Lawrence J. TIMMERMAN Airport

Milwaukee County, Wisconsin

Strategic Development & Airport Master Plan Study

LAWRENCE J. TIMMERMAN AIRPORT
Milwaukee County, Wisconsin

Final
Strategic Development
And
Airport Master Plan Study

Prepared By
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2007
Accepted by Milwaukee County's Committee On Transportation, Public Works, And Transit on January 23, 2008 and by Milwaukee County's Board of Supervisors On February 7, 2008

"The preparation of this document may have been supported, in part, through the Airport Improvement Program financial assistance from the Federal Aviation Administration as provided under Title 49, United States Code, Section 47104. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of this report by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted therein nor does it indicate that the proposed development is environmentally acceptable in accordance with appropriate public laws."

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Lawrence J. TIMMERMAN AIRPORT

Chapter One

INVENTORY

INVENTORY

The information outlined in this chapter provides a foundation, or starting point, for all subsequent chapters. Therefore, it is essential that a complete and accurate inventory is conducted. The information was obtained from on-site inspections of the Airport, interviews with Milwaukee County staff and Airport tenants, review of previous planning studies, and a review of on-line Web pages about the Airport.

The initial step in the preparation of the Strategic Development and Airport Master Plan Study for Lawrence J. Timmerman Airport is the collection and analysis of information pertaining to the Airport and the area it serves. This includes an inventory of existing facilities and background information on the area. This information is summarized into descriptions of the Airport's setting, role in the state and national aviation systems, administration and history, air traffic activity, regional climate, airside and landside facilities, access, and community profiles.

AIRPORT SETTING

Lawrence J. Timmerman Airport is a general aviation public-use airport located on the northwest side of Milwaukee County. A generalized service area for the Airport, based upon the addresses of businesses and individuals who base their aircraft at the Airport, has been defined by the Southeastern Wisconsin Regional Planning Commission (SEWRPC) as the central and northern portions of Milwaukee County, northeastern Waukesha County, southern Ozaukee County, and southeastern Washington County.

The Airport is located within the corporate limits of the City of Milwaukee, with several land parcels south of Hampton Avenue within the corporate limits of Wauwatosa. Access is provided from Appleton Avenue via Hampton Avenue/91st Street (Swan Road) or Silver Spring Drive, with interchanges available to both approaches from U.S. Highway 45 (Zoo Freeway).

The location of the Airport in its regional and national setting has been depicted in **Exhibit 1A.**

AIRPORT SYSTEM PLANNING ROLE

Airport planning exists at local, regional, state, and national levels. Each level has a different emphasis and purpose. This master planning effort provides planning at the local level, while the preparation of a *Regional Airport System Plan for Southeastern Wisconsin: 2010* by SEWRPC in December 1996 reflects planning at the regional level. The *Wisconsin State Airport System Plan 2020* reflects planning at the state level for 100 airports included in the state plan.

At the national level, the Airport is included in the National Plan of Integrated Airport Systems (NPIAS). This includes 3,660 airports which are important to the national air transportation system. The Airport is designated as a "commercial reliever" in the NPIAS, although this designation no longer denotes a special funding category. The NPIAS includes an estimate of the total development needs for each of the nation's airports which are eligible for Federal funding assistance.

AIRPORT ADMINISTRATION AND HISTORY

Lawrence J. Timmerman Airport is owned, operated, and maintained by Milwaukee County. The Milwaukee County Board of Supervisors and County Executive provide policy direction through the seven-member Transportation and Public Works Committee. An Airport Director, hired by the County, is responsible for the day-to-day management of both Timmerman and General Mitchell International Airports. The Airport Division of the Milwaukee County Department of Public Works is responsible for the planning, design, construction, operation, and maintenance of airport facilities. The Federal Aviation Administration, through the contract tower program, provides air traffic control services.

In the late 1920's, Milwaukee Air Terminals, Inc. purchased the land upon which the Airport was subsequently constructed. The Curtis-Wright Corporation purchased the Airport in 1936, with the intent of using the facility for flight training, and to promote general aviation. In 1945, they sold the facility to Flightways, Inc., who in turn sold it to Milwaukee County in 1947.

The main hangar, a pump house, and a storage shed were the first buildings constructed in 1928, with only the main hangar remaining today. Metal T-

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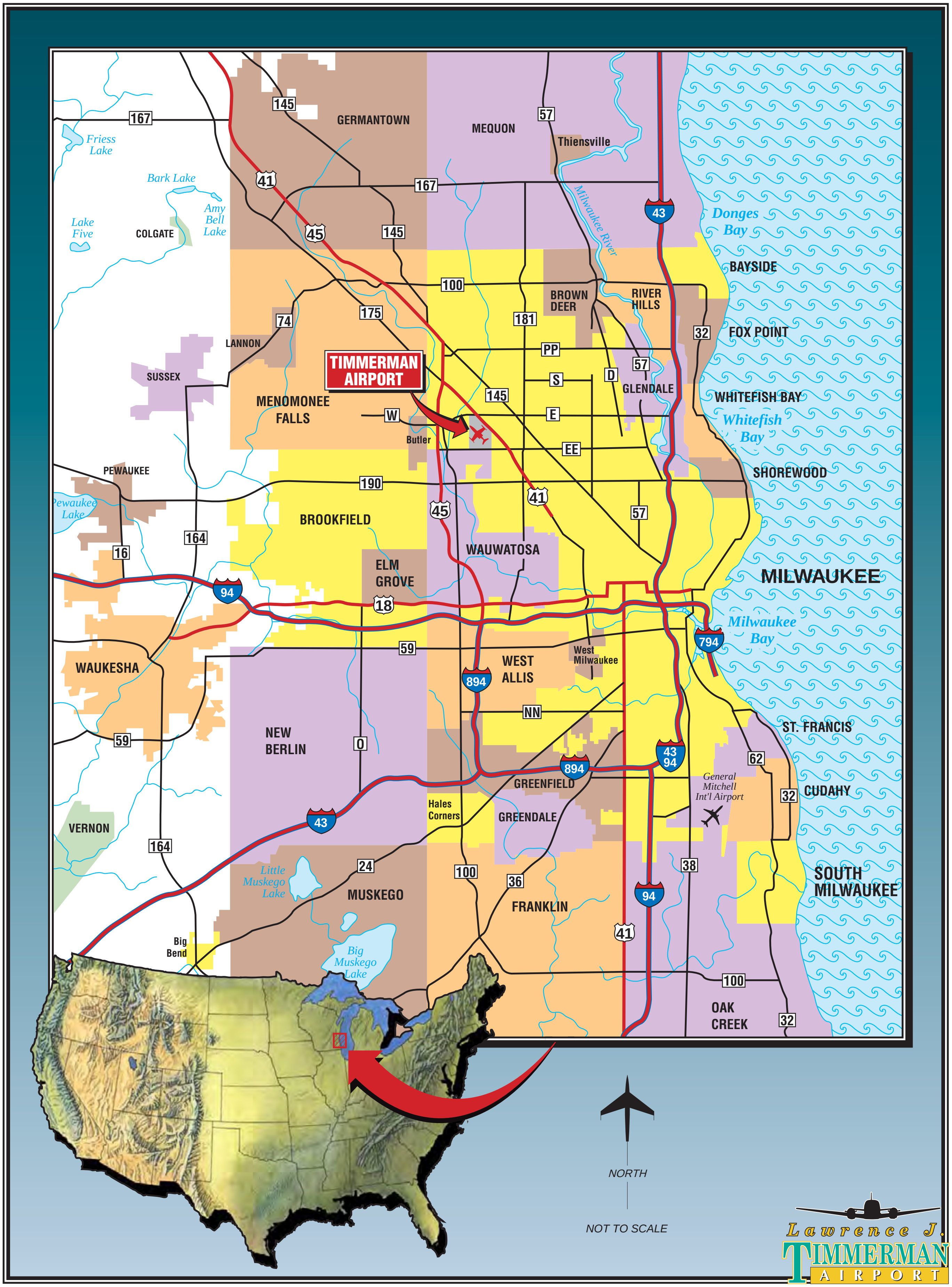

Exhibit 1A
LOCATION MAP

hangars, round-top hangars, and another metal hangar were added in the mid- to late-40's. Masonry hangars were constructed in 1953 and 1961, with the control tower constructed in 1959. The CAP hangar was constructed in 1964, the maintenance/storage hangar south of the control tower was built in 1967, and the County maintenance building in 1974. Forty-three additional storage hangars have been constructed within the past 20 years for varying sizes of aircraft, with three clear-span hangars added as recently as 1995. The Sheriff's Hangar is the most recent hangar addition on the airfield.

AIR TRAFFIC ACTIVITY

The recording of air traffic activities is an important function in the operation of an airport. Since 1961, air traffic activities have been recorded by the local air traffic control tower. A summary of annual traffic movements has been provided in **Exhibit 1B.**

Activity movements are summarized daily by the control tower, then submitted in monthly and annual reports to Milwaukee County. The movements are categorized as civil, military, or air taxi, with itinerant operations differentiated from local activity. This information was summarized for the period since 1995 to examine current trends and has been summarized in **Table 1A**. Based upon information provided by Gran-Aire, Inc., several dozen aircraft are operated at the airport under F.A.R. Part 135 (air taxi) rules. Actual operations by these aircraft over the past year indicate that the air taxi activity in **Table 1A** underestimates actual operations.

Each of the runways on the Airport use standard left-hand traffic patterns. The turf runways and taxiways are closed from November 1st through May 1st of each year. Based upon records maintained by Milwaukee County (and verified in April 2007), there are approximately 128 aircraft based at the Airport, consisting of 107 single engine piston, 14 twin engine (piston and turboprop), 4 rotorcraft, and three jet aircraft.

CLIMATE

Located in the Great Lakes Region of the United States, Milwaukee County experiences a variety of weather conditions ranging from cold, wintry conditions to warm, pleasant summers. The mean maximum temperature in January (the coldest month) is 27 degrees Fahrenheit, while the mean maximum temperature in July (the warmest month) is 80 degrees Fahrenheit. The average annual snowfall is 49 inches, while average annual rainfall is 32.2 inches. Prevailing winds during the summer months are from the southwest, while winds through the winter months are from the west-northwest. Prevailing winds from April through June are generally from the north-northeast.

AIRPORT FACILITIES

Airport facilities can be classified into two broad categories: airside and landside. The airside facilities include

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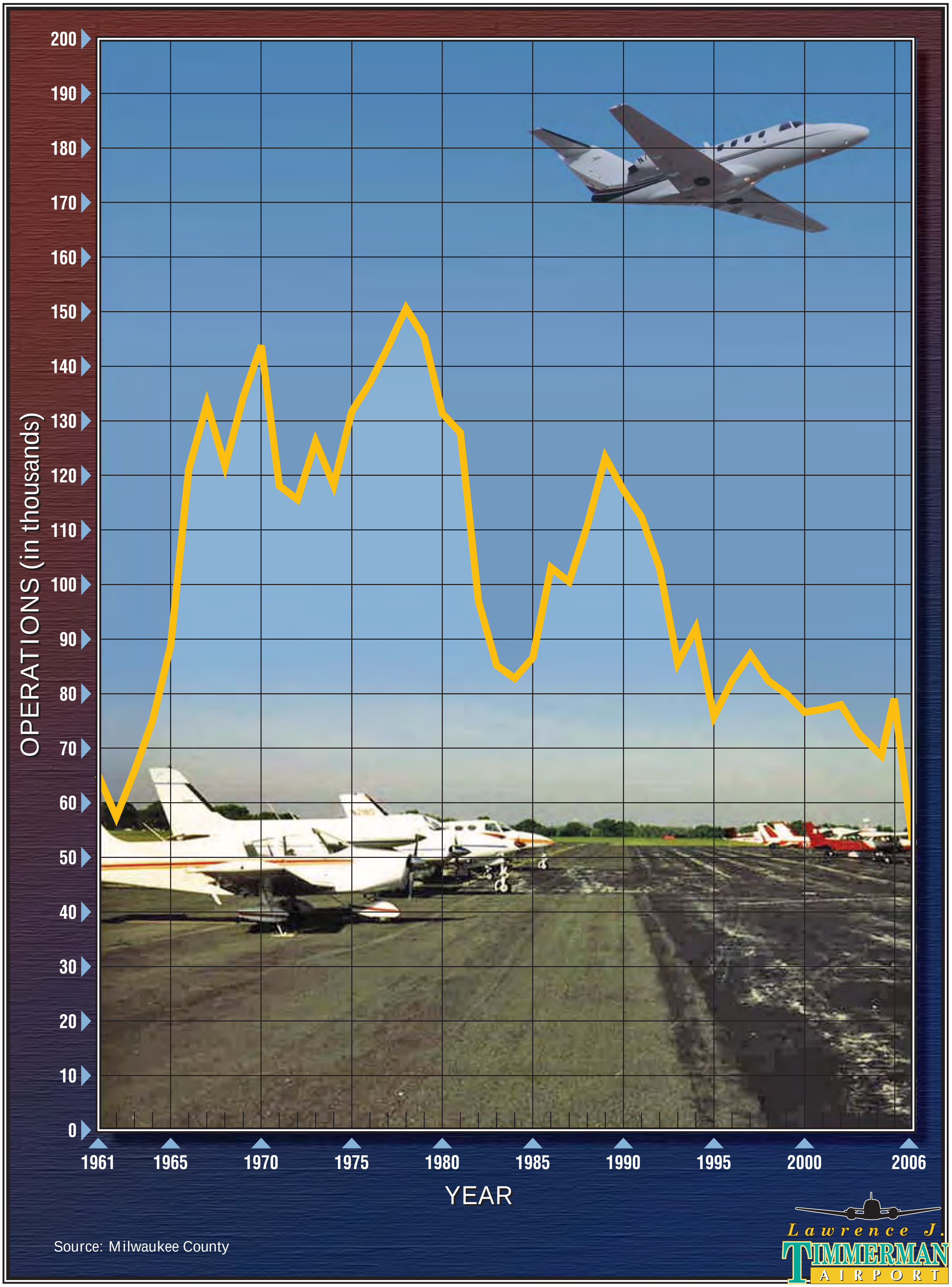

Exhibit 1B
ANNUAL AIRCRAFT MOVEMENTS
1961-2006

TABLE 1A **Annual Aircraft Movements, 1995-2006** **Lawrence J. Timmerman Airport**	Itinerant			Local	
	Air Taxi	**Civil**	**Military**	**Civil**	**Total**
1997	228	51,103	48	35,653	87,032
1998	56	56,326	62	25,751	82,195
1999	253	64,291	41	15,230	79,815
2000	620	58,663	193	16,961	76,437
2001	971	51,399	50	24,562	76,982
2002	948	50,463	63	26,343	77,817
2003	858	46,681	56	24,919	72,514
2004	780	41,388	81	26,885	69,134
2005	1,125	43,507	195	34,227	79,054
2006	904	27,009	152	24,945	53,010

those facilities directly associated with aircraft operations. Landside facilities provide the transition from surface to air transportation, including support facilities.

AIRSIDE FACILITIES

Airside facilities include runways, taxiways, airport lighting, and navigational aids. **Table 1B** summarizes airside facilities available on the Airport.

The dual parallel runway system is served by a full-length parallel taxiway system, and a series of connecting taxiways. The labeling system for the runway and taxiway system has been identified on the existing facilities layout, which is presented in **Exhibit 1C**. Run-up aprons are available at each of the runway thresholds. The paved runways and all paved taxiways on the airfield have medium intensity edge lighting.

A rotating beacon, used universally for the identification of civil and military airports, is located on the Airport, north of the main hangar. Four-box visual approach slope indicators (VASI-4) are located on Runways 15L, 33R, 4L, and 22R. The threshold of each hard-surfaced runway is also identified with runway end identification lights (REILs).

Several types of navigational aids are available for aircraft enroute to the Airport: Very High Frequency Omnidirectional Range (VOR), Loran-C, RNAV, and the Global Positioning System (GPS). VOR's provide azimuth readings to pilots of properly equipped aircraft, transmitting a radio signal at every degree to provide individual navigational courses along each compass point. Frequently, distance measuring equipment is combined with VOR equipment (to create VOR-DME), or VOR equipment is combined with military equipment (to create a VORTAC). The Timmerman VOR-DME

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Exhibit 1C
EXISTING FACILITIES

is located on the west side of the airfield. Other VOR facilities in the area which may be used to navigate to the Airport include: Badger VORTAC, West Bend VOR, Burbun VOR/DME, and Kenosha VOR/DME.

TABLE 1B
Airside Facilities Data
Lawrence J. Timmerman Airport

	Hard-Surfaced Runways			
	Runway 15L	**Runway 33R**	**Runway 4L**	**Runway 22R**
Runway length (ft.)	4,106	4,106	3,202	3,202
Runway width (ft.)	75	75	75	75
Runway surface material	asphalt	asphalt	asphalt	asphalt
Runway condition	very good	very good	very good	very good
Runway edge lighting (intensity)	medium	medium	medium	medium
Runway traffic pattern	left	left	left	left
Runway load bearing strength:				
Single wheel (lbs.)	30,000	30,000	30,000	30,000
Runway markings	nonprecision	nonprecision	nonprecision	nonprecision
Runway latitude	43-06-56.934N	43-06-23.470N	43-06-25.550N	43-06-51.078N
Runway longitude	088-02-19.033W	088-01-47.754W	088-02-17.234W	088-01-51.750W
Runway elevation (ft. AGL)	743.9	743.7	737.1	738.3
Visual slope indicator	4-box VASI	4-box VASI	4-box VASI	4-box VASI
Runway end identifier lights (Y or N)	Y	Y	Y	Y
Displaced threshold (Y or N)	N	N	N	N
	Turf Runways			
	Runway 15R	**Runway 33L**	**Runway 4R**	**Runway 22L**
Runway length (ft.)	3,254	3,254	2,862	2,862
Runway width (ft.)	275	275	275	275
Surface material	turf	turf	turf	turf
Condition	good	good	good	good
Edge lighting	none	none	none	none
Traffic pattern	left	left	left	left
Latitude	43-06-49.037N	43-06-21.038N	43-06-25.038N	43-06-44-037N
Longitude	088-02-23.319W	088-01-56.319W	088-02-07.319W	088-01-47.319W
Elevation (ft. AGL)	742.3	733.4	731.9	736.5

Sources: Airport Master Record and Aviation System Standards (AVN) Data.

Loran-C is a ground-based enroute navigational aid which utilizes a system of transmitters located in various locations across the continental United States. Loran-C varies from VOR, VOR-DME, or VORTAC, in that pilots are not required to navigate using a specific facility. With properly equipped aircraft, pilots using Loran-C can directly navigate to any airport in the United States.

RNAV is a method of navigation which permits aircraft operation on any desired flight path using VOR transmitters. Special equipment installed in the aircraft permits direct flights and eliminates the need to fly directly to or from the VOR site.

GPS is another enroute navigational (and approach) aid available to pilots. Initially developed by the United States

Department of Defense, it is being increasingly used in civilian aircraft navigation. A system of satellites has been deployed to transmit electronic signals which aircraft may in turn use to calculate their relative location. It is similar to Loran-C in that pilots are not required to navigate between navigational facilities. GPS provides the greatest level of accuracy of all enroute navigational aids currently available.

The FAA is establishing new instrument approach procedures each year at airports across the United States using GPS. Since GPS does not require expensive ground-based equipment for the transmission of electronic navigational signals, GPS instrument approach procedures can be developed to almost every airport in the country at a very low cost.

The FAA commissioned the Wide Area Augmentation System (WAAS) in July 2003. The WAAS refines the GPS guidance for enroute navigation and approaches. General aviation, corporate, air taxi, and regional airline operators are expected to benefit from this augmentation to GPS signals. The FAA is certifying new approaches at the current rate of about 300 per year.

GPS approaches fit into three categories, each based upon the desired visibility minimum of the approach. The three categories of GPS approaches are: precision, non-precision with vertical guidance, and non-precision. To be eligible for a GPS approach, the airport landing surface must meet specific standards as outlined in FAA *AC 150/5300-13, Airport Design, Change 7* (attached in Appendix).

Overlay approaches have been established locally, to Runways 15L and 4L. The VOR or GPS approach to Runway 15L allows for approaches when cloud ceilings are as low as 515 feet and visibility is restricted to one mile. The VOR or GPS approach to Runway 4L allows approaches to 555 feet and one mile visibility.

A localizer approach is also available to Runway 15L, providing a minimum approach to 515 feet, and visibility to one mile.

There are 10 other public use airports in the *Regional Airport System Plan for Southeastern Wisconsin: 2010* which are also within a 30 nautical mile radius of the Timmerman Airport. Three of the facilities are in private ownership. The following list provides some basic information about each facility, including their associated city, distance from Timmerman Airport, longest runway, annual operations, and based aircraft*:

- General Mitchell International Airport, Milwaukee, 11.5 nm south-southeast. Longest runway: 9,690 feet. Annual operations: 219,000. Based aircraft: 90.

- John H. Batten Airport, Racine, 23.1 nm south-southeast. Longest runway: 6,556 feet. Annual operations: 59,900. Based aircraft: 93.

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* Source: AirNav.com/2001 SEWRPC

- Kenosha Regional Airport, Kenosha, 31.2 nm south. Longest runway: 5,499 feet. Annual operations: 82,900. Based aircraft: 167.

- Sylvania Airport, Sturtevant, 24.7 nm south. Longest runway: 2,343 feet. Annual operations: 42,000. Based aircraft: 31.

- Burlington Municipal Airport, Burlington, 27.8 nm south-southwest. Longest runway: 4,300 feet. Annual operations: 55,000. Based aircraft: 70.

- East Troy Municipal Airport, East Troy, 24.0 nm southwest. Longest runway: 3,900 feet. Annual operations: 51,000. Based aircraft: 92.

- Waukesha County Airport, Waukesha, 9.8 nm west-southwest. Longest runway: 5,848 feet. Annual operations: 105,000. Based aircraft: 226.

- Capitol Airport, Brookfield, 6.4 nm west-southwest. Longest runway: 3,501 feet. Annual operations: 39,000. Based aircraft: 80.

- Hartford Municipal Airport, Hartford, 21.2 nm northwest. Longest runway: 3,001 feet. Annual operations: 15,300. Based aircraft: 83.

- West Bend Municipal Airport, West Bend, 19.1 nm north-northwest. Longest runway: 4,494 feet. Annual operations: 51,000. Based aircraft: 98.

Exhibit 1D depicts the airspace in the vicinity of the Airport, highlighting the other airports which were presented in the preceding list and the surrounding navigational aids.

LANDSIDE FACILITIES

Landside facilities include the storage and maintenance hangars, administration space, parking apron, and fueling facilities. Landside facilities have been itemized in **Table 1C**.

Gran-Aire, Inc., the fixed base operator, provides fueling services, aircraft storage, tiedown services, aircraft maintenance, and flight instruction. They lease the main hangar, storage hangars, and tie-down apron from Milwaukee County. Gran-Aire uses several aircraft in charter services and flight instruction including a King Air 200 and Cessna 414 Chancellor.

Most of the airport facilities are located on the north side of the airfield, with the exception of the control tower, the old Falk hangar (which is leased to Chem Rite Industries), and the Sheriff's Hangar, which are located on the east side of the airfield. The entrance into the facilities on the north side is from Appleton Avenue, while the facilities on the east side are accessed from N. 91st St./Swan Road. The hangars in the north airfield area provide storage for approximately 125 aircraft, depending upon the size of aircraft stored in the larger hangars. The north ramp has tie-down positions for 45 aircraft and another six positions for large aircraft

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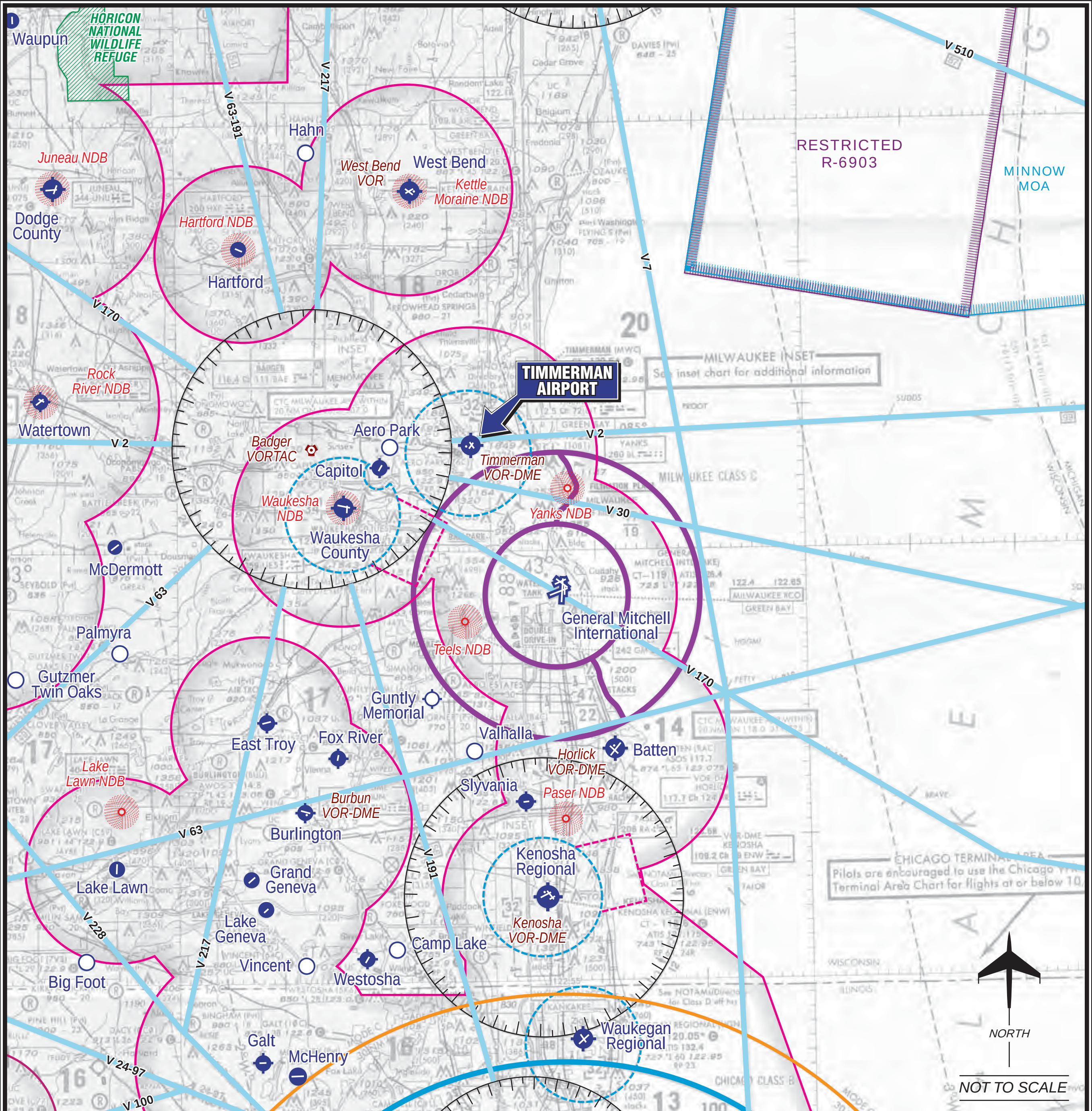

LEGEND

- Airport with other than hard-surfaced runways
- Airport with hard-surfaced runways 1,500' to 8,069' in length
- Airports with hard-surfaced runways greater than 8,069' or some multiple runways less than 8,069'
- Non-Directional Radiobeacon (NDB)
- VORTAC
- VHF Omni Range (VOR)
- VOR-DME
- Compass Rose
- Mode C
- Class B Airspace
- Class C Airspace
- Class D Airspace
- Class E Airspace
- Class E Airspace with floor 700 ft. above surface
- Victor Airways
- Wilderness Area
- MOA-Military Operations Area
- Restricted Area

Source: Chicago Sectional Chart, US Department of Commerce, National Oceanic and Atmospheric Administration October 30, 2003

Lawrence J. TIMMERMAN AIRPORT

Exhibit 1D
REGIONAL AIRSPACE

parking immediately in front of the main hangar. There are a total of six tie-downs on either side of the main hangar, in addition to the tie-downs on the south side of the hangar.

TABLE 1C
Landside Facilities Data
Lawrence J. Timmerman Airport

Description	Area/ Units	Year Constructed	Type of Construction
Main Hangar	17,835 sq. ft.	1928	Masonry/Steel
"Schwartzburg" Hangar (152 Hangar)	4,000 sq. ft.	1947	Steel
Quonsets: East Middle West	2,380 sq. ft. 2,296 sq. ft. 2,296 sq. ft.	1946	Wood Frame/ Asphalt Shingle
C.A.P. Hangar	5,100 sq. ft.	1964	Steel/Masonry
South "Metal" T-Hangars "A" Row "B" Row "C" Row "D" Row "E" Row "F" Row	22,080 sq. ft. 4 units 4 units 4 units 4 units 4 units 4 units	1945	Steel
North "Masonry" T-Hangars "I" Row "J" Row "K" Row "L" Row	35,248 sq. ft. 10 units 10 units 9 units 9 units	1953/1961	Masonry/Steel
"M" and "N" T-Hangars	21 units/ 26,850 sq. ft.	1986	Steel
"O" and "P" T-Hangars	19 units/ 28,810 sq. ft.	1986	Steel
"G" Row Clearspan Hangars	3 units/ 13,950 sq. ft.	1995	Steel
County Maintenance	4,700 sq. ft.	1974	Steel/Masonry
Control Tower	6,290 sq. ft. (4 floors + cab)	1959	Masonry/Steel
Chem Rite Industries (Old Falk Hangar)	6,200 sq. ft.	1967	Masonry
Sheriff's Hangar	4,300 sq. ft.	2,000	Steel
Fuel Storage: (Above-Ground) Jet-A 100LL	 15,000 gallons 15,000 gallons	 1992 1992	 Steel Steel

A tie-down area is also available on the east side, next to the control tower. This "tower" ramp has a total of 35 positions available, with 14 positions currently used by locally based aircraft.

The Civil Air Patrol, operating from a hangar in the north airfield area, have several aircraft which they use for various functions, including search and rescue.

The fuel farm is located northwest of the T-hangars on the north side of the airfield. The above-ground facility provides storage for 15,000 gallons of Jet-A and 15,000 gallons of 100LL Avgas. Gran-Aire uses two trucks to dispense Jet-A and two trucks to dispense Avgas to aircraft.

The Milwaukee County maintenance building, with a five-bay garage, is also located on the north side of the airfield. Several full-time employees provide year-round airport maintenance activities.

An off-airport fire station for the City of Milwaukee (Appleton Ave. Station) is located immediately north of the C.A.P. hangar, facing onto Appleton Avenue.

COMMUNITY PROFILE

The community profile provides a better understanding of the dynamics of growth, and the potential changes that may be expected in aviation needs. Socioeconomic factors need to be considered, along with airport service areas, to define the demand for aviation facilities at a given location. Current demographic and economic information was researched from several sources, including U.S. Bureau of the Census, U.S. Department of Commerce, and the Southeastern Wisconsin Regional Planning Commission.

Milwaukee County consists of 19 cities and villages. It has one of the finest county park and parkway systems in the nation, with nearly 15,000 acres dedicated to 150 parks and parkways. This provides opportunities for a broad range of recreational activities, including golf, hiking, biking, skiing, swimming, and other recreational activities. One such example is Madison Park and the Milwaukee County Golf Course immediately south of Timmerman Airport.

The economy of the Milwaukee area has traditionally been dominated by manufacturing firms. However, the traditional dominance of manufacturing has been subject to increasing challenge from the service sector, although half of the top ten private-sector employers are manufacturing companies. One of the bigger factors in economic trends has been the geographic decentralization of major companies. A much larger proportion of regional economic growth has been occurring in the outlying counties in the region. Particularly large rates of growth have occurred north and west of Milwaukee, in Ozaukee, Washington, and Waukesha Counties.

The seven-county region (Milwaukee, Waukesha, Racine, Kenosha, Ozaukee, Washington, and Walworth) had a 2000 population of 1.93 million, and was projected to increase to 2.08 million in 2020 by SEWRPC. Population within the service area (defined by SEWRPC as central and northern portions of Milwaukee County, northeastern Waukesha County, southern Ozaukee County, and southeastern Washington County) has been estimated (using planning analysis zone boundaries) for 1990 at 1.25 million, and projected to increase to 1.28 million by 2010. The employment within this same area is estimated at 754,700 for 1990, and projected to grow to 821,900 for 2010.

Information on the socio-economic characteristics and travel patterns of general aviation pilots at the public-use airports in Southeastern Wisconsin has been collected by the Regional Planning Commission in past years, and provides an overview of the pilot community. Previous surveys have provided the following overviews: Active pilots generally fly for pay, including instructors, inspectors, air taxi pilots, and corporate pilots; inbound and outbound flights averaged 1.8 crew members and 1.4 passengers per flight; and the purpose for trips were social-recreational, work-related, and for pilot proficiency. Business aviation surveys indicated that most business aircraft are fully equipped for instrument flight operations, business flights carried an average of 2.5 passengers (exclusive of crew), and that for businesses that owned or leased aircraft, almost 60 percent ranked the convenience of a nearby airport capable of accommodating their aircraft as very important.

SUMMARY

The information discussed on the previous pages provides a foundation upon which the remaining elements of the master planning process will be developed. The following two chapters address forecasts of aviation demand and facility needs assessments.

DOCUMENT SOURCES

A variety of different documents were referenced in the inventory process. The following listing reflects a partial compilation of these sources. The listing does not include the data provided directly by the Milwaukee County staff, or airport drawings and leases which were referenced for information. An on-site inventory was also used to review the condition of facilities for the master planning effort.

During the update of the master plan in early 2004, Milwaukee County and Gran-Aire provided updated information on the airport, activity, and based aircraft.

"Airport Facility Directory, East Central U.S.," U.S. Department of Commerce, National Oceanic and Atmospheric Administration, December 25, 2003 Edition.

"Chicago Sectional Aeronautical Chart," U.S. Department of Commerce, National Oceanic and Atmospheric Administration.

"A Regional Airport System Plan for Southeastern Wisconsin: 2010," Southeastern Wisconsin Regional Planning Commission, November 1996.

"Regional Economic Information System," U.S. Department of Commerce, Economics and Statistics Administration, Bureau of Economic Analysis, Regional Economic Measurement Division.

"U.S. Terminal Procedures, East Central U.S.," U.S. Department of Commerce, National Oceanic and Atmospheric Administration, December 25, 2003 Edition.

The following Web pages were also visited for information during the preparation of the inventory:

http://www.airnav.com/
http://www.gcrl.com/
http://www.nasao.org/
http://www.theflightdeck.com/
http://www.wisrep.org/

Lawrence J.
TIMMERMAN
AIRPORT

Chapter Two

AVIATION DEMAND FORECASTS

AVIATION DEMAND FORECASTS

The proper planning of a facility of any type must begin with a definition of the demand that it can reasonably expect to accommodate over a specified period. For the Timmerman Airport Strategic Development and Airport Master Plan Study this involves the development of a set of forecasts that best define the potential for future aviation demand. These forecasts will be used as a basis for determining the types and sizes of facilities required to accommodate the aviation needs of the Timmerman Airport service area through the planning period.

However, the primary objective of a forecasting effort is to define the magnitude of change that can be expected over time. Because of the cyclical nature of the economy, it is virtually impossible to predict with certainty year-to-year fluctuations in activity when looking twenty years into the future. However, a trend can be established which characterizes long-term growth potential. While a single line is often used to express the anticipated growth, it is important to remember that actual growth may fluctuate above and below this line. The point to remember about forecasts is that they serve only as guidelines, and planning must remain flexible to respond to unforeseen facility needs.

The spectrum and pace of change since the first powered flight is almost beyond comprehension, as aviation has become the most dynamic form of transportation in the world. Because it is dynamic, changes and major technological breakthroughs have resulted in erratic growth patterns. More recently, regulatory and economic actions have created very significant impacts upon activity patterns at most airports. The following sections will assess the historical aviation trends at the airport and provide the rationale for the selection of planning forecasts.

GENERAL AVIATION TRENDS

Following more than a decade of decline, the general aviation industry was revitalized with the passage of the *General Aviation Revitalization Act* in 1994, which limits the liability on general aviation aircraft to 18 years from the date of manufacture. This legislation sparked an interest to renew the manufacturing of general aviation aircraft, due to the reduction in product liability, as well as renewed optimism for the industry. The high cost of product liability insurance was a major factor in the decision by many American aircraft manufacturers to slow or discontinue the production of general aviation aircraft.

However, this continued growth in the general aviation industry appears to have slowed considerably in 2001, negatively impacted by the events of September 11th. Thousands of general aviation aircraft were grounded for weeks, due to "no-fly zone" restrictions imposed on operations of aircraft in security-sensitive areas. This, in addition to the economic recession already taking place in 2001-02, has had a profoundly negative impact on the general aviation industry.

According to a report released by the General Aviation Manufacturers Association (GAMA), aircraft shipments were down 13.4 percent for the third quarter and 6.2 percent year-to-date. The Aerospace Industries Association of America (AIAA) expects general aviation shipments to decline for the first time since 1994, down 8.8 percent, to 2,556 aircraft. The number of general aviation hours flown is projected to decline by 2.2 percent in 2002 and increase by only 0.4 percent the following year.

At the end of 2001, the total pilot population, including student, private, commercial, and airline transport, was estimated at 649,957. This is an increase of 3.9 percent, or 24,000 pilots, from 2000. Student pilots were the only group to experience a decrease in 2001, down 6.6 percent from 2000. The number of student pilots is projected to decline by 4.5 percent in 2002, and an additional 1.2 percent the following year. After 2004, the number of student pilots is expected to increase at an average annual rate of 1.0 percent, totaling 90,000 in 2013, which is less than the number recorded in 2000 (93,064).

However, the events of September 11th have not had the same negative impact on the business/corporate side of general aviation. The increased security measures placed on commercial flights has increased interest in fractional and corporate aircraft ownership, as well as on-demand charter flights. This is reflected in the forecast of active general aviation pilots (excluding air transport pilots), which are projected to increase by 54,000 (0.8 percent annually) over the forecast period.

According to the FAA, general aviation operations and general aviation aircraft handled at enroute traffic control centers increased for the ninth consecutive year. The forecast for general aviation aircraft assumes that business use of general aviation will expand much more rapidly than personal/sport use, due largely to the expected growth in fractional ownership.

In 2000, there was an estimated 217,533 active general aviation aircraft, representing a decrease of 0.9 percent from the previous year and the first decline in five years. **Exhibit 2A** depicts the FAA forecast for active general aviation aircraft in the United States. The FAA forecasts general aviation aircraft to increase at an average annual rate of 0.3 percent over the 13-year forecast period. Single-engine piston aircraft are expected to decline in the short-term, and then begin a period of growth after 2004. Multi-engine piston aircraft are expected to remain relatively flat throughout the forecast period. Turbine-powered aircraft are expected to grow at an average annual rate of 2.1 percent over the forecast period, while turbojet aircraft are expected to grow at an annual average growth rate of 3.4 percent. This strong growth rate for turbojet aircraft can be attributed to the growth in the fractional ownership industry, new product offerings (which include new entry level aircraft and long-range global jets), and a shift away from commercial travel by many travelers and corporations.

Manufacturer and industry programs and initiatives continue to revitalize the general aviation industry with a variety of programs. For example, Piper Aircraft Company has created Piper Financial Services (PFS) to offer competitive interest rates and/or leasing of Piper aircraft. Manufacturer and industry programs include the "No Plane, No Gain" program promoted jointly by the General Aviation Manufacturers Association (GAMA) and the National Business Aircraft Association (NBAA). This program was designed to promote the use of general aviation aircraft as an essential, cost-effective tool for businesses. Other programs are intended to promote growth in new pilot starts and to introduce people to general aviation. These include "Project Pilot" sponsored by the Aircraft Owners and Pilots Association (AOPA), "Flying Start" sponsored by the Experimental Aircraft Association (EAA), "Be a Pilot" jointly sponsored and supported by more than 100 industry organizations, and "Av Kids" sponsored by the NBAA. Over the years, programs such as these have played an important role in the success of general aviation and will continue to be vital to its growth in the future.

AIRPORT SERVICE AREA

The service area of an airport is defined by its proximity to other airports providing similar levels of service. The 10 other public use airports included in the *Regional Airport System Plan for Southeastern Wisconsin: 2010*, which also fall within a 30-mile radius of Timmerman Airport, were identified in the inventory chapter. Geographically, the airport service area includes central and northern portions of Milwaukee

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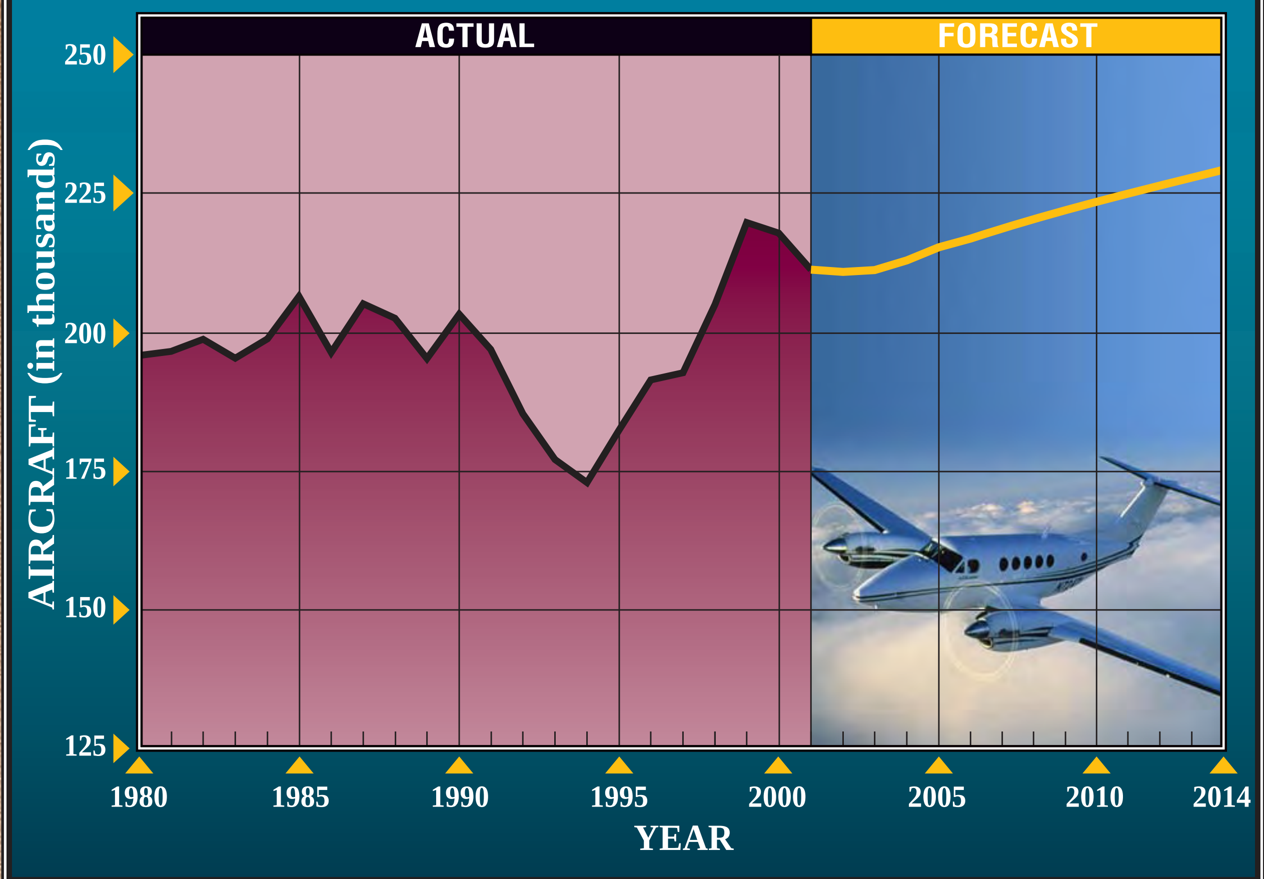
ACTIVE GENERAL AVIATION AIRCRAFT



U.S. ACTIVE GENERAL AVIATION AIRCRAFT (in thousands)

	FIXED WING									
	PISTON		TURBINE		ROTORCRAFT					
Year	Single Engine	Multi-Engine	Turbo-prop	Turbojet	Piston	Turbine	Experi-mental	Sport	Other	Total
2001 (Actual)	145.0	18.3	6.6	7.8	2.3	4.5	20.4	NA	6.5	211.4
2004	144.9	18.2	6.8	8.4	2.5	4.4	20.4	1.0	6.5	213.1
2009	147.6	18.0	7.4	10.3	2.6	4.5	21.0	4.1	6.6	222.2
2014	149.6	17.8	8.0	12.3	2.8	4.6	21.4	6.2	6.7	229.5

Sources: FAA General Aviation and Air Taxi Activity (and Avionics) Surveys.
FAA Aerