORT BACKGROUND

Airport Planning Process

The City of Monticello retained Shive-Hattery Engineers and Architects, Inc., Engineers, and Professional Design Services of Iowa, Inc., Planner to prepare an Airport Development Plan for the Monticello Municipal Airport. A grant-in-aid was obtained from the Iowa Department of Transportation to carry out a scope of work designed to address the extent, cost, feasibility, and schedule of future airport facility needs.

The primary goal of the Airport Development Plan was to identify future airport development needs which would satisfy aviation demand in a feasible and prudent manner. The objectives are noted below and were incorporated into the planning process described in Figure 1-1.

OBJECTIVES:

1. To provide an effective graphic presentation of the future development of the airport and anticipated land uses in the vicinity of the airport.

2. To establish a realistic schedule for the implementation of the development proposed in the plan, particularly for the short term capital improvement program.

3. To propose an achievable financial plan to support the implementation schedule.

4. To justify the plan technically and procedurally through a thorough investigation of concepts and alternatives on technical, economic, and environmental grounds.

5. To present for public consideration, in a convincing and candid manner, a plan which adequately addresses the issues and satisfies local, State, and Federal regulation.

6. To document policies and future aeronautical demands for reference in municipal deliberations on spending and debt incurrence and land use controls, e.g., subdivision regulations and the erection of potential obstructions to air navigation.

7. To set the stage and establish the frame work for a continuing planning process. Such a process should monitor key conditions and adjust plan recommendations if required by changed circumstances.

The report is presented in six chapters, the first of which summarizes relevant background information used in the preparations of Chapter Two through Six.

FIGURE 1-1: AIRPORT DEVELOPMENT PLANNING PROCESS

I. INVENTORY

- -Existing airport sites(s)
- -Airport service area
- -Goals and objectives

II. FORECAST

- -Registered aircraft
- -Based aircraft
- -Itinerant and local operations
- -Air taxi operations
- -Design aircraft
- -Decision Point

III. BENEFIT/COST ASSESSMENT

- -Demand/Capacity
- -Airport service level
- -Decision Point

IV. FACILITY NEED

- -Wind coverage
- -Runway length, width, strength
- -taxiway
- -Landing and navigational needs
- -FAR Part 77
- -Terminal area

V. ALTERNATIVES

- -On/Off airport land use
- -Environmental considerations
- -Development alternatives

VI. PLANS

- -ALP
- -Imaginary surfaces
- -Clear zone plan/profile
- -Terminal area plan

VII. IMPLEMENTATION

- -Development schedule
- -Cost estimates
- -O & M
- -Capital revenue sources
- -Strategy for implementation

Citizen Participation on-going
SOURCE: PDS, 1990

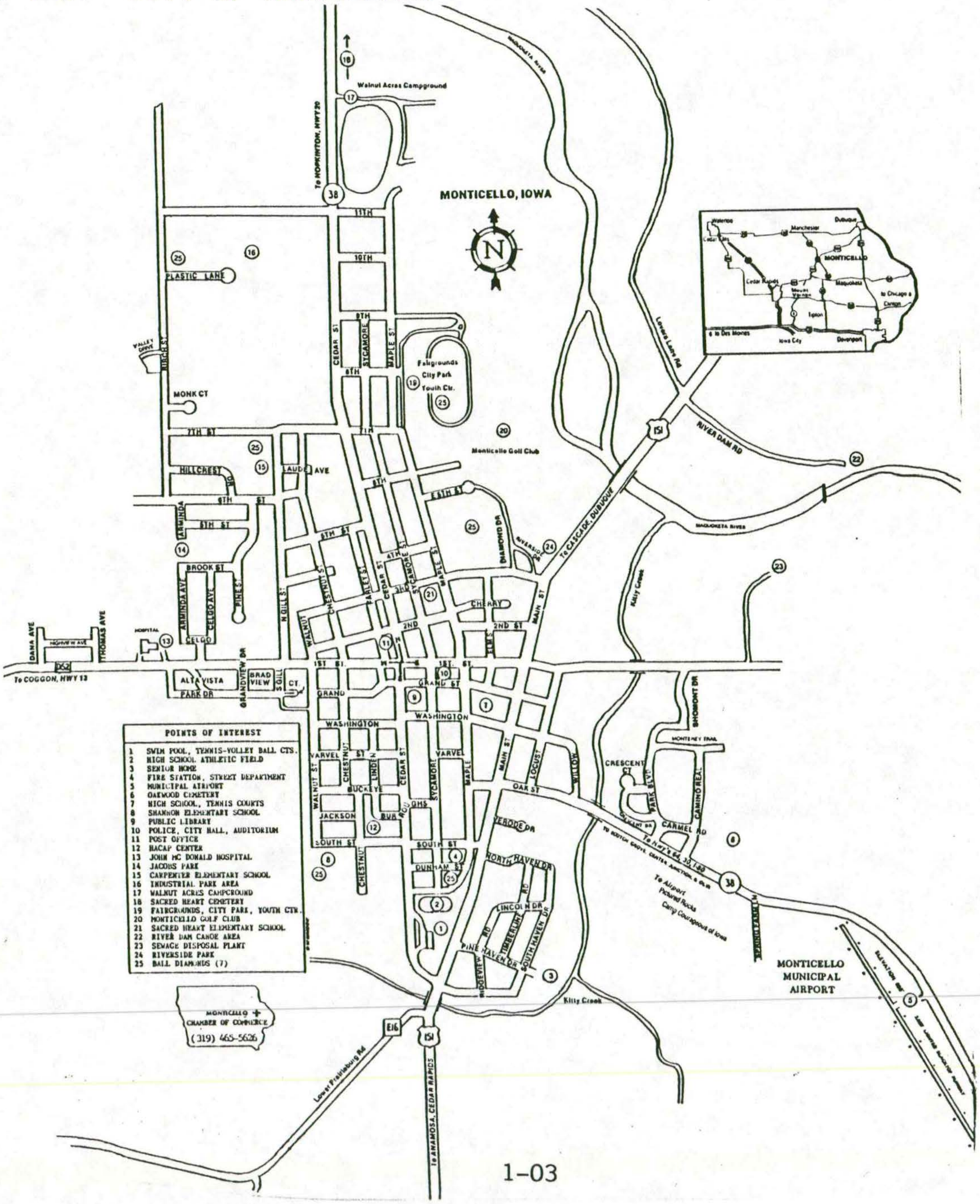
BACKGROUND

Historic Development

Monticello came into existence as a prairie settlement in October 1836 along the east bank of Kitty Creek near it's confluence with the Maquoketa River.

Partly due to an unusually large number of industries for a community of about 4,000 and because Monticello has become a "territory hub" for a growing number of sales-oriented operations, the community has experienced a steady growth. The "Pittsburgh of the Prairie" name adopted by the community identifies a stable economy and population base.

FIGURE 1-2: CITY OF MONTICELLO



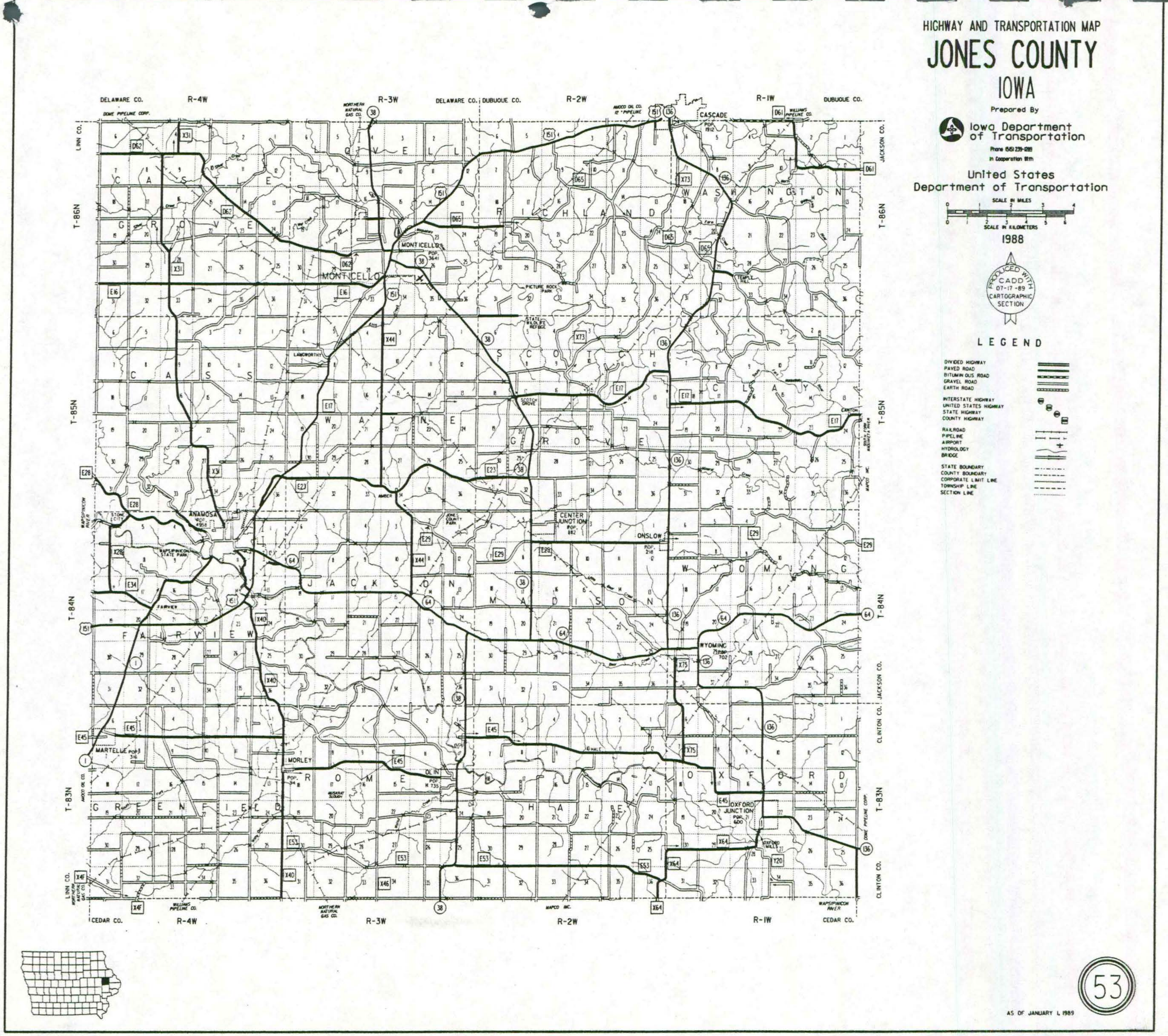


FIGURE 1-3: PROJECT LOCATION

TABLE 1-1: INDUSTRY - MONTICELLO

AMERICAN STITCHING AND STAPLING CO.
Started in 1988, company deals in Stitcher and Stapling machines for the printing industry. Sales area is across the United States and Germany.

BARD CONCRETE
Produces ready-mix concrete for agriculture, commercial and residential use.

BEHRENDS CRUSHED STONE
Production, sales and delivery of agricultural lime, crushed stone products, sand and gravel to farms, business and industry.

CASCADE DIE MOLD, INC.
Complete design and mold building capabilities (2 CNC Machining Centers, CAD System) and 10 Plastic Injection Molding presse s with tonnage of 30 through 610 and part weight of 1 through 125 ounces. Secondary Production of Sonic Welding, Assembly, Hot Stamping and Machining.

COMMANDER BUILDINGS, INC.
Fabricators of structural steel building framing systems for industrial commercial, institutional and agricultural applications.

DMR VAN CONVERSIONS, INC.
Specialists in custom vans, full-size and mini. Also customizing sport trucks and 5th wheel towers; lifts for the handicapped. FLEXSTEEL seats. Incorporated 1981.

DRIED WHEY, INC.
Produces roller dried whey for use as a principal ingredient for animal feed.

E.A.C. INDUSTRIES INC.
A subsidiary of Wabash Transformers, E.A.C. manufactures electrical transformers for small appliances such as typewriters, clothes washers and dryers, etc.

ENERGY MANUFACTURING CO. INC.
Energy produces hydraulics equipment, cylinders, valves, pumps, motors and truck hoists. It also performs sub-contract work for many other manufacturing firms.

FRANKLIN EQUIPMENT, INC.
Since 1915, Franklin has manufactured livestock waterers, a full line of farm gates, and hardware. Its products are distributed throughout the United States and Canada.

FRONTIER PRODUCTS
Manufacturers of livestock pre-mixes, utilizing minerals, vitamins, antibiotics and trace elements in combinations usable to livestock feeders over a wide area. It also operates a separate Soybean extraction plant.

GEORGIA-PACIFIC CORP.
This packaging division manufactures corrugated shipping containers, including die-cutting.

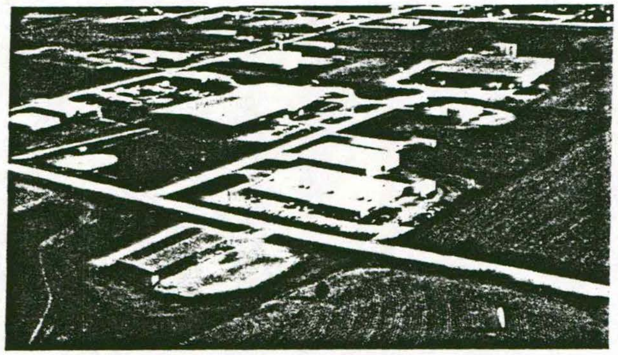
HAUSER CUSTOM CASTING MACHINERY
Manufacturers and rebuilders of die casting machinery.

J-MAC, INC.
Manufacturers of a nationally-distributed line of cattle oilers and face fly units.

JULIN PRINTING CO.
Designers and producers of highest quality commercial offset printing, serving accounts across the nation. Large multi-color equipment, and color separation scanning.

LEWISystems MENASHA CORPORATION*
Injection molding of industrial material handling containers such as used in food processing, food distribution and containers for industrial use like tote boxes, etc.

LONE STAR PRINTING
Specializing in commercial and residential printing. Offering: copying, typesetting, forms, letterheads, business cards, envelopes, etc.



INDUSTRIAL PARK - LEWISystems*

MONTICELLO AVIATION, INC.
Provides major airframe and engine service and maintenance, aircraft rental, pilot service, pilot training and ground school courses. It is a Cessna Pilot Center.

MONTICELLO EXPRESS, INC.
Publishers of The Monticello Express and The Jones County Super Shopper, winner of 220 national and state awards for newspaper excellence. Publication printer. Designers and producers of custom offset printing. Monticello's oldest continuing business since 1865.

MONTICELLO MACHINE SHOP
Repair of farm machinery and industrial equipment. Provides all types of machine work including lathe, mill, and drill presses. All types of welding including mig, tig, stick, and torch on all types of material including steel, cast, aluminum, stainless steel, and magnesium. A large steel inventory is always on hand.

MONTICELLO SHOPPERS GUIDE
Weekly advertising publication for Monticello trade area. Complete office supply retail outlet and custom offset printer.

MONTY PRODUCE CO.
Buying, grading and packaging eggs for more than 65 years....presently handling over 500,000 eggs per day.

N & N TRAILER SALES
Manufactures and services livestock trailers.

POLO PLASTICS
Manufacturers of flexible P.V.C. vinyl plastic products custom-made for hospitals and industries, and distributed throughout the United States and many foreign countries. Includes die-cutting, silk screening, sewing and radio frequency sealing.

PUBLISHERS IDEA EXCHANGE
Number ONE advertising idea service in North America. Some 2,400 newspapers, advertising agencies and store groups subscribe to this monthly ad-idea magazine.

RIDDLE, INC.
Manufactures printed circuit boards for the electronic industry.

STAR BUILDINGS, Div. H. H. Robertson
The Monticello Plant of Star Manufacturing Company is a manufacturer of pre-engineered metal buildings which are distributed throughout the U.S., Canada, the Pacific Basin, and the Far East. Used for retail stores, factories, warehouses, hangars, schools, churches, agricultural buildings, etc. A wide variety of framing systems offer low-cost erection, minimum maintenance, and ease of expansion.

SWISS VALLEY AG SERVICE
Organized in 1897 (The Farmers Mutual Co-operative Creamery Company), it is the second oldest industry in Monticello...supplying farmers feed, fertilizers, seed, ag chemicals and hardware.

TRIANGLE AGRI SERVICE
A livestock feed and premix supplier. Services include consulting, computer programs for livestock management, Grain and Forage Lab analysis and veterinary consultation.

WELTER STORAGE EQUIPMENT CO. INC.
The Welter Co. buys and sells new and used warehouse storage equipment, office furniture and forklifts. It also fabricates and installs pallet racking conveyor systems and mezzanines for factories and warehouses.

YEOMAN & COMPANY (YO-HO)
Manufacturers of garden tools, scrapers, small hand tools, lawn brooms, steel and aluminum snow shovels and pushers, cold pack sets, etc., widely sold under the "YO-HO" and private labels.

YEOMAN & SONS SALES CO., INC.
A midwestern sales company to hardware jobbers & grocery chains for liquid fertilizers, crushed lime, chemical ice melter, lawn seed, potting soils and bagged washed sand.

ZIMMERMAN LAWN ORNAMENTS
Manufacturers of custom concrete lawn ornaments, Retail/Wholesale.

Transportation

The City of Monticello is located in north central Jones County, approximately half-way between Cedar Rapids (30 miles) and Dubuque (35 miles) via U.S. Highway 151. Rail service has been discontinued to the community.

TABLE 1-2: LENGTH OF TIME GOODS IN TRANSIT

CITY	MILES	DAYS BY MOTOR FREIGHT
Denver	820	2
Des Moines	150	1
Chicago	230	1
Minneapolis	225	1
St. Louis	310	1
Kansas City	320	2
Omaha	280	1
Milwaukee	200	1

SOURCE: IDED, Community Quick Reference, Nov. 1986

Access to the city is provided by seven highways. Overnight travel service is conveniently available to each of the above cities and others within these perimeters. Seven truck delivery companies are available to provide these services; as well as Greyhound Bus passenger and package service. The city is near midway on the primary highway link (Federal Highway 151) between Cedar Rapids and Dubuque.

The Monticello Airport complements the surface transportation services available to meet commercial and citizen needs; as attested by the significant activity experienced at the field. A hard surfaced runway, with useful electronic navigation aids, provides a comfortable assurance to users, resulting in a steady growth of utilization by both industry and individuals.

Commercial flights are available with a short flight to Cedar Rapids and Dubuque (15 minutes); or an approximate 45 minute drive. Charter air service, and major engine and airframe repair capability are available at the Monticello Municipal Airport; providing service to locally based aircraft as well as outside the service area, and itinerant, enroute traffic.

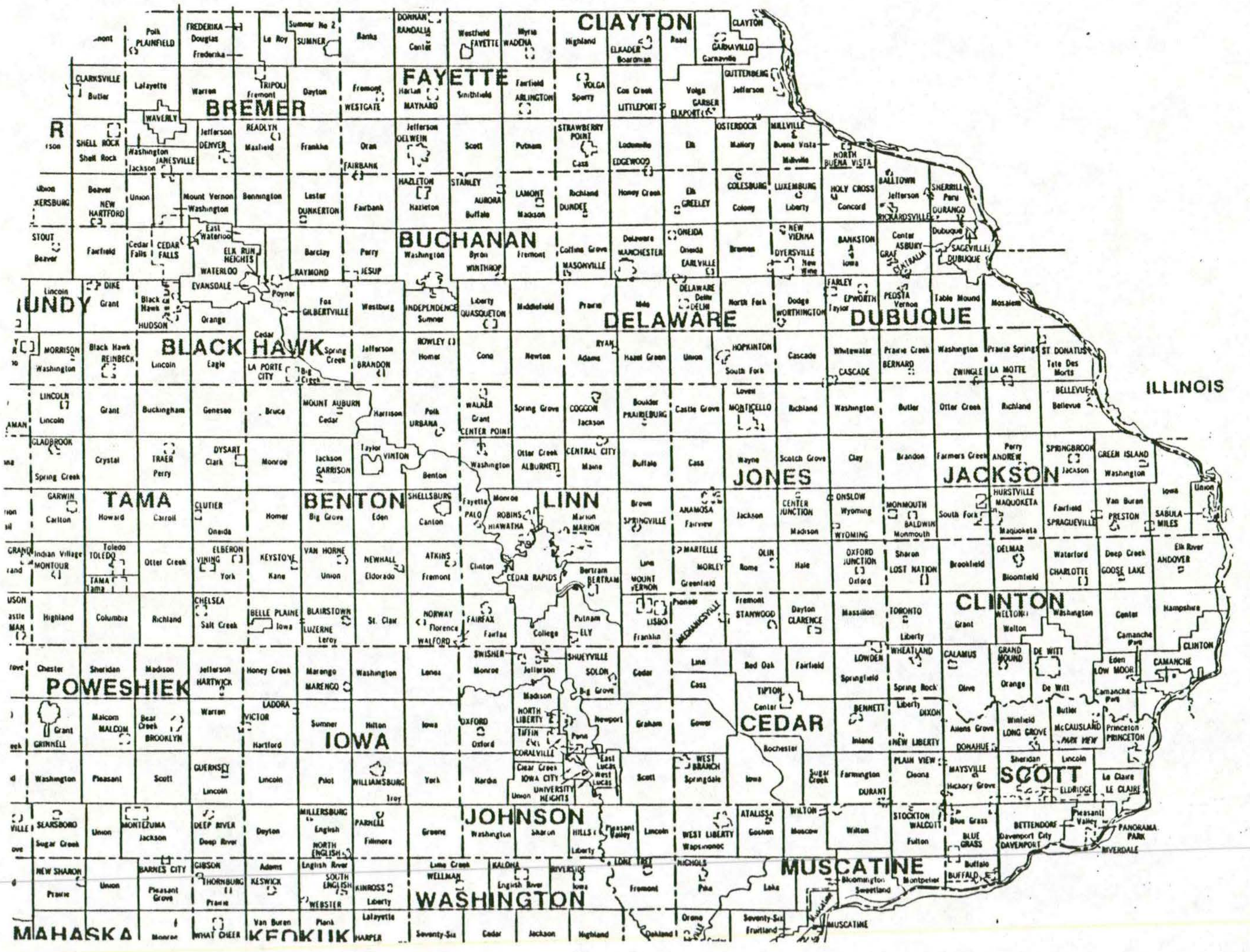
AIRPORT SERVICE AREA

Political Subdivisions

An airport is considered to have an area of influence which extends beyond city boundaries. The general area coincides closely with retail trade areas. The airport service area is that geographic area wherein local users of the airport reside, own businesses or store their aircraft. It is generally defined by radial distances halfway to another comparable airport; although, this can vary greatly depending on the scope and quality of services made available at area airports.

The Monticello Airport Service Area extends across Jones County and may be divided into a primary and secondary service area. The primary airport service area would include all of Jones County while the fringe or secondary airport service area would encompass the southern part of Delaware and Dubuque counties.

FIGURE 1-4: AIRPORT SERVICE AREA



The Monticello Airport service area includes 14 townships and 12 communities.

TABLE 1-3: POLITICAL SUBDIVISIONS - AIRPORT SERVICE AREA

TOWNSHIPS

Fairview	Wayne	Lovell	Union(Del.)
Jackson	Cass	Richland	Hazel Green(Del.)
Madison	Boulder(Ln.)	Cascade	
Scotch Grove	Castle Grove	South Fork(Del.)	

COMMUNITIES

Monticello	Sand Springs	Scotch Grove
Lang Worthy	Hopkinton	Onslow
Anamosa	Cascade	Wyoming
Stone City	Canton	Center Junction

SOURCE: PDS, 1990

The airport service area encompasses 504 square miles and had a 1980 population of 20,401.

Physical Features

The terrain within the county is generally level to gently rolling topography, with scattered patches of timber lands. Primary drainage is provided by the Maquoketa and Wapsipinicom Rivers; crossing diagonally in a northwest to southeast direction. The airport area is drained by Kitty Creek, to the Maquoketa River.

The climate is described as subhumid and continental. Average temperature is 23.7 degrees Fahrenheit in winter and 72.6 in the summer; with normal daytime highs of 32 in winter, and 79 in summer. The daily maximum high of 83.7 occurs during the month of July. Average rainfall is 33.7 inches, and snowfall averages 30.2 inches per year; with 1 inch or more of snow on the ground an average of 70 days per year. Prevailing winds are from the northwest in cold weather and from the south and southwest in warm weather. Low visibility winds are more likely from a northwest or northerly direction because of blowing snow. Wind data from Cedar Rapids will be used for aeronautical study purposes, as appropriate data is not available for the Monticello Airport.

Population Changes

Final counts from the 1990 U.S. Census are not yet available. Preliminary indications are that the county population has remained relatively unchanged since the 1980 U.S. Census of population. Throughout the twenty year planning period, the airport service area population is expected to remain fairly stable with no substantial population gain or loss.

TABLE 1-4: AIRPORT SERVICE AREA POPULATION

TOWNSHIP/ INCORPORATED AREA	1960	1970	1980	NUMBER	PERCENT
Cass Twp.	648	574	709	+61	+9.4
Anamosa	---	---	34	+34	+100.0
Castle Grove Twp.	620	465	480	-140	-22.6
Clay Twp.	358	300	271	-87	-24.3
Fairview Twp.	5572	5456	6053	+481	+8.6
Anamosa	4616	4389	4924	+308	+6.7
Greenfield Twp.	790	779	716	-74	-9.4
Martelle	247	341	316	+69	+27.9
Morley	2	4	0	-2	-100.0
Hale Twp.	514	444	412	-102	-19.8
Jackson Twp.	528	461	472	-56	-10.6
Lovell Twp.	883	1030	4590	+3707	+419.8
Monticello	3190	3509	3641	+451	+14.1
Madison Twp.	857	753	747	-110	-12.8
Center Junction	201	172	182	-19	-9.5
Onslow	134	139	124	-10	-7.5
Oxford Twp.	1281	1118	1033	-248	-19.4
Oxford Junction	725	666	600	-125	-17.2
Richland Twp.	753	836	810	+57	+7.6
Cascade	286	394	395	+109	+38.1
Rome Twp.	1350	1261	1271	-79	-5.9
Morley	122	119	94	-28	-23.0
Olin	703	710	735	+32	+4.6
Scotch Grove Twp.	570	437	451	-119	-20.9
Washington Twp.	446	392	388	-58	-13.0
Cascade	12	6	5	-7	-58.3
Wayne Twp.	886	793	795	-91	-10.3
Wyoming Twp.	1447	1260	1203	-244	-16.9
Onslow	135	114	94	-41	-30.4
Wyoming	797	746	702	-95	-11.9
TOTAL	20,693	19,868	20,401	-292	-1.4

SOURCE: 1980 CENSUS, Number of Inhabitants, PC80-1-A17

Estimates made by the Census Bureau in mid-1989 show that Jones County had a minimal increase of 0.5 percent in 1988, while 41 counties in the state lost population. This is compared to a report that 90 of Iowa's 99 counties lost population between 1980 and 1988.

Statewide projections for the 1990's suggests continued population loses within rural areas. Population experts are, however, quick to point that there are exceptions to this trend, and they identify the primary reason for this to be the attitude and willingness to work together on the part of the local citizens. Also, those communities established as regional marketing centers do far better than others. In consideration of the past history of Monticello and it's strong position as a small region marketing center, it appears that a modest population growth can be expected in the 1990's.

Income

Table 1-5 summarizes income generated by employment as reported by Job Service of Iowa, and covered by job insurance. Total private sector wages generated in 1989 within Jones County increased $12,033,699 from 1986 through 1989, or 28%; while the government sector increased by $2,181,993 or 28.4%. Manufacturing represented the largest sector of wages paid 1989 with a total of $20,476,135 followed by trade at $14,910,713. These figures serve to confirm the apparent economic structure in Monticello. As noted manufacturing and trade income far exceeds the total agricultural labor income within the county.

TABLE 1-5: JONES COUNTY - TOTAL YEARLY WAGES, 1986-1989

Private Sector	1989	1988	1987	1986
Ag-Mining	$1,621,007	$1,361,613	$1,020,941	$ 875,207
Construction	3,245,892	2,199,083	1,523,644	1,374,150
Manufacturing	20,476,135	19,345,057	18,483,274	16,526,948
Transportation	2,990,631	2,927,376	2,890,849	2,918,450
Trade	14,910,713	14,114,474	13,322,754	12,390,591
Finance	3,308,645	2,944,963	2,841,079	2,673,855
Service	8,016,378	7,534,877	6,406,027	5,576,501
Total Private Sector	$54,369,401	$50,427,443	$46,488,568	$42,335,702
Public Sector				
Federal	1,601,571	1,557,912	1,543,091	1,461,557
State	9,478,354	8,892,011	8,704,644	7,945,437
Local	11,222,322	10,473,486	9,675,061	9,449,634
Total Government	$22,302,247	$20,923,409	$19,922,796	$18,856,628

SOURCE: JOB SERVICE OF IOWA, Job Insurance Coverage by Major Industry Group - Covered total yearly wages. 1986-1989

Public sector wages increased from $18,856,628 in 1986 to $22,302,247 in 1989.

Labor Force

The average annual employment covered by job insurance increased from 8,780 in 1984 to 9,420 in 1989. Unemployment decreased from 8.5 percent in 1985 to 4.0 percent in 1988. Reference may be made to Table 1-6.

TABLE 1-6: LABOR FORCE, ANNUAL AVERAGE, JONES COUNTY 1984-1989

	1984	1985	1986	1987	1988	1989
Resident Civilian Labor Force	8780	8750	8860	8850	9150	9420
Resident Unemployed	660	750	600	500	370	400
Percent Unemployed	7.5	8.5	6.7	5.7	4.0	4.2
Resident Total Employment	8120	8010	8270	8350	8790	9020

SOURCE: JOB SERVICE OF IOWA, Labor Force Summary Annual Averages 1984-1989

Manufacturing employment increased from 830 persons in 1984 to 1,140 in 1989. The 37.3 percent increase in manufacturing employment within the six year period is significant. Employment in all sectors increased except in transportation, finance, insurance and real estate. Employment within the retail trade sector increased from 870 persons in 1984 to 1,010 persons in 1989.

TABLE 1-7: AVERAGE ANNUAL LABOR FORCE, JONES COUNTY 1984-1989

	1984	1985	1986	1987	1988	1989
Non Ag & Salary	4560	4550	4580	4710	4970	5210
Manufacturing	830	820	880	940	1030	1140
Non-manufacturing	3720	3730	3700	3760	3952	4070
Construction	140	110	120	120	182	220
Transportation	180	170	170	160	150	140
Wholesale & Retail Trade	1230	1250	1280	1320	1390	1410
Wholesale Trade	370	350	360	330	350	400
Retail Trade	870	900	920	990	1040	1010
Finance, Insurance & Real Estate	170	180	170	170	160	170
Services & Mining	830	850	840	870	910	960
Government	1160	1160	1140	1130	1160	1170

SOURCE: JOB SERVICE OF IOWA, Labor Force Summary Annual Averages 1984-1989

MONTICELLO MUNICIPAL AIRPORT

Site

The airport is located within and adjacent to the present corporate boundary of the City. Direct access from the downtown area is provided via State Highway 38, approximately 1 1/2 miles. The airport is bordered on the east and north by Hwy. 38; which restricts growth in those directions. Approaches from the north are over generally open land. Other than the highway, approaches from the south are over relatively uneven land and over and adjacent to several farmsteads. The approaches and side clearances do not meet standards at several points (this will be covered in detail later in the report). The airport elevation is 847.0 feet above mean sea level, and the geographic coordinates are latitude 42 13' 40"N., longitude 91 09' 51"W.

In a regional sense, Monticello Municipal Airport is 15 minutes air flight from either Cedar Rapids or Dubuque, 190 air miles from Chicago, 210 from Minneapolis/St. Paul, 260 from St. Louis and Omaha, and 290 from Kansas City.

CLIMATE

Weather conditions play an important role in the planning and development of an airport. Temperature is an important factor in determining runway length; wind speed and direction influence runway orientation. The percent of time visibility is impaired is a major factor in determining the need for navigational aids and lighting.

The climate of Monticello is typical to Iowa, and generally the northern midwest region. Annual precipitation averages 33.7 inches per year, including an annual average snowfall of 30.2 inches. Summers in Monticello vary from dry weather and low humidity and persistent south to southwest winds to periods with high precipitation. Rain may occur in violent thunderstorms of short duration to long periods of wet and cooler weather. Temperatures typically range from 60 to 100 .

Winters average about 50 degrees cooler than summer, with lows to -20 degrees on occasion. Cold fronts are usually accompanied by strong northwesterly or northern winds and, when accompanied by snow, are the primary cause of low visibility. The first major winter storm usually strikes before the end of November.

Facilities

The airport's primary runway is asphalt surfaced, 3500 feet in length and 50 feet in width. The runway is aligned NW/SE, and is numbered 13/31. A crosswind runway 5/23 is a turf facility, 2300 feet long and 120 feet in width. RW 5/23 was constructed in 1989. The 3500 foot primary runway is adequate for virtually all light, single engine aircraft, and many of the light twins used for business and air taxi operators. The crosswind runway serves light aircraft during periods of strong crosswinds on the primary runway.

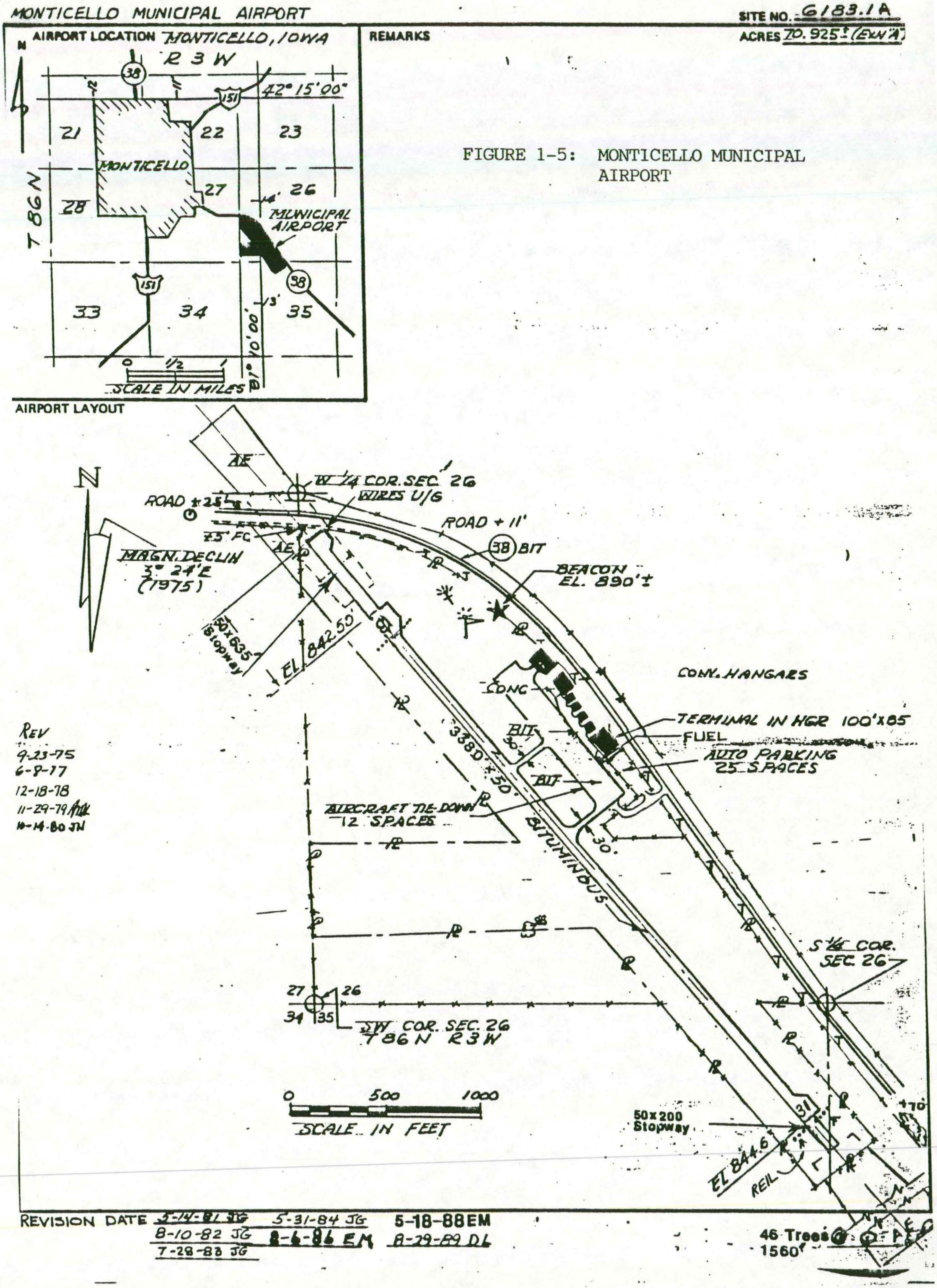


FIGURE 1-5: MONTICELLO MUNICIPAL AIRPORT

According to records, the paved runway was first built in 1963, 2800 ft. long and 50 ft. wide; with an 8 inch rolled stone base and seal coat surface. In 1970, the runway was extended 700 ft. to the south with an 8 inch rolled stone base and 2 inch bituminous surface. Reportedly, the runway, taxiway and apron pavements were overlaid in 1977 with 2 inches of asphaltic concrete. A seal coat was placed on all pavements in 1984. The Iowa State Airport Pavement Management System report indicated that the pavement was evaluated in May of 1989. A Pavement Condition Index (PCI) was derived for each representative pavement area. The PCI's ranged from 68 (good condition) to 61 (good condition), with an average applied to all pavements of 62 (good condition). The PCI report also provides background on the survey process, an inventory of pavement feature data, summary of sample unit PCI and distress data, PCI for each feature, overall frequency of condition for years requested, and a five year budget plan estimating the annual rehabilitation dollars required to maintain a desired level of pavement condition. An asphalt paved apron, approximately 400 ft. X 225 ft. is located to the north of the runway connected by two 40 ft. taxiways. An area in front of the T-hangars, northwest of the apron is also paved.

Low Intensity Runway Lights (LIRL) are in place on R13/31. Runway End Identifier Lights (REIL) are installed for R31 approaches, in addition to runway threshold lights. Visual Approach Slope Indicator (VASI) equipment is available for both R13 and R31 approaches. Runway lights, REIL's, and VASI's are radio operated. A standard rotating beacon, landing direction indicator and wind sock are located northwest of the hangars and east of the runway northwest end.

Runway markings are in place on R13/31. A non-precision instrument approach to R31 with circling minimums of 1380-1 1/2 is based on a Non-Directional Beacon (NDB) located 1.6 NM southeast. An RNAV approach to R31 is also available for approaches to R31. Approach charts have been reproduced as Figures 1-7 and 1-8.

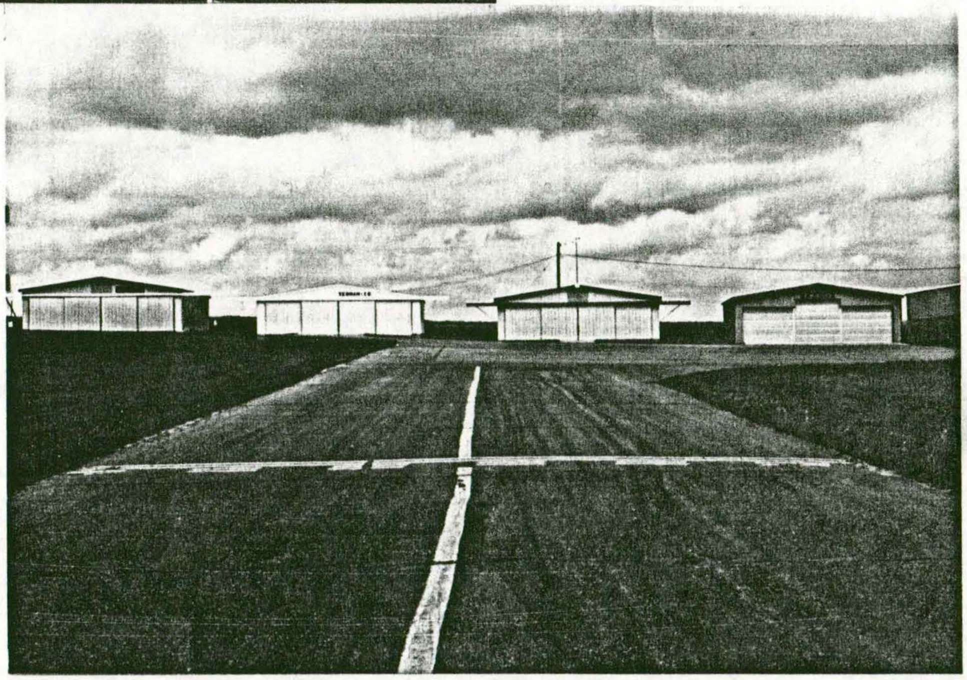
FAA Form 5010 notes the presence of obstructions in approaches and sidelines. These objects are penetrations of FAA established safety area; and should be removed when practicable to provide for optimum safety of flight operations. Higher visibility minimums may be established for both VFR and IFR operations if the obstructions are considered substantial. These higher minimums will result in restricted operations, and possibly missed flights into the airport. A sketch of the airport which is a part of FAA Form 5010, is shown as Figure 1-5.

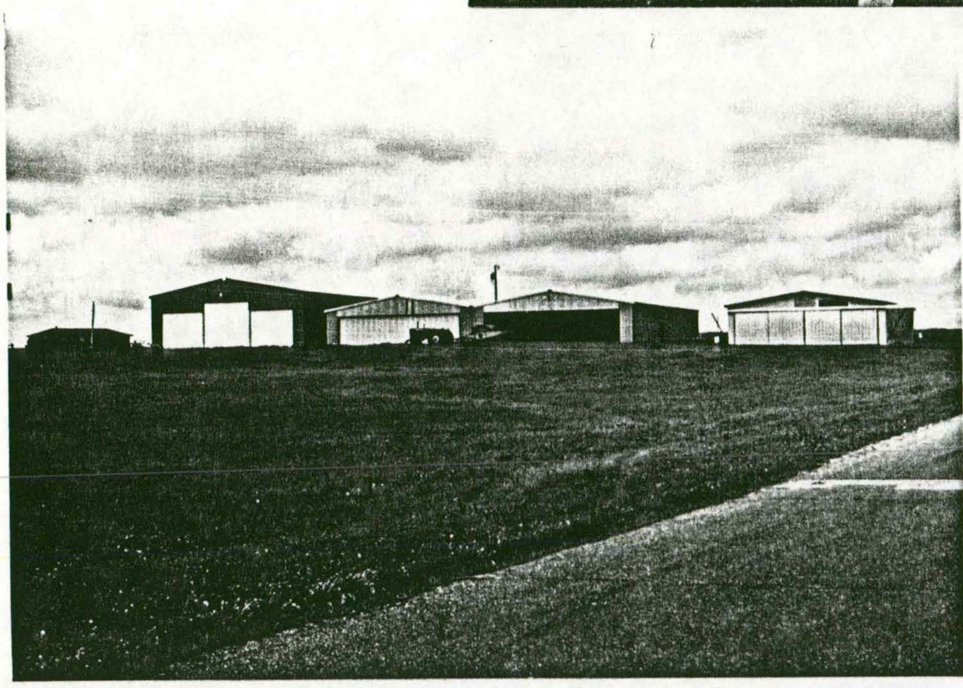
Hangar space for 13 aircraft is provided in six buildings adjacent to the apron. Additional T-hangar units have been planned. Reference may be made to Figure 1-6.

The apron area and adjacent turf has tie-downs for eight aircraft. The fixed-base-operator, Monticello Aviation, Inc., provides major airframe and engine service, aircraft rental, pilot and charter service, flight instruction and ground school courses. He is a certified Cessna dealer and Pilot Center. He also serves as full-time airport manager.

FIGURE 1-6:

AIRPORT HANGARS





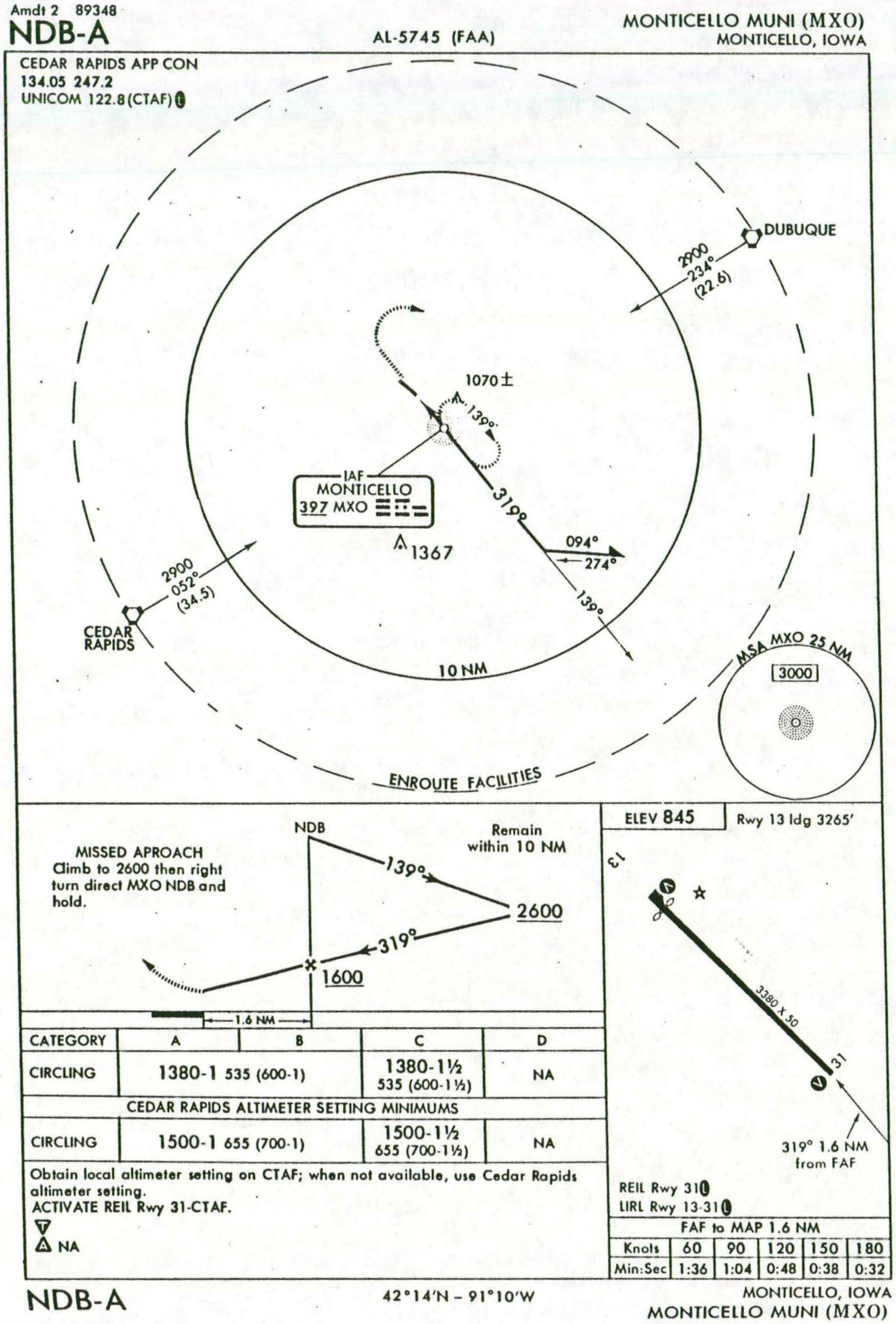


FIGURE 1-7: NDB-A

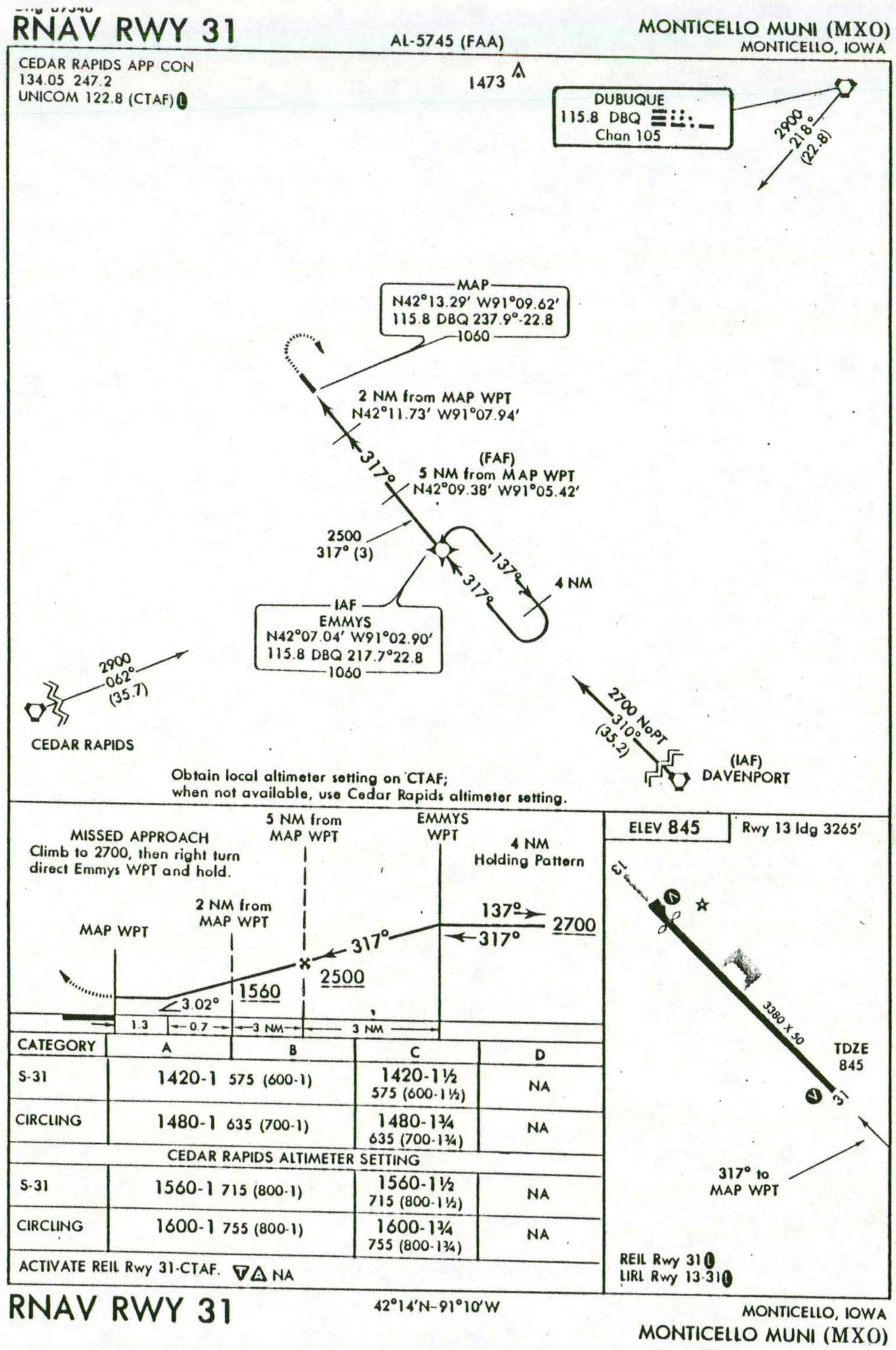


FIGURE 1-8: RNAV RWY 31

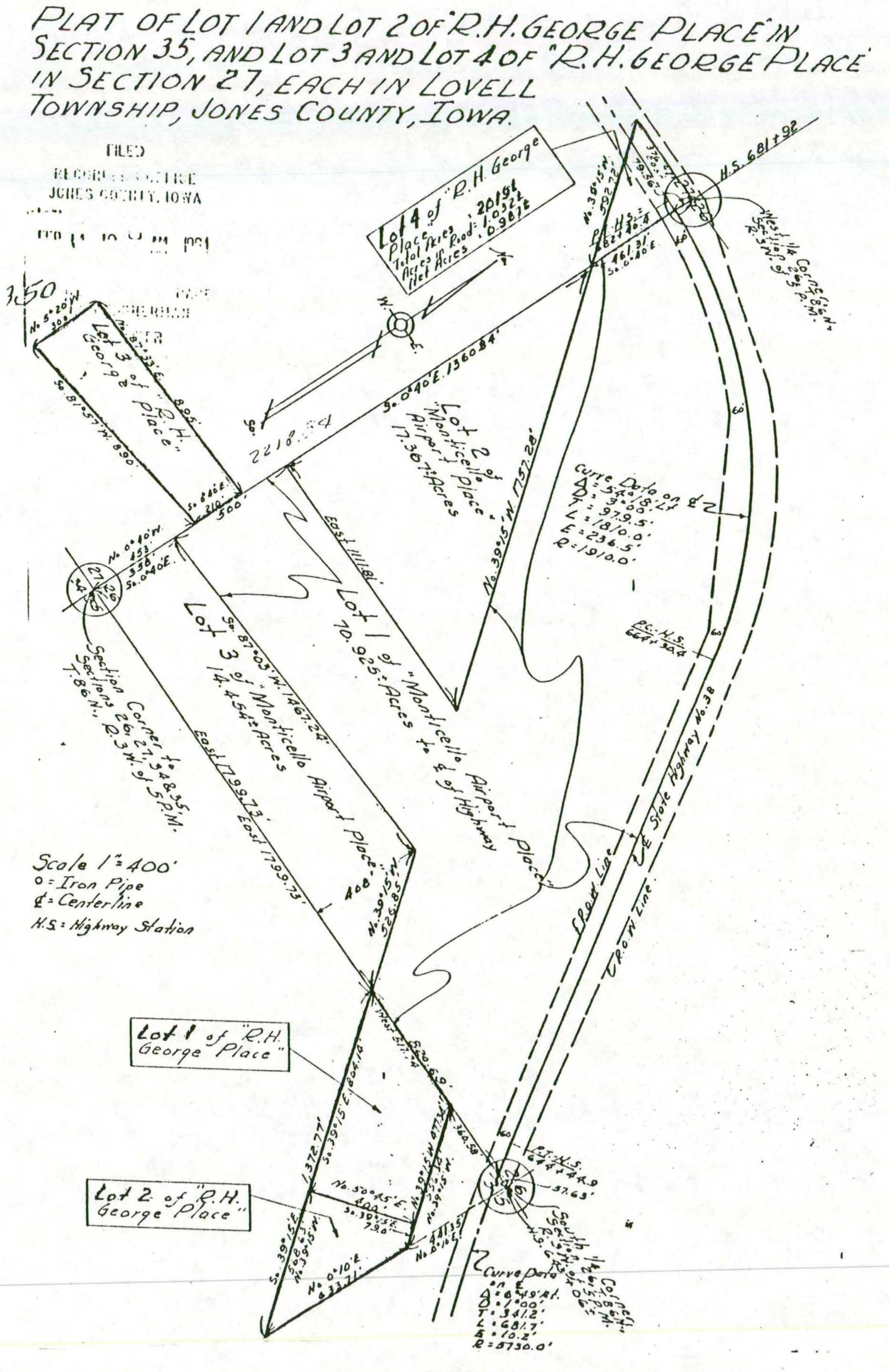


FIGURE 1-9: AIRPORT PLAT

Plat of Lot 1 and Lot 2 of "R. H. George Place" in Section 35, and Lot 3 and Lot 4 of "R. H. George Place" in Section 27, each in Lovell Township, Jones County, Iowa.

Dubuque, Iowa   January 24, 1964

I hereby certify the plat shown on Sheet 1 of 3 hereof is a true and correct plat of Lot 1 and Lot 2 of "R. H. George Place" in Section 35, and Lot 3 and Lot 4 of "R. H. George Place" in Section 27, each in Lovell Township, Jones County, Iowa, and is comprised of the tracts of land described as follows:

Lot 1 and Lot 2 of said "R. H. George Place" is in the Northwest One-Quarter of Section 35, Township 86 North, Range 3 West of 5th Principal Meridian,
Commencing at the Northwest Corner of said Section 35, thence
East, 1,799.73 feet to the point of beginning, thence
South 39° 15' East, 1,372.77 feet to the Quarter Section Line, thence
North 0° 10' East, along said Quarter Section Line, 633.71 feet, thence
North 39° 15' West, 556.34 feet to Section Line between Sections 26 and 35, thence
West along said section line 517.74 feet to point of beginning.

Lot 3 of said "R.H. George Place" is in the Southeast One-Quarter of Section 27, Township 86 North, Range 3 West of 5th Principal Meridian,
commencing at the Southeast Corner of said Section 27, thence
North 0° 40' West, 453.00 feet to point of beginning, thence
South 81° 57' West, 890.00 feet, thence
North 5° 20' West, 300.00 feet, thence
North 87° 33' East, 895.00 feet to Section Line between Sections 26 and 27, thence
South 0° 40' East, along said section line 210.00 feet to point of beginning.

Lot 4 of said "R. H. George Place" is in the Southeast One-Quarter of Section 27, Township 86 North, Range 3 West of 5th Principal Meridian,
beginning at the East One-Quarter Corner of said Section 27, thence
South 0° 40' East, 461.31 feet along section line between Sections 26 and 27, thence
North 39° 15' West, 592.72 feet to Quarter Section Line, thence
East, 376.91 feet along said Quarter Section Line to point of beginning, which Lot 4 is subject to the road right-of-way of the State of Iowa along State Highway No. 38;

all of the foregoing is as surveyed, platted, named and numbered by me.

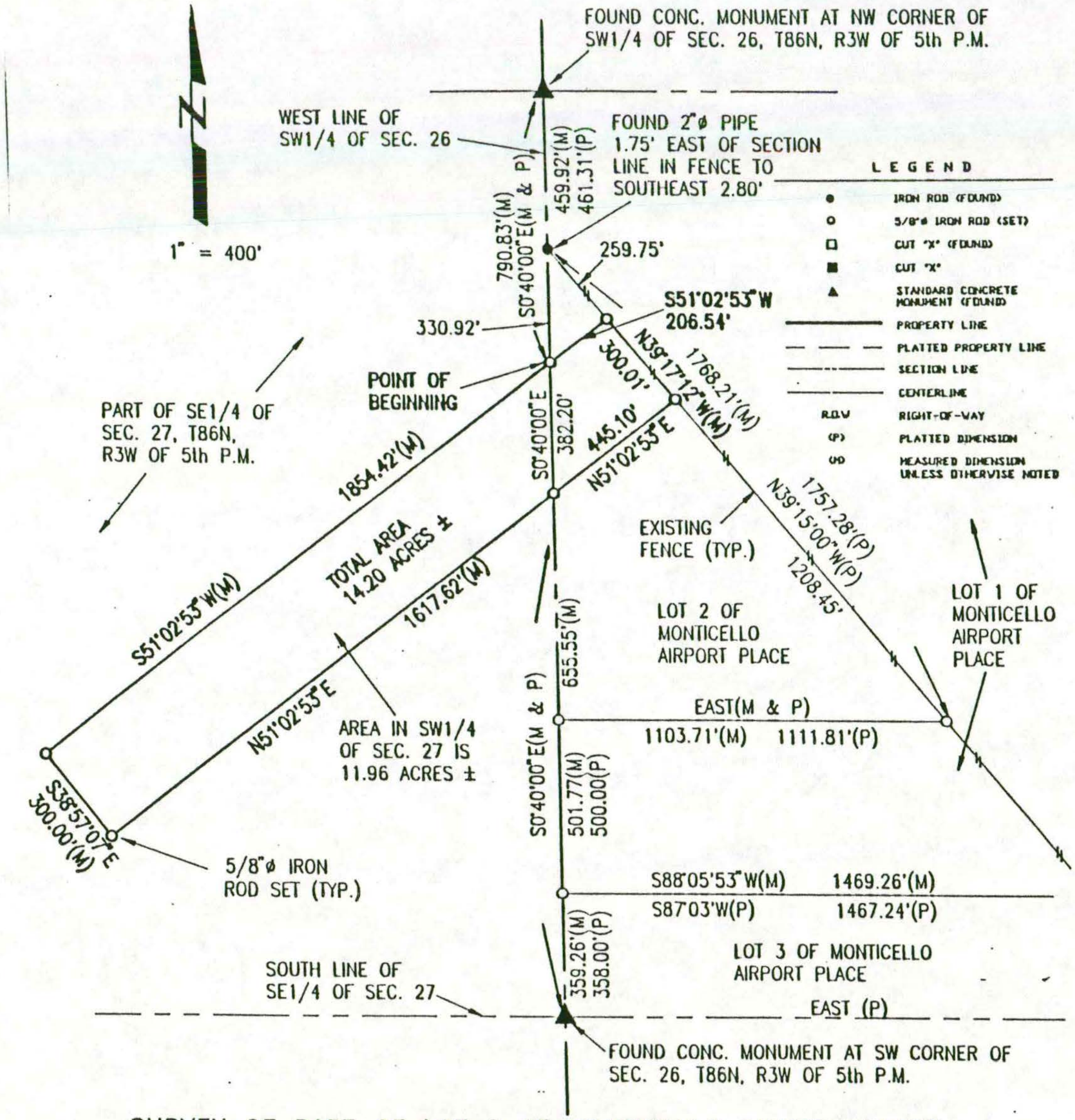
Bartels, McMahan & LeMay Engineering Co.

By *Carl F. Bartels*
Carl F. Bartels
Licensed Professional Civil Engineer & Land Surveyor

Monticello, Iowa   *JANUARY 29*, 1964

The foregoing plat of Lot 1 and Lot 2 of "R. H. George Place" in Section 35, and Lot 3 and Lot 4 of "R. H. George Place" in Section 27, each in Lovell Township, Jones County, Iowa, which is comprised of the tracts of land described as follows:

Lot 1 and Lot 2 of said "R. H. George Place" is in the Northwest One-Quarter of Section 35, Township 86 North, Range 3 West of 5th Principal Meridian,
commencing at the Northwest Corner of said Section 35, thence
East, 1,799.73 feet to the point of beginning, thence
South 39° 15' East, 1,372.77 feet to Quarter Section line, thence
North 0° 10' East, along said Quarter Section line, 633.71 feet, thence
North 39° 15' West, 556.34 feet to Section line between Sections 26 and 35, thence
West along said section line 517.74 feet to point of beginning.



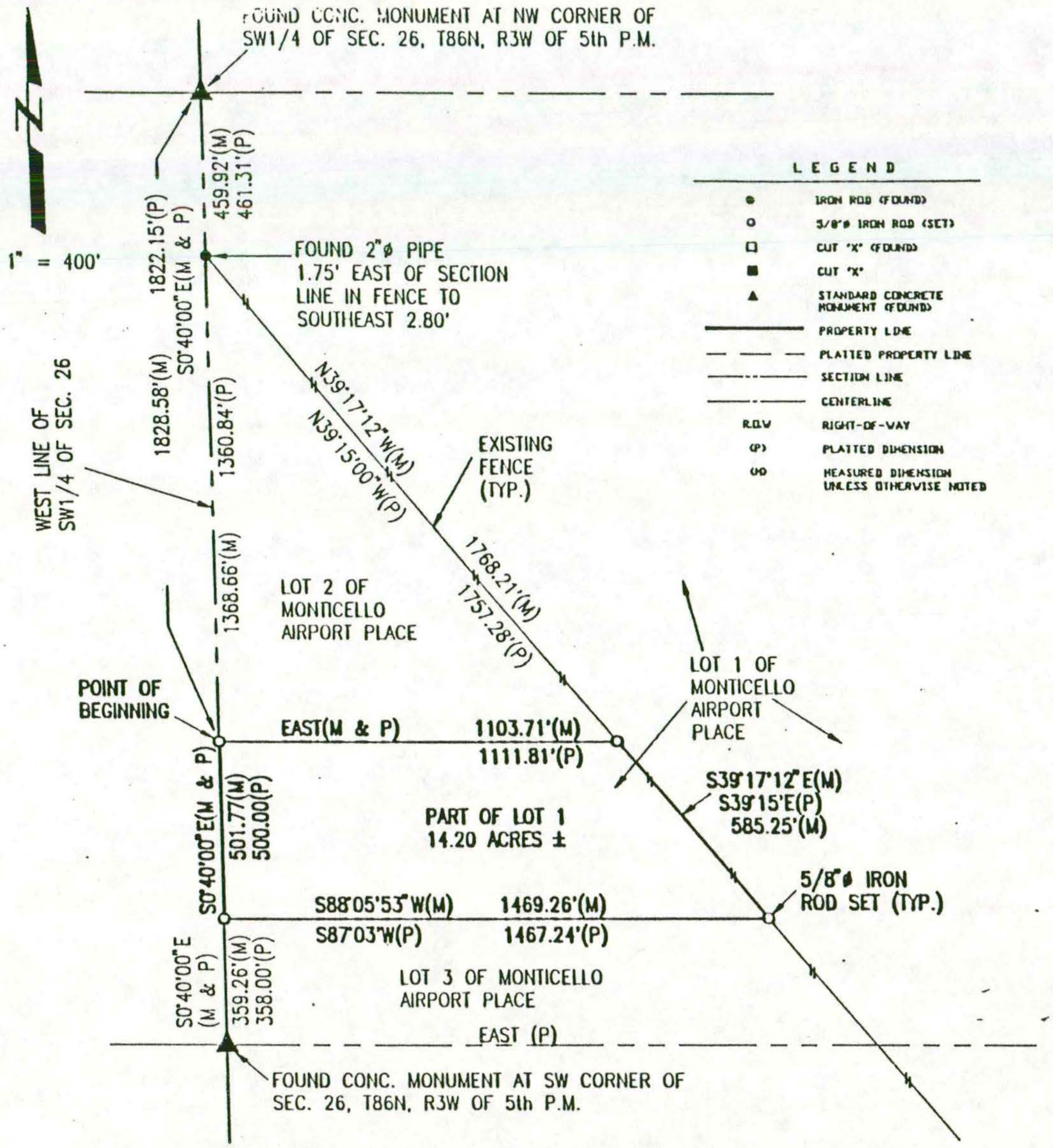
SURVEY OF PART OF LOT 2 OF MONTICELLO AIRPORT PLACE AND PART OF THE SE1/4 OF SECTION 27, T86N, R3W, OF 5th P.M. JONES COUNTY, IOWA

I hereby certify that on May 30, 1989 at the request of the City of Monticello, I supervised a survey of Part of Lot 2 of Monticello Airport Place and Part of the Southeast Quarter of Section 27, Township 86 North, Range 3 West of the Fifth Principal Meridian, Jones County, Iowa, and established the property lines and set iron rods at the corners noted and that this plat is correct and in accordance with the said survey.

David J. Elgin
Iowa Reg. No. 9216
May 30, 1989

SHIVE-HATTERY ENGINEERS AND ARCHITECTS, Inc. IOWA ILLINOIS TEXAS	SURVEY OF PART OF LOT 2 OF MONTICELLO AIRPORT PLACE & PART OF SE1/4 OF SEC. 27-86-3 JONES COUNTY, IOWA		SHEET 1
	DATE 7 JUNE 89	SCALE 1" = 400'	DWG. NO.
	DRAWN KDF	FIELD BOOK 827	189103-C
	REVIEWED DJE	REVISION	

FIGURE 1-10: LAND ACQUISITION



SURVEY OF PART OF LOT 1 OF MONTICELLO AIRPORT PLACE
JONES COUNTY, IOWA

I hereby certify that on May 30, 1989 at the request of the City of Monticello, I supervised a survey of Part of Lot 1 of Monticello Airport Place, Jones County, Iowa, and established the property lines and set iron rods at the corners noted and that this plat is correct and in accordance with the said survey.

David J. Elgin
Iowa Reg. No. 9216
May 30, 1989

SHIVE-HATTERY ENGINEERS AND ARCHITECTS, INC. IOWA ILLINOIS TEXAS	SURVEY OF PART OF LOT 1 OF MONTICELLO AIRPORT PLACE JONES COUNTY, IOWA		SHEET 1
	DATE 7 JUNE 89	SCALE 1" = 400'	DWG. NO.
	DRAWN KDF	FIELD BOOK 827	189103-0
	REVIEWED DJE	REVISION	

FIGURE 11: LAND DISPOSAL

AIRPORT SYSTEMS

State System of Airports

The 1985 Iowa Aviation System Plan includes all 112 public owned airports in Iowa. These airports provide access to the national system of airports by scheduled commercial carriers, air taxi, and general aviation aircraft. Of the 112 airports, eleven are classified as commercial airlines. The remaining 101 airports are served by air taxi and accommodate general aviation aircraft ranging in size from a single engine aircraft to jet aircraft.

The state system of airports consists of five service classifications which are defined as follows:

General Aviation III:	Provides access to Iowa communities supporting low activity levels.
General Aviation II:	Provides access to Iowa's market and population centers requiring service by limited numbers of business jets and single engine or light twin engine aircraft.
General Aviation I:	Provides access to Iowa's market and population centers requiring significant service by business jets and twin engine piston or turbo aircraft.
Commercial Service II:	Provides scheduled passenger service by commuter aircraft.
Commercial Service I:	Provides scheduled passenger service by transport aircraft and qualifies for Federal primary airport improvement funding.

Each of the 112 airports within the system were placed in a service classification. The 1985 Iowa Aviation System Plan also developed design standards for each of the service classifications.

The state system airports are listed by service and design classification in Table 1-8.

TABLE 1-8: IOWA AIRPORT SERVICE AND DESIGN CLASSIFICATION

Type Service	Commercial Service		General Aviation Airports				
Service Classification	Commercial Service I	Commercial Service II	General Aviation I	General Aviation II		General Aviation III	
Design Classification	General Transport	Basic Transport	Basic Transport	General Utility	Basic Utility-II	Basic Utility-I Paved	Basic Utility-I Turf
	Cedar Rapids	Burlington	Algona	Atlantic	Albia	Corning	Akron
	Des Moines	Clinton	Ames	Boone	Audubon	Cresco	Allison
	Sioux City	Dubuque	Carroll	Chariton	Bloomfield	Milford	Anita
	Waterloo	Fort Dodge	Council Bluffs	Charles City	Centerville	New Hampton	Bedford
		Mason City	Creston	Cherokee	Clarion	Onawa	Belmond
		Ottumwa	Davenport	Clarinda	Eagle Grove	Osage	Eldora
		Spencer	Denison	Decorah	Emmetsburg	Rockwell City	Grundy Center
			Forest City	Estherville	Greenfield	Sibley	Guthrie Center
			Iowa City	Fairfield	Humboldt	Waukon	Hartley
			Keokuk	Fort Madison	Ida Grove		Hawarden
			Marshalltown	Grinnell	Iowa Falls		Keosauqua
			Muscatine	Hampton	Manchester		Lake Mills
			Newton	Harlan	Mapleton		Lamoni
				Independence	Maquoketa		Manning
				Jefferson	Oelwein		Monona
				Knoxville	Osceola		Mount Ayr
				Le Mars	Pella		Northwood
				Monticello	Rock Rapids		Paullina
				Mount Pleasant	Sac City		Primghar
				Orange City	Sioux Center		Sully
				Oskaloosa	Tipton		Toledo
				Perry	Vinton		Traer
				Pocahontas	Washington		Wall Lake
				Red Oak	Waverly		Woodbine
				Sheldon	West Union		
				Shenandoah	Winterset		
				Spirit Lake			
				Storm Lake			
				Webster City			

SOURCE: 1985 IOWA STATE AVIATION SYSTEM PLAN

The Monticello Municipal Airport was identified as a General Aviation II, General Utility airport in terms of service classification. The Monticello Municipal Airport should support facility development as outlined in Table 1-8. Cedar Rapids was placed in the Commercial Service I classification and General Transport design. Dubuque is classified as Commercial Service II and Basic Transport design.

Table 1-9 summarizes minimum development standards by service classification. Development standards/guides for Monticello (GAII-GU) suggest that an adequate level of service would be provided by a primary runway facility 4,000 feet in length and 75 feet in width. A turf crosswind runway 3,400 feet in length and 150 feet in width would supplement service.

TABLE 1-9: IOWA AIRPORT DEVELOPMENT GUIDES

Type Service	Commercial Service		General Aviation Airports				
Service Classification	Commercial Service I	Commercial Service II	General Aviation I	General Aviation II		General Aviation III	
Design Classification	General Transport	Basic Transport	Basic Transport	General Utility	Basic Utility-II	Basic Utility-I Paved	Basic Utility-I Turf
Primary Runway							
Length	*Critical Aircraft	5,000	5,000	4,000	3,400	3,400	2,720
Width	150	100	100	75	60	60	120
Surface	Hard	Hard	Hard	Hard	Hard	Hard	Turf
Taxiway	Full Parallel	Full Parallel	Partial Parallel	Turnaround	Turnaround	Turnaround	None
Secondary Runway							
Length	Same as Primary	4,000	4,000	3,400	2,720	2,720	None
Width	150	75	75	150	120	120	—
Surface	Hard	Hard	Hard	Turf	Turf	Turf	—
Taxiway	Full Parallel	Turnaround	Turnaround	None	None	None	—
Primary Runway Lights							
Edge-Intensity	HIRL	MIRL	MIRL	MIRL	MIRL	MIRL	LIRL
End Identifier	Yes	Yes	Yes	Yes	Varies	Varies	No
VASI	Yes	Yes	Yes	Yes	Varies	Varies	No
Approach	Yes	Yes	Varies	No	No	No	No
Navaids							
Beacon	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Seg. Circle	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lighted Wind Indicator	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NDB	Yes	Yes	Yes	Yes	Yes	Yes	—
Land							
Title	420	300	300	170	120	120	80

* Critical Aircraft: Aircraft which requires the greatest runway development.

SOURCE: 1985 IOWA STATE AVIATION SYSTEM PLAN

Consideration may be given to hard surfacing the crosswind runway, thereby exceeding the minimum level of service provided by a turf facility. At low activity airports, the benefit/cost associated with the hard surfacing of the crosswind runway may be questionable since less than 15 percent of the operations would typically be conducted on that runway. For planning purposes, ultimate development of the crosswind runway should be contemplated, but may be considered a low priority improvement unless aviation activity would merit construction.

National Plan of Integrated Airports

The federal airport system consists of those airports; public, civil, and joint use (military/civil) within the U.S. and its territories considered necessary to provide a system of airports adequate to anticipate and meet the needs of the nation's civil aeronautics. Criteria for inclusion in the NPIAS is as follows:

> "An airport that was included in the predecessory to the current Plan should remain in the Plan if it is subject to a current compliance obligation resulting from a FAAP or ADAP grant."

> "An existing airport that is included in an accepted SASP or RASP may be included in the Plan if it has at least 10 based aircraft and services a community located 30 minutes or more average ground travel time from the nearest existing or proposed Plan airport. Proposed airports to serve such communities will be included if there is clear evidence that at least 10 aircraft will be based at the airport within the first year of its operation."

The Federal Aviation Administration (FAA), recognizing the need to reduce overall airport development costs, developed the airplane design group concept linking airport requirements to using aircraft. Consequently, FAA AC 150-5300-13 presents dimensional criteria by airplane design groups, based upon aircraft approach speed and wingspan.

Basic Utility Stage One	This type of airport serves 75 percent of the single-engine and small twin-engine airplanes used for personal and business purposes. Precision approach operations are not usually anticipated. This airport is designed for small airplanes in Airport Reference Code B-I.
Basic Utility Stage Two	This type of airport serves all the airplanes of stage I, plus some small business and air-taxi type twin-engine airplanes. Precision approach operations are not usually anticipated. This airport is also designed for small airplanes in Airport Reference Code B-I.

General Utility Stage One	This type of airport serves all small airplanes. Precision approach operations are not usually anticipated. This airport is designed for airplanes in Airport Reference Code B-II.
General Utility Stage Two	This type of airport serves large airplanes in Aircraft Approach Category A and B and usually has the capability for precision approach operations. This airport is normally designed for Airport Reference Code B-III.
Transport	An airport designed, constructed, and maintained to serve airplanes in Aircraft Approach Category C and D.

Area Airport Facilities

Table 1-10 summarizes existing conditions for selected airports that are part of the state aviation system. These airports both complement and compete with the Monticello Municipal Airport.

TABLE 1-10: AREA AIRPORT FACILITIES - MONTICELLO, MAQUOKETA, DYERSVILLE, MANCHESTER, CEDAR RAPIDS, AND DUBUQUE

	Monticello	Maquoketa	Tipton	Manchester	Cedar Rapids	Dubuque
Ownership	City	City	City	City	City	City
Elevation	845	770	840	987	864	1076
Longitude	091-10-00W	90-45-00	91-09-10	91-29-54	91-42-31	90-42-33
Latitude	42-14-00N	42-03-00	41-45-48N	42-29-36	41-53-04	42-24-11
Acreage	71	---	68	56	2914	1059
Runway	13/31	15/33	11/29	18/36	9/27	13/31
Length	3500	3300	3000	3000	7000	6498
Width	50	60	60	50	150	150
Surface	Asphalt	Asphalt	Conc	Asphalt	Asphalt	Asphalt
Gross Weight (000)	12 SW	---	---	---	100 SW 174 DW 300 DTW	75 SW 125 DW 215 DTW
Lighting	LIRL	---	MIRL	LIRL	HIRL	HIRL
Marking	NPI/NPI	---	Basic	Non-Standard	PIR/PIR	PIR/PIR
VASI/PAPI	V2L/V2L	Yes/Yes	N/N	N/N	Y/Y	Y/N
REIL	-/Yes	Yes/Yes	N/N	N/N	N/Y	N/N
Secondary						
Runway	5/23	---	---	---	13/31	18/36
Length	2000	---	---	---	5450	4902
Width	120	---	---	---	150	150
Surface	Turf	---	---	---	Asphalt	Concrete
Gross Weight	---	---	---	---	100 SW 174 DW 300 DTW	70 SW 85 DW
Lighting	---	---	---	---	MIRL	MIRL
Marking	Boundary	---	---	---	---	NPI
Beacon	Yes	Yes	No	Yes	Yes	Yes
NDB	Yes	Yes	No	No	Yes	Yes
Wind Indicator	Yes	---	Yes	Yes	Yes	Yes
Based						
Aircraft	12	---	7	3	138	36
S.E.	10	---	7	3	112	23
M.E.	2	---	0	0	18	13
Jet	0	---	0	0	8	0

SOURCE: FAA FORM 5010

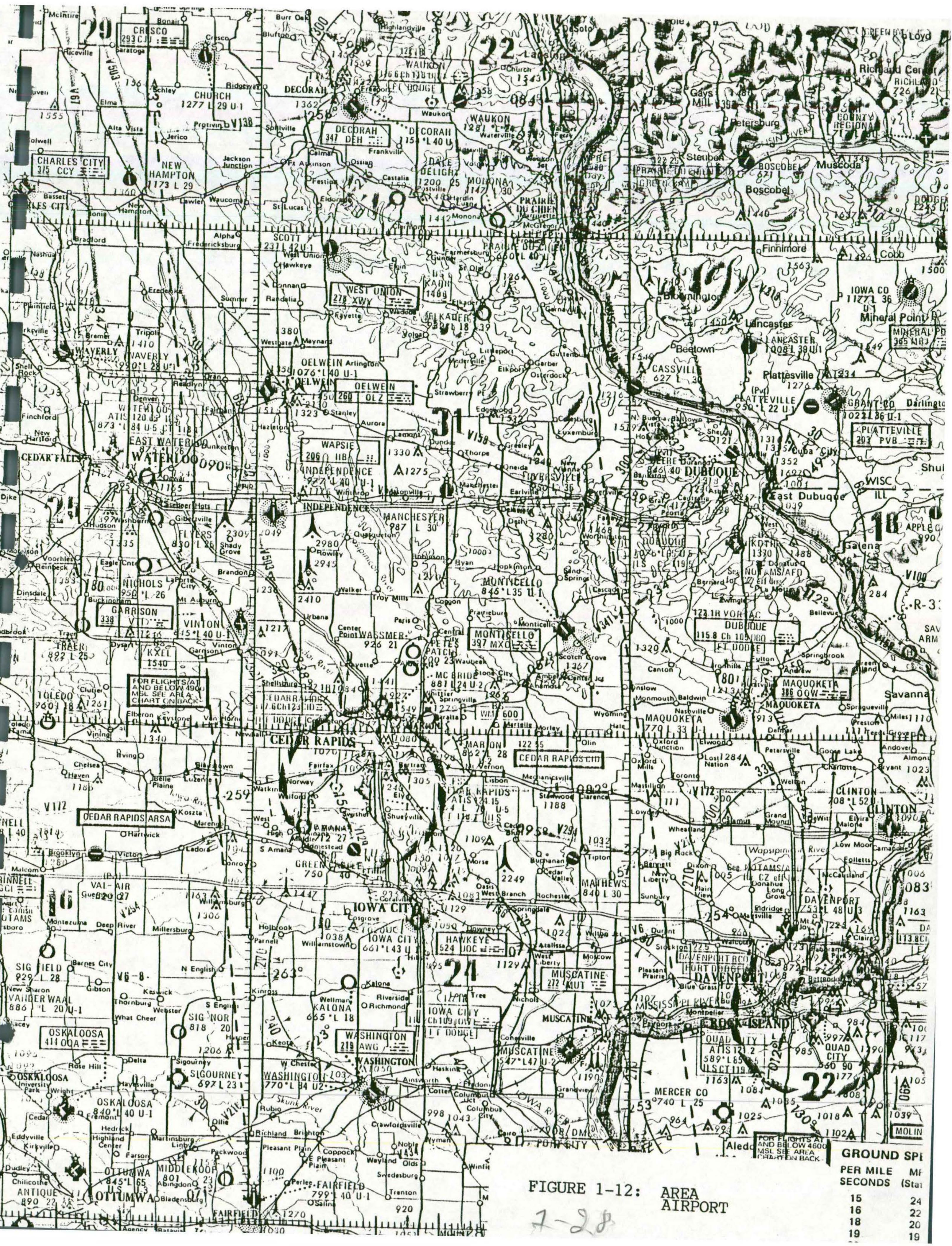


FIGURE 1-12: AREA AIRPORT

1-28

PLAN SURVEY

MONTICELLO MUNICIPAL AIRPORT

Surveys returned: 18

1. Is the Monticello Municipal Airport an important community facility in terms of attracting new industry?
   A. YES - 13
   B. NO - 2
   C. SOMEWHAT IMPORTANT - 3

2. Is the Monticello Municipal Airport an asset in keeping the business and industry from relocating?
   A. YES - 13
   B. NO - 4
   C. NO RESPONSE - 1

3. Within your place of business or employment, how many jobs are directly and indirectly dependent to some degree upon the availability of general aviation?

NUMBER	A. DIRECTLY	B. INDIRECTLY
0-5	15	12
6-10	1	2
11-25	1	1
26-50	0	0
51+	0	1
Other	0	1
No Response	1	1

4. Is the expansion of your place of business dependent to some degree upon having an adequate airport facility?
   A. YES - 5
   B. NO - 9
   C. SOMEWHAT DEPENDENT - 4

5. Is the airport used by our business or place of employment for the following?
   A. Shipment of spare parts, products, supplies, etc. (incoming or outgoing)
   YES: 5 NO: 9 NO RESPONSE: 2

   B. Management, marketing, and sales personnel
   YES: 9 NO: 8 NO RESPONSE: 1

6. Does your business or place of employment own and operate an airplane.
   A. YES - 13
   B. NO - 5

7. If your business or place of employment operates an aircraft how many operations are conducted within the average week/month?
   A. Average week - 4
   B. Average month - 4-20

8. Do you use or would you consider using air taxi service for business transportation?
   A. Do use currently?
      Yes - 3
      No - 4
      No Response - 11
   B. Will consider using air taxi services in the future?
      Yes - 11
      No - 5
      No Response - 1

9. Do others use aircraft as a mode of transportation to reach your place of business in Monticello?
   A. YES - 9
   B. NO - 9

10. Should an industrial park be developed adjacent to the airport?
   A. YES - 6
   B. NO - 4
   C. NO RESPONSE - 7

11. Are the following of importance to your community?
   A. Air Ambulance
      YES - 13
      NO - 2
      NO RESPONSE - 3

   B. Transport of medical personal
      YES - 14
      NO - 2
      NO RESPONSE - 2

   C. Law Enforcement
      YES - 11
      NO - 4
      NO RESPONSE - 3

   D. Crop dusting & Agricultural Services
      YES - 10
      NO - 5
      NO RESPONSE - 3

   E. Other - Business
      YES - 13
      NO - 2
      NO RESPONSE - 3

AVIATION DEMAND

CHAPTER TWO

FORECAST OF AVIATION DEMAND

INTRODUCTION

Forecast Methodology

The forecast of aviation activity provides a basis by which to evaluate present facility service capabilities against immediate and long range aviation activity. Consequently, unmet needs that exist can be identified and the service level of the facility improved. Facility improvements must be evaluated within the context of benefits and costs. The forecast of aviation activity then provides a basis by which to:

- Identify unmet facility needs
- Examine benefits and costs
- Identify a point in time when a specific improvement may be contemplated

Consideration should be given to distinguishing the difference between present activity and potential activity or demand. The forecast of aviation demand should be based upon the potential demand within the airport service area. In estimating potential demand, consideration must be given to a number of variables which influence demand within the airport service area.

- Aircraft ownership (registered aircraft)
- Pilots
- Population change income
- Labor force characteristics
- Major industrial and business users
- Existing airport facilities and services (FBO)
- Area airport facilities and services, state system

Economic activity within the airport service area along with area airport facilities and services are the more important variables influencing aviation demand. In relatively small communities, the addition or elimination of a single industry can substantially change the level of aviation activity. In large communities, a plant opening or closure may have less impact upon total usage due to the mix of activity found.

Aircraft ownership is influenced by socioeconomic trends within the airport service area as well as the cost associated with aircraft ownership. Nationally, general aviation has undergone a major change with long-term growth of the active fleet slowing down. The FAA reported that for the period 1980 through 1986, the active general aviation fleet grew at a relatively constant annual rate of only 0.01 percent. An active aircraft is one that is flown at least one hour during the previous year. Production of a new aircraft has also declined with 1495 units being shipped in 1986 compared to 17,811 units in 1978. The slow down in historic growth of the general aviation fleet is influenced by a number of variables.

"Factors such as the availability of low cost alternatives for recreational flying, changes in taster and preferences, declining student and private pilot populations, rapidly rising prices and operating costs of conventional aircraft, and continued high interest rates may all be contributing to the downtown."

SOURCE: FAA, FAA Aviation Forecasts, FY1988 -1999, FAA-/APO-88-1, February, 1988, page 71

Future aircraft ownership within the airport service area is expected to reflect national trends.

The forecast of aviation activity will also be influenced by the extent of facility development and accessibility of the airport site to the user. The assumption made herein that the existing airport site would be retained. Should in later phases of the planning process it be determined that the existing site can not be developed and an alternative site is selected, activity may be more or less than the estimates provided within the forecast data.

A final consideration falls within the realm of individual choice. The decision to base an aircraft at one facility or another is influenced by the extent of facility development and services provided. For example, the availability of aircraft storage facilities and associated costs are important considerations in basing an aircraft as are services provided by the Fixed Base Operator (FBO).

Touch and go operations generated by student traffic may be largely due in part to efforts by the FBO in promoting aviation while itinerant traffic is influenced by economic activity within the airport service area. The decision to travel or transport an item from one point to another is based upon a number of factors.

- Distance and accessibility, isolation
- Trip purpose and cost
- Availability of other modes

National Trend

The total number of general aviation aircraft within the United States increased form 198,800 in 1979 to 213,200 in 1982. A decrease in the number of general aviation aircraft was recorded in 1983 followed by annual increases in 1984 and 1985. As of January 1, 1989, the general aviation fleet consisted of 210,266 aircraft.

Of the 210,266 active general aviation aircraft 78.4 percent were single engine piston powered aircraft. Multi-engine piston aircraft compromised 10.8 percent of the fleet in 1989 followed by rotorcraft with 3.0 percent. While the number of single and twin engine piston powered aircraft experienced little growth, the turbine-powered fleet recorded an annual growth of 1.2 percent, from 6,333 to 6,406.

The total active general aviation aircraft fleet is expected to grow

TABLE 2-1: ACTIVE GENERAL AVIATION AIRCRAFT

ACTIVE GENERAL AVIATION AIRCRAFT
(In Thousands)

AS OF JANUARY 1	FIXED WING: PISTON: SINGLE ENGINE	FIXED WING: PISTON: MULTI-ENGINE	FIXED WING: TURBOPROP	FIXED WING: TURBOJET	ROTORCRAFT: PISTON	ROTORCRAFT: TURBINE	OTHER	TOTAL
Historical*								
1985	171.9	25.5	5.8	4.3	2.9	4.2	6.3	220.9
1986	164.4	23.8	5.4	4.4	2.9	3.5	6.3	210.7
1987	171.8	23.9	6.0	4.5	2.9	4.0	7.0	220.0
1988	171.0	23.4	5.3	4.4	2.8	3.5	6.8	217.2
1989E	164.8	22.8	5.3	4.2	2.6	3.8	6.9	210.3
Forecast								
1990	166.2	22.8	5.5	4.3	2.5	4.5	7.1	212.9
1991	167.0	22.6	5.7	4.6	2.6	4.7	7.4	214.6
1992	167.7	22.5	5.8	4.8	2.6	5.3	7.7	216.4
1993	167.7	22.4	5.9	5.0	2.5	5.5	8.0	217.0
1994	167.0	22.4	6.1	5.3	2.4	5.9	8.3	217.4
1995	166.5	22.5	6.4	5.6	2.4	6.2	8.6	218.2
1996	166.0	22.6	6.7	5.9	2.4	6.6	8.9	219.1
1997	165.5	22.7	6.9	6.1	2.4	7.1	9.0	219.7
1998	165.2	22.8	7.1	6.3	2.3	7.3	9.2	220.2
1999	165.0	22.9	7.3	6.5	2.2	7.7	9.3	220.9
2000	164.7	23.0	7.5	6.7	2.2	8.1	9.5	221.7
2001	164.4	23.1	7.7	6.9	2.1	8.5	9.7	222.4

* Source: FAA Statistical Handbook of Aviation

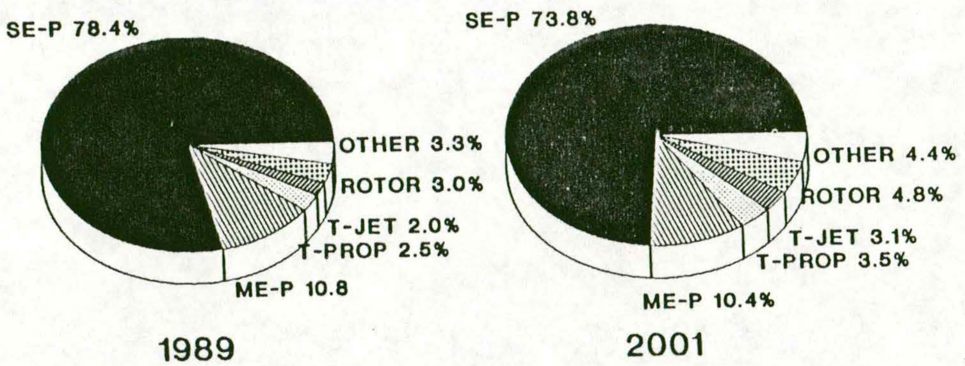
Notes: Detail may not add to total because of independent rounding.
An active aircraft must have a current registration and it must have been flown at least one hour during the previous calendar year.

slowly over the entire forecast period. An annual growth of 0.6 percent from 1990 to 1995 and annual growth of 0.3 percent from 1996 through 2001.

As noted in Table 2-1 and Figure 2-1, the composition of the fleet is also expected to change. The number of single engine piston aircraft is expected to decline at annual rate of 0.1 percent. The multi-engine piston aircraft is expected to decline through 1994 and then increase at 100 units per year, with an annual growth rate of 0.1 percent. The number of turbine powered aircraft is projected to increase at an annual rate of 3.6 percent through 2001.

As noted in Figure 2-1, single engine piston aircraft will make up 73.8 percent of the active fleet in 2001 compared to 78.4 percent in 1989. Turbo-prop and jet will increase comprising 6.6 percent of the total fleet in 2001 compared with 4.5 percent in 1989.

FIGURE 2-1: PERCENT BY AIRCRAFT TYPE



SOURCE: FAA, FAA Aviation Forecasts, FY1990-2001, FAA-APO 90-1, pg. 100

Approximately 33.9 million total hours were flown by general aviation aircraft in FY1989. Single engine piston aircraft accounted for 65.1 percent of all hours flown, multi-engine piston aircraft, 12.7 percent; turbine-powered aircraft, 12.1 percent; and rotorcraft 8.3 percent. Total hours flown by general aviation aircraft increased at an annual rate of 1.2 percent within the period 1987 to 1989. Reference may be made to Table 2-2 and Figure 2-2.

TABLE 2-2: GENERAL AVIATION HOURS FLOWN

GENERAL AVIATION HOURS FLOWN

(In Millions)

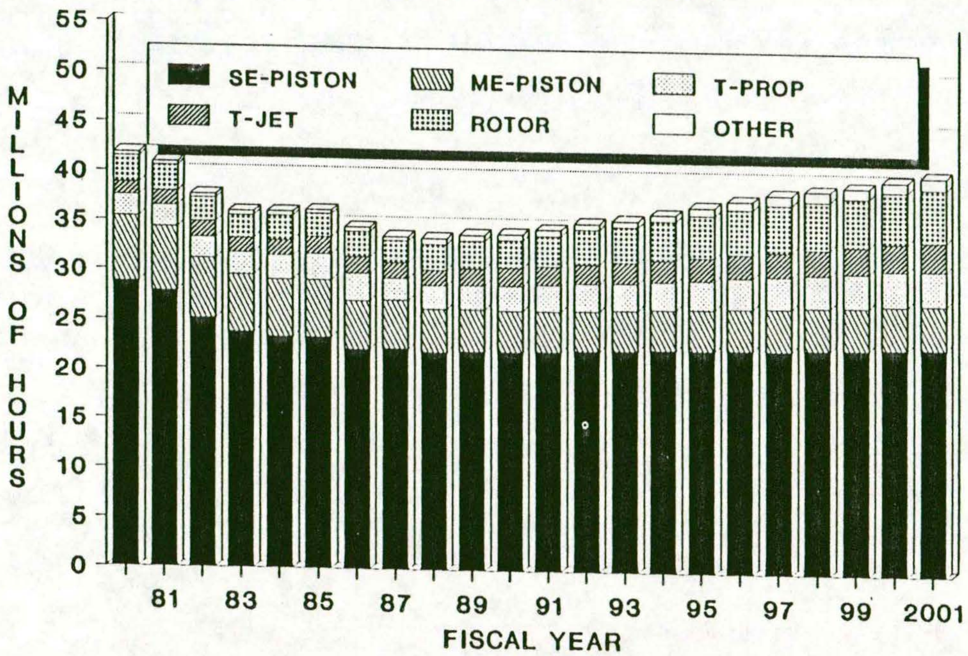
FISCAL YEAR	FIXED WING: PISTON SINGLE ENGINE	FIXED WING: PISTON MULTI-ENGINE	FIXED WING: TURBOPROP	FIXED WING: TURBOJET	ROTORCRAFT: PISTON	ROTORCRAFT: TURBINE	OTHER	TOTAL
Historical*								
1985	23.4	5.7	2.6	1.8	0.6	1.7	0.4	36.2
1986	22.2	4.9	2.7	1.7	0.8	1.8	0.4	34.5
1987	22.3	4.9	2.2	1.6	0.6	1.6	0.4	33.6
1988	22.0	4.4	2.3	1.6	0.6	2.0	0.6	33.5
1989E	22.1	4.3	2.4	1.7	0.5	2.3	0.6	33.9
Forecast								
1990	22.1	4.2	2.5	1.8	0.5	2.3	0.6	34.0
1991	22.2	4.1	2.6	1.9	0.5	2.6	0.6	34.5
1992	22.3	4.1	2.7	2.0	0.5	3.0	0.6	35.2
1993	22.4	4.1	2.7	2.1	0.6	3.0	0.6	35.5
1994	22.5	4.1	2.8	2.2	0.6	3.4	0.6	36.2
1995	22.5	4.2	2.9	2.3	0.6	3.7	0.8	37.0
1996	22.6	4.2	3.1	2.4	0.6	4.0	0.8	37.7
1997	22.6	4.3	3.2	2.5	0.5	4.3	1.0	38.4
1998	22.7	4.3	3.3	2.6	0.5	4.4	1.0	38.8
1999	22.8	4.3	3.4	2.7	0.5	4.5	1.0	39.2
2000	22.9	4.4	3.5	2.8	0.5	4.8	1.0	39.9
2001	23.0	4.4	3.5	2.9	0.5	4.9	1.2	40.4

* Source: FAA Statistical Handbook of Aviation

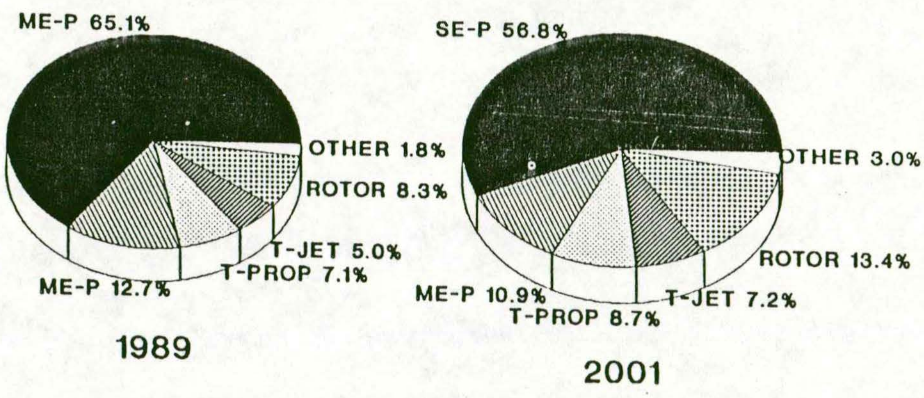
Notes: Detail may not add to total because of independent rounding.

compared to 33.9 million hours recorded in 1989. Reference may be made to Figure 2-2 which illustrates past and future changes in hours flown by general aviation aircraft.

FIGURE 2-2: GENERAL AVIATION HOURS FLOWN



PERCENT BY AIRCRAFT TYPE



SOURCE: FAA, FAA Aviation Forecasts, FY1990-2001, FAA-APO 90-1, pg. 102

The FAA estimates that the number of hours flown by general aviation aircraft through 2001 will increase at an average annual rate of 1.5 percent. By 2001 hours flown by general aviation aircraft is expected to approach 40.4 million.

Iowa Trends

Aviation activity in Iowa has also experienced considerable change. Table 2-3 summarizes the number of aircraft registered in the State of Iowa from FY74 through FY86. As noted, the number of aircraft experienced a continual increase to 1979 when 3,530 aircraft were registered in the State. Beginning in 1980, the number of aircraft registered has experienced a continual decrease with 3,079 aircraft registered in FY84, 2,962 in FY85, 2,925 in FY86, 2,599 in FY87, and 2,535 in FY88.

TABLE 2-3: REGISTERED AIRCRAFT, IOWA, FISCAL YEAR 1974-1988

YEAR	AIRCRAFT	YEAR	AIRCRAFT
1974	2,565	1982	3,417
1975	2,620	1983	3,335
1976	3,144	1984	3,099
1977	3,308	1985	2,962
1978	3,492	1986	2,962
1979	3,530	1987	2,599
1980	3,492	1988	2,535
1981	3,417	1989	

SOURCE: IDOT, AERONAUTICS DIVISION, 1989 (Airworthy Aircraft)

Annual changes in aircraft ownership parallel economic changes. As the Gross State Product in real terms begins to grow in a positive direction, the number of aircraft may also increase. Historically, as the Gross State Product increased, so did the number of registered general aviation aircraft. This historic pattern however is expected to undergo some changes and are expected to reflect national trends. Consequently, the number of general aviation aircraft registered within the State of Iowa is expected to be somewhat less than that estimated in the 1985 State Aviation System Plan.

TABLE 2-4: REGISTERED AIRCRAFT, IOWA, 1988-2007

YEAR	IDOT (1)	PDS (2)
1985	2,962	2,962
1988	----	2,974
1990	----	2,948
1992	3,250	2,948
1997	----	2,986
2000	3,875	3,000
2005	4,200	3,000
2007	----	3,000

SOURCE: (1) IOWA DEPARTMENT OF TRANSPORTATION
(2) PROFESSIONAL DESIGN SERVICES OF IOWA, INC.

Regional Trends

A seven county area was selected for a more indepth comparative assessment than that provided by a review of statewide trends. Table 2-5 summarizes registered general aviation aircraft by county for the period 1984 through 1990. The number of registered aircraft within the seven county area decreased from 435 aircraft in 1984 to 228 in 1990. As of May 1990 there were 228 registered aircraft within the seven county area.

TABLE 2-5: REGISTERED AIRCRAFT, SELECTED COUNTIES, 1984-1990

				YEAR			
COUNTY	1984	1985	1986	1987	1988	1989	1990
Cedar	9	10	9	11	11	9	6
Clinton	29	27	26	23	25	25	16
Dubuque	93	89	76	65	54	71	41
Delaware	5	6	7	7	9	9	7
Jackson	22	19	15	14	14	15	8
Linn	257	263	251	254	238	270	138
Jones	20	19	16	16	13	13	12
TOTAL	435	433	400	390	364	412	228
Jones County as % of total	4.6%	4.4%	4.0%	4.1%	3.6%	3.2%	5.3%

SOURCE: FAA, Census of U.S. Civil Aircraft, December 31, 1984-1988
IDOT Air and Transit, June 1989 and May 1990

In 1990 Linn recorded 60.5% of the total registered aircraft followed by Dubuque with 18.0% of the total. Nearly 7.0% percent of the area aircraft were registered in Clinton County while Jones recorded 5.3%. Jackson County recorded 3.5% registered aircraft with Delaware (3.1%) and Cedar (2.6%) followed closely behind. Jones County captured 5.3% registered aircraft in 1990.

A downward trend is representative of the number of registered aircraft in Jackson and Linn Counties. Within exception to small annual variation, the remaining five counties showed a relative degree of stability.

Of the 13 registered aircraft in 1988, 11 were single engine piston powered aircraft. The remaining two aircraft were twin engine piston powered aircraft. There were no turbo prop or jet aircraft registered within Jones County.

TABLE: 2-6: REGISTERED AIRCRAFT BY TYPE, 1984-1988

		SINGLE ENGINE		MULTI-ENGINE		TURBOPROP
YEAR	TOTAL	1-3 PLACE	4+ PLACE	1-6 PLACE	7+ PLACE	1-12 PLACE
1984	20	9	9	2	0	0
1985	19	8	9	2	0	0
1986	16	5	9	1	1	0
1987	16	7	8	1	0	0
1988	13	5	6	2	0	0
1989	15	6	6	3	0	0

SOURCE: FAA, Census of U.S. Civil Aircraft, December 31, 1984-1988
FAA FORM 5010 - 1989

Table 2-7 list current registered aircraft by identification number and model. The table also identifies the mailing address of the owner.

TABLE 2-7: REGISTERED AIRCRAFT, JONES COUNTY, 1990

ID	ADDRESS	MODEL	YEAR	BASED AIRPORT
16097	Monticello	Cessna 150L	1972	IA 153
20 EC	Anamosa	Cessna 337G	1975	IA 153
2485 E	Anamosa	Aeronca 7AC	1946	00001
2654 R	Monticello	Cessna 182	1967	IA 153
3923 N	Center Junction	Beech 35	1947	IA 144
41 JN	Scotch Grove	Piper PA23-250	1976	IA 153
4808 G	Monticello	Cessna 172	1980	IA 153
5223 A	Anamosa	Cessna T210N	1979	IA 153
55200	Monticello	Cessna 172	1982	IA 153
71076	Scotch Grove	Cessna 182	1968	IA 153
736 GH	Anamosa	Cessna R172	1977	IA 153
99911	Anamosa	Ercoupe 415 C	1947	IA 144

SOURCE: IDOT, Air and Transit Division, May 1990

The number of aircraft registered within Jones County since 1984 has been within 12 to 20. In the year 1984 20 aircraft registered in the county while by 1988 13 were reported registered compared to 12 in 1990.

The number of aircraft registered in Jones County over the 20 year planning period is expected to experience some annual variation and remain relatively constant with no significant increase nor decrease in aircraft ownership. This assumption is based upon the following:

* Positive economic and population growth within Monticello and Anamosa
* A stabilized rural population in Jones County
* A stronger farm economy within the airport service area
* Aggressive efforts to create new job opportunities

Aircraft ownership is expected to be concentrated in Monticello and Anamosa and will be influenced to some extent by the financial condition and business plan of local operator(s).

TABLE 2-8: REGISTERED AIRCRAFT JONES COUNTY

YEAR	REGISTERED AIRCRAFT
1990	12 - 14
1995	14 - 18
2000	18 - 20
2010	18 - 20

SOURCE: PDS, 1990

The number of aircraft based at a facility is dependent to some degree upon the geographic location of the facility as well as the extent of facility development and services provided. In assessing the number of aircraft that would be based at a public owned airport, consideration must be given to the relationship such a facility would have two existing private and public airports in the area.

Should the City of Manchester elect to make improvements to the Manchester Municipal Airport, there may be some impact upon the service area previously defined for the Monticello Municipal Airport. Likewise, the construction of a public airport at Dyersville would also impact the service area.

The number of based aircraft at public owned airports within the seven county area for the period 1984-1990 is summarized in Table 2-9.

TABLE 2-9: BASED AIRCRAFT - PUBLIC AIRPORTS, 1984 - 1989

AIRPORT	1984	1985	1986	1987	1988	1989
Monticello	16	18	14	14	16	15
Manchester	6	5	5	5	4	3
Dubuque	77	64	53	55	47	36
Cedar Rapids	166	166	166	140	156	165
Maquoketa	15	15	12	11	13	12
Tipton	8	9	8	8	8	7
TOTAL	288	277	258	233	244	238

Monticello as % of Total	1984	1985	1986	1987	1988	1989
	5.6%	6.5%	5.4%	5.4%	5.6%	6.3%

SOURCE: IDOT, Office of Advance Planning 1984-1989

The number of aircraft based at Monticello has remained stable throughout the period 1984 to 1989. Of the public airports noted in the above table, no significant changes were noted except for Dubuque where a significant decrease in the number of based aircraft was recorded.

TABLE 2-10: BASED AIRCRAFT - MONTICELLO, 1990-2010

YEAR	BASED AIRCRAFT
1990	15 +/-
1995	17 +/-
2000	20 +/-
2010	20 +/-

SOURCE: PDS, 1990

The future mix of based aircraft is expected to consist of single and twin engine aircraft with a gross weight under 12,500 pounds. Aircraft in excess of 12,500 pounds gross weight would most likely be based at Cedar Rapids or Dubuque.

Based aircraft characteristics:

Approach Speed	Under 91 knots
Wingspan	Under 49 feet
Gross Weight	Under 12,500 pounds

AIRCRAFT OPERATIONS

Annual, Itinerant, and Local Operations

An aircraft operation is defined as the airborne movement of aircraft in controlled and non-controlled airport terminal areas and about given enroute fixes or at other points where counts can be made. Each movement counts as an operation. A "touch and go", for example, counts as two operations.

Total annual aircraft operations are further broken down into local and itinerant operations. A local operation is defined as one by an aircraft that:

1. Operates within the local traffic pattern or within sight of the control tower;
2. is known to be departing for or arriving from local practice areas; or
3. executes simulated instrument approaches of low passes at the airport.

An itinerant aircraft operation is one that operates outside the local traffic pattern. A typical example of an itinerant operations is an air taxi operation. Aviation operations are most often discussed in terms of:

1. Total annual aircraft operations
   - Total annual local
   - Total annual itinerant
2. Peak day and peak hour operations

Aircraft operations are a function of the following elements:

1. Based Aircraft
2. Resident Pilots
3. Airport Facilities
4. Airport Management

Without a daily log of operational activity, an estimate of total annual itinerant and local operations are most often derived from a random survey or local sources. A high degree of correlation has historically been found between aircraft operations and service area population, based aircraft, and registered pilots. However, recent changes in the economy appear to have altered historic relationships somewhat. Local operations, for example, have decreased dramatically.

General aviation operations at tower airports decreased by 41 percent from 1979 to 1985. Comparable non-tower airport data is not available but is considered similar. This overall figure was indicative of a nationwide trend, initially caused by rising fuel prices, but later sustained by rising costs in other aspects of flying, particularly maintenance, insurance and initial purchase costs. The latter factor was affected significantly by rapidly rising liability insurance costs of the manufacturers; a factor continuing to have a major impact, and nearly shutting down production of light aircraft.

Counting programs conducted by the Iowa Department of Transportation provide a detailed indication of activity levels. The Monticello Municipal Airport was surveyed in the four seasons of 1985/86. The full report of this survey is included in the appendix. The spring, summer, and fall activity was measured for approximately four weeks each, while the winter activity was measured for 2.5 weeks.

During the spring period, single engine aircraft registered 98.56% of the activity, while twins were 1.08%, and a few helicopter operations were conducted. Weekend operations constituted 23%, but Monday, Tuesday, and Friday amounted to 58% of the total. This would appear to represent heavy business use. Heavy Monday and Friday activity is more likely to be business use, both by departing, local businessmen on Monday, and departing outside businessmen on Friday. These are only assumptions based on statistics, which may also be influenced by instructional class schedules or special FBO operations. The hours between 5 and 7 P.M. experienced 40% of the total, with an average of approximately 6 operations per hour; while the overall average during the survey period was only 0.9 operations per hour. There was an average of 20 operations per day during the spring; the summer period had 32 per day, while the fall returned to 20, and winter had only 11 per day.

The summer period, experienced a greater proportion of activity during the weekends; 30.4%, versus 36% for the Monday, Tuesday, and Friday period; although, Wednesday and Thursday had the highest daily total. The 5 to 7 P.M. period was still the heaviest, although the 9 to 10 A.M. period was close behind. This also, is typical of summer flying.

The fall activity was similar to that of spring, with a higher percentage of weekend flying. Winter traffic was so low as to be statistically unreliable; however, the disproportionate amount of traffic on Wednesday and Thursday, 48%, is surprising.

A brief summary of traffic is included in Table 2-2. Departures counted have been doubled to reflect aircraft operations.

TABLE 2-11: MONTICELLO COUNT SUMMARY OPERATIONS

	SPRING	SUMMER	FALL	WINTER
Total Operations	663	986	510	186
% Single	98.56%	96.55%	86.27%	92.47%
% Twins	1.08%	3.45%	13.73%	7.53%
Average Per Day	20.00	32.00	20.00	11.00
Hours of Monitoring	663	736	559	406

On an annual basis, a total of 2404 hours of monitoring traffic was conducted. 1117 departures were observed in this period, for an overall average of 0.46 departures per hour. 94.36 percent of these departures were by single engine aircraft, 5.55 percent by twins, and one helicopter departure. No jet engine aircraft operations were observed. On the basis of this count, the figures were extrapolated to an estimated annual count of 7,694.

The state traffic count did not include inquiries as the purpose of the flight; therefore, no data on local, transient, or touch-and-go's was obtained.

FORECAST OF FUTURE ACTIVITY

Future activity at an airport such as Monticello's may be affected by a number of factors; or it may, as is the case for many small airports stay with previously identified trends, both locally and nationally, and change consistent with recent experience at the airport. Local planners and decision makers should always be mindful of this uncertainty. The greatest mistake, however, in planning the development of an airport, is to not provide the capability to respond to changing demands for service capability. It is therefore important to consider several potential, reasonable scenarios, and to identify the needs of each; and to then provide for capability to satisfy these needs to the greatest extent practicable. We will therefore frame these forecasts with this thought in mind.

Activity is primarily broken down in terms of amount (numbers of operations), purpose of operation (local flight, transient, and training), type of approach services used (visual flight rules - VFR, or instrument flight rules - IFR - whether non-precision or precision), and types of aircraft (propellers, jet propulsion, helicopters, and special types such as ultra-lights, gliders, sail planes and balloons). Each of these categories - as well as other factors - will affect airport development needs. The advent of the various activities, or time on the scene, affects development scheduling and revenue planning. The purpose for which aircraft are used is also important, in determining the extent of development required in order to meet community objectives. Business traffic will support and enhance economic activity, and provide jobs. Sometimes a company will have a specific need for runway length, hangaring, or instrumentation that will dictate a requirement for facilities much greater than other aircraft based at the field. Some facilities may be required to provide for emergency flight equipment to the community. Pleasure flying and charter services will improve the quality of life of the citizens, and may influence people to locate or stay in the community. Aviation flight services such as crop dusting, aerial photography and mapping will provide income and jobs and can service other businesses in the area.

Airport capacity is not usually an issue at rural airports; however, development may be dictated by safety or convenience. For instance, the FAA recommends that each runway be provided with a parallel taxiway, or the capability therefore, so that aircraft do not have to taxi on the runway. During busy periods of activity, significant delays may occur while an aircraft is taxiing on the runway, even at relatively low activity airports. The lack of a parallel taxiway will greatly limit the number of operations that can be conducted on a runway during a period of time.

Table 2-12 summarizes the number of aircraft operations anticipated through 2009. As previously noted, the total number of annual aircraft operations is dependent to a large extent upon economic activity within the airport service area.

TABLE 2-12: ANNUAL OPERATIONS, 1990 - 2009

YEAR	LOW	MIDDLE	HIGH
1990	6405	7328	8250
1994	7259	8305	9350
1999	8540	9770	11000
2009	8540	9770	11000

SOURCE: PDS, May 1989

The number of total annual operations is expected to follow the middle trend line with some annual deviation above and below. Within the 20 year planning period, the annual aircraft operations are expected to approach 9,770. An optimistic estimate of 11,000 may be realized should conditions that existed in the seventies prevail.

Sixty percent of the total annual operations are expected to be itinerant in nature. Reference may be made to the following table.

TABLE 2-13: LOCAL AND ITINERANT OPERATIONS, 1990 - 2009

YEAR	LOCAL(40%)	ITINERANT(60%)
1990	2931	4397
1994	3322	4983
1999	3908	5862
2009	3908	5862

SOURCE: PDS, May 1989

Operational mix is expected to consist, for the most part of single and light twin engine aircraft.

Approach Speed:	Less than 91 Knots
Wingspan:	Up to 49 feet

An airport developed to Airplane Design Group I standards would accommodate nearly all the aircraft expected to use the facility. Occasional activity in excess of 250 operations per year by aircraft with a wing span greater than 49 feet but less than 79 feet would suggest that the facility be designed to Airplane Design Group II standards.

Representative airplanes within Approach Category A and B with Wingspans of less than 49 feet that may utilize the Monticello Municipal Airport are noted as follows:

Piper Cheyenne	10,500 pounds	B-1
Mitsubishi MU-2	10,800 pounds	B-1
Cessna 402	6,850 pounds	B-1
Beech King Air F90	10,950 pounds	B-1
Piper Navajo	6,500 pounds	B-1
Beech Baron B55	5,100 pounds	A-1

Approach Category A and B aircraft with a wing span more then 49 feet but less than 79 feet may utilize the facility includes the following:

Beech King Air C90-1	9,650 pounds	B-II
Cessna Citation II	13,300 pounds	B-II
Cessna 441	9,925 pounds	B-II

Airport Capacity

No indepth assessment of peak day and peak hour operational activity was made. Reference to FAA AC 150/5060-5, Airport Capacity and Delay, provides the following scenario concerning airport capacity.

Conditions:

1. Class A and B Aircraft
2. Approved approach procedure
3. Arrivals equal departures
4. There are no airspace limitations affecting runway use

Variables:

1. Airport configuration
2. Percent touch and go operations
   - 0 - 25 percent
   - 26 - 50 percent

Under IFR conditions, 20 to 24 operations per hour could be conducted. Hourly operational capacity will vary under VFR conditions subject to the number of touch and go operations and direction of the operation. The existing airport with a single runway could accommodate in excess of 100,000 annual aircraft operations.

AIR PASSENGERS/FREIGHT

Commuter Airline/Air Taxi

The Airline Deregulation Act of 1978 provided for the phase out of the Civil Aeronautics Board (CAB) control over pricing market entry and market exit. Consequently, there has been a pronounced effect upon air service in Iowa with the communities of Ottumwa and Clinton being served at present by commuter air carriers. Commuters also serve Fort Dodge, Mason City, Dubuque, and Burlington.

The Iowa DOT concluded in the 1982 State Airport Systems Plan that commuter air carrier service to Iowa communities, other than those with prior air carrier service to Iowa communities appears marginal.

> "Although commuter air service has been established in several very small markets in Iowa (Clinton, Marshalltown, and Spencer), the prospects for the expansion of such services in Iowa are limited."

SOURCE: IDOT, 1982 Iowa Aviation Systems Plan, (p.27)

The nearest scheduled service is provided at the Cedar Rapids Municipal Airport. Major carriers include American West, United Airlines, TWA, Air Midwest, American Eagle, Northwest Airlines, United Express (February, 1990). Scheduled commuter service is available at Dubuque by Great Lakes and American Eagle.

The most appropriate service level for the Monticello Airport service area is the air taxi or charter. The fixed base operator at Monticello, Monticello Aviation, Inc. currently provides charter service.

The Monticello Municipal Airport may generate up to 4397 passenger enplanements and 18 tons of air freight by the year 2010. An increase in itinerant aircraft operations would contribute to future enplanements as well as air freight activity. Such may be induced in part by increased industrial activities in Jones County.

TABLE 2-14: AIR PASSENGERS AND FREIGHT, 1991 - 2010

YEAR	PASSENGER ENPLANEMENTS	AIR FREIGHT (IN TONS)
1990	3298	13
1995	3737	15
2000	4397	18
2010	4397	18

SOURCE: PDS, May, 1990

AIRPORT SERVICE LEVEL

Summary

The forecast of aviation activity represents a trend line along which actual occurrences are anticipated. Actual occurrences will fall above and below the trend line. In summary, future numbers of based and registered aircraft, together with operational activity, will experience a modest growth through the year 2009. Aircraft mix will consist for the most part of operations by single and light twin engine aircraft.

An aircraft facility developed to Airplane Design Group II standards would accommodate anticipated aviation activity through the year 2009. Airplanes with a gross weight in excess of 12,500 pounds would be expected to use area transport category airports. Activity by small airplanes with 10 passenger seats or more is expected to be minimal. The Monticello Municipal Airport should be developed to accommodate 100 percent of the small airplane fleet.

A small airplane is defined in FAA AC 150/5300-13 as an airplane with a maximum certificated takeoff weight of 12,500 pounds or less. The approach speed would be less than 121 knots and the wing span less than 79 feet.

Gross weight	-	less than 12,500 pounds
Approach speed	-	less than 121 knots
Wing span	-	less than 79 feet
Passenger seats	-	less than 10

FACILITY REQUIREMENTS

CHAPTER THREE

AIRPORT FACILITY REQUIREMENTS

INTRODUCTION

Development Concept

Chapter Three outlines those facilities required to meet and satisfy anticipated aviation activity through the year 2010. Facility requirements outlined herein are based upon Federal Aviation Administration (FAA) and Iowa Department of Transportation (IDOT) airport design standards and guidelines.

The FAA has continued to refine design standards for airport facilities. FAA AC 150/5300 - 13 dated 9/28/89 sets forth new requirements that contributes to the development and maintenance of a national system of safe, delay-free, and cost-effective airports. FAA AC 150/5325-4A dated 1/29/90 presented guidelines for determining runway length.

Within the FAA AC 150/5300-13, Airport Reference Codes (ARC) were developed and are based upon two components.

- Approach Speed
- Wing Span

Current airplanes were placed into five categories based upon approach speed.

Category A:	Speed less than 91 knots.
Category B:	Speed 91 knots or more but less than 121 knots.
Category C:	Speed 121 knots or more but less than 141 knots.
Category D:	Speed 141 knots or more but less than 166 knots.
Category E:	Speed 166 knots or more.

The Airplane Design Group (ADG) are aircraft placed into groupings based on wingspan. These groups are as follows:

Group I:	Up to but not including 49 feet.
Group II:	49 feet up to but not including 79 feet.
Group III:	79 feet up to but not including 118 feet.
Group IV:	118 feet up to but not including 171 feet.
Group V:	171 feet up to but not including 214 feet.
Group VI:	214 feet up to but not including 262 feet.

Utility airports are those that serve aircraft in Approach Category A and B while a transport category airport is one designed, constructed, and maintained to serve airplanes in Approach Category C and D. Utility airports are subdivided based upon the level of service they are expected to provide.

Airport Classification	Airport Reference Code
Basic Utility - Stage I	ARC B-I
Basic Utility - Stage II	ARC B-I
General Utility - Stage I	ARC B-II
General Utility - Stage II	ARC B-III

A majority of aircraft operations at low activity general aviation airports will be by aircraft with a gross landing and/or take-off weight under 12,500 pounds. The approach speeds would typically be less than 91 knots while wingspans would generally not exceed 49 feet. Where there is measurable operational activity by business aircraft, the airport would find increased activity by aircraft with an approach speed in excess of 91 knots but less than 121 knots and wingspan less than 79 feet.

The Airport Reference Code (ARC) does not set forth runway length requirements. Reference must be made to FAA AC 150/5325-4A, Runway Length Requirements for Airport Design i n order to determine runway length. Four sets of runway curves were developed for those airplanes with a gross weight less than 12,500 pounds. The small airplanes were divided into those with 10 passenger seats or more and those with less than 10 passenger seats.

Three sets of curves were developed for those airplanes with less than 10 passenger seats:

1. 75% of the fleet
2. 95% of the fleet
3. 100% of the fleet

The recommended design parameters for the Monticello Municipal Airport are as follows:

1. Runway length - 100 percent of the small airplane fleet.
2. Facility separation - ARC Code, B-II

The Wisconsin Department of Transportation grouped current aircraft into sets based upon approach speed, wingspan, weight, and engine classification. Using FAA criteria, the type of airport required to serve that set of aircraft was identified. Reference may be made to Table 3-1 which identifies the aircraft set by a four digit code. The fourth number designates the airport type which should serve that aircraft.

AIRCRAFT SETS

For airport design purposes, all aircraft have been grouped into sets which reflect commonality in size or operating characteristics. The aircraft sets are coded according to the following 4-digit identification:

1st column designates the aircraft's approach speed category:

- A =< 91 knots
- B = 91-120 knots
- C = 121-140 knots
- D = 141-166 knots
- E => 166 knots

2nd column designates the aircraft's wing span design group:

- 1 =< 49'
- 2 = 49'-78'
- 3 = 79'-117'
- 4 = 118'-170'
- 5 = 171'-196'
- 6 = 197'-262'

3rd column designates the aircraft's weight and engine classification:

- A =< 12,500 lbs./single engine
- B =< 12,500 lbs./multiple engine
- C = 12,500 lbs.-59,999 lbs.
- D = 60,000 lbs.-300,000 lbs.
- E => 300,000 lbs.

4th column designates the airport type which should serve the particular aircraft:

- 1 = Basic Utility Stage I
- 2 = Basic Utility Stage II
- 3 = General Utility Stage I
- 4 = General Utility Stage II
- 5 = Transport
- 0 = Local Service

The following listing groups individual aircraft models by aircraft set designation.

TABLE 3-1: AIRPORT TYPE AND ASSOCIATED AIRPLANES

SOURCE: WISCONSIN DEPARTMENT OF TRANSPORTATION
<u>Wisconsin Airport System Plan: 1986 - 2010</u>, December, 1986

PLANE MAKE	MODEL
ABCO	SPECIAL
ACRO SPORT	II
ADVENTURE FARRIS	P51D
AERO COMMANDER	112
AERO COMMANDER	100
AERO COMMANDER	100-180
AERO COMMANDER	112-A
AERO COMMANDER	S-2
AEROCAR	III
AERONCA	50-L
AERONCA	65-TL
AERONCA	50-C
AERONCA	C-3
AERONCA	65-TC
AERONCA	50-F
AERONCA	65-LA
AERONCA	K
AERONCA	65-CA
AERONCA	0-58-B
AERONCA	65-LB
AERONCA	7-EC
AERONCA	0-58-B
AERONCA	65-TAL
AERONCA	7-DC
AERONCA	65-C
AERONCA	7-AC
AERONCA	15-AC
AERONCA	11
AERONCA	7-CCM
AERONCA	15
AERONCA	6
AERONCA	7
AERONCA	11-CC
AERONCA	11-AC
AERONCA	11-BC
AERONCA	7-BCM
AEROTEK-PITTS	S-2A
AIR TRACTOR	301-A
ALON	A-2A
AMERICAN EAGLET	231
B/6 DART	150
BAKENG-HURD	DOUBLE DUCE
BAKER	SPECIAL 001
BARNEY OLDFIELD	BABY GREAT LAKE
BARRACUDA	CA-2
BECKHAM-SHEAHAN	CASSUTT M
BEDE	BD-4
BEDE	BD-5B
BEDE	BD-5
BEDE-HALEY	BD-5
BEDE-MCCOOK	BD-4
BEDE-THOMPSON	BD-5 JET
BEE AVIATION	HONEY BEE
BEECHCRAFT	B-17-L
BEECHCRAFT	D-17-S
BEECHCRAFT	E-33-C
BEECHCRAFT	F-33-A
BEECHCRAFT	D-45
BEECHCRAFT	B-24-R
BEECHCRAFT	A-23-19
BEECHCRAFT	C-24-R
BEECHCRAFT	E-17-L
BEECHCRAFT	C-33-A
BEECHCRAFT	A-24-R
BEECHCRAFT	A-36-TC
BEECHCRAFT	A-23-24
BEECHCRAFT	A 23-19
BEECHCRAFT	E-33-A
BEECHCRAFT	A-23-A
BEECHCRAFT	M-35
BEECHCRAFT	G-17-S
BEECHCRAFT	A-19
BEECHCRAFT	S-35
BEECHCRAFT	33
BEECHCRAFT	23
BEECHCRAFT	YOU-22A
BEECHCRAFT	22

AIA1 (2.5)

PLANE MAKE	MODEL
BEECHCRAFT	B-33
BEECHCRAFT	H-35
BEECHCRAFT	F-33
BEECHCRAFT	J-35
BEECHCRAFT	A-33
BEECHCRAFT	K-35
BEECHCRAFT	G-35
BEECHCRAFT	N-35
BEECHCRAFT	BE-77
BEECHCRAFT	P-35
BEECHCRAFT	35
BEECHCRAFT	E-33
BEECHCRAFT	C-33
BEECHCRAFT	U-35-B
BEECHCRAFT	B-19
BEECHCRAFT	V-35
BEECHCRAFT	A-23
BEECHCRAFT	V-35-A
BEECHCRAFT	D-35
BEECHCRAFT	V-35-B
BEECHCRAFT	77
BEECHCRAFT	V-35-B-TC
BEECHCRAFT	A-36
BEECHCRAFT	B-24
BEECHCRAFT	E-35
BEECHCRAFT	A-35
BEECHCRAFT	F-35
BEECHCRAFT	B-77
BEECHCRAFT	36
BEECHCRAFT	C-24
BEECHCRAFT	B-23
BEECHCRAFT	A-24
BEECHCRAFT	C-35
BEECHCRAFT	C-23
BEECHCRAFT	B-35
BELLANCA	14-13
BELLANCA	17-30-A
BELLANCA	17-30-A
BELLANCA	17-30
BELLANCA	17-30A
BELLANCA	14-19-2
BELLANCA	7-ACA
BELLANCA	14-19-3
BELLANCA	14-13-2
BELLANCA	CH-300
BELLANCA	7-ECA
BELLANCA	7-KCAB
BELLANCA	8
BELLANCA	14
BELLANCA	8-GCBC
BELLANCA	7-GCBC
BELLANCA	8-KCAB
BELLANCA	17.
BELLANCA	7
BLAIR-FLOOD	SIDEWINDER
BOEING	N-2-S-4
BOEING	A-75
BOEING	A-75-N-1
BOEING	E-75-N-1
BOEING	A-75-L-3
BOEING	B-75-N-1
BOEING	A-75-L-300
BOEING	E-75
BOEING	PT-17-A
BOEING-JONES	75
BOWERS FLY BABY	1-A
BOWERS-HAUGE	FLY-BABY
BREEZY	RUL
BREEZY	RUL-1
BUCKER	BU-133
BUCKER	BU-133-L
BUCKER-JUNGMANN	CASA 1.131
BUD	A
BURNS	BA-42
BUSHBY-ARMSTRONG	MUSTANG II
BUSHBY-CARLSON	MIDGT MUSTANG
BUSHBY-DEWEESE	MUSTANG II

AIA1 (2.5)

PLANE MAKE	MODEL
BUSHBY-GRIMM	MUSTANG II
BUSHBY-KROGMAN	MUSTANG II
BUSHBY-LAREAU	MIDGET MUSTAN
BUSHBY-MACHUS	MUSTANG II
BUSHBY-MALICK	MUSTANG II
BUTT	ALPHA
CA-61/ANDERSON	MINI-ACE
CANADAIR	F-86 MK.5
CANADIAN	T-33
CANADIAN CAR & FOUNDRY	HARVARD MKIV
CASSUTT	II
CASSUTT	II-M
CASSUTT	III-M
CASSUTT	D
CASSUTT-CORE	SPORT RACER
CASSUTT-ELG	III-M
CENTRAIR	PEGASUS 101-A
CESSNA	152-II
CESSNA	
CESSNA	180-K
CESSNA	P-210
CESSNA	175-A
CESSNA	R-182RG
CESSNA	182-RG
CESSNA	182-B
CESSNA	A-185-F
CESSNA	182-E
CESSNA	172-C
CESSNA	182-C
CESSNA	172-A
CESSNA	T-210-F
CESSNA	170-B
CESSNA	150-D
CESSNA	170
CESSNA	172-M
CESSNA	150-M
CESSNA	182-D
CESSNA	150-L
CESSNA	210
CESSNA	150-H
CESSNA	210-M
CESSNA	207
CESSNA	172-N
CESSNA	U-206-F
CESSNA	172-P
CESSNA	206
CESSNA	172-RG
CESSNA	U-206
CESSNA	172-IP
CESSNA	205-A
CESSNA	175
CESSNA	TU-206-F
CESSNA	L-19
CESSNA	205
CESSNA	175-B
CESSNA	TU-206-C
CESSNA	177
CESSNA	180-J
CESSNA	177-A
CESSNA	T-41-B
CESSNA	177-B
CESSNA	195-B
CESSNA	177-RG
CESSNA	140
CESSNA	180
CESSNA	195
CESSNA	180-A
CESSNA	T-210-M
CESSNA	180-C
CESSNA	190/195
CESSNA	180-D
CESSNA	T-210
CESSNA	180-E
CESSNA	190
CESSNA	180-F
CESSNA	172-K
CESSNA	180-H

PLANE MAKE	MODEL
CESSNA	180-H
CESSNA	188-A
CESSNA	180-I
CESSNA	R-172-IP
CESSNA	210-L
CESSNA	188
CESSNA	210-J
CESSNA	P-206-B
CESSNA	210-H
CESSNA	185-A
CESSNA	210-G
CESSNA	A-188-B
CESSNA	210-D
CESSNA	185
CESSNA	210-B
CESSNA	170-A
CESSNA	210-A
CESSNA	182
CESSNA	150-J
CESSNA	182-G
CESSNA	U-206-G
CESSNA	182-A
CESSNA	U-206-A
CESSNA	150-E
CESSNA	TU-206-G
CESSNA	182-Q
CESSNA	150-C
CESSNA	150-B
CESSNA	T210L
CESSNA	182-P
CESSNA	140-A
CESSNA	172-E
CESSNA	T-41
CESSNA	182-N
CESSNA	172-F
CESSNA	172-H
CESSNA	172-I
CESSNA	182-M
CESSNA	R-182
CESSNA	P-210-N
CESSNA	P-206-C
CESSNA	182-L
CESSNA	C-38
CESSNA	172-B
CESSNA	172
CESSNA	182-K
CESSNA	150-G
CESSNA	150-F
CESSNA	172-D
CESSNA	182-J
CESSNA	TR-182
CESSNA	150
CESSNA	120
CESSNA	182-H
CESSNA	172-G
CESSNA	182-R
CESSNA	R-172-K
CESSNA	A-185-E
CESSNA	182-F
CESSNA	A-152
CESSNA	U-206-C
CESSNA	A-150-M
CESSNA	150-A
CESSNA	A-150-L
CESSNA	172-L
CESSNA	A-150-K
CESSNA	152
CESSNA	210-N
CESSNA	T-210-L
CESSNA	TU-206-E
CESSNA	P-206-A
CESSNA	150-K
CGS-PETERSON	HAWK
CGS-PETERSON	650
CHAMPION	7
CHAMPION	7-EC
CHAMPION	7-GCAA
CHAMPION	7-FC
CHAMPION	7-GCB
CHAMPION	7-ECA
CHAMPION	7-KCAB
CHAMPION	7-GC
CHAMPION	7-HC
CHAMPION	7-GCBC
CHANCE-VOUGHT	F4U-4
CHESTER	SPECIAL
CHRISTEN-BOYD	EAGLE II
CHRISTEN-DOYLE	EAGLE II
CHRISTEN-HUMPHREY	EAGLE II
CHRISTEN-JOHNSON	EAGLE
CHRISTEN-ROSS	EAGLE II
CHURCH	JC-1
CLANCY	SKYBABY
CLOYD-HOMEBUILT	SH-2
COMMONWEALTH	185
CONSOLIDATED	BT-13
CORBEN	C-1
CORBEN	E-JR ACE
CORBEN	BABY ACE
CORBEN-FUCHS	JUNIOR ACE E
CORBEN-GRUNSKA	BABY ACE D
CORBEN-LAMBERT	BABY ACE D
CORBEN-OLSEN	BABY ACE
CUBBER II	C-1
CULVER	V
CULVER	LCA
CURTISS-WRIGHT	C-1 ROBIN
CURTISS-WRIGHT	CW-1
CURTISS-WRIGHT	O-52
CURTISS-WRIGHT	E-8-75
CURTISS-WRIGHT	E-4000
CURTISS-WRIGHT	4000
CURTISS-WRIGHT	E-8-90
CURTISS-WRIGHT	TRAVEL AIR 12
CURTISS-WRIGHT	TRAVEL AIR 16-E
CYGNET	2F-2A
DART	GK33
DAVIS	DA-2-A
DAVIS	D-1-W
DAVIS	D-2
DAVIS-VAN BELKOM	DA-2
DICKAU	ESPERANZA
DIXON	FORMAL VEE
DREWS	B-1-A
DYKE-WHITE	DELTA JD-2
EAA	ACRO SPORT
EAA	POBER PIXIE
EAA-BEYERSDORF	BIPLANE P-2
EAA-CHOMO	EAA BIPLANE
EAA-ERICKSON	ACROSPORT II
EAA-GORES	ACRO SPORT II
EAA-GUNDERSON	BIPLANE AG-1
EAA-KNUTSON	AERO-SPORT II
EAA-MASSOPUST	ACRO SPORT II
EAA-MEADE	BIPLANE GAM-1
EAA-RODER	ACRO SPROT-15
EAA-UNERTL	BIPLANE P-1
ELMENDORF	A-1
ERCOUPE	415-E
ERCOUPE	415
ERCOUPE	415-D
ERCOUPE	415-G
ERCOUPE	415-C
ERCOUPE	415-CD
ERCOUPE-ALON	A-2A
ERCOUPE-ALON	A-2
ERCOUPE-FORNEY	F-1
ERCOUPE-MOONEY	M-10 CADET
ESTUPINAN	HOVEY WD-A
EVANS-DION	VP-1
EVANS-KEMMER	VP-1
EVANS-MOCKRUD	VP-1
EVANS-SHAFFER	VP-1
FAIRCHILD	24-W-41-A
FAIRCHILD	FC-2-W-2
FAIRCHILD	24-W-46
FAIRCHILD	24-C-8-F
FAIRCHILD	24-C-8-A
FAIRCHILD	24-C-8-C
FAIRCHILD	24-J
FAIRCHILD	24-W-40
FAIRCHILD	M-62-A-4
FAIRCHILD	24-W
FAIRCHILD	M-62C
FAIRCHILD	24-R-46
FAIRCHILD	M-62-A-3
FAIRCHILD	M-62-C
FAIRCHILD	PT-26
FAIRCHILD	M-62-A
FAIRCHILD	PT-26A
FIKE	D
FLAGLOR	SCOOTER
FLAGLOR-DURLEY	SCOOTER
FOCK WULF	F W 190
FOCKE-WULF REPLICA	FW-190
FOKKER	D 6 1/2
FOKKER	D-VI
FOKKER	DR-1 TRI-PLAN
FORSGREN	LF-1
FRANKLIN SPORT	90
FULWILER-DERJAEGE	WWI
GANTZER	NESMITH-COUGAR
GDISIS	GLASAIR
GOLDWING-PETERSON	GOLD DUSTER ST
GREAT LAKES	2T-1A-2
GREAT LAKES	2-T-1-A
GREAT LAKES	2T-1A
GREAT LAKES	2T-1A-E
GREAT LAKES	2-T
GREAT LAKES-ADAMS	2T-1
GRIFFIN-PITTS	S-1C
GROB	G-109
GRUMMAN	J-2-F-6
GRUMMAN	G-164
GRUMMAN	AF-2S
GRUMMAN	G-164-A
GRUMMAN AMERICAN	AA-5B
GRUMMAN AMERICAN	AA-5A
GRUMMAN AMERICAN	AA-1C
GRUMMAN AMERICAN	AA-1B
GRUMMAN AMERICAN	AA-1A
GRUMMAN AMERICAN	AA-1
GRUMMAN AMERICAN	AA-5
GRUMMAN-AMERICAN	AA-5-A
GRUMMAN-AMERICAN	AA-5-B
GUMM	MINICAB-MOD
GUNDERSON	TRAINER
GUPPY-MINTZLAFF	SNS-2
HALBERSTADT-SWANSON	D IV
HARLOW	PJC-2
HATZ	CB-1
HATZ-SCHMUNK	CB-1
HATZ-STRUB	LB-1
HATZ-VANDERGEEST	CB-1
HAWK	3
HEATH	PARASOL
HEATH-BAUMER	PARASOL
HEATH-DEANGELO	PARASOL
HEGY/CHUPAROSA	R C H I
HELIO COURIER	H-391
HOLLANDER-CASSUTT	III-M
HOWARD	DGA-15-J
HOWARD	DGA-15-P
HU-GO CRAFT	VPS
INMAN	ACRO SPORT I
INTERSTATE	S-1-A
JEANIES	TEENIE
JEWETT-LOURDES	0
JEWETT-MULLIKEN	Q-2
JEWETT-SAVELS	Q-2
JEWETT-SWANNINGSON	QUICKIE
JEWETT-UNGERECHT	Q-2
JEWETT-WOLETZ	QUICKIE
JOHNSON	MINICOUPE
JOHNSON	O-1-L
JOHNSON	ROCKET 185
JURCA	MJ-5J2
KIRK-LUMLEY	COTTONTAIL
KOSTLEVY	FHK HAWK
LAIRD	SPECIAL
LAIRD	LC-DW500
LAKE	LA-4-200
LAKE	LA-4
LAPAN	IT-400
LINCOLN	PT-K
LITTLE ABBIE	KW-1
LOCKHEED	VEGA-5-C
LOVING-OMERNICK	LOVINGS LOVE
LUSCOMBE	8-C
LUSCOMBE	8-E
LUSCOMBE	8
LUSCOMBE	8-I
LUSCOMBE	8-F
LUSCOMBE	11-A
LUSCOMBE	T-8-F
LUSCOMBE	8-A
LUTON-SPONEM	MINOR
MARANDA-TURNER	AMF-5-14-D
MAULE	M-4
MAULE	M-5-235C
MAULE	M-4-210-C
MAULE	M-5
MAULE	M-4-220C
MAULE	M-5-220-C
MEADOWCROFT	CHINNOK
MESSERSCHMITT	ME-109-C4K
MESSERSCHMITT	BO-209
METKE	1-MOD
MEYER	LITTLE TOOT
MEYERS	OTW
MEYERS	200-A
MIDGET MUSTANG	M-1
MIDGET MUSTANG	MM-1
MIGNET	HM-293
MONG SPORT	MS-2
MONG SPORT	MS-2-K
MONNETT	MONEI
MONNETT	SONERAI II
MONNETT	MONI
MONNETT-BECK	MONI
MONNETT-BUTLER	SONERAI II
MONNETT-CULVER	SONERAI-II
MONNETT-DENIL	SONERAI II
MONNETT-EISENBRANDT	SONERAI II
MONNETT-GABLE	MONI
MONNETT-KAMKE	SONERAI II
MONNETT-KEIP	SONERAI II
MONNETT-KLUDY	SONERAI I
MONNETT-LARSON	SONERAI II
MONNETT-LASEURE	SONERAI II
MONNETT-LAVIN	SONERAI IIL
MONNETT-MALZAHN	SONERAI II
MONNETT-MANGAN	SONERAI II
MONNETT-MAREK	MONI
MONNETT-MCCOY	SONERAI-I
MONNETT-MIRACLE	SONERAI II
MONNETT-NELSEN	SONERAI II
MONNETT-NIELSEN	SONERAI ILL
MONNETT-NOVAK	SONERAI II
MONNETT-ROBERTS	SONERAI II
MONNETT-SIKORA	SONERAI II
MONNETT-SONERIA	SONERIA II LTS
MONNETT-TAPPON	SONERAI II
MONNETT-WARNING	MONI
MONNETT-WOOD	SONERAT II
MONOCOUPE	110 SPECIAL
MONOCOUPE	110
MONOCOUPE	90-A
MONOCOUPE	113
MOONEY	M-20-E
MOONEY	M-20-G
MOONEY	M-20-D
MOONEY	M-18
MOONEY	M-20-B
MOONEY	M-20-A
MOONEY	M-20-F
MOONEY	M-20-J
MOONEY	M-20-C
MOONEY	M-20-K
MOONEY	M-18-L
MOONEY	M-20
MORANE-SAULNIER	181
NAVION	NAVION
NAVION	L-17-B
NAVION	G-1
NAVION	B
NAVION	A
NAVY	N3N-3
NICHOLAS BEAZLEY	NB-8-G
NORTH AMERICAN	SNJ-5
NORTH AMERICAN	TP-51
NORTH AMERICAN	P-51D
NORTH AMERICAN	AT-6D
NORTH AMERICAN	P-64
NORTH AMERICAN	NAVION E
NORTH AMERICAN	P-51-D
NORTH AMERICAN	T-28C
NORTH AMERICAN	T-28
NORTH AMERICAN	HARVARD MK-4
NORTH AMERICAN	T-28-A
NORTH AMERICAN	AT-6
NORTH AMERICAN	T-28-B
NORTH AMERICAN	AT-6-G
NORTH AMERICAN	NAVION
NORTH AMERICAN	AT-6-A
NORTH AMERICAN	P-51
NORTH AMERICAN	F-51D
OLAH	CASSUTT III-M
OLDFIELD SPECIAL	BABY GREATLAKES
OLDFIELD-LARSON	BABY GREATLAKES
OLDFIELD-TRIDLE	BABY GREATLAKES
OWEN	S-1
PARKER	JP-001
PAZMANY-FLYNN	PL-4
PAZMANY-RODENCAL	PL-4
PAZMANY-THOMAS	PL-2
PEEREIA-MAHLER	OSPREY II
PEREIRA-BOREMANS	OSPREY II
PEREIRA-RICHARTZ	OSPREY II
PEREIRA-SCHAEFER	OSPREY II
PEREIRA-SCHIFFERER	OSPREY II
PEREIRA-SCHIFFERER	O SPREY II
PEREIRA-TROWBRIDGE	OSPREY II
PEREIRA-WILSON	OSPREY II
PERTH AMBOY	BIRD BK
PETE MYERS SPCIAL	M1
PHEASANT	OLB
PIEL-BENTLEY	CP 750 BERYL
PIEL-BORREMANS	CP-311 EMERAU
PIEL-FOBES	SUPR EMERAUDE
PIEL-GULTCH	EMERAUDE 301A
PIEL-MCCONNELL	CP-304-A EMERAU
PIEL-WEAVER	CP-301
PIERERA-SCHAEFER	OSPREY II
PIETENPOL	AIRCAMPER
PIETENPOL	GN-1
PIETENPOL-BEESON	AIRCAMPER
PIETENPOL-CHALLIS	CHAFFINCH
PIETENPOL-KNIGHT	AIR CAMPER
PIETENPOL-LOEHNDORF/DU	AIRCAMPER
PIETENPOL-MARTALOCK	AIR CAMPER
PIETENPOL-MOCK	AIR CAMPER
PIETENPOL-SWENSON	AIRCAMPER
PIPER	PA-28-200-R
PIPER	140
PIPER	140
PIPER	PA-36-
PIPER	PA-28R
PIPER	PA-28-
PIPER	PA-28-
PIPER	PA-28-
PIPER	PA-36-
PIPER	PA-28-
PIPER	PA-28-
PIPER	PA-28-
PIPER	PA-32-
PIPER	PA-28-2
PIPER	PA-28-1
PIPER	PA-28-2
PIPER	PA-32-3
PIPER	PA-28-2
PIPER	PA-28-1
PIPER	PA-28-2
PIPER	PA-32-3
PIPER	PA-28-2
PIPER	PA-25-2
PIPER	PA-28R-1
PIPER	PA-32-30
PIPER	PA-28R-2
PIPER	PA-28-18
PIPER	PA-28-18
PIPER	PA-32-26
PIPER	PA-32-26
PIPER	PA-28-16
PIPER	PA-28RT-
PIPER	PA-32-26
PIPER	PA-28-14
PIPER	PA-28-14
PIPER	PA-28-18
PIPER	PA-28R-2
PIPER	PA-28-180
PIPER	PA-38-112
PIPER	PA-28-160
PIPER	E-2
PIPER	PA-28-140
PIPER	PA-28-140
PIPER	PA-28-180
PIPER	PA-25-235
PIPER	PA-28-140
PIPER	PA-28RT-2
PIPER	PA-22-150
PIPER	J-3-C-85
PIPER	PA-20-115
PIPER	PA-18A-15
PIPER	PA-25-235
PIPER	J-3-F-60
PIPER	PA-18-135
PIPER	J-3-C-75
PIPER	PA-18-150
PIPER	J-3-F-65
PIPER	PA-18-95
PIPER	J-4-A
PIPER	PA-18-A
PIPER	PA-24-250
PIPER	PA-18-S
PIPER	PA-14
PIPER	PA-18A-135
PIPER	PA-24-260
PIPER	PA-22-108
PIPER	L-4
PIPER	PA-20-150
PIPER	PA-20-135
PIPER	PA-25-150
PIPER	PA-18-105 S
PIPER	PA-24-400
PIPER	PA-18-125
PIPER	PA-22-160
PIPER	PA-22-20 CO
PIPER	PA-24-260-C
PIPER	J-5-A
PIPER	PA-20-125
PIPER	PA-22-125

A1A1 (2.5)

PLANE MAKE	MODEL
PIPER	PA-22-125
PIPER	J-3-L-65
PIPER	PA-24-180
PIPER	PA-18-105
PIPER	PA-18A-135 RS
PIPER	J-4-E
PIPER	PA-24-260-B
PIPER	PA-22-20
PIPER	J-3-C-65
PIPER	PA-22-135
PIPER	PA-25-235-C
PIPER	PA-36
PIPER	PA-28
PIPER	PA-15
PIPER	PA-18
PIPER	PA-12
PIPER	J-3
PIPER	PA-17
PIPER	PA-22
PIPER	PA-24
PIPER	J-5
PIPER	PA-39
PIPER	PA-20
PIPER	J-2
PIPER	PA-11
PIPER	PA-25
PIPER	PA-16
PIPER	PA-38
PITCAIRN	PA-39
PITTS	S-1S
PITTS	SIS
PITTS	SC-1
PITTS	SPECIAL
PITTS	S-2A MOD
PITTS-BARNEY	S-1C
PITTS-BAUMGARTNER	S-1
PITTS-EAA	S-2
PITTS-FERGUS	SC-1
PITTS-GARCIA	S-1
PITTS-GRIFFIN	S-1C
PITTS-HEGY	S-1C
PITTS-HEIRONIMUS	S-1S
PITTS-HINCHCLIFFE	S-1
PITTS-KILLOUGH	S-1S
PITTS-KING	S-1S
PITTS-LIND	S-1D
PITTS-MERRICK	S-1
PITTS-MILES	S-1C
PITTS-MUMM	S-1C
PITTS-OTTERBACK	S-1
PITTS-POBEREZNY	P-6
PITTS-POBEREZNY	P-7
PITTS-SCHLAMER	S1E
PITTS-SCHMIDT	S-1S
PITTS-SHEA	S-1C
PITTS-SWEET	SA-1
PITTS-WERNER	S-2E
PITTS-WHEELER	S-1
PITTS-WOOLAWAY	S-1C
POBER SPORT	P-5
POBER SPORT	P-12
POLTER	GEIST
POPER SPORT	P-5
PORTERFIELD	LP-65
PORTERFIELD	35-70
PORTERFIELD	CP-65
PRINCE	BUSH-HOPPER I
PUSHER	WOODS-CHAPTER
R	112-1
R	112-A
RAND	KR-2
RAND ROBINSON	KR-1
RAND-ANDREW	KR-1
RAND-BAK	KR-2
RAND-BEILFUS	KR-2
RAND-EIDE	KR-2
RAND-KINKEMA	KR-2

A1A1 (2.5)

PLANE MAKE	MODEL
RAND-LUDTKE	KR-2
RAND-THOMA	KR-2
RAND-TIMLER	KR-2
RAND-TIMLER	KR-1
RAND-WARNELL	KR-1
REARWIN	9000
REARWIN	8135-T
REARWIN	7000
REARWIN	8135 CLOUDSTER
REARWIN	8500
REARWIN	8500
REARWIN	8135
REARWIN	175
REPLICA-NIEUPORT	NIEUPORT
REPUBLIC	RC-3
REPUBLIC-DOWNER	RC-3
REZICH BROTHERS	SPECIAL
RICHARD	190A
ROCKWELL	112-A
ROCKWELL	112-TC
ROCKWELL	112
ROCKWELL	114
RUTAN	VARIVIGGEN
RUTAN	VARIEZE
RUTAN-AMS/OIL	68
RUTAN-COX	VARIEZE
RUTAN-ESH	LONG-EZ
RUTAN-HILLESHEIM	VARIEZE
RUTAN-LEMASTER/PAGE	VARI-EZE
RUTAN-PALMER	VARI-EZE
RUTAN-PASCARELLA	VARI EZE
RUTAN-PAVLOVICH	VARIEZE
RUTAN-RADTKE	VARIEZE
RUTAN-ZABLER	VARIEZE
RYAN	ST-3
RYAN	SCW-145
RYAN	NAVION B
RYAN	ST-3-KR
RYAN	NAVION
RYAN	A
RYAN	SCW
SAWYER	GLASAIR
SCORPION	SCORPIAN 133
SCOTT	IS-1
SH/KLAPMEIER	GLASAIR
SHAFOR	GANAGOBIE
SKY HOPPER	22
SKY HOPPER	10
SLO-JO	SJ-165
SMITH GREGORIE	MINIPLANE DSA-1
SMITH MINIPLANE	DSA-1
SMITH-GREGORIE	MINIPLANE DSA-1
SMITH-KLEIN	MINIPLANE
SMITH-MINIPLANE	DSA R-1
SMITH-MINIPLANE	DSA-1
SMITTYS TERMITE	JT-1
SMYTH-PIEPER	SIDEWINDER
SMYTH-RAICOS	SIDEWINDER
SNOW	600
SNOW	AIR TRACTOR
SNOW	600S2C
SNOW	S-2-C
SNOW	AT-301
SNOW	S-2
SOUTH BAY	CA-61
SOUTHWORTH TANDEM	S-1 TEDDYBEAR
SPARTAN	C-3165
SPARTAN	EXECUTIVE 7W
SPENCER	SPECIAL
SPEZIO-JAROS	SPORT
SPINKS	AKROMASTER
STARDUSTER	TOO
STARDUSTER	SA-200
STATE SECURITIES	ARROW F
STEARMAN	4-C
STEEN	SKYBOLT
STEEN-ALLEN	SKYBOLT

A1A1 (2.5)

PLANE MAKE	MODEL
STINSON	108
STINSON	108-1
STINSON	10A
STINSON	108-3
STINSON	SM-8A
STINSON	SR-5A
STINSON	L-5-E
STINSON	SM-6B
STINSON	10-A
STINSON	108-2
STINSON	SR-8C
STINSON	SR-7B
STINSON	HW75
STINSON	SR-9C
STINSON	V77
STITS	SA-3
STITS	SA-6-A
STITS	SA-7-D SKYCOUPE
STITS	SA-9A
STITS	SA-11-A
STITS	SA-3-B
STITS	SA-3-A
STITS	SA-7-D
STITS	SA-6
STITS-SKEETO	SA-8
STOLP-CORNING	STARDUSTER TO
STOLP-DANIELS	SA300
STOLP-DELEY	SA-100
STOLP-EHLERS	ESA300
STOLP-ERIKSEN	STARDUSTER TOO
STOLP-ERIKSEN	STARDUSTER TOO
STOLP-GROOM	STARDUSTER TOO
STOLP-HENDERSON	STARDUSTER
STOLP-KENNEDY	STARDUSTER
STOLP-LIEN	STARDUSTER TO
STOLP-PFUNDHELLER	SA-300
STOLP-SEABRIGHT	SA-100
STOLP-STARLET	866-01-AB
STORY	WD-6
SWALLOW	TP
SWALLOW-KARAMIT IS	B
SWANSON	HALBERSTADT D 4
SWIFT	GC-1B
SWIFT	GC-1
TAYLOR	MONOPLANE
TAYLOR	T-2
TAYLOR-BECKHAM	MONO HB
TAYLOR-STEEVES	COOT-A
TAYLORCRAFT	BC-12-65
TAYLORCRAFT	F-19
TAYLORCRAFT	L-2M
TAYLORCRAFT	BC-12-D
TAYLORCRAFT	BL
TAYLORCRAFT	BC-65
TAYLORCRAFT	BL-65
TAYLORCRAFT	BC-12-DL
TAYLORCRAFT	BF-50
TAYLORCRAFT	BL-12-65
TAYLORCRAFT	BF-12-65
TAYLORCRAFT	DC-65
TAYLORCRAFT	BC-12-85
TAYLORCRAFT	BC-12D-1
TAYLORCRAFT	L-2-M
TAYLORCRAFT	L-2
TAYLORCRAFT	A
TAYLORCRAFT	DCO-65
TAYLORCRAFT	BL-65
TAYLORCRAFT	DC-65
TAYLORCRAFT	F-19
TAYLORCRAFT	BC-12
TAYLORCRAFT AVIAT	B-2 CHUMMY
TEMAN-KENNY	MONO-FLY
TERATORN	TIERRA I
TERATORN	TIERRA II
TERATORN-MARSHALL	TIERRA II
TERRATORN	TIERRA II
TERRATORN	TIERRA II

A1A1 (2.5)

PLANE MAKE	MODEL
TERRATORN-MCDANIEL	TIERRA
TESCHENDORF	FOUR-RUNNER
THOMAS-DICKAU	ESPERANZA-4
THORP	T-18
THORP-EWING	T-18
TIMM	N-2-T-1
TROJAN	A-2
TURNER	T-40-A
UEBEL-KNIGHT-TWIS	LIGHT WEIGHT
ULTRA LIGHT	HAWK 4
VANGRUNSVEN-PEDERSON	RV-3
VANTUIL	SPORTSMAN
VARGA	2150 A
VELLINE	BREEZY RLU-1
VELOON	COUGAR
VIKING-FLANAGAN	DRAGONFLY
VIKING-HAZELWOOD	DRAGONFLY
VIKING-HAZELWOOD	DRAGONFLY
VIKING-SWAN	DRAGONFLY
VOLKSPLANE	VP-2
VOLKSPLANE	VP-1
VOLKSPLANE	WE-1
VOLMER	VJ-22
VOLMER-FINN	SPORTSMAN VJ22
VULTEE	BT-13
VULTEE	BT-15
VULTEE	BT-13-A
WAG-AERO-POBEREZNY	CUBY
WACO	10
WACO	GIE
WACO	VKS-7-F
WACO	CUC
WACO	CTO
WACO	YOC
WACO	YKS-7
WACO	YKS-6
WACO	YKC
WACO	RNF
WACO	CJC
WACO	DJC-6
WACO	ARE
WACO	RPT
WACO	ASO
WACO	UPF-7
WACO-SOCATA	MS-894-A
WAG-AERO	ACRO TRAINER
WAG-AERO	CHUBBY-CUBY
WAG-AERO	WAG A BOND
WAG-AERO	CUBY
WAG-AERO-BARTLING	CUBY
WAG-AERO-EVENSON	SUPER CUBY
WAG-AERO-MCMANUS	SPORTSMAN 2+2
WAG-AERO-NYHOLM	CUBY
WAG-AERO-SCHNEIDER	SPORT TRAINER
WAG-AERO-SCHWEFEL	CUBY
WARWICK	W-4
WEBER-RAND	KR-2
WEFEL FLYING FLEA	HM-360
WHITAKER	CENTERWING
WITTMAN	WITTS V
WITTMAN	W-8
WITTMAN	TAILWIND
WITTMAN	W-10
WITTMAN	WO
WITTMAN	BONZO
WITTMAN	DFA
WITTMAN	W-37
WITTMAN	W-9-L
WITTMAN-COUGHLIN	W-10
WITTMAN-HUCH	TAILWIND
WITTMAN-MCQUISTON	TAILWIND W-8
WITTMAN-THIESSEN	TAILWIND
WOODY	PUSHER
WRIGHT-JVL VOTEC	FLYER REPLICA
ZENAIR-ASHWORTH	CH-200 ZENITH
ZENAIR-PHILLIPS	CH-250
ZENAIR-ROMBOUGH	CRICKET MC-12

A1A2 (3.0)

PLANE MAKE	MODEL
BEECHCRAFT	B-36-TC
CESSNA	T-210-N
DEHAVILLAND	DH-89A MKIV
DEHAVILLAND	TIGER MOTH82A
DEHAVILLAND-REPLICA	BE2C
PIPER	PA-32R 300
PIPER	PA-32R-301T
PIPER	PA-32-301T
PIPER	PA-32-160
PIPER	PA-32RT-301T
PIPER	PA-32RT-300
PIPER	PA-32R
PIPER	PA-32RT-300T
PIPER	PA-32R-300
PIPER	PA-32

A1A3 (3.5)

DE HAVILLAND	DHC-2
DEHAVILLAND	DHC-1
DEHAVILLAND	DHC-2

A1B1 (3.0)

ZENAIR-EBNETER	CRICKET MC-12

A1B2 (3.5)

AERO COMMANDER	560-F
AERO COMMANDER	560
BEECHCRAFT	76
BEECHCRAFT	T-34-A
BEECHCRAFT	EA-76
BEECHCRAFT	T-34-B
BEECHCRAFT	T-34-C
BEECHCRAFT	T-34
CESSNA	337-A
CESSNA	320-A
CESSNA	337-B
CESSNA	337-C
CESSNA	337-E
CESSNA	337
CESSNA	320-E
CESSNA	320-C
CESSNA	337-F
CESSNA	337-D
CESSNA	T-337-G-P
CESSNA	337-G
CESSNA	320-D
DORNIER	DO-28-A-1
DORNIER	DO-28-B-1
DORNIER	DO-28
GRUMMAN	G-44-A
GRUMMAN	G-44
GRUMMAN AMERICAN	GA-7 COUGAR
GULFSTREAM AMERICAN	GA-7
HALSMER	SAFETY TWIN #3
PARTENAVIA	68B VICTOR
PIPER	PA-601P
PIPER	PA-34-200
PIPER	PA-601B
PIPER	PA-34-T
PIPER	PA-34
PIPER	PA-34-200T
PIPER	PA-34-200-T
PIPER	PA-44-180
PIPER	PA-23-250-D
PIPER	PA-23-235
PIPER	PA-23-250-B
PIPER	PA-23-250
PIPER	PA-23-150
PIPER	PA-23-250-C
PIPER	PA-23-250-E
PIPER	PA-23-160
PIPER	PA-44
PIPER	PA-30
PIPER APACHE	PA-23

A1B3 (4.0)

PLANE MAKE	MODEL
AEROSTAR	601
BAUMAN	B-290
BONANZA	T-34
CESSNA	320
LEARFAN	2100
NOMAD	N-22-B
NOMAD	N-24
NOMAD	N-22
PIAGGIO	P-136-L
PIAGGIO	P-168 PORTOI
PIPER	PA-34-220-T
PIPER	PA-34-220T
PIPER	PA-34-
PIPER	PA-23-250-I
PIPER	PA-23-250-F
PIPER	PA-34
ROCKWELL	500-S
ROCKWELL	500-S
ROCKWELL	500

A1C4 (5.0)

DeH HERON	114

A2A2 (3.5)

PILATUS	PC-6

A2B2 (4.0)

AERO COMMANDER	500-B
AERO COMMANDER	500

A2B3 (4.5)

AERO COMMANDER	680
AERO COMMANDER	500-U
AERO COMMANDER	680T
AERO COMMANDER	720
AERO COMMANDER	681
AERO COMMANDER	500-S
AERO COMMANDER	680S
AERO COMMANDER	680-E
AERO-COMMANDER	680S
AERO-COMMANDER	680S
ANTONOV	AN-14
BEECHCRAFT	E-18-S
BEECHCRAFT	E-18
BNA-2A	TRISLANDER
DeH DOVE	104
PZL	M-15
PZL	AN-2
YU SHI	11

A2C4 (5.5)

ANTONOV	AN-28
BREGUET	914S
CASA	C212 AVIOCAR
DEHAVILLAND	DH6
GAC	100
IAI	ARAVA-201
NORTH AMERICAN	B-25-N
NORTH AMERICAN	B-25-J
PZL	AN-28
VOLPAR	CENTENNIAL

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PLANE MAKE	MODEL
AIDI	IC-2
DEHAVILLAND	DHC7
DEHAVILLAND	DHC-7-102
DEHAVILLAND	DHC-7-103
DEHAVILLAND	DHC-4
DOUGLAS	DC-3-G202A
DOUGLAS	DC-3-G202A
DOUGLAS	C-47-D
DOUGLAS	A-26-C
DOUGLAS	DC-3-A
DOUGLAS	DC-3-C
DOUGLAS	DC-3
HERALD	HP
ILYUSHIN	IL-12

A3D4 (6.5)

ANTONOV	AN-72
FAIRCHILD	C-123
MAI-GSTOL	GSTOL

A4D5 (7.5)

BOEING	YC-14
LOCKHEED	1649

B1B2 (4.0)

BEECHCRAFT	B-58
BEECHCRAFT	56-TC
BEECHCRAFT	B-55
BEECHCRAFT	C-55
BEECHCRAFT	A-55
BEECHCRAFT	C-50
CESSNA	310
CESSNA	310-B
CESSNA	310-A
CESSNA	310-D
CESSNA	310-C
PIPER	PA-30-B
PIPER	PA-30-C

B1B3 (4.5)

AERO COMMANDER	690-A
AERO COMMANDER	690
AEROSTAR	
AJI	HUSTLER
BEECHCRAFT	D-50-A
BEECHCRAFT	C-45-H
BEECHCRAFT	G-18-S
BEECHCRAFT	C-45
BEECHCRAFT	D-18-S
BEECHCRAFT	D-95-A
BEECHCRAFT	AT-11
BEECHCRAFT	58-P
BEECHCRAFT	B-60
BEECHCRAFT	D-55
BEECHCRAFT	BE-60
BEECHCRAFT	60
BEECHCRAFT	C-18-S
BEECHCRAFT	D-95
BEECHCRAFT	95
BEECHCRAFT	58
BEECHCRAFT	G-18
BEECHCRAFT	E-55
BEECHCRAFT	D-18
BEECHCRAFT	99
BEECHCRAFT	F-90
BEECHCRAFT	65
BEECHCRAFT	58P
BEECHCRAFT	B-100
BEECHCRAFT	B-95
BEECHCRAFT	56
BEECHCRAFT	58TC
BEECHCRAFT	A-100
CESSNA	310-G

[redacted]4.5)

PLANE MAKE	MODEL
CESSNA	410
CESSNA	402-B
CESSNA	310-J
CESSNA	421-B
CESSNA	305
CESSNA	401-A
CESSNA	340
CESSNA	414
CESSNA	T-310-R
CESSNA	402
CESSNA	650
CESSNA	310-Q
CESSNA	401-B
CESSNA	425
CESSNA	310-R
CESSNA	310-K
CESSNA	421
CESSNA	310-L
CESSNA	401
CESSNA	310-N
CESSNA	404
CESSNA	310-P
CESSNA	305-A
CESSNA	500
CESSNA	310-F
CESSNA	421-A
CESSNA	310-H
CESSNA	411
CESSNA	310-I
CESSNA	421-C
CESSNA	340-A
CESSNA	414-A
CESSNA	501
CHEYENNE	
EMBRAER	326
FORD	4-AT-E
HAMILTON	WESTWIND
LOCKHEED	12-A
MITSUBISHI	MU-2B-36A
MITSUBISHI	MU-2B-30
MITSUBISHI	MU-2-B-25
MITSUBISHI	MU-2-F
MITSUBISHI	MU-2-B
MITSUBISHI	MU-2-B-20
MITSUBISHI	MU-2-J
MITSUBISHI	MU-2
PIPER	PA-31-325
PIPER	PA-31-350
PIPER	PA-31-T
PIPER	PA-31-P
PIPER	PA-31-310
PIPER	PA-31-352
PIPER	PA-31T
PIPER	PA-31
PIPER	PA-601
ROCKWELL	681-B
SIKORSKY	S-76

B1C4 (5.5)

BREGUET	FAL-10
BREGUET	FAL-20
EMBRAER	121
FAIRCHILD SWEARINGEN	METRO
LEAR JET	28-29
MITSUBISHI DIAMOND	MU-300
NORTH AMERICAN	NA-265-40-A
NORTH AMERICAN	NA-265-40
NORTH AMERICAN	NA-265
PIAGGIO	PD-808
ROCKWELL	SABRE 40
SWEARINGEN	SA-227-AC
SWEARINGEN	SA-226
SWEARINGEN	SA-226-TC
SWEARINGEN	SA-26-T
SWEARINGEN	SA-226-T(B)
SWEARINGEN	MERLIN III-C

B2B3 (5.5)

PLANE MAKE	MODEL
AERO COMMANDER	600
BEECHCRAFT	B-80
BEECHCRAFT	E-90
BEECHCRAFT	UC-45-J
BEECHCRAFT	H-18-S
BEECHCRAFT	BA-560
BEECHCRAFT	A-90
BEECHCRAFT	B-90
BEECHCRAFT	H-18
BEECHCRAFT	C-90
CESSNA	441
KING AIR	90
ROCKWELL	840
TURBO COMMANDER	200

B2C4 (6.0)

AERO COMMANDER	1121
BEECHCRAFT	300
BEECHCRAFT	B-200
BEECHCRAFT	200
CESSNA	550
DASSAULT-PAN AM	FANJET
DASSAULT/SUD	FAN JET FALCON
EMBRAER	EMB 110
FALCON	50
GRUMMAN	G-73
GRUMMAN	G-159
GRUMMAN-AMERICAN	G-159
HANDLEY PAGE	JETSTREAM
HAWKER SIDDELEY	DH125-400
HAWKER SIDDELEY	HS-125-700A
HAWKER SIDDELEY	DH-125-3-AR
HAWKER SIDDELEY	DH-125-400A
HAWKER SIDDELEY	HS-125-400
HAWKER SIDDELEY	DH-125-
KING AIR	200
NORD	1101
NORD	262
ROCKWELL	SABRE 60
ROCKWELL	SABRE 65
SHORT BROS.	330
SHORT BROS.	360
SHORTS	SD3-30

B3C5 (7.0)

ANTONOV	AN-30
ANTONOV	AN-24
CASA	C-207A AZOR
CONVAIR	580
CONVAIR	340
CONVAIR	240
CONVAIR	440
DEHAVILLAND	DHC-5
FAIRCHILD HILLER	FH227
FOKKER	F-27
FOKKER FAIRCHILD	F27
HINDUSTANI	748
HS-748	ANDOVER C
HS-748	ANDOVER
MARTIN	404
NIHON	YS-11

B3D5 (7.5)

BREGUET	200
DEHAVILLAND	COMET 4C

B4E5 (8.5)

ILYUSHIN	IL-76

C1C5 (6.5)

PLANE MAKE	MODEL
GATES LEARJET	55
HANSA	HAB-320
HS 125	1-406
HS-748	700
HS-748	600
LEAR JET	23
LEAR JET	55
LEAR JET	24-F
LEAR JET	25-B
LEAR JET	35-A
LEAR JET	24-B
LEAR JET	24
LEAR JET	25
ROCKWELL	JC 1121
ROCKWELL	SABRE 75A

C2B4 (6.0)

ROCKWELL	980

C2C5 (7.0)

CANADAIR	CHALLENGER
LOCKHEED	1329-25
REPUBLIC	F-84
ROCKWELL	NA-265-60
ROCKWELL	SABRE 80
ROCKWELL	NA-265
ROCKWELL	601
SABERLINER	JET

C3C5 (7.5)

YAKOVLEV	YAK-40

C3D5 (8.0)

AW-650	ARGOSY
BAC	111-300
BAC	111-400
BAC	111-200
BAC	111-475
BOEING	B-17-G
BOEING	727-200
BOEING	737
BOEING	727-100
DOUGLAS	DC9 10/20 SER.
DOUGLAS	DC9 30/40 SER.
DOUGLAS	DC9 SUPER 80
DOUGLAS	DC9-50
DOUGLAS	DC-9
DOUGLAS	DC-6A
DOUGLAS	DC-9-80
DeH TRIDENT	121-2
DeH TRIDENT	121-2E
FAIRCHILD	C-119
FOKKER	F-28
GULFSTREAM AMERICAN	G-1159A
GULFSTREAM AMERICAN	G-1159
HS-NIMROD	MK2
LOCKHEED	P-3
LOCKHEED	188
SUD	210
TUPOLEV	TU-124
VICKERS	VC-2
YAKOLEV	YAK-42

C4D5 (8.5)

PLANE MAKE	MODEL
AIRBUS	A-310
ANTONOV	AN-10
ANTONOV	AN-12
BOEING	720B
BOEING	C-97-G
BOEING	720
BOEING	757
BREGUET	1150
CANADAIR	CL-600
CANADAIR	CL-44
CANADAIR	CL 600
LOCKHEED	1011-600
LOCKHEED	100-20
LOCKHEED	400
LOCKHEED	100-30
TRANSALL	C-160

C4E5 (9.0)

AIRBUS	A-300
BOEING	707-100
BOEING	707-420
BOEING	767
BOEING	707-320B
BOEING	707-320
LOCKHEED	1011-200
LOCKHEED	1011-1
LOCKHEED	C-141A
LOCKHEED	C-141B
TUPOLEV	TU-114
VICKERS	VC-10-1150
VICKERS	VC-10-1100
VICKERS-VISCOUNT	745-D

C5E5 (9.5)

BOEING	747-SP

C6E5 (10)

ANTONOV	AN-22
LOCKHEED	C-5A

D1C5 (7.0)

LEAR JET	31CJ
LEAR JET	35
LEARJET	35-A

D3D5 (8.5)

BAC	111-500
BRITISH AEROSPACE	146
BRITISH AEROSPACE	B11
BRITISH AEROSPACE	146-200A
DeH TRIDENT	121-3
DeH TRIDENT	121-3B
TUPOLEV	TU-134

D4D5 (9.0)

BOEING	707-200
CONVAIR	990
CONVAIR	880
TUPOLEV	TU-154

D4E5 (9.5)

PLANE MAKE	MODEL
BOEING	777
DOUGLAS	DC-10 30/40
DOUGLAS	DC-8-61
DOUGLAS	DC-8-63
DOUGLAS	DC8 60/70 S
ILYUSHIN	IL-86
ILYUSHIN	IL-62
LOCKHEED	1011-400
LOCKHEED	1011-500
LOCKHEED	1011-250
LOCKHEED	T-33-A
LOCKHEED	P-38L
LOCKHEED	T-33
LOCKHEED	L1011-500 SE
LOCKHEED	10-E ELECTRA
ROCKWELL	B-1

D5E5 (10)

BOEING	B-52
BOEING	747
BOEING	E-4
BOEING	747-SR

E2D5 (8.5)

LOCKHEED	SR-71

E3E5 (9.5)

TUPOLEV	TU-144

H1H0 (2.0)

S1S0 (1.5)

U1U0 (1.0)

Y1Y0 (0.5)

Z1Z0 (0.0)

Z7Z0 (0.0)

FIGURE 3-1 AIRPLANE DESIGN GROUP CONCEPT

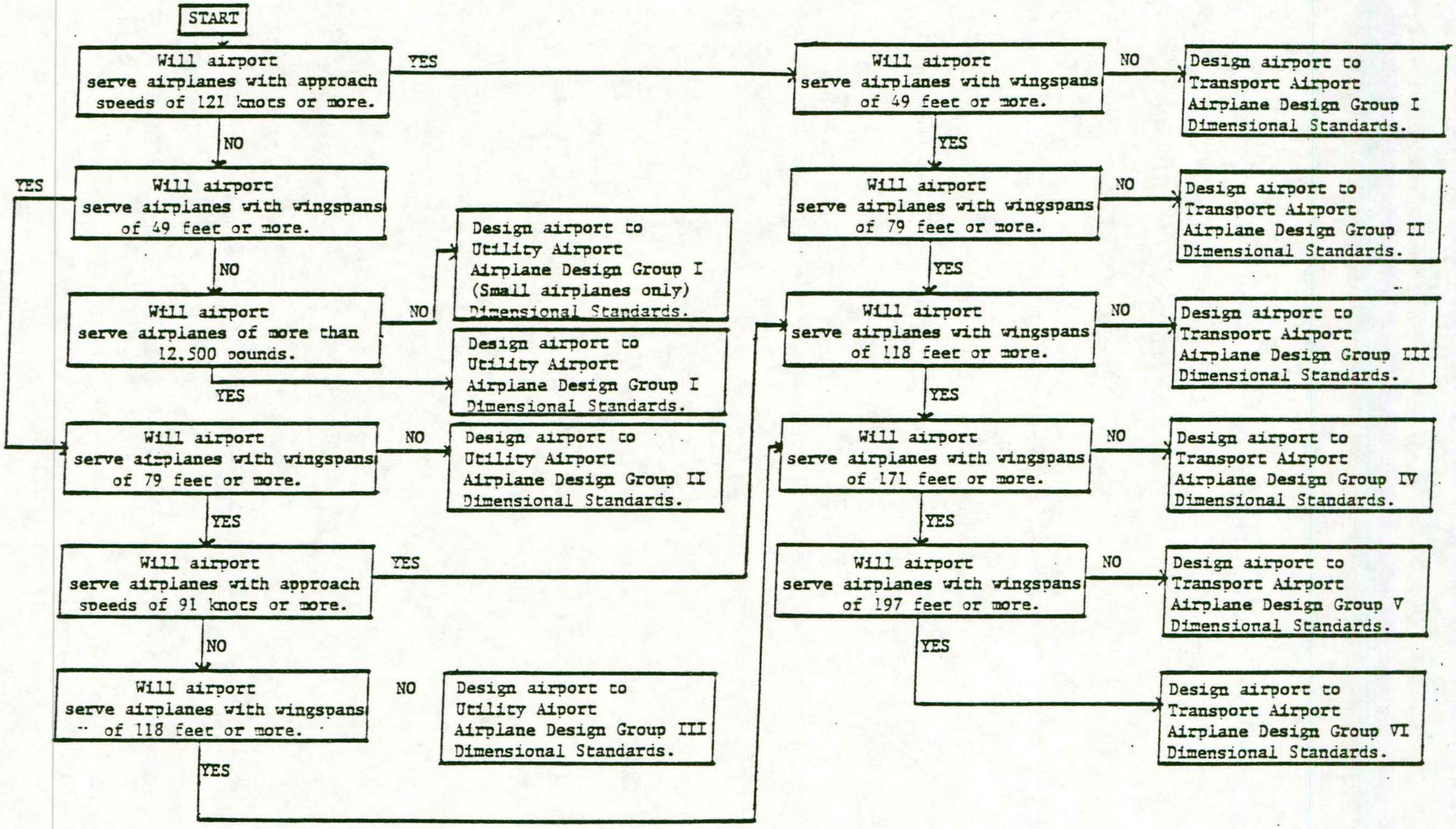
MONTICELLO MUNICIPAL AIRPORT

DESIGN AIRCRAFT

* Approach Speed: Less than 121 knots
* Wingspan: Less than 79 feet

DESIGN

* Utility Airport (General Utility Stage I)
* Airplane Design Group II



RUNWAYS AND TAXIWAYS

Runway Alignment and Wind Coverage

Runway alignment is based upon a number of factors to include topography, cultural features, physical features, land ownership, and environmental and climatic conditions. Of these, wind coverage provided by an existing or proposed runway is a primary concern.

The optimum runway orientation is one which will provide the airport a 95 percent level of wind coverage at a crosswind component value not exceeding 12 m.p.h. (10.5 knots) for small airplanes and 15 m.p.h. (13 knots) plus for large airplanes. A large airplane is defined as an airplane of more than 12,500 pounds maximum certificated take-off weight.

In Iowa, the wind is so varied that consideration must be given to supplemental wind coverage. Of primary concern is the affect of the crosswind component on small airplanes. Historically, the primary runway alignment has been one that will obtain maximum wind coverage at 12 m.p.h. crosswind component value. The primary runway alignment for most airports in Iowa fall between 0 00', and N 30 00' W. A north/northwesterly alignment typically provides wind coverage of 78 to 88 percent at the 12 m.p.h. crosswind.

A second or crosswind runway alignment is then selected to provide the airport with a 95 percent level of wind coverage. The crosswind alignment was generally N 90 00' E to N 29 00' E. The IDOT, as a rule of thumb, recommended a minimum 60 degree separation between runway facilities. Although this is not a standard, it does minimize a duplication of wind coverage.

For the most part, the primary runway has been hard surfaced while the crosswind runway has been maintained as a turf facility. Even though the same airplane may use both runways, limited funds for construction and maintenance has precluded hard surfacing of the crosswind runway at most general aviation airports in Iowa. Where the crosswind component exceeded the operational characteristics of the airplane, an alternate airport could be used. When benefits extended from hard surfacing the crosswind runway are compared to construction and maintenance costs, use of an alternate airport or development of a turf runway appears the most realistic choice. Where there is substantial use of the airport by small airplanes, a crosswind runway may still be desired even though it may never be hard surfaced.

Where a crosswind runway can not be constructed due to topographic conditions, cultural features an/or environmental constraints, the primary runway consideration may be given to increasing the width of the primary runway. Reference may be made to Appendix 1 of FAA AC 150/5300 - 13 which discusses runway width and allowable crosswind.

TABLE 3-2: RUNWAY WIDTH VS. ALLOWABLE CROSSWIND

Runway Width	Allowable Crosswind
Less than 75 feet	10.5 knots (12 m.p.h.)
75 feet but less than 100 feet	13.0 knots (15 m.p.h.)
100 feet but less than 150 feet	16.0 knots (18.4 m.p.h.)
150 feet or more	20.0 knots (23 m.p.h.)

SOURCE: FAA AC 150/5300 - 13 p.87

Since wind data is not available for the Monticello Municipal Airport, wind data tabulated for Cedar Rapids was selected as being most representative. Reference may be made to Figure 3-1 which depicts an all-weather wind rose for Cedar Rapids.

Calms = 6.1%
Ceiling and visibility group:
Greater than 1000 ft and/or 3 miles = 90.2%
Less than 1000 ft and/or 3 miles = 9.8%

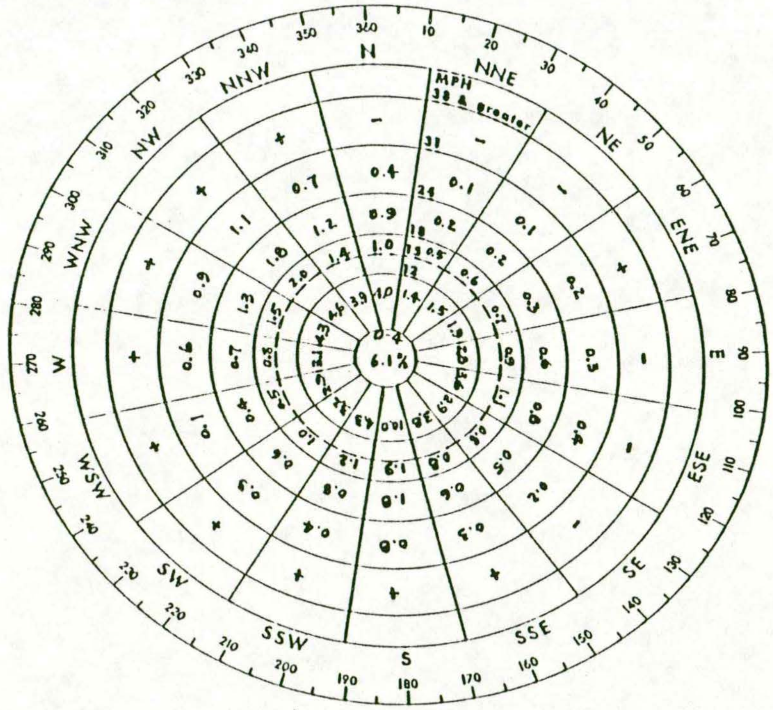
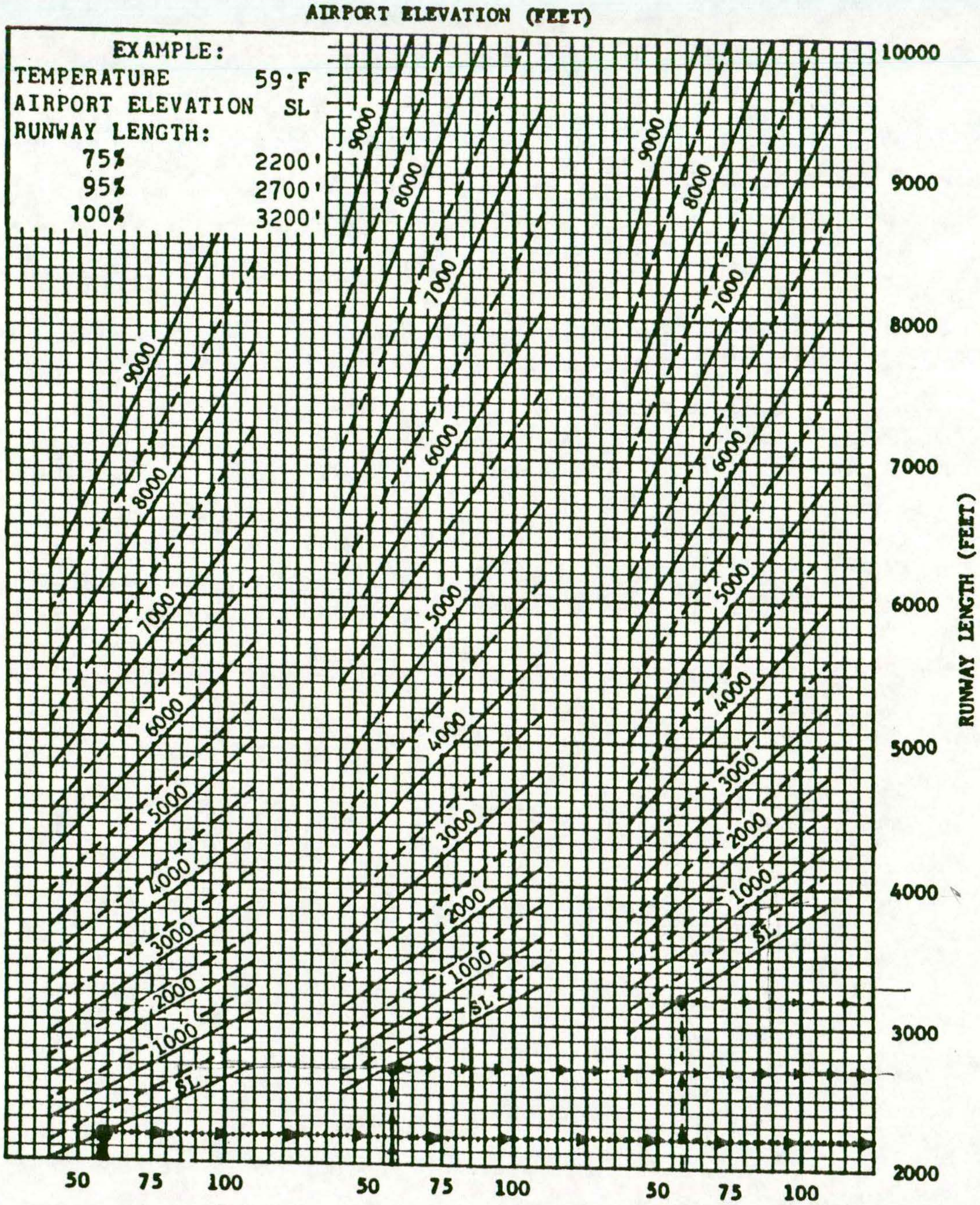


FIGURE 3-1: CEDAR RAPIDS WIND ROSE (MPH), RECORD OF PERIOD 1964-1968.

Runway Length

Table 3-2 sets forth the runway length curves for those airplanes having less than 10 passengers seats. Given an elevation of 845 feet above sea level and a mean daily maximum temperature of 87 F., a runway, 3900 feet in length, would accommodate 100 percent of the small airplane feet. For airport planning purposes, it is recommended that the runway be developed to a length of 4000 feet.

100% of fleet	3900'+ (4000')
95% of fleet	3300'+ (3400')
75% of fleet	2700'+ (2800')



MEAN DAILY MAXIMUM TEMPERATURE (F°), HOTTEST MONTH OF YEAR

75% OF FLEET 95% OF FLEET 100% OF FLEET

FIGURE 3-2: RUNWAY LENGTH TO SERVE SMALL AIRPLANES HAVING LESS THAN 10 PASSENGER SEATS.

Obstacle Free Zone, (OFZ)

The obstacle Free Zone (OFZ) is a three dimensional volume of airspace. The runway OFZ extends 200 feet beyond each end of the runway and to a width of 250 feet for non-precision instrument and visual runways serving small airplanes with an approach speed 50 knots or more.

The approach OFZ applies to runways with an approach light system. The inner-transitional surface OFZ applies only to precision instrument runways. The obstacle free zone is to be maintained free of all objects except frangible navigational aids.

Runway Object Free Area, (OFA)

The runway object free area (OFA) is a two dimensional ground area surrounding the runway. The OFA extends 500 feet beyond the runway end and outward 200 feet from the runway centerline for non-precision instrument and visual runway constructed to Airplane Design Group I standards.

For visual and non-precision instrument runways constructed to Airplane Design Group II standards, the OFA extends outward 600 feet from the runway end and 250 feet out from the runway centerline.

The runway obstacle free area clearing standard precludes parked aircraft and objects.

Runway Safety Area,(RSA)

The runway safety area represents an area extending along and outward from the runway that is capable of supporting airplanes which veer off, undershoot or overrun the runway. Design standards set forth in AC 150/5300 - 13 require the runway safety area to be capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and firefighting equipment, as well as an aircraft, without causing structural damage to the aircraft.

Consequently, the RSA must be graded and free of objects except for frangible mounted structures. Grades should be designed to prevent accumulations of water. A good turf should be maintained to prevent erosion.

For nonprecision instrument and visual runways designed to Airplane Design Group I standards, the RSA extends 240 feet beyond the runway end and 60 feet outward from the runway centerline. Those runways constructed to Airplane Design Group II standards, the runway safety area (RSA) extends 300 feet beyond the runway end and outward from the centerline 75 feet.

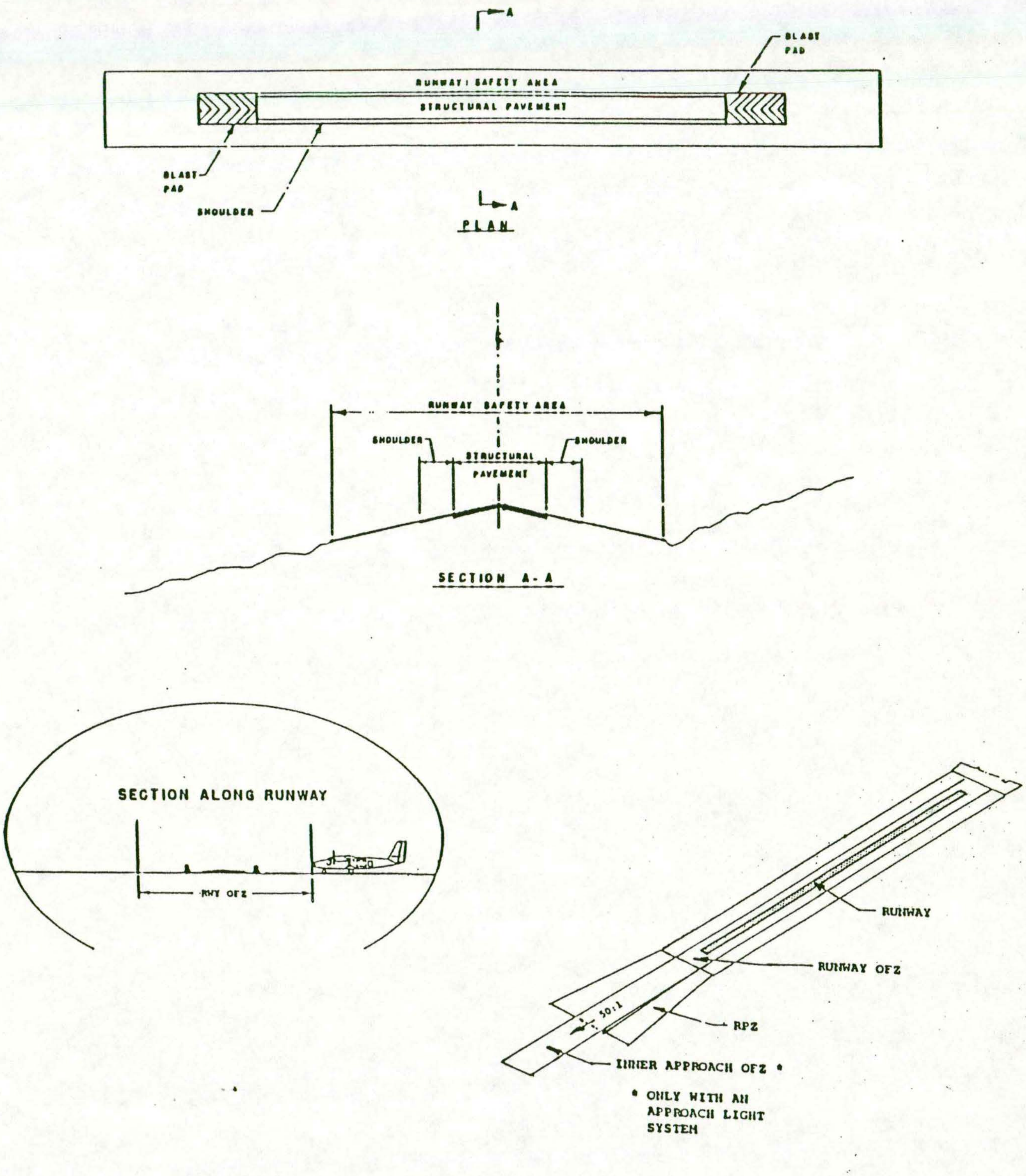


FIGURE 3-3: RUNWAY RSA AND OFZ

Declared Distance

The declared distance standards may be used under special circumstances when the runway can not be constructed to conventional runway standards.

> "Conventional runway configurations, i.e. runways with safety areas beyond both runways ends and without displaced thresholds, clearways, or stopways, are recommended."

SOURCE: FAA AC 150/5300 - 13 p.22

Prior approval by the Federal Aviation Administration is required before using declared distances standards.

Taxiways

Taxiways are constructed for the purpose of moving aircraft between various components of the airport. As activity increases, taxiways become necessary for the purpose of increasing airport capacity and providing for increased safety.

The Iowa DOT, as a rule of thumb, generally finds justification for a full parallel taxiway system when total annual operations exceed 50,000 and a partial parallel taxiway when annual operations approach 30,000. Based upon the forecast of aviation demand and IDOT criteria, there would appear to be no activity justification for the construction of a full parallel taxiway to increase runway capacity. A full and/or partial parallel taxiway would be expected to receive a low priority in terms of funding.

Should a partial or full parallel taxiway be constructed, the following minimum criteria should be maintained.

- Runway Centerline to Taxiway Centerline:
  240 feet (Design Group II)

- Taxiway Centerline to Parallel Taxiway and/or Taxilane Centerline:
  105 feet (Design Group II)
  1.2 times the wingspan of the most demand airplane plus 10 feet.

- Taxiway Centerline to Parked Aircraft and objects: 0.7 times the wingspan of the most demanding airplanes plus 10 feet.
  65.5 feet (Design Group II)

- Taxiway Width:
  35 feet

- Radius of Taxiway Turn: 75 feet

- Taxiway Safety Area:
  79 feet (Design Group II)

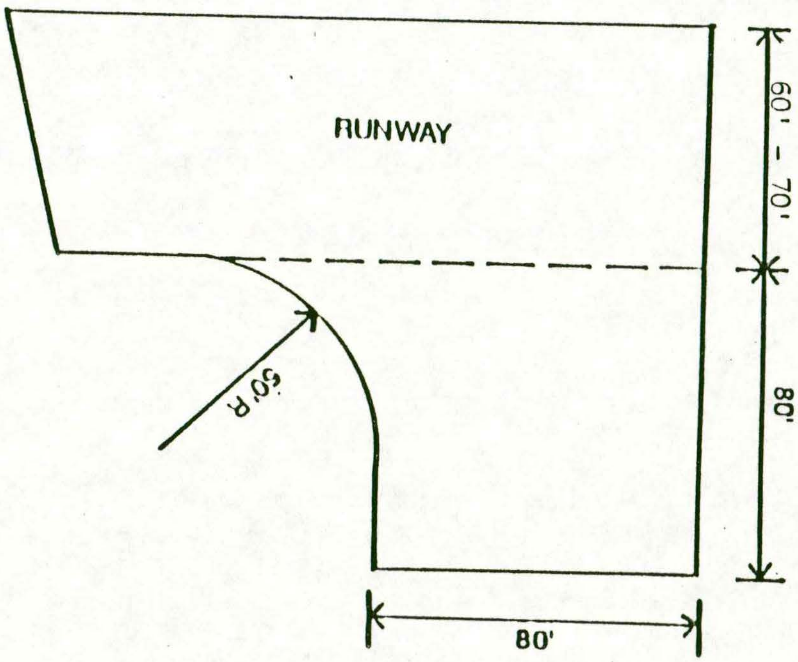
- Taxiway Object Free Area:
  131 feet (Design Group II)
  or 1.4 times the wingspan of the most demanding airplane plus 20 feet.

Should a new runway be built, and the present runway pavement used as a taxiway, it is recommended that separation of 300 feet be established for future precision instrument operations.

Taxiway exits should be located based upon activity. At low activity airports, a right angle taxiway exit located at the runway end and near the mid-point of the runway would provide an adequate level of service.

Turn arounds are currently available, but they should be expanded to meet the established standards.

FIGURE 3-4: TURNAROUND



SOURCE: FAA AC 150/5300 - 4B, CHG. 6

The taxilane is defined as that portion of the aircraft parking area used for access between taxiways, aircraft parking positions, hangars, and storage facilities.

The width of the taxilane should be 0.6 times the wingspan of the most demanding aircraft plus ten feet. Using a wingspan of 48.9 feet (Airplane Design Group I), the taxilane should be 80 feet. Consequently, no hangar, fence, etc. should be located within 40 feet of the taxilane centerline. The internal taxiway system providing access to tee-hangars should be no less than 20 feet in width.

DRAINAGE

An adequate drainage system is important for the safety of aircraft operations and for the longevity of the pavements. Improper drainage can result in the formation of puddles on pavements which are hazardous to aircraft landing or taking off. Improper drainage can also reduce the load bearing capacity of subgrades and the anticipated life of expensive pavement structures.

Surface drainage systems should be designed on a five year frequency of storm. Methods of computation are contained in FAA Advisory Circular 150-5300-5B, Airport Drainage.

Subsurface drainage systems are desirable where water may rise to within one foot of the pavement section. Water in the subgrade contributes directly to frost boil and heaving action. Also, saturated subgrades exhibit a greatly reduced load bearing capacity. For these reasons, soil conditions and subsurface water conditions play an important part in airport design.

A subsurface drainage system consisting of 4 and 6 inch perforated tile may be required under the paved areas of the airport.

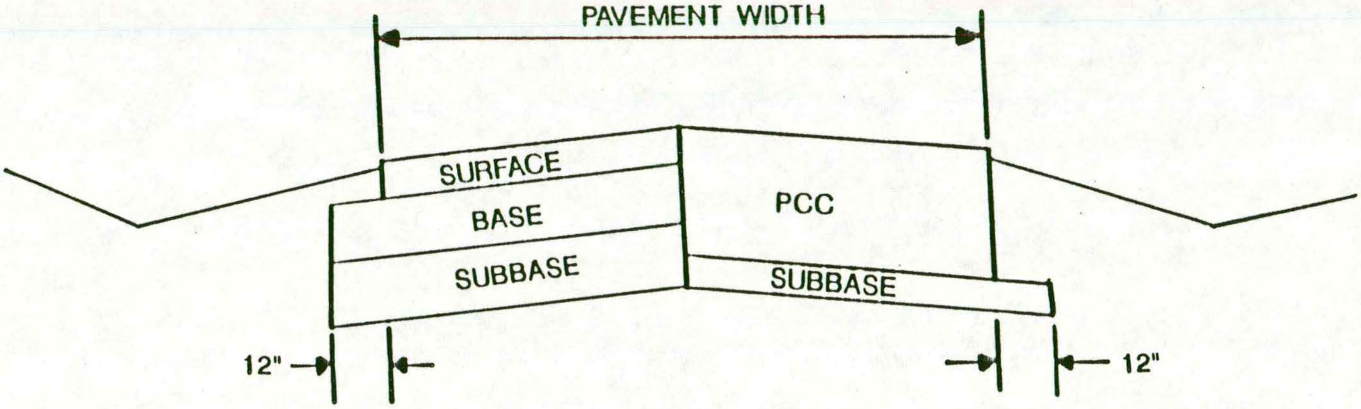
Runway, Taxiway, and Apron Paving

Airport pavement is intended to provide a smooth and safe all weather surface free from particles and other debris that may be picked up by propeller wash. The pavement should be of sufficient thickness and strength to accommodate the anticipated loads without undue pavement stress. Pavement for the Monticello Municipal Airport Facility should be designed to accommodate single wheel gear, of 12,500 lbs. maximum weight.

The various pavement courses are shown graphically in Figure 3-5 and describe as follows:

SURFACE COURSE:	Includes Portland cement concrete, bituminous concrete, aggregate bituminous mixtures, or bituminous surface treatments.
BASE COURSE:	Consists of a variety of different materials which generally fall into two main classes, treated and untreated. The untreated bases consist of stone, gravel, limerock, sand-clay, or a variety of other materials. The treated bases normally consist of a crushed or uncrushed aggregate that has been mixed with cement or bitumen, or a mixture of soil and lime.
SUBBASE COURSE:	Consists of a granular material or a stabilized soil.

FIGURE 3-5: TYPICAL PAVEMENT SECTION



SOURCE: FAA AC 150/5320-6C

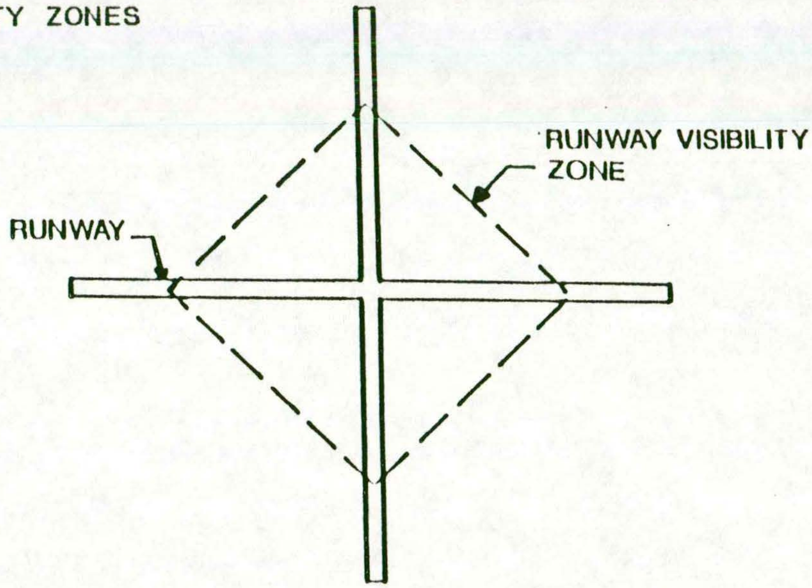
A report of the pavement inventory, condition and a five year budget plan estimating the annual rehabilitation dollars required to maintain a desired level of pavement condition, was published in January, 1990 by the Iowa DOT, from a survey conducted in May of 1989. This is the latest and most reliable information concerning the pavement at Monticello Municipal Airport, and is reprinted herein in its entirety for reference in further planning activities.

Runway Grade Change and Visibility

Consideration must also be given to runway grade changes, line of sight along and between runways as well as elimination of obstructions within the obstacle free zone (OFZ). The following line of sight criteria should be obtained:

> Runway grade changes should be such that any two points five feet above the runway centerline will be visible along the entire length of the runway where a full parallel taxiway does not exist. Where a full parallel taxiway does exist, the criteria may be reduced to one half the runway length rather than the entire runway length.
>
> Where intersecting runways exist, a runway visibility zone is created as depicted in the following figure.

FIGURE 3-6: VISIBILITY ZONES

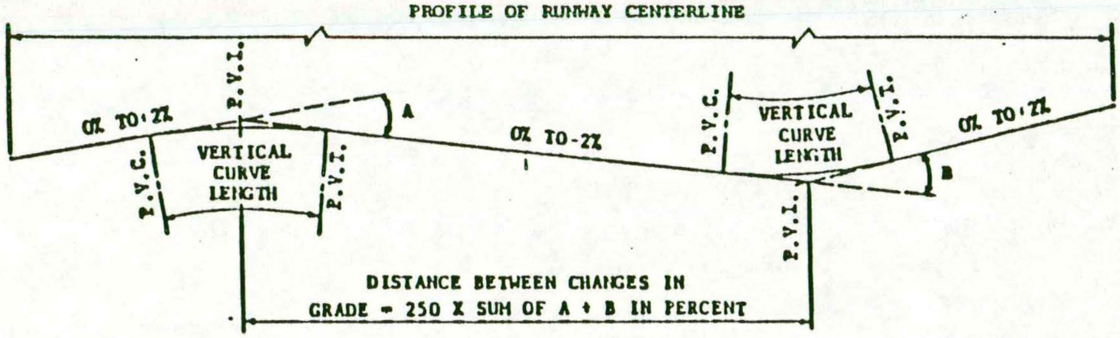


Runway grades, terrain, etc. must be such that a line of sight is maintained within the visibility zone of the intersecting runways five feet above the centerlines. Reference may be made to FAA AC 150/5300-13 concerning the location of runway visibility points.

Maximum grade changes should not exceed two percent where vertical curves are required. The length of the vertical curve should not be less than 300 feet for each percent grade change less than 0.4 percent.

Transverse grades on the runway should be at least one percent and no more than two percent. Within ten feet of the pavement edge, the grade should have a minimum slope of three percent and not to exceed five percent. Reference may be made to Figure 3-7 concerning a typical runway cross section.

FIGURE 3-7: RUNWAY PROFILE AND CROSS SECTION

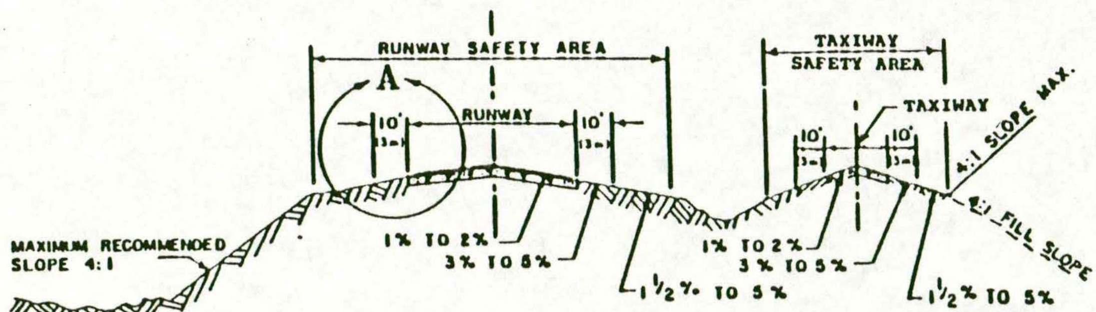


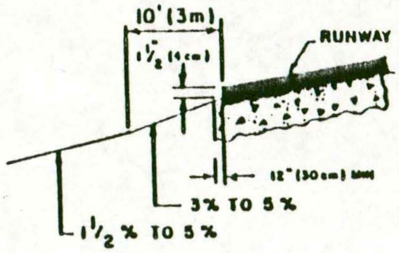
VERTICAL CURVES

LENGTH OF VERTICAL CURVES WILL NOT BE LESS THAN 300' FOR EACH 1% GRADE CHANGE, EXCEPT THAT NO VERTICAL CURVE WILL BE REQUIRED WHEN GRADE CHANGE IS LESS THAN 0.4%.

GRADE CHANGE

MAXIMUM GRADE CHANGE SUCH AS (A) OR (B) SHOULD NOT EXCEED 2%.

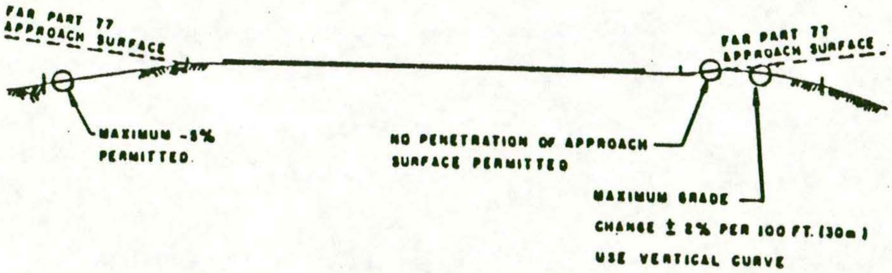




DETAIL A

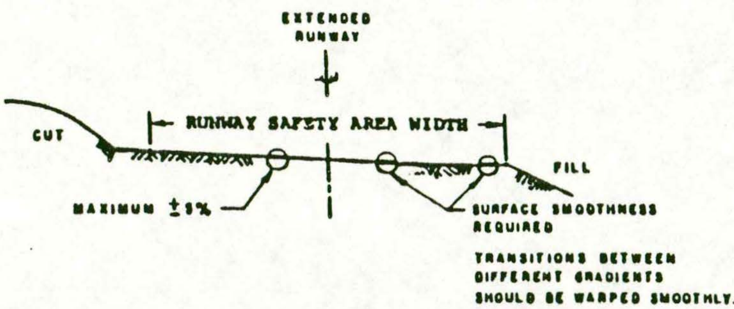
TRANSVERSE SLOPES SHOULD BE ADEQUATE TO PREVENT THE ACCUMULATION OF WATER ON THE SURFACE.
SLOPES SHOULD FALL WITHIN THE RANGES SHOWN ABOVE.
THE RECOMMENDED $1\frac{1}{2}$" (4 cm) PAVEMENT EDGE DROP IS INTENDED TO BE USED BETWEEN PAVED AND UNPAVED SURFACES.
IT IS DESIRABLE TO MAINTAIN A 5% SLOPE FOR THE FIRST 10' (3m) OF UNPAVED SURFACE IMMEDIATELY ADJACENT TO THE PAVED SURFACE.

The longitudinal grade extending outward from the threshold should not exceed three (3) percent with any slope being downward. Beyond 200 feet the maximum allowable negative grade is five (5) percent. No part of the runway safety area longitudinal grade should penetrate the approach surface. Reference may be made to FAA AC 150/5300-13 concerning longitudinal and traverse gradient standards for taxiway safety areas.



LONGITUDINAL GRADE

LONGITUDINAL GRADE LIMITATIONS



TRANSVERSE GRADE

Pavement Markings

A non-precision instrument runway is one to which a non-precision approach has been approved. NPI markings consist of basic marking in addition to threshold markings.

- **Centerline markings:** The centerline markings consist of a broken line having 120 foot dashes and 80 foot blank spaces. The minimum width is 18 inches.

- **Designation markings:** Each runway end is marked with designated numbers representing the magnetic azimuth, measured clockwise from north of the centerline from the approach end and recorded to the nearest 10 degrees with the last zero omitted.

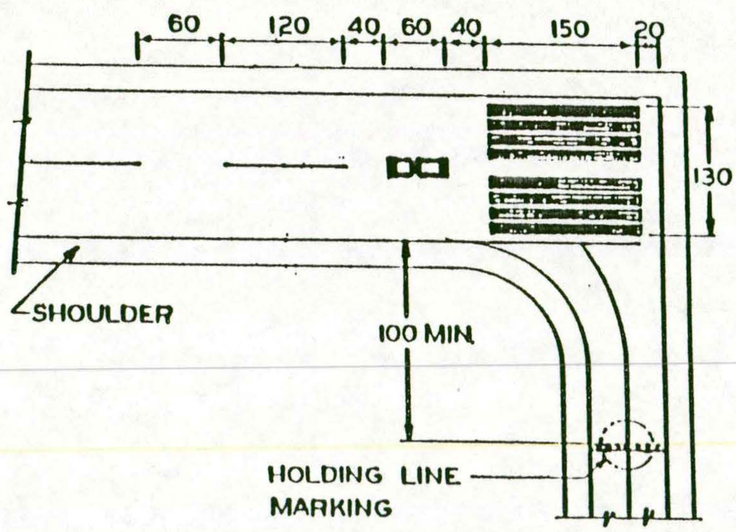
- **Threshold markings:** Threshold markings consist of eight 150' X 12' stripes. Each stripe is separated by three feet except the center where the separation is 16 feet. Where the runway is less than 150 feet, the width of the stripes and separation is reduced proportionally.

- **Fixed distance marking:** Two solid longitudinal bars located either side of the runway centerline 1,000 feet from the threshold.

Non-precision instrument markings should be placed on the primary runway provided a non-precision instrument approach has been approved for that runway. Otherwise basic runway markings should be maintained. Reference may be made to Figure 3-8. Unpaved runways are normally defined by placing markers at the corners of the runway and at 400 foot intervals along the length of the runway.

Taxiways are marked by a continuous stripe, six inches in width, along the taxiway centerline. Holding lines are located on the taxiway 150 feet from the runway edge. Additional information on pavement markings may be obtained from FAA AC 150/5340-1E.

FIGURE 3-8: NON-PRECISION INSTRUMENT MARKINGS



LANDING AND NAVIGATIONAL AIDS

Runway and Taxiway Lighting

A Low Intensity Runway Light (LIRL) system is operational on RW13/31, the primary runway. This should be upgraded to a Medium Intensity Runway Light (MIRL) system to serve the class of aircraft and operations anticipated. A low intensity (LIRL) system may be installed on the secondary runway, or turf strip, if desired.

Runway lights are used to outline the edges of the runway during periods of darkness or low visibility. Each runway edge light fixture emits a white light except on instrument runways where yellow is substituted for white on the last 2,000 feet or one-half the runway length whichever is less. The runway lights are located no more than ten feet from the defined runway edge and spaced no more than 200 feet on center. The light stake should be no less than 30 inches high due to snow removal and grass cutting. The lights, located on both sides of the runway should be directly across from each other and perpendicular to the runway centerline. Special requirements exist at runway intersections.

Two groups of threshold lights, the second part of a runway light system, are located symmetrically about the runway centerline. The threshold lights emit a 180 red light inward and 180 green light outward. The threshold lights should be located no closer than two feet and no more than ten feet from the runway threshold. The two groups of lights contain no less than three fixtures for a VFR runway and four fixtures for an IFR runway. The outer most light is located in line with the runway edge lights. The remaining lights are placed on ten foot centers towards the runway centerline extended. Air-to-ground radio control for the runway light system should also be maintained.

Taxiway edge lights should be located no more than ten feet from the taxiway edge on no more than 200 foot centers. The taxiway edge light which emits a blue light define the lateral limits of the system. Reflectors may be used in lieu of taxiway lights where activity is minimal.

Reference may be made to the following FAA Advisory Circulares:

AC 150/5300-24 Runway and Taxiway Edge Lighting Systems
AC 150/5340-27 Air-To-Ground Radio Control of Airport Lighting Systems

Precision Approach Path Indicator, (PAPI)

The Precision Approach Path Indicator (PAPI) is the current standard aid to aircraft on approach. The colored light beam enables the pilot to determine if his/her approach is high, on course, or low.

L-881: System containing of two light bars
L-880: System containing of two light units

The PAPI system should be located on the left side of the runway (approach end) and so sited and aimed that it defines an approach path with adequate clearance over obstacles and a minimum threshold crossing height. Reference may be made to FAA AC 150/5345-28D. Since Runways 13 and 31 are currently equipped with VASI - 2 units, it is not recommended to convert to PAPI's unless the VASI units are extensively damaged or are no longer repairable.

Runway End Identification Lights, (REIL)

Runway End Identification Lights (REIL's) are now on the primary runway. REIL's are located in line with the threshold lights, 75 feet from the runway edge. IDOT recommends installation of a REIL system when the annual operations exceed 3,000. Reference may be made to FAA AC 150/5300-14B, AC 150/5300-2C, and AC 150/5340-25 concerning REIL design and siting requirements. Units should also be installed on RW 13.

Rotating Beacon

An airport beacon light is installed and operating. The beacon light emits alternating white and green flashes of light, and should be located no closer than 750 to a runway centerline. The Monticello beacon is only approximately 500 feet from runway centerline. It is not recommended that it be relocated in the foreseeable future. Reference may be made to FAA AC 150/5340-21 and AC 150/5345-12.

Segmented Circle and Lighted Wind Indicator

The segmented circle consists of a 100 foot diameter circle with a minimum of 18 segments constructed around the surface wind indicator. The marking system may be used to convey traffic patterns. A lighted wind indicator is normally installed at the center. Reference may be made to FAA AC 150/5345-5. The segmented circle can be constructed around the present lighted wind indicator.

Nondirectional Beacon

A nondirectional radio beacon (NDB) is located southeast of the terminal area and 1.6 n m from the northwesterly approach threshold to RW 13/31. Future metal buildings, power lines, metal fences, etc. should be located no closer than 100 feet to the NDB. The NDB radiates a signal which can be used by pilots to provide electronic directional guidance to the airport. This consists of two 65 foot poles spaced approximately 350 feet with two wires strung between them. The ground should be smooth, level, and well drained. The location should take into account the obstruction standards described in this report.

The NDB is used to establish NDB-A approach on RW 31.

TERMINAL AREA

Hangers

At most general aviation airports, "T" type hangars are constructed to accommodate based aircraft. In addition, a fixed base operator (FBO) shop is also constructed. Corporate, conventional-type hangars may also be found.

The terminal area should be designed to allow space for the construction of T-hangars, conventional hangars and a FBO shop. The FBO shop building often containing space for terminal building activities, should be located adjacent to the itinerant aircraft apron. The IDOT recommends a 60' X 80' structure be constructed for use as a FBO facility.

T-hangar dimensions vary with manufacturers and need. Critical dimensions would include those concerning clear door, depth, wing depth, and tail height. Space requirements using a nested T-hangar concept as illustrated as follows:

NUMBER OF UNITS	STRUCTURE WIDTH	STRUCTURE LENGTH	CLEAR DOOR	WING DEPTH	TAIL DEPTH
6	52'	143'6"	40'6" X 12'	19'	20'1"
8	52'	184'6"	40'6" X 12'	19'	20'1"
10	52'	225'6"	40'6" X 12'	19'	20'1"

Hangar structures should be separated by a minimum of 75 feet. A taxiway, 20 feet in width should be maintained so as to provide access from the apron area to individual hangar stalls.

The number of units to be constructed depends upon demand. For planning purposes, it is assumed that all based aircraft will be placed in hangars. Reference to the forecast of aviation activity would suggest that the airport may need no less than 20 stalls by 2010.

The demand for hangar space is influenced not only by the absolute number of aircraft, but by the cost, availability, and condition of the units as well. For planning purposes, it is assumed that all registered and based aircraft would be kept in hangars. For reasons previously noted, a number of aircraft owners may choose to tie down their aircraft, should hangar rental cost be beyond what the owner is willing to pay. The demand for hangar space may also be influenced by the cost of comparable space at area airport facilities.

There is insufficient space for T-hangars between RW13/31 and Highway 38. If they must be constructed prior to development of a new runway. They should be located adjacent to Highway 38, northwest of the present end of the runway. If a new runway is built southeast of the existing one, a very efficient and manageable T-hangar area can be developed northwest or southeast (or both) of the present terminal area.

Terminal Building

Terminal building functions are provided for within the FBO maintenance facility. The SASP recommends the following minimum space at utility airports:

- A public waiting room and service area of 500 square feet.
- A pilot's briefing area of 180 square feet.
- An airport administrator's office of 180 square feet.
- If a new terminal building is to be constructed, it should provide a minimum of 1000 square feet.

Automobile Parking

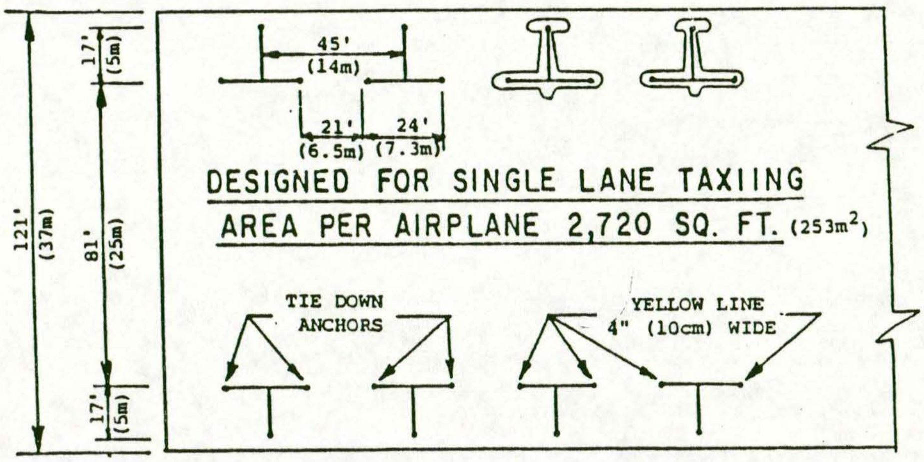
The IDOT recommends a hard surfaced area capable of accommodating a number of parking spaces equal to the number of based aircraft. Based upon the forecast of based aircraft, it would appear that an improved surface lot to accommodate upwards of 20 vehicles may be needed by the year 2010.

Apron Tiedowns

An apron area should be maintained to provide space for aircraft movements (queuing space) and improved surface tiedowns for itinerant aircraft. The queuing area provides space for aircraft access to the FBO shop, individual hangars, fuel, pad, etc.

A typical tiedown area is illustrated in Figure 3-9:

FIGURE 3-9: TIEDOWN LAYOUTS



Taxilane:
81' between Tiedowns
Single lane taxiing

The existing itinerant aircraft parking area supports 8 improved surface tiedown spaces.

Since all based aircraft are expected to be in hangars, the primary concern is with itinerant aircraft. The available tie downs are considered adequate during the planning period.

Access Road

The SASP recommends that the primary access road to the terminal area be hard surfaced. The width should be no less than 22 feet in width with provisions for shoulder and drainage.

FAR PART 77

Obstruction Standards

Part 77 of Volume XI, Federal Aviation Regulations, sets forth a number of standards to be used in identifying obstructions to air navigation. These standards are of considerable importance. The discussion herein is primarily extracted from Part 77. These standards may be used as a guide in the preparation of a zoning ordinance and the layout plan.

Standards for Determining Obstructions

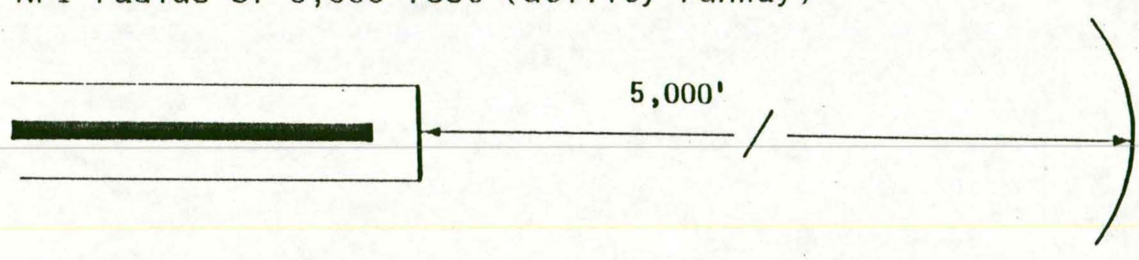
1. A stationary or mobile object is defined as an obstruction to air navigation if it is of a greater height than any one of the following:
   - A. A height of 500 feet above the ground at the site.
   - B. A height of 200 feet above the ground or airport elevation, whichever is higher, within three nautical miles of the airport reference point.
   - C. The surface of a takeoff or landing area of an airport or any imaginary surface.
   - D. Traverse ways on or near an airport to be used for the passage of mobile objects.

- Interstate Highway	17 feet
- Public Roadway	15 feet
- Private Road	10 feet or height of the highest mobile object
- Railroad	23 feet

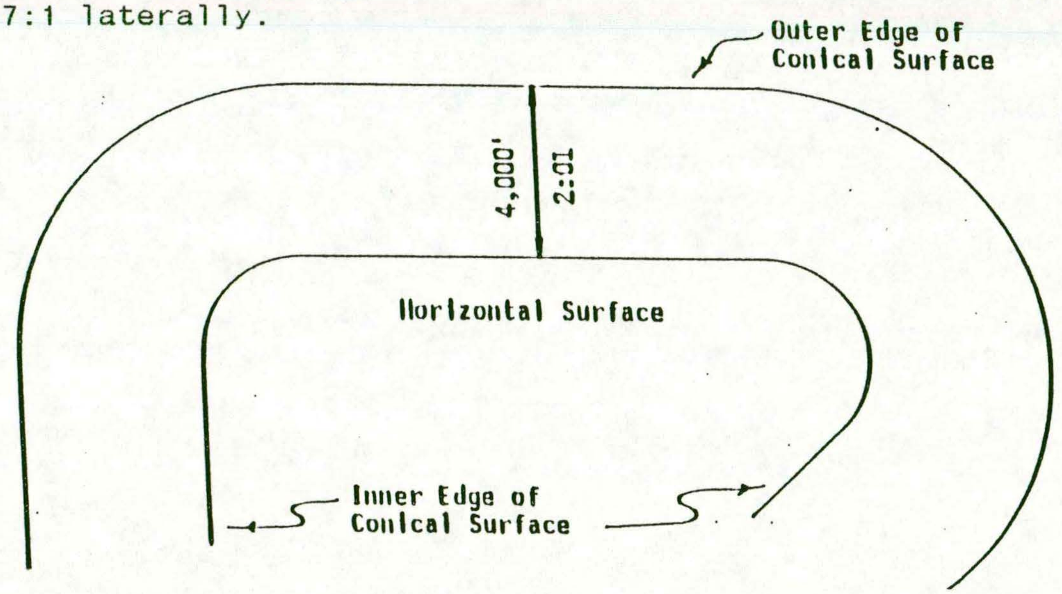
Imaginary Surfaces

Imaginary surfaces establish areas where any object penetrating that surface would be considered an obstruction to air navigation. The imaginary surface establishes an imaginary line that separates ground activities from aircraft activities. In order to select the applicable imaginary surface, the type of approach to each runway must be considered.

A. **Horizontal Surface:** The horizontal surface is a plane 150 feet above the established airport elevation. It is constructed by swinging arcs of specific radii from the center of each end of the primary surface and by connecting the arcs by lines tangent to those arcs.
   - Visual radius of 5,000 feet
   - NPI radius of 10,000 feet (runway larger than utility)
   - NPI radius of 5,000 feet (utility runway)



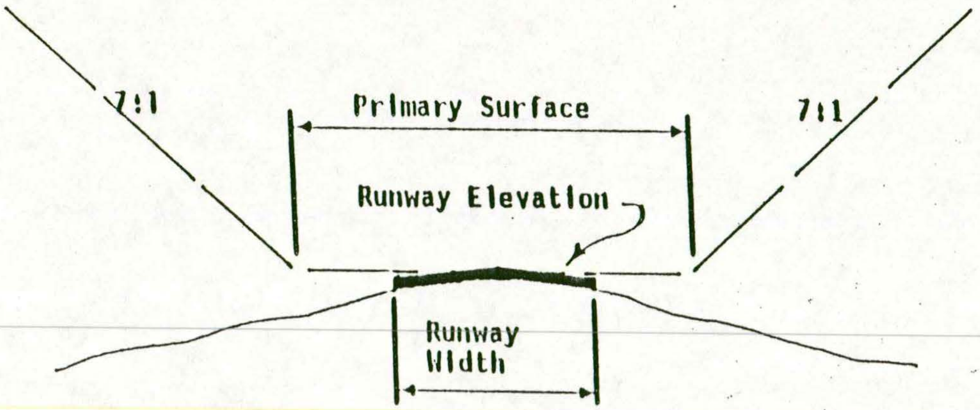
B. Conical Surface: The conical surface extends outward and upward from the periphery of the horizontal surface at a slope of 20:1 for a horizontal distance of 4,000 feet at the ends and 7:1 laterally.



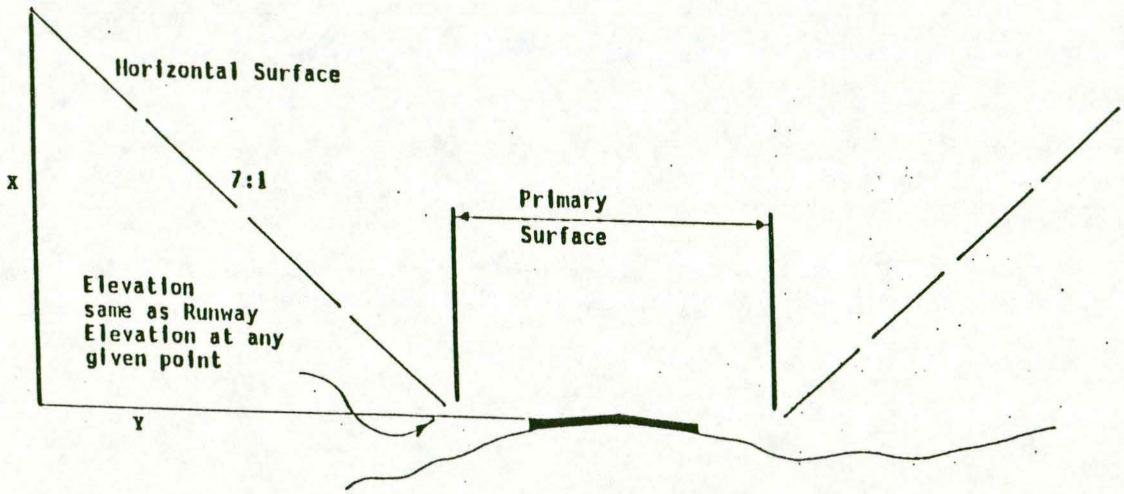
C. Primary Surface: The primary surface is longitudinally centered on the runway and extends 200 feet beyond the runway end in the case of a paved runway. The primary surface end coincides with the runway end in the case of a turf runway. The width of the primary surface varies with the approach.

	WIDTH	END OF RUNWAY	
Utility			
NPI	500'	200'	(Visibility minimum greater than 3/4 mile)
Larger than Utility			
NPI	500'	200'	
NPI	500'	200'	(Visibility minimum as low as 3/4 mile)

The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline.



D. **Transitional Surface:** The transitional surface extends upward at lope of 7:1 from the edge of the primary surface and approach surfaces. They extend outward and upward from the runway centerline and runway centerline extended until they intersect with the horizontal surface.



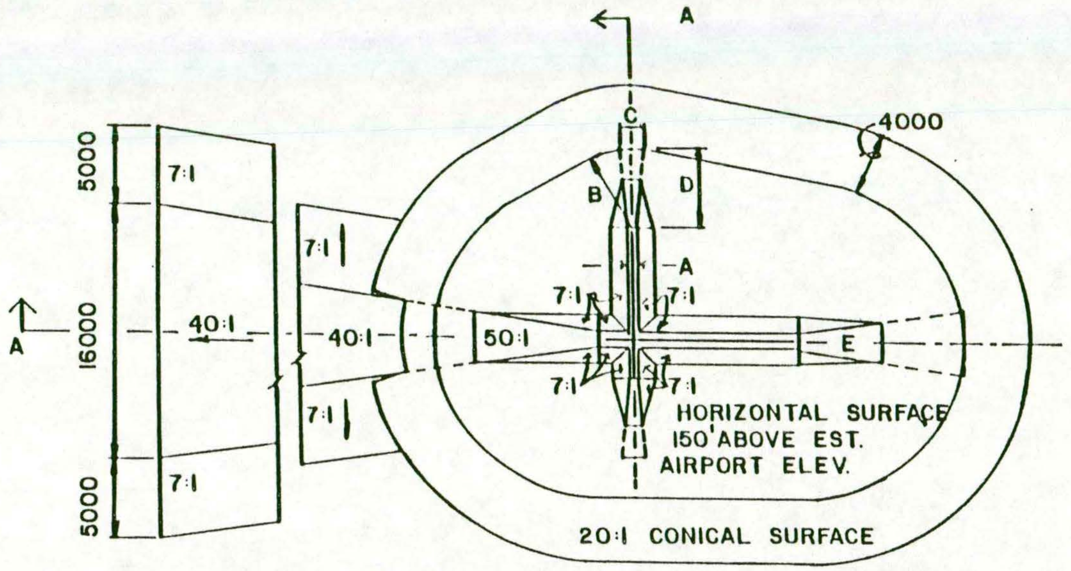
x and y vary in dimension and are determined by the distance required for an imaginary line at 7:1 slope, to intersect with the horizontal surface.

E. **Approach Surface:** The approach surface is longitudinally centered on the extended runway centerline. The inner edge of the approach surface coincides with primary surface and expands uniformly outward to a width determined by the type of approach:

Visual: 250' X 5,000 X 1,250'
NPI: 500' X 10,000 X 3,500' (Runway larger than utility with visibility minimum as low as 3/4 of a mile.)
NPI: 500' X 5,000 X 2,000' (utility runways)

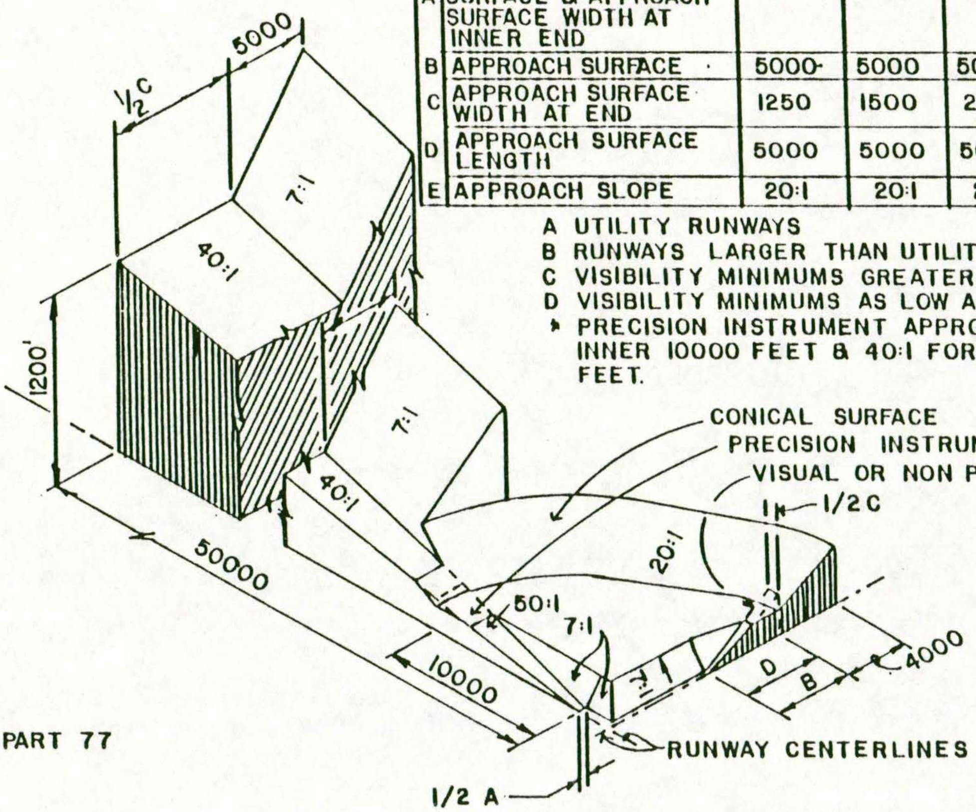
The approach slope also varies:
Visual: 20:1
NPI: 34:1 (larger than utility)
NPI: 20:1 (utility runways)

FIGURE 3-10: AIRPORT IMAGINARY SURFACE



	ITEM	DIMENSIONAL STANDARDS (In feet)					
		VISUAL RUNWAY		NON-PRECISION INSTRUMENT RUNWAY			PRECISI INSTRU RUNWA
		A	B	A	B		
					C	D	
A	WIDTH OF PRIMARY SURFACE & APPROACH SURFACE WIDTH AT INNER END	250	500	500	500	1000	1000
B	APPROACH SURFACE	5000	5000	5000	10000	10000	10000
C	APPROACH SURFACE WIDTH AT END	1250	1500	2000	3500	4000	16000
D	APPROACH SURFACE LENGTH	5000	5000	5000	10000	10000	*
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 10000 FEET & 40:1 FOR AN ADDITIONAL 40000 FEET.



Source: FAR PART 77

Runway Protection Zone (RPZ)

The RPZ represents a projection of the inner approach surface on the ground. The inner edge of the RPZ coincides with the primary surface. The RPZ extends outward uniformly to a width determined by the length and side angle. The trapezoidal shaped RPZ should be under control of the airport owner and maintained free of obstructions and concentrations of people. Reference may be made to FAA AC 150/5300-13, for applicable dimensions. Typical RPZ configurations are noted as follows:

Utility Runways:
- Visual Approach: 250' X 1,000' X 450' (8.035 acres)
- Non-precision Instrument Approach: 500' X 1,000' X 800' (14.922 acres)
- Visual Approach opposite Non-precision Instrument Approach: 500' X 1,000' X 650' (13.2 acres)

Obstacle Free Zone, (OFZ)

The runway obstacle free zone consists of the volume of air space centered above the runway. The runway OFZ extends 200 feet beyond each end of the runway and to a width of 250 feet for non-precision instrument and visual runways, serving small aircraft with approach speeds of 50 knots or more.

The obstacle free zone is to be maintained free of all objects except frangible navigational aids, including taxiing and parked aircraft.

Runway Object Free Area (OFA)

The runway object free area is a two dimensional ground area surrounding the runway. The runway OFA precludes parked airplanes and objects, except objects which are fixed by their purpose. The OFA is 500 feet wide, and extends 600 feet beyond the runway end for runways serving design group II aircraft.

Building Restriction Line (BRL)

The BRL should be located to identify suitable locations for building areas on airports. It is recommended that the BRL encompass the runway protection zones (RPZ), the runway visibility zone, and all airport areas with less than 35 foot clearance under FAR Part 77 surfaces.

Object Clearance Criteria

Safe and efficient operations at an airport require that certain areas on and near the airport be clear of objects or restricted to objects with a certain function, composition, and/or height. The object clearing criteria subdivides the FAR Part 77, Subpart C airspace and the object free area (OFA) ground area by type of objects tolerated within each subdivision. Aircraft are controlled by aircraft operating rules and not by criteria.

LAND USE

Land Use

Airport land use may be discussed in terms of the:

- Impact of adjacent land uses on the airport.
- Impact of the airport on adjacent land uses.

Each of the two general areas can further be broken down into specific impacts. The impacts may not all be negative as some impacts are quite positive in nature. The objective is to insure that the land use conflicts are reduced to a minimal level in view of the fact that it may not be possible to alleviate all problems. The following land use goals in the vicinity of the airport will provide a set of parameters upon which to design specific land use policies. These goals are not static nor is the list all inclusive. Throughout the planning period, goals are expected to change to meet unforeseen demand.

Goals

- The airport and associated imaginary surfaces should be protected from encroachment of land uses that might impair operational capabilities of the facility.

- Having identified the ultimate level of airport development, care should be exercised throughout the planning period to insure that future expansion of the facility is not compromised.

- Adjacent airport environs should be protected against aircraft operations and noise.

- Establish or organize land uses on the airport and off the airport that will complement each other.

Land Use Compatibility

Land use compatibility depends upon a number of factors. In other words to imply that an industrial activity is compatible depends upon what the type to include processes. The latter is of concern where considerable amounts of heat is released.

The listing of adjacent land use activities shown in Table 3-3, as identified by the FAA, are potentially compatible. Potentially compatible may be defined as a land use that does not exceed Part 77 requirements, and has properly been designed so that there are no conflicts with airport operation; including smoke, blowing trash, noxious odors, electronic interference, and noise sensitivity.

The compatibility of each of these land use activities depends upon the proximity of the specific land use to the airport; the level of sound proofing and the type, height, and location of building structures.

The land uses identified herein as being compatible are not all inclusive nor is the list intended to suggest that such community land uses be located in the vicinity of the airport. Such land uses, when incorporated into the comprehensive growth and management plans, should insure a degree of compatibility within the vicinity of the airport.

Land Area Requirements

An adequate amount of land should be made available to support airport functions and accommodate required facilities. Such land should be owned in fee simple title. Runway protection zone aviation easements should also be acquired.

Natural Corridors

Rivers
Lakes
Streams
Canals
Drainage Basins
Flood Plain Areas
Natural Buffer Area
Forest Reserves
Land Reserves and Vacant Land

Open Space Areas

Memorial Parks and Pet Cemeteries
Water & Sewage Treatment Plants
Water Conservation Areas
Marinas, Tennis Courts
Golf Courses
Park & Picnic Areas
Botanical Gardens
Bowling Alleys
Landscape Nurseries
Archery Ranges
Golf Driving Ranges
Go-Cart Tracks
Skating Rinks
Passive Recreation Areas
Reservation/Conservation Areas
Sod and Seed Farming
Tree and Crop Farming
Truck Farming

Industrial and Transportation Facilities

Textile & Garment Industries
Fabricated Metal Products Industries
Brick Processing Industries
Clay, Glass, Stone Industries
Chemical Industries
Tire Processing Companies
Food Processing Plants
Paper Printing & Publishing Industries
Public Workshops
Research Labs
Wholesale Distributors
Bus, Taxi, and Trucking Terminals
Foundaries
Saw Mills
Office Parks
Industrial Parks
Public Buildings
Auto Storage
Parking Lots, Gas Stations
Railroad Yards
Warehouse & Storage Buildings
Machine Shops
Freight Terminals

Airport and Aviation Oriented Facilities

Airparks
Banks
Hotels
Motels
Restaurants
Aerial Survey Labs
Aircraft Repair Shops
Aircraft Factories
Aviation Schools
Employee Parking Lots
Aerospace Industries
Airfreight Terminals
Aviation Research & Testing
Aircraft and Aircraft Parts Manufacturers

Commercial Facilities

Retail Business
Shopping Centers
Parking Garages
Finance & Insurance Companies
Professional Services
Gas Stations
Real Estate Firms
Wholesale Firms

DEVELOPMENT ALTERNATIVES

CHAPTER FOUR

DEVELOPMENT ALTERNATIVES

Introduction

Chapter Three set forth the extent of facility development that is required to provide a satisfactory level of service through 2010. Chapter Four provides an assessment of various development alternatives. Development alternatives vary in scope from a "no project" alternative to airport relocation. Within this range of possibilities exist a number of development scenarios. The primary objective is to identify those development actions that provide an adequate level of service.

Airport Relocation

The existing airport site can accommodate those facilities identified in Chapter Three. Consequently, no consideration need be given at present to the development of an alternative airport site.

Physical constraints that do exist can be dealt with at moderate cost when compared to the cost of airport relocation. Such constraints are Highway 38, pole lines, terrain and housing developments within the immediate vicinity of the airport.

No Development Alternative

Those facility improvements recommended within Chapter Three are required in order to provide an adequate level of service. Therefore, "No Development" alternative is not considered a prudent choice. The primary concern is not if the improvement is needed but when. Priorities need to be established, giving first consideration to those actions that provide for increased safety and the maintenance of existing facility components. The importance of meeting the needs of current businesses, as well as that required to attract new business is critical to the economic well-being of the community.

The Iowa Department of Transportation annually rates each airport in the state system. A numerical rating for each airport is obtained by comparing structural, safety, and service features to specified design criteria. A rating below 50 percent of the maximum indicates that the item is below tolerable standards and should be considered for improvement.

TABLE 4-1: IOWA AIRPORT SUFFICIENCY RATING

	MAXIMUM POSSIBLE RATING	ACTUAL SUFFICIENCY RATING
STRUCTURAL ADEQUACY		
Runway		
Wearing Surface	8.0	5.0
Base/Subbase	10.0	9.0
Drainage	6.0	4.5
Taxiways/Aprons	6.0	4.3
TOTAL STRUCTURAL RATING	30.0	22.8
SAFETY		
Runway		
Length	5.0	2.5
Width	4.0	1.2
Surface Condition	9.0	5.9
Primary Surface Geometrics	11.0	8.5
Approach Obstructions	7.0	4.5
Turnarounds/Taxiways	4.0	1.8
TOTAL SAFETY RATING	40.0	24.4
SERVICE		
Runway		
Length	8.0	4.1
Lighting	5.0	3.2
Capacity	4.0	4.0
Airfield Lighting	5.0	3.5
Aprons - Terminal/Parking	4.0	4.0
Land Area	4.0	1.0
TOTAL SERVICE RATING	30.0	19.8
TOTAL BASIC RATING	100.0	67.0
TOTAL ADJUSTMENT RATING	100.0	59.6
SYSTEM LEVEL ADJUSTMENT	100.0	55.0

SOURCE: IDOT, Iowa Airport Sufficiency Rating, December, 1989

Runway 13/31 - Primary Runway

Runway 13/31 is 3500 feet in length and 50 feet in width. The runway is rated to support an aircraft with a gross weight up to 4,000 pounds (single wheel). RW 13/31 provides an 84.7 percent level of wind coverage at the 12 m.p.h. crosswind component value. The ultimate runway length should be no less than 4,000 feet, to serve the class of aircraft currently using and expected to use the airport.

At Monticello Airport, however, a condition exists which should be considered at this time. The primary runway has several incursions of the safety clearance areas recommended by the FAA. These Safety areas may be considered to be "gold plating" to many veteran fliers accustomed to minimal facilities and inconsistent construction standards; particularly at small, rural airports. The modern pilot is, however, more likely to have trained and generally operated from a better quality of facilities, and are accustomed to standardized, more expansive, pavements and clearance areas. The recommended standards are based on actual accident records and, where implemented, have proven to reduce accidents, and to greatly enhance a sense of security in landing and takeoff operations. They also provide greater convenience for the pilot through a reduction of concerns for special maneuvers and procedures to accommodate airport hazards.

Several alternatives are available to the City in regard to clearing approaches to current standards; and providing for future development. The current violations of clearance standards are not causing action by the state or the FAA to limit or restrict operations to the airport; therefore, no on-going penalty is imposed. These standards are, however, based on providing for a designed level of safety. It follows that, when standard clearances are not available, safety levels are lowered below that considered desirable. The past accident record at the airport indicates little or no problems from this condition. The standards have been established for a long time and overall experience has definitely shown that accident rates will be reduced when they are met. Most all airports will take the necessary actions to achieve substantial compliance with the standards.

The most serious condition which exists at this time is lack of additional hangar space in the terminal area; because of the Building Restriction Line (BRL) and the proximity of Hwy. 38. In fact, the BRL, located in accordance with FAA AC 150/5300-13, paragraph 210, would be beyond the highway right-of-way line along the entire length of the runway. This does not mean that buildings cannot be built in this area; however, they would not meet the established standards of development, and are not recommended. (It is understood that a determination of no hazard has been received from the FAA for construction of an additional hangar building northwest of the present complex. Because of the existing buildings, this location would be considered "shielded" under FAA policies.)

Additional hangars, preferably T-hangars, should be built in the near future to provide for anticipated expansion. If the BRL were shifted southwesterly as a result of the proposed new runway development, more than adequate space would be made available either northwest or southeast of the present terminal area. Without this development, the most preferable location for T-hangar development would be along Hwy. 38, west of RW 13 threshold. Unless terrain in that area was lowered, they must be located at least 600 feet west of the runway.

Justification for the new runway to be built at this time is based on several factors, summarized as follows:

1. The existing safety problems should be corrected for enhanced user protection, reduce potential city liability, and for improved protection of people and property on the ground.

2. Action to eliminate current safely violations on the present runway would be prohibitively expensive.

3. A parallel taxiway facility is desirable for all runways, and carries the same priority of development as the runway when competing for FAA funding assistance.

4. A new runway would eliminate the necessity to remove farmsteads in the path of the existing runway approaches.

5. Additional hangar facilities could be built in the much more convenient area adjacent to Hwy. 38, in more than adequate capacity, and on land presently owned by the City.

6. The new runway could be designed to serve larger, more sophisticated aircraft, and precision approach navigation aids.

The present facility does not, feasibly, have these capabilities. While there is not a current, heavy demand for this class of service, the status of economic development in Monticello today and projected for the future, is likely to require such facilities at any time. It is not at all unusual, in present competitive markets, for companies in rural communities, particularly those within a short flight time to major markets such as Chicago, Minneapolis, St. Louis, and Kansas City, to utilize very expensive, turbine-powered aircraft, including jets, to build and maintain an adequate market area, necessary to stay competitive. The type of economic activity in the Monticello community could well initiate this demand at any time. If this demand were to be realized it would, of course, be critical to the community to satisfy the need in a very short time, or stand to lose an industry which is highly important to the economic well being. It is not recommended that a "jet runway" with a precision navaid be built at this time; but the capability to do so should be provided.

If this plan of development is accepted a series of steps should be initiated immediately to prepare for this possibility.

1. Approve a plan of development which provides these capabilities.

2. Identify and purchase the necessary lands, both for airport development and protection of approach and side clearance areas.

3. Establish an airport zoning ordinance to preclude the erection or growth of hazards to navigation, and to provide for compatible land uses in the airport vicinity.

4. Develop and adopt a financial plan for the foreseeable future to meet the needs in accordance to schedule. At this time consideration toward the establishment of an airport authority under State Statute should be made.

5. Establish a community development committee or subcommittee to monitor the business and civic needs related to aviation that may be developing as a result of changes or growth within the community. Every effort should be made to identify airport demands at the earliest date so that appropriate action can be taken in a timely manner.

The proposed development of a new RW 15/33 to 4000 feet will require the following:

1. Acquisition of approximately 80 acres of land in fee title
2. Acquisition of 10 acres of land in easement or fee for Runway Protection Zone control.

A non-precision approach should be established on RW 33 and a visual approach on RW 15. Medium Intensity Runway Lights (MIRL) should be provided. The preliminary estimate of cost for this development is 1.2 million to 1.6 million dollars.

Development of the new runway should take place when there is 250 or more annual itinerant operations by heavy twin engine aircraft that require runway lengths up to 4000 feet; when reduced approach minimums are needed; when additional hangar space is needed; or when increased demands are anticipated.

The other alternate available is to extend the existing runway to 4000 feet in length, and widen it to 75 feet.

Extension of the runway can feasibly only be made to the southeast, because of the proximity to Hwy. 38. The addition of 300 feet of pavement, beyond the existing 200 foot overrun, will provide the required 4000 foot runway, providing the northwest threshold remains as is. The RW 31 approach surfaces do not meet FAR Part 77 clearance standards over the highway; however, the threshold is located in accordance with standards of FAA Advisory Circular 150/5300-13, Appen. 2; for location of thresholds where existing pavement extends beyond the runway end.

An additional 15 +/- Acres of land must be acquired in fee title, and 9 +/- Acres of easement control, in the southeast extension area. Also, the present farmstead buildings, along Hwy. 38, east of the present threshold to RW 24, must be removed.

Considerable fill material is needed in the extension area, and to provide for the runway safety area and appropriate side slopes. The fill material can be obtained from the area between the runway and Hwy. 38, near the southeast end of the runway. This will also reduce the obstruction currently related to these terrain elevations.

Pavement of the extension would be similar to the existing pavement. Although this existing pavement is not in bad condition, it does have numerous cracks and some surface irregularities. An overlay of 2 inches of asphaltic concrete would provide for consistent surface and comparable pavement strength.

The existing VASI-2 and REIL units must be relocated to the new runway end. Runway edge lighting should be changed to Medium Intensity Runway Lights (MIRL).

Fencing should be erected on the entire airport boundary.

The preliminary cost estimate for this development is $944,655. The cost of a parallel taxiway, added for comparative purposes with the new runway proposal, would be $540,250; for a total cost of $1,484,905.

Extension of the existing runway would not provide for clear building areas for additional hangars in the present area. Hwy. 38 and some terrain features would continue to be classified as obstructions, and the runway could not be further extended to any substantial increase. Approach minimums could not be lowered; and it would not be possible to ever, feasibly, meet design standards for a precision instrument approach.

Runway 5/23 - Crosswind Runway

The existing turf runway facility, RW 5/23, is 2,120 feet in length and 120 feet in width. The Iowa Department of Transportation encourages a minimum 60 degree separation between runway facilities. Since the present runway provides almost 90 degrees separation, no consideration was given to identifying a new alignment for the crosswind runway.

The present facility does not meet design standards for side slopes and approach area land interests. Action should be taken to remove high terrain on the northwest side, and to place this material as fill on the southeast side, on the southwest half of the runway. Also, property interests, at least easements, should be obtained in the Runway Protection Zones (formerly clear zones).

It is recommended the threshold to RW 23 be maintained southwest of RW 13; so long as that pavement is used as a runway. If the proposed new runway is established, the threshold should be located where clearance will be obtained over Hwy. 38. It is further recommended that the new RW 15 threshold be located southeast of RW 5/23, to permit operations on RW 5/23 while an aircraft may be preparing to take off on RW 15.

Terminal Area

The existing terminal area is well situated with respect to air and land side components. Given the location, adjacent to a hard surfaced road, the terminal area has a high degree of accessibility. Development within the terminal area is functional and provides an area for the following components:

- Vehicle parking and circulation
- Itinerant aircraft parking
- FBO shop
- Terminal office/pilot lounge
- Aircraft refueling
- Based aircraft storage

The relationship of the landside terminal area components to each are, for the most part, considered quite functional. The most salient need is for additional T-hangar units. Improvements within the terminal area that should be considered are noted as follows:

1. Taxilanes need to be established within the apron area that provide access to individual hangars.

2. The minimum distance between hangar structures and the aircraft parking area needs to be increased so as to accommodate a taxilane. Aircraft parking should be located no closer than 71 feet to the taxilane centerline.

Consideration may also be given to locating future hangars in the immediate vicinity of the terminal office. This alternative will eliminate the need to construct and maintain additional taxiways. In addition the west access road would be eliminated. Access to the terminal area would be provided by the east access road. Since side clearances of the present runway would be violated this development should await construction of the new runway.

Consideration may also be given to the construction of an agricultural aircraft parking and wash-down area.

Taxiways

No new taxiways have been considered for the present facility. If the new runway is built, the present runway surface will provide a full parallel taxiway facility.

Connecting taxiways will be required when the new runway is built.

If a new runway is not built, a parallel taxiway should be developed when traffic increases provide sufficient demand.

Apron

The existing apron area is expected to satisfy aviation activity through 2006. Other than maintenance, no other improvements are recommended.

ENVIRONMENTAL CONSIDERATIONS

NEED:

The need for the proposed actions are based upon present and future levels of aviation activity summarized in Chapter Two. A no project alternative would not allow the airport to satisfy aviation demand expectations.

ENVIRONMENTAL CONSEQUENCES

1. Noise: FAA Order 1050.26 Appendix 6, Chapter 5, Paragraph 47, Page 26 states: "No noise analysis is needed for proposals involving Utility or basic transport type airports whose forecast of operations do not exceed 90,000 annual adjusted propeller operation or 700 annual adjusted jet operations."
2. Compatible Land Use: In general, industrial, agricultural, and open space land uses are compatible with the operation of the airport. The proposed actions are consistent with such community planning as has been carried out.
3. Social Impacts: The proposed actions will not involve the relocation of any existing residence or place of business. The proposed actions will require the removal of crop land from production.
4. Induced Socioeconomic Impacts: The proposed action may have positive impact upon industrial development in the airport service area.
5. Air Quality: The proposed actions are not expected to have any negative impact upon the Clean Air Act Amendments of 1977.
6. Water Quality: Provided mitigating measure to control erosion during construction are followed, the proposed action will have no significant detrimental impact upon water quality.
7. DOT, Section (F): There are no Section 4 (F) lands proposed for acquisition.
8. Historical, Architectural, Archaeological, and Cultural Resources: There are no known historical or cultural resources which would be affected by the proposed actions.
9. Biotic Communities: The proposed actions will have no known significant impact upon biotic communities.
10. Endangered and Threatened Species of Flora and Fauna: There are no known endangered or threatened species on the airport site.
11. Wetlands: There are no wetland areas in the vicinity of the airport.
12. Flood Plain: The airport is located adjacent to major drainage.
13. Prime and Unique Farmland: The proposed actions will remove certain amounts of farmland from production.

14. Energy Supply and Natural Resources: The proposed actions are expected to have no significant impact upon energy supplies and other natural resources.
15. Light Emissions: No detrimental impacts are expected.
16. Solid Wastes: No detrimental impacts are expected.
17. Construction Impacts: Such impacts resulting from construction are of short term nature and should have no detrimental impact provided mitigating measures are employed.

The preceding outline includes subject matter typically contained within an Environmental Assessment. As previously noted, the Iowa DOT does not require a full-blown Environmental Assessment. As such, no in-depth analysis was accomplished for items 1 through 17. Should any of the preceding have an impact or be impacted by the proposed actions, detailed evaluation of the impact should be accomplished prior to proceeding with implementation.

An environmental assessment will be required should FAA funding be utilized for land acquisition and/or runway construction. The cost of preparing the environmental assessment is an eligible item for FAA participation.

AIRPORT LAYOUT PLAN

CHAPTER FIVE

AIRPORT LAYOUT PLAN

Introduction

The Airport Layout Plan (ALP) consists of four drawings depicting existing conditions and future facility changes and additions. The Plan represents a projection of needs for the next twenty years. These projections are derived from extensive review of how airports such as this normally evolve; but, more importantly, indicates the influence that the anticipated future development of the City of Monticello may have upon the needs and requirements of local airport service.

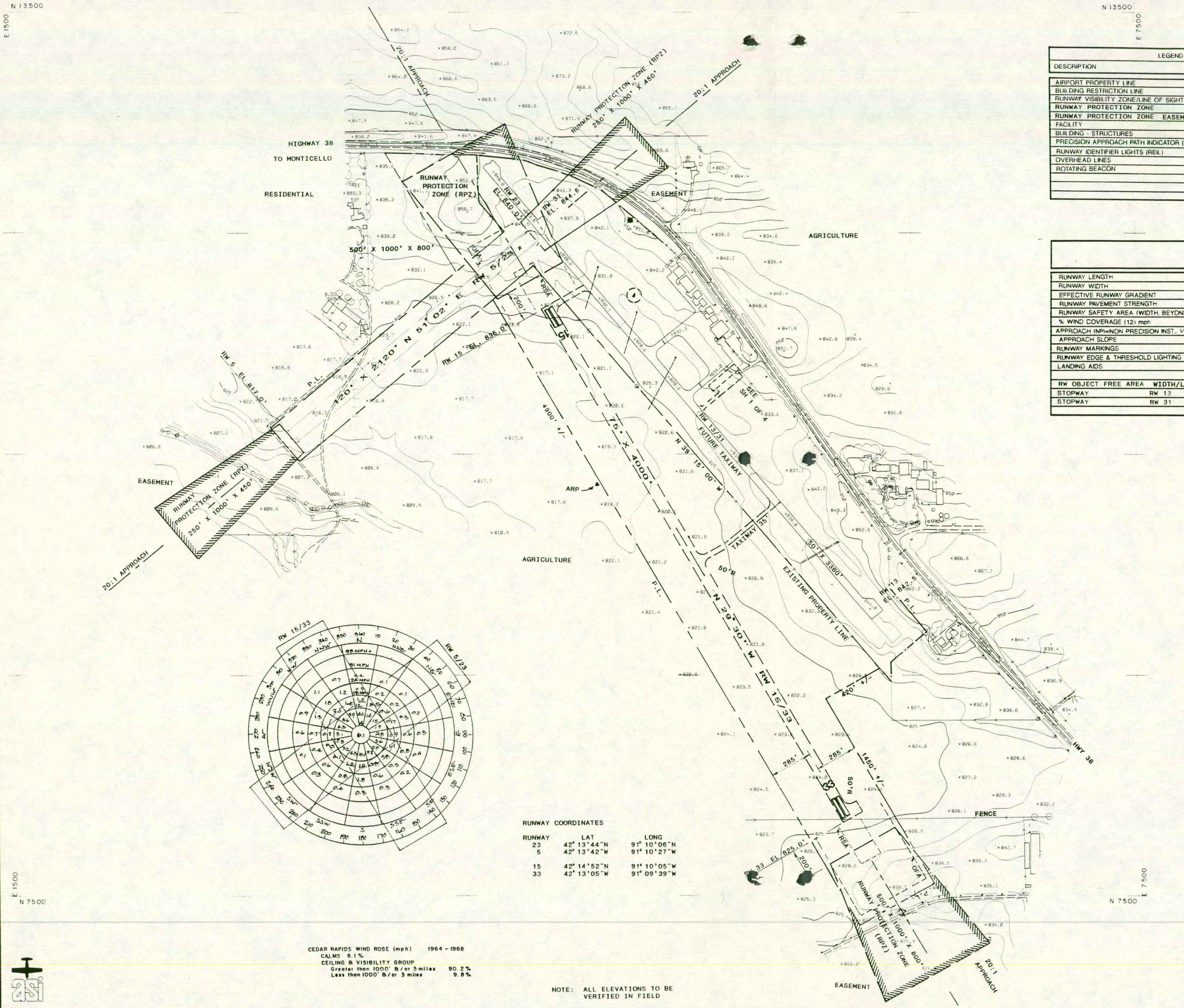
The usefulness and worth of the Plan is dependent on two critical factors: 1. that it be considered, studied, and utilized in any decision making process concerning the airport; and 2. that it will be constantly and continuously reviewed against current events and conditions, and the current policies and desires of the airport managing authority. In other words, hopefully it is a useful planning tool (not just a blueprint for development), and most importantly, it will serve no purpose unless it is actively considered and continuously updated as the need is indicated.

It is suggested that the ALP be displayed in a prominent place, or places, where airport management officials will be frequently exposed to it - and it will be readily available for review during meetings of the managing groups. Secondly, a process should be officially established, and responsibility assigned, to periodically review the ALP, and the supporting information in the Master Plan, to identify the need for updating or changing directions.

The ALP depicts no further expansion of RW 13/31, as previously explained. It does include the new 4000 foot long and 75 feet wide RW 15/33. The runway is anticipated to meet the needs of aircraft based at or visiting the community on a substantial basis during the next twenty years. It is not unlikely, however, that a need for a runway length to serve small business jet type aircraft (5000 to 5500 feet long) and/or a precision approach navaid may be experienced during this time period. This possibility should always be kept in mind; particularly in terms of maintaining the possibility for additional land acquisition, for both the extension and the increased areas of controlled land for airspace protection and clearances.

The existing runway is shown as the active primary runway; but is also shown as a future parallel taxiway, with connecting taxiways to the new runway. Also shown on this runway are double displaced thresholds. This arrangement will permit use of the existing overrun pavement, for the start of take-off roll and for rollout on landing and in the event of an aborted take-off.

No further development is recommended for RW 5/23. It is recommended that earth be removed from the northwest side of the runway and used as fill on the southwest side to meet standards for maximum side slopes.



LEGEND		
DESCRIPTION	EXISTING	ULTIMATE
AIRPORT PROPERTY LINE	PL	PL
BUILDING RESTRICTION LINE	BRL	BRL
RUNWAY VISIBILITY ZONE/LINE OF SIGHT		
RUNWAY PROTECTION ZONE		
RUNWAY PROTECTION ZONE EASEMENT		
FACILITY		
BUILDING - STRUCTURES		
PRECISION APPROACH PATH INDICATOR (PAPI)		
RUNWAY IDENTIFIER LIGHTS (REIL)		
OVERHEAD LINES		
ROTATING BEACON		

TOPOGRAPHIC SURVEY
scale
0 300 600

CONTOUR INTERVAL = 5 FOOT

ELEVATIONS BASED ON MEAN SEA LEVEL

COMPILED BY STEREOPHOTO GRAMMETRIC METHOD FROM AERIAL PHOTOGRAPHY

DATE OF PHOTOGRAPHY 5 - 1 - 90

STANDARD PROCEDURE DICTATES THAT PHOTOGRAMMETRIC MAPS BE FIELD CHECKED PRIOR TO USE. IN AREAS WHICH ARE OBSCURED BY VEGETATION OR PHYSICAL FEATURES, CONTOURS AND DETAIL MAY ONLY BE APPROXIMATE.

MAG. DEC. 3° 30' E 1980

	RW 13/31		RW 15/33		* RW 5/23	
	EXISTING	FUTURE	EXISTING	FUTURE	EXISTING	FUTURE
RUNWAY LENGTH	3380'	ABANDON RW 13/31		4000'	2120'	2120'
RUNWAY WIDTH	50'			75'	120'	120'
EFFECTIVE RUNWAY GRADIENT	0.49			0.32	1.08	1.08
RUNWAY PAVEMENT STRENGTH	4000 SW			12,500 SW	TURF	TURF
RUNWAY SAFETY AREA (WIDTH. BEYOND THRESH.)	120'/240'			150'/300'	120'X240'	120'X240'
% WIND COVERAGE (12) mph	84.7			86.4	78.4	78.4
APPROACH (NPI=NON PRECISION INST., V=VISUAL)	NPI			NPI	V	V
APPROACH SLOPE	20:1			20:1	20:1	20:1
RUNWAY MARKINGS	NPI			NPI		
RUNWAY EDGE & THRESHOLD LIGHTING	LIRL			MIRL	LIRL	LIRL
LANDING AIDS	VASI			PAPI		
				REIL		
RW OBJECT FREE AREA WIDTH/LENGTH				500'/600'	250'/300'	250'/300'
STOPWAY RW 13	50' X 635'					
STOPWAY RW 31	50' X 200'					

* SMALL AIRPLANE ONLY

AIRPORT DATA			
		EXISTING	FUTURE
AIRPORT ELEVATION		845'	840'
AIRPORT REFERENCE POINT	LONG.	91°-10-00"	91° 10'01"
	LAT.	42°-14'-00"	42° 13'27"
MEAN MAX. TEMP.		83.7° F	83.7° F
% WIND COVERAGE		90.9	95.0
AIRPORT NAVIGATIONAL AIDS		NDB	NDB
AIRPORT ACREAGE		70.9 AC	151
F B O FACILITIES		YES	YES
FUEL		100LL	100 LL
BEACON		YES	YES
SEGMENTED CIRCLE			YES
LIGHTED WIND INDICATOR		YES	YES
EASEMENTS		YES	YES

AIRPORT CATEGORY	B-II	B-II
DESIGN GROUP	II	II
APPROACH SPEED	A&B	A&B

NOTE:
* TAXIWAY SAFETY AREA - 79'
* TAXIWAY OBJECT FREE AREA - 131'
* BUILDING RESTRICTION LINE TO ENCOMPASS RUNWAY PROTECTION ZONE, VISIBILITY ZONE, A ND AREAS WITH LESS THAN 35' CLEARANCE.
* ALL OBJECTS TO BE REMOVED AND/OR RELOCATED AS PER FAR PART 77 REQUIREMENTS.
* RELOCATE THRESHOLD ON RW 5/23 AS REQUIRED TO ACCOMMODATE FAR PART 77 REQUIREMENTS AND RW SAFETY AREA.

RUNWAY COORDINATES

RUNWAY	LAT	LONG
23	42° 13'44"N	91° 10'06"N
5	42° 13'42"W	91° 10'27"W
15	42° 14'52"N	91° 10'05"W
33	42° 13'05"W	91° 09'39"W

CEDAR RAPIDS WIND ROSE (mph) 1964 - 1968
CALMS 6.1%
CEILING & VISIBILITY GROUP
Greater than 1000' &/or 3 miles 90.2%
Less than 1000' &/or 3 miles 9.8%

NOTE: ALL ELEVATIONS TO BE VERIFIED IN FIELD

SHIVE-HATTERY ENGINEERS & ARCHITECTS, INC.

DATE		BY

REVISIONS

MONTICELLO MUNICIPAL AIRPORT
MONTICELLO, IOWA

PDS PROFESSIONAL DESIGN SERVICES of Iowa, Inc.
P.O. BOX 191 · ANKENY, IOWA · 50021
(515) 964-1229

SCALE 1" = 300' | J. SEARLE
DATE 10/15/90

AIRPORT LAYOUT PLAN

SHEET 1 OF 4

5-02

The non-precision approach procedure has been assumed to continue for RW 31 - based on the NDB and on RNAV - and visual approaches for RW's 13, 5, and 23. Similar approach procedures are assumed to be established for the new runway when it is developed.

T-Hangar development areas have been shown; to be constructed as the need arises, but not before opening of the new runway. The existing FBO hangar and other hangars are considered acceptable for the planning period, unless maintenance or rebuilding costs become prohibitive. This area could be considered for future business aircraft owners, who build and maintain their own facilities.

Areas on airport property and in the vicinity are indicated for possible industrial development. Highway frontage property opposite the airport is particularly appropriate for this purpose. It is highly recommended that aggressive action be taken to develop this property for airport and aviation related businesses. This will enhance use and development of the airport, as well as the economy of the community.

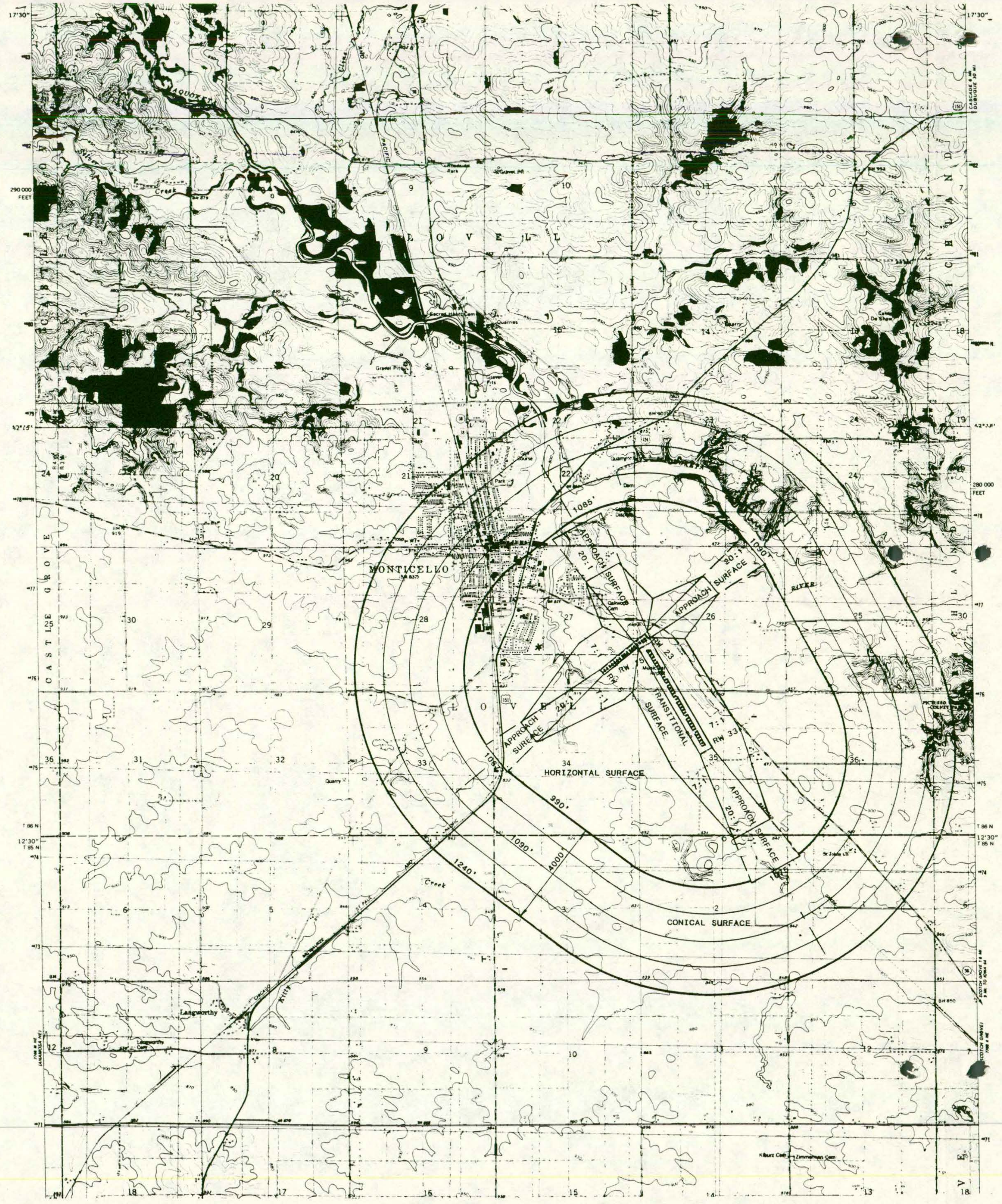
Land areas to be acquired are shown for the new runway development. Of more immediate importance are land acquisitions for protection of encroachment of the existing runway facilities. The continued industrial and residential growth in Monticello provides a high likelihood that land areas around the airport may be subjected to development proposals in the very near future. Lesser protective measures, such as zoning and comprehensive planning should be taken as early as practicable to establish at least an interim presence in the land areas. The City is in an enviable position of not having to buy out extensive developed areas in order to provide needed expansion. The cost savings to be realized from this condition are well worth considerable effort and up-front acquisitions at this time.

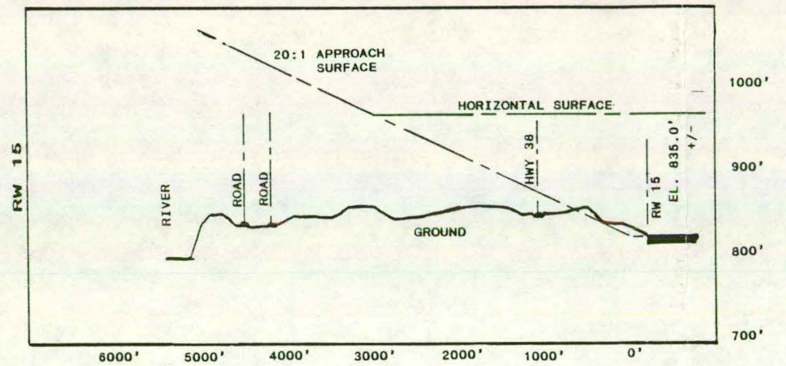
<u>Airport Airspace Drawing</u>

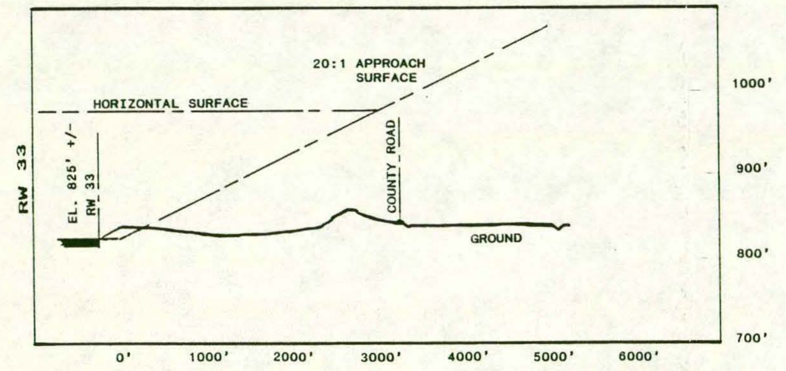
The airport airspace drawing is the second sheet of the airport layout plan and shows the airport imaginary surfaces in plan and profile, as outlined in Federal Aviation Regulations (FAR) Part 77, <u>Objects Affecting Navigable Airspace</u>. The plan view is drawn to a scale of 1" = 2,000', with elevation contours of the imaginary surfaces super-imposed over a U.S.G.S. 7 1/2 minute quadrangle map of the area surrounding the airport. The map identifies ground features in the vicinity of the airport and those physical features which may have an adverse effect on airspace. Items specifically noted include cities, highways, railroads, rivers, towers, grain elevators, and other terrain features which are significantly higher in elevation than the airport site, or which have an effect upon airport development.

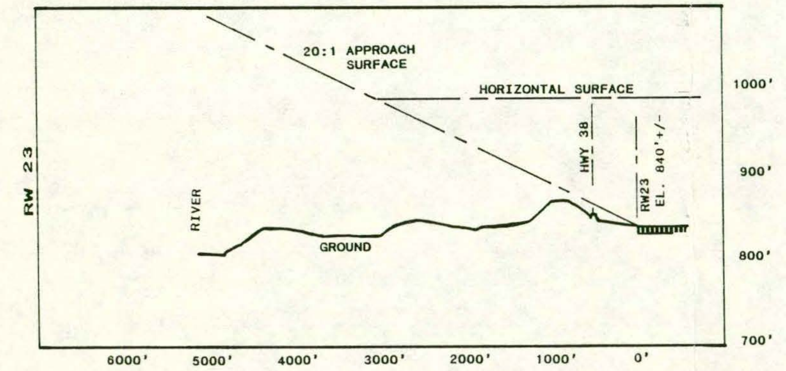
Small scale profile views of the imaginary surfaces along centerline of each runway are also included on the drawing. The profile views depict the approach slopes and their relation to physical features of the terrain that exist beyond the runway ends.

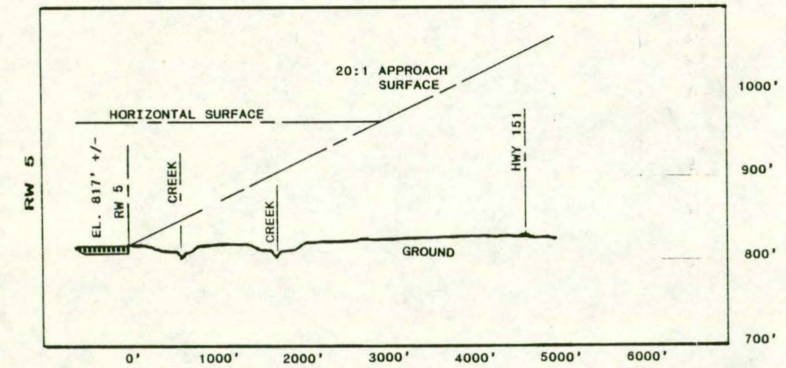
AIRPORT ELEVATION - 840' ASL











RUNWAY END PROFILES

VERTICAL SCALE 1"=100'
HORIZONTAL SCALE 1"=1000'

NOTE: ALL OBJECTS TO BE REMOVED AS PER FAR PART 77 REQUIREMENTS

OBSTRUCTION / DISPOSITION TABLE				
DESCRIPTION	ELEV.	OBSTRUCTION	LOCATION	RECOMMENDATION

SHIVE-HATTERY ENGINEERS AND ARCHITECTS, INC.

DATE	REVISIONS	BY

MONTICELLO MUNICIPAL AIRPORT
MONTICELLO, IOWA

PDS PROFESSIONAL DESIGN SERVICES of Iowa, Inc.
P.O. BOX 191 • ANKENY, IOWA • 50021
(515) 964-1229

SCALE 1"=2000' J. SEARLE
DATE 10/15/90
SHEET 2 OF 4

AIRPORT AIRSPACE

5-04

Runway Protection Zone Drawing

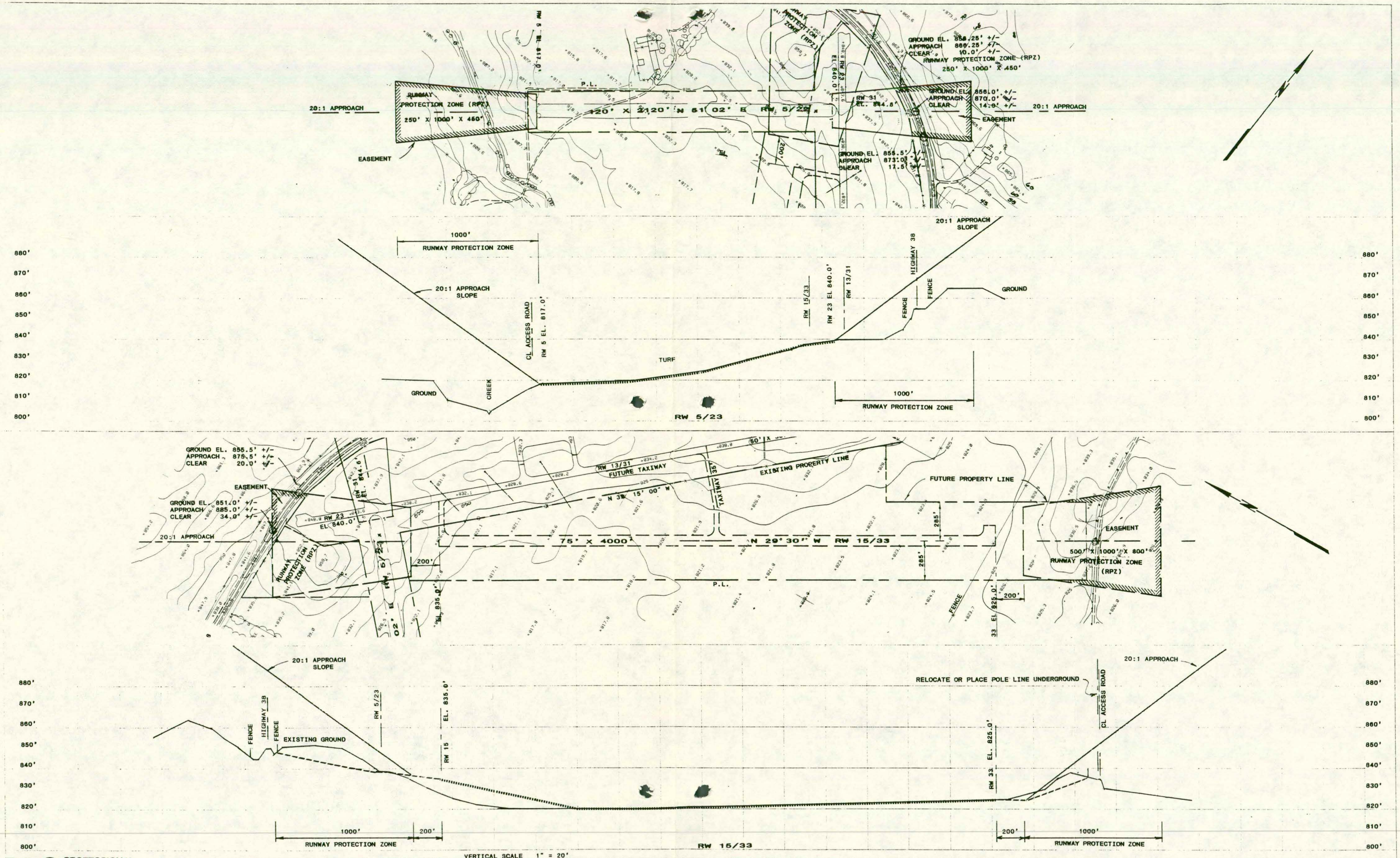
This drawing consists of large scale plan and profile views of the inner approach surface for each end of each runway. The plan views, drawn to a scale of 1" = 300', for each runway and the respective clear zone at each runway end, along with pertinent ground features.

Directly below the plan views are drawn the respective profile views showing the planned approach slopes. The profiles extend a minimum of 1,000 feet beyond the runway ends at slopes of 20:1. Above-ground physical features, such as trees, power poles, roadways, building, etc. are identified in plan views and shown in profile in order to determine if any obstructions exist in the clear zone. It is highly important to take action to remove or nullify all obstructions shown in the runway approaches and side clearance areas. If removal is of questionable feasibility, application may be made to the FAA for a determination of whether a hazard exists.

Terminal Area Drawing

The terminal area drawing shows the location of existing structures, taxiways, tiedown and apron areas as well as vehicle access and parking areas. The terminal area plan also shows proposed improvements.

The terminal area plan should be updated to as-built status each time an improvement is made. Utilities may be shown on the terminal area plan or on a separate drawing so that an accurate record is maintained. Subsurface drainage improvements are noted on the drawing. Since the information was obtained from secondary sources, field verification must be made at the time construction is contemplated. In fact, all underground utility location should be verified in the field prior to the commencement of any construction activities.



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SHIVE-HATTERY ENGINEERS AND ARCHITECTS, INC.

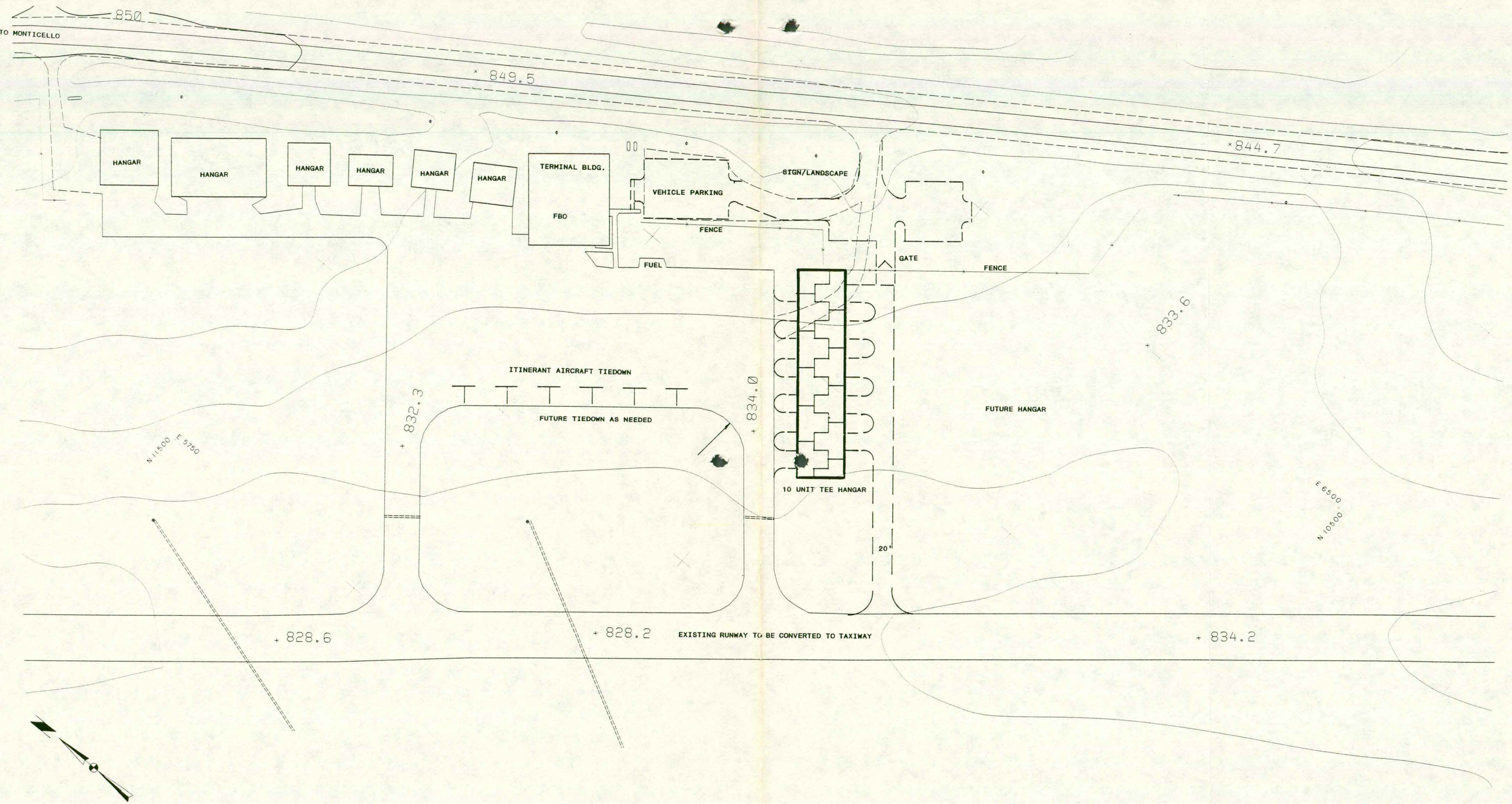
PLATE 2-DOUBLE PLAN AND PROFILE

MONTICELLO MUNICIPAL AIRPORT
MONTICELLO, IOWA

RUNWAY PROTECTION ZONE

SHEET 3 OF 4
DATE 10/15/90

5-06



TOPOGRAPHIC SURVEY
scale
0 50 100

CONTOUR INTERVAL= 5 FOOT
ELEVATIONS BASED ON MEAN SEA LEVEL

COMPILED BY STEREOPHOTOGRAMMETRIC METHOD FROM AERIAL PHOTOGRAPHY

DATE OF PHOTOGRAPHY 5-1-90

STANDARD PROCEDURE DICTATES THAT PHOTOGRAMMETRIC MAPS BE FIELD CHECKED PRIOR TO USE. IN AREAS WHICH ARE OBSCURED BY VEGETATION OR PHYSICAL FEATURES, CONTOURS AND DETAIL MAY ONLY BE APPROXIMATE.

SHIVE-HATTERY ENGINEERS AND ARCHITECTS, INC.

DATE	REVISIONS	BY

MONTICELLO MUNICIPAL AIRPORT
MONTICELLO, IOWA

PDS PROFESSIONAL DESIGN SERVICES of Iowa, Inc.
P.O. BOX 191 · ANKENY, IOWA · 50021
(515) 964-1229

	P-215
SCALE 1"=50'	J. SEARLE
DATE 10/ 15/90	
SHEET 4 OF 4	

TERMINAL AREA PLAN

5-07

DEVELOPMENT SCHEDULE AND COST

CHAPTER SIX
IMPLEMENTATION

DEVELOPMENT SCHEDULE

The Development Schedule is a listing of capital improvements needed at the airport over the twenty-year planning period. The development schedule is divided into two five-year phases and ten-year phase.

1. Phase One: 1991-1995
2. Phase Two: 1996-2000
3. Phase Three: 2001-2010

Phase One activities would obviously involve those actions which will allow the airport to provide a better level of service. Safety and maintenance items would also generally be given a high priority. Those development items, while desirable, but not critical to the operation of the airport, would generally be given a lower priority. There are a number of factors for which consideration needs to be given when assigning priorities to specific airport components. These considerations are as follows:

1. Absolute need to include safety and maintenance requirements.
2. Availability of grants-in-aids
   * Federal Aviation Administration
   * Iowa Department of Transportation
   * Other
3. Local financial constraints
4. Unforeseen changes in aviation activity within the twenty-year planning period.

In maintaining flexibility, the development schedule should be reviewed along with the aviation forecasts at five year intervals. Hangars may be constructed in a phase other than indicated since proposed hangar development is expected to be financed in part or wholly by the private sector.

The three development phases are described in terms of projects. Those projects having the highest priority were assigned to the first development phase while those having a lower priority were placed in the third development phase.

1. Construct new primary runway
   * RW 18/36
2. Construct connecting taxiway
   * RW 18 to terminal area
3. Provide runway protection zones (RPZ)
   * Each runway

PHASE ONE: 1991-1995

Within Phase One, the first development project proposed is land acquisition in fee for RW 15/33. Easements for that area of the runway protection zone extending beyond airport property would also be obtained within the initial development project. Approximately 80.0 acres of land would be acquired in fee with an additional 25.5 acres in easement acquired for associated runway protection zones (RW 15/33 & RW 5/23).

The second project in Phase One involves grading and drainage requirements necessary for the construction of the primary runway and connecting taxiway. The third project includes final subgrade preparation and paving of RW 15/33 and taxiway. The pavement areas would consist of a four (4) inch granular subbase and six (6) inch P.C.C. paving. The paved areas would also be marked within this project. Subsurface drainage would be provided along RW 15/33 and connecting taxiways.

The fourth project provides for the installation of medium intensity runway edge and threshold lights on RW 15/33. A precision approach path indicator (PAPI) and runway end identifier lights (REIL) would be installed. Installation of a rotating beacon light would also be a part of the fourth project.

A non-precision instrument approach is planned for each runway. Implementation of Phase One projects will provide the Monticello Municipal Airport with a new primary runway of 75 feet in width and 4,000 feet in length.

Development Summary - Phase One: 1991-1995

1. Land Acquisition and Fencing
   - A. Fee Title 80.0 Acres
   - B. Runway Protection Zone RW 15 1.3 Acres +/-
   - C. Runway Protection Zone RW 33 8.9 Acres +/-
   - D. Runway Protection Zone RW 5 7.2 Acres +/-
   - E. Runway Protection Zone RW 23 4.3 Acres +/-

2. Runway 15/33 Improvements
   - A. 6 inch P.C.C. - 75' X 4000'; Turnaround
   - B. Medium Intensity Runway Edge and Threshold Lights
   - C. Precision Approach Path Indicator, Runway End Identifier Lights
   - D. Pavement Markings

3. Connecting Taxiway
   - A. 6 inch P.C.C. 35'
   - B. Taxiway Edge Lights or Reflectors, Marking

The primary emphasis of Phase One activities is the construction of a new primary runway.

PHASE TWO: 1996-2000

Additional hangar space may be contemplated in Phase Two. The ALP depicts the location of a 10 unit tee type hangar. Hangar development is expected to be completed by the private sector should additional space be needed.

PHASE THREE: 2001-2010

No major capital projects are contemplated.

Table 6-1 summarizes the estimated development cost anticipated through 2010.

TABLE 6-1: DEVELOPMENT COSTS

PHASE ONE: 1991-1995

ITEM	DESCRIPTION	TOTAL
I.	LAND ACQUISITION	
	1. Land in Fee	$200,000
	2. Land in Easement	12,750
	3. Appraisal	4,000
	4. Land Survey	8,000
	5. Land Negotiation	2,500
	6. Legal Recording, Admin.	2,000
	7. Contingencies (5%)	11,463
	SUBTOTAL	$240,713
II.	GRADING (RW 15/33, Connecting Taxiway)	
	1. Mobilization, Clearing, Grubbing	20,000
	2. Excavation and Grading	200,000
	3. Erosion Control	8,000
	4. Seeding and Fertilizing	22,500
	5. Fencing	22,175
	6. Drainage - 18" R.C.P.	12,000
	7. Intakes	1,600
	8. Contingencies	14,314
	9. Engineering, Legal, & Admin.	48,667
	SUBTOTAL	$349,256
III.	RUNWAY PAVING (RW 15/33)	
	1. Subgrade Preparation	35,005
	2. 4" Granular Base	105,015
	3. 6" P.C.C.	528,612
	4. Shouldering	8,000
	5. 4" Subdrains/Outlets	50,000
	6. Runway Markings (NPI)	12,600
	7. Contingencies	36,962
	8. Engineering, Legal, & Admin.	125,669
	SUBTOTAL	$901,863
IV.	LIGHTING AND LANDING AIDS	
	1. Edge and Threshold Light System (MIRL)	40,000
	2. PAPI	14,000
	3. REIL	10,000
	4. Contingencies	3,200
	5. Engineering, Legal, & Admin.	10,880
	SUBTOTAL	$ 78,080

V.	CONNECTING TAXIWAY	
	1. Excavation and Grading (See Item II)	0
	2. Subgrade Preparation	3,681
	3. 4" Granular Base	11,043
	4. 6" P.C.C.	57,056
	5. Markings	10,000
	6. Contingencies	4,089
	7. Engineering, Legal, & Admin.	13,903
	SUBTOTAL	$ 99,772
VI.	TAXIWAY LIGHTING	
	1. Medium Intensity	8,700
	2. Contingencies	435
	3. Engineering, Legal, & Admin.	13,903
	SUBTOTAL	$ 23,038
	TOTAL PHASE ONE	$1,692,722

PHASE TWO: 1996-2000

I.	Ten Unit Tee Hangar by Private sector	$ 197,000

PHASE THREE: 2001-2010

I.	No major capital projects anticipated other than maintenance.	0

The estimated costs include a five (5) percent contingency Engineering, legal and administrative costs associated with the project were placed at 17 percent of the estimated construction cost.

The total estimated capital cost to implement Phase One is 1,692,722 dollars. In addition to the capital costs associated with the construction of airport facilities, the airport owner will also incur costs associated with the operation and maintenance of those facilities.

Recognizing local financial constraints of local governing bodies, alternative sources of funding must be examined in order to implement the capital facilities and provide for the maintenance of those facilities. Sources of funding include not only those generated by local governments but private sector sources as well. In addition, grants-in-aid available from State and Federal airport development programs represent additional sources of financial assistance. Development of public infrastructure should be undertaken to enhance not only public health and safety, but with the intent stimulating private investment as well.

STATE AND FEDERAL ASSISTANCE

Federal Assistance

The Federal Airport Act of 1946 created the Federal-Aid Airport Program (FAAP) and a National Airport Plan (NAP). The Airport and Airway Development Act of 1970 repealed FAAP and NAF programs and established the Airport Development Aid Program (ADAP) and National Airport System Plan (NASF). Public law 97-24B (Airport and Airway Improvement Act of 1982) required the publication of a National Plan of Integrated Airport Systems (NPIAS) by September 3, 1984 and created the Airport Improvement Program (AIP). Airports in Iowa have benefitted from the various Federal airport assistance programs since FAAP was created in 1946.

The Airport and Airway Trust Fund created in 1970 as a repository for the tax monies paid by the aviation users supports Federal programs. The primary source of revenue is generated by a eight (8) percent tax on passenger tickets. Other sources include a tax on freightway bills, international departures, and general aviation fuel. The Airport and Airway Safety and Capacity expansion Act of 1987 set annual funding ceilings for each year through 1992.

At present, the Federal Aviation Administration provides grants-in-aid up to 90 percent of the project cost on eligible items. In general, eligible items include all airport requirements except those which specifically benefit the private sector. For example, hangar facilities and the taxiway 20 feet out from the hangar are not eligible. Vehicle parking lots are not eligible nor are terminal buildings except at Commercial Airports.

State Assistance

The Iowa Department of Transportation provides assistance for airport improvements at those airports included in the State System of Airports.

At the present time, the rate of participation is 70 percent on eligible items. Airport components eligible for assistance are the same as those eligible for Federal assistance. Sources of aviation revenue are noted as follows:

1. Fuel
   A. Aviation gas tax - 8 cents per gallon
   B. Jet fuel tax - 3 cents per gallon
2. Aircraft registration fees
   A. Commercial: $35/aircraft
   B. General Aviation:
   Year 1 - 1.5% of list price
   Year 2 - 75% of first year
   Year 3 - 50% of first year
   Year 4 - 25% of first year
   minimum $15/aircraft

The amount of money that will be available from Federal sources is estimated at 2.1 million dollars and 1.7 million from State sources.

Private Sector Investment

The investment of public funds should also provide an impetus for private investment. An area in which private investment may be used effectively is for the development of tee-hangar facilities. Hangars benefit specific airplane owners. Consequently, it is reasonable to place the responsibility for hangar development with the private sector.

Such facilities constructed with private capital on the airport facility may be deeded to the airport owner in trade for a long term lease. The advantage of such an arrangement is that it relieves the airport owner (sponsor) of the burden of financing private hangar facilities while retaining possession and control of all real property on the airport.

The proposed development policy assumes that the private sector will construct future tee-hangar facilities and taxiway pavement within twenty (20) feet of the hangar. After a 10 to 15 year amortization period, the hangars constructed by the private sector would become airport property. Revenue generated from hangar rental would at this point be available to the airport owner.

Another alternative available would include a joint effort between the private sector and public sector. The latter may be required in some cases where the income generated form the rental of hangar stalls is insufficient to cover annual amortization costs.

Airport Maintenance

The primary emphasis of the Airport Development Plan is placed upon identifying those facility needs required to bring the airport to design standards and satisfy aviation demand activity. However, once the facility component is constructed, maintenance becomes a major emphasis. Not only should the public investment in facilities be enhanced, those actions required to maintain a high degree of safety must be undertaken and hazardous conditions corrected immediately. A daily airport inspection program should be established and deficiencies noted. This action should be undertaken by the airport manager with deficiencies reported to the Airport Board for correction by the City.

Annual O & M Costs

An annual budget for the following items would need to be established: grounds maintenance, insurance, electrical power, snow removal, and administrative services. The private sector would be expected to incur costs associated with building maintenance.

Since the primary runway would be newly constructed, major expenditures for maintenance should be minimal. Runway marking and maintenance of the runway light system would involve annual inspection. The basic components (runway pavement, etc.) are expected to have a life extending over the 20-year planning period, should adequate maintenance be provided.

An annual O & M budget of 35,000-50,000 dollars may be required to satisfy annual operating expenses.

The annual O & M budget would generally contain the following line items.

- Grounds maintenance to include snow removal and mowing
- Insurance to include liability coverage
- Telephone, postage, travel
- Utilities to include electrical power and heating fuel
- Administrative supplies, advertising
- Maintenance of radio, landing and navigational equipment
- FBO services contract and/or compensation for the airport manager
- Pavement marking and minor pavement repair

The FBO contract should identify specific services to be provided.

- Hours of operation
- Aircraft maintenance
- Pilot training

TABLE 6-2: 1990 BUDGET

Airport Manager	$12,000
Consultant	15,765
Gen. Insurance	3,000
Misc. Contract Work	0
Telephone	365
Utility Services	2,500
Building and Grounds	6,000
Other Capital Equipment	3,000
TOTAL	$42,630

SOURCE: City of Monticello

<u>Funding</u>

The development scenario described in Chapter Six proposes implementation of airport facility components in stages over a twenty-year period. Project implementation would appear feasible only with State and Federal assistance. Consequently, a realistic strategy for implementation must assume State and Federal assistance.

Generally, the airport must have at least ten (10) based aircraft or be designated as a State System Airport to be placed in the National Plan of Integrated Airport System, (NPIAS). In addition, the proposed actions must have been found environmentally acceptable in accordance with Public Laws 91-190, 91-258, and 90-495. An environmental review would be required for new airport land acquisitions, runway expansion, or a project which would accommodate larger aircraft (reference FAA Order 1050.1C).

The strategy for implementation assumes a combination of State, Federal, and private investment.

A previously noted, the private sector is expected to construct and maintain new hangar facilities. The local share (sponsor) may come from the following sources:

1. Private Contribution, Local Development Corporation
2. General Obligation Bonds
3. Revenue Bonds
4. Annual levy not exceed 27 cents per 1,000 dollars of assessed valuation (Airport Authority)
5. Other public entities (28 E Agreement)

Airport generated revenue is used to satisfy annual O & M expenditures. Revenue are generated from the following sources:

1. Hangar rent
2. Gasoline sales
3. Farm
4. Misc. sources

Revenue generated in Monticello is primarily derived from hangar and tiedown fees. Estimated revenue for 1990 was placed at 1,700 dollars.

AIRPORT AUTHORITY

BACKGROUND:

Until 1970, all public airports in Iowa were owned and operated by a single municipality. Within the past few years, there has been a growing interest in the multi-jurisdictional ownership and operation of the general aviation airport. The depressed economy of the 1980's together with efforts to attract new industry provided a basis upon which to evaluate the importance of general aviation as a mode of transportation. Area communities along with county government soon recognized that the airport provided access to the area from large urban areas where corporate offices were located. The general aviation airport was recognized as an import component of the area's transportation infrastructure.

Airport Authorities may be created by one or more municipalities. For example, the Polk County Authority consists of three communities and the county. The authority allows a multi-jurisdictional approach to maintaining the airport as part of the overall transportation system in the county. Procedures for creating an Airport Authority are set forth in Chapter 330A of the Iowa Code and are briefly described as follows:

1. The governing body of each municipality or county that desires to participate in the creation of an authority must pass a resolution of its intent to do so. The resolution in addition to expressing intent, must also include the names of other municipalities, the number of Board members to be appointed, name of the authority as well as the date, time, and place for public hearing. The resolution must be published at least once and at least 14 days prior to the hearing date.

2. After the hearing, the governing body must pass a ordinance authorizing the creation of an authority and to execute the Airport Authority Agreement.
   The governing body may elect to have 3 readings of the ordinance and may waive the 2nd and 3rd readings.

3. The Airport Authority Agreement is separate from the ordinance and can be amended. The Agreement should include provisions for the appointment of Board members, the levy amount and period of time the assessment is to cover, as well as, provisions for additional members and procedures for withdrawal. The Agreement should also set forth procedures for arbitration. There is no requirement for a public election.

4. Board
   The Airport Authority Board is the governing body of the authority and consists of at least 3 or more members. The Polk County Airport Authority Board consists of 7 members. Board members are appointed by the governing body of those entities having joined the Authority.

5. The authority has the power to:

- acquire, construct, and operate aviation facilities
- enter into contracts with local, state, and federal government
- fix and collect fees and rentals
- have the power of eminent domain
- borrow money and issue bonds

6. Member municipalities may be agreement levy up to 27 cents per $1000. dollars taxable valuation. There is a great deal of flexibility provided as to the levy amount. In no case should it be less than what is necessary to provide for debt service and to provide an adequate annual O & M budget. For example, Panora, Yale, and Guthrie Center provided a 27 cent levy whereas Guthrie County provided a 13 cent levy. The bonds are exempt from both federal and state income tax. The levy may extend over a 40 year period. In no case should it be less than the time period required to retire the airport revenue bonds. Excess revenues collected are placed in a capital reserve fund.

7. Existing airport facilities may be transferred or sold to the Authority. For example, the City of Audubon upon executing the airport authority agreement transferred title of the Audubon Municipal Airport to the Audubon County Authority.

8. Members may withdraw from the authority but only after having satisfied any obligation incurred while a member of the authority.

For additional information, reference should be made to Chapter 330A of the Iowa Code.

MONTICELLO MUNICIPAL AIRPORT SERVICE AREA:

As with all airports in Iowa, the airport service area extends beyond the corporate boundary of the airport owner. The airport service area of the Monticello Municipal Airport would encompass no less than geographic extent of Jones County. Should no public airport improvements be made to facilities in Delaware and Dubuque Counties, the service area would extend into those counties as well. Should an airport authority be created, an invitation to join should be offered to those governing bodies located within the primary and secondary airport service areas. For purposes herein, the discussion is limited to Jones County. Political subdivisions that may join the authority are noted as follows:

- Jones County (unincorporated area)
- Monticello
- Anamosa
- Cascade
- Center Junction
- Wyoming
- Martelle
- Morley
- Olin
- Onslow
- Oxford Junction

AUTHORITY CREATION:

1. Adopt Resolution
2. Hold Public Hearing
3. Enact Ordinance to Join and Execute Airport Authority Agreement

Board of Supervisors:

1. Adopt Resolution
   Date________
2. Public "Notice" Publication
   Date________
3. Hold Hearing
   Date________
4. Enact Ordinance
   First Reading__________
   Second Reading__________
   Third Reading__________

City Council(s)

	1 Anamosa	2 Monticello	3 Cascade	4 Center Junction	5 Onslow
1. Adopt Resolution Date					
2. Public Notice Publication Date					
3. Hold Hearing Date					
4. Enact Ordinance					
First Reading					
Second Reading					
Third Reading					

	6 Oxford Junction	7 Martelle	8 Morley	9 Wyoming	10 Oxford Junction
1. Adopt Resolution Date					
2. Public Notice Publication Date					
3. Hold Hearing Date					
4. Enact Ordinance					
First Reading					
Second Reading					
Third Reading					

Scenario One assumes that Jones County and the ten incorporated municipalities join in the creation of the authority. It also assumes that 1.692 million in capital expenditures would be made within the 20 year planning period. In addition to debt service associated with the capital construction, an annual O & M appropriation would also be required. An annual O & M expenditure of 25,000 dollars is used for this illustration.

Given:

1. Capital Projects

1,692,722	Total Capital Construction
1,184,905	IDOT Grant-in-Aid (70%)
507,817	Local Share (30%)
15,000	Misc. costs associated with Bond sale

2. Amortization

Period: 15 Year $525,000
Aug. Interest Rate 7.0 Percent
Debt Service

Year	Total Payment
1991	$ 14,117
1992	53,880
1993	52,700
1994	56,500
1995	54,975
1996	58,438
1997	56,578
1998	59,702
1999	57,497
2000	60,275
2001	57,715
2002	55,115
2003	57,495
2004	54,525
2005	51,510
2006	53,450
TOTAL	854,472 (Rounded off)

Avg. Annual Payment
$53,404.50
Use $55,000 for illustration

SOURCE: RUAN SECURITIES
PDS OF Ia., Inc.

3. Annual O & M:
Average Annual = $ 35,000

4. Total Average Annual Expenditure
1991-2005: $25,000 + 55,000 =80,000

TABLE 6-3: SCENARIO ONE (ALTERNATIVES A & B)

SCENARIO TWO (Total City, Rural County)

	Total	Per 1000 Dollars	% of Total
Total City	$146,697,225	$ 146,697.225	28.73%
Rural County	363,824,047	363,824.047	71.27%
TOTAL	$510,521,272	$ 510,521.272	100.00%

ALTERNATIVE "A"	ALTERNATIVE "B"	
Total City, Rural County	City	Rural Co.
Levy/1000 dollars	146,697.22	363,824.04
0.06 = $30,631	0.06 = 8,802	0.06 = 21,829
0.08 = 40,842	0.08 = 11,735	0.08 = 29,106
0.10 = 51,052	0.10 = 14,669	0.10 = 36,382
0.12 = 61,263	0.12 = 17,603	0.12 = 43,659
0.14 = 71,473	0.14 = 20,537	0.14 = 50,935
0.16 = 81,683	0.16 = 23,471	0.16 = 58,212
0.20 = 102,104	0.20 = 29,338	0.20 = 72,765
0.27 = 137,841	0.27 = 39,607	0.27 = 98,232

Note: 27 cents is the maximum levy allowed.

Total City = Anamosa, Cascade, Center Junction, Martelle, Monticello, Morley, Olin, Onslow, Oxford Junction, Wyoming

SOURCE: PDS, 1990

FOR EXAMPLE:

Alternative "A" City Levy 16 cents; Rural County, 16 Cents = $81,683.
Alternative "B" City Levy 27 cents; Rural County, 11 cents = $79,628.

Excess revenues not used for O & M and/or debt service shall be placed in the Authority Capital Reserve Fund.

Alternatives "A" assumes that all incorporated communities join the authority in addition to Jones County. Alternative "A" assumes that all members agree to the same levy. A 16 cent levy would generate a sufficient amount of revenue to provide 25,000 dollars for annual O & M expenditures and debt service associated with a 1,692,722 dollars capital expenditure.

Should Alternative "B" be chosen as more representative, the incorporated cities in this scenario would contribute 27 cents or 39,607 dollars based upon 1989 taxable valuation. A County levy of 11 cents would generate 40,021 dollars providing the Authority with 79,628 dollars annually.

Other alternatives may be developed from the above table. It is unlikely that all incorporated communities will join the authority.

It is recommended that representation on the Board reflect the community's commitment to the Authority. The size of the Board is left to local decision-makers, but in no case shall it be less than three (3) members.

Should each member be entitled to representation, the Board in Scenario One would consist of eleven (11) members. Should each member be entitled to a representative based upon the contribution made, the county would be entitled to and additional ten (10) representatives thereby creating a Board with a total of 21 members.

A board of nine (9) would appear more reasonable. The following is offered for consideration.

Jones County	4 members
Anamosa	1 member
Monticello	1 member
Wyoming	1 member
Olin City	1 member
Oxford Junction	1 member

The remaining incorporated communities may be represented by a county appointed from their area.

The size of the Board, like the levy, can be finalized after obtaining some indication of which entities may wish to join the Authority.

A second scenario was prepared based upon the assumption that the Authority would consist of no more than Jones County and the incorporated communities of Anamosa and Monticello.

TABLE 6-4: SCENARIO TWO: (ALTERNATIVES A & B)

	Total	Per 1000 dollars	% of Total
Monticello	$65,392,790	$ 65,392.79	13.66%
Anamosa	49,489,824	49,489.82	10.34%
Rural County	363,824,047	363,824.07	76.00%
TOTAL	$478,706,661	$478,706.661	100.00%

ALTERNATIVE "A"	ALTERNATIVE "B"	
City and Rural Co.	City	Rural Co.
LEVY/1000 dollars	114,882.61	363,824.04
0.06 = 28,722	0.06 = 6,893	0.06 = 21,829
0.08 = 38,297	0.08 = 9,191	0.08 = 29,106
0.10 = 47,871	0.10 = 11,488	0.10 = 36,382
0.12 = 57,445	0.12 = 13,786	0.12 = 43,659
0.14 = 67,019	0.14 = 16,084	0.14 = 50,935
0.16 = 76,593	0.16 = 17,232	0.16 = 58,212
0.20 = 95,741	0.20 = 22,977	0.20 = 72,765
0.27 = 129,251	0.27 = 31,018	0.27 = 98,232

NOTE: 27 cents is the maximum levy allowed.

SOURCE: PDS, 1990

FOR EXAMPLE:

Alternative "A" City Levy 17 cents; Rural County Levy, 17 cents =$81,380
Alternative "B" City Levy 27 cents; Rural County Levy, 14 cents = 81,953

Alternative "A" assumes a 16 cent levy in Monticello, Anamosa, and Unincorporated Jones County. Alternative "B" assumes a 27 cent levy in Monticello and Anamosa and a 13 cent levy in unincorporated Jones County. Either alternative would generate a revenue amount in excess of the 80,000 dollars required.

An Airport Authority Board consisting of 5 members would be satisfactory in the case of Scenario Two although seven would not be unreasonable.

Jones County	3 members or 3 members
Anamosa	1 member or 2 members
Monticello	1 member or 2 members

SUMMARY

The following documents will be required should one or more municipalities desire to create an Airport Authority.

1. Resolution
2. Public Hearing Noise
3. Ordinance
4. Airport Authority Agreement
5. By laws

The following are considered to be major issues for which a consensus must be established prior to proceeding with formation of the authority.

1. Who desires to join
2. Representation on the Airport Authority Board
3. Levy amount and period of time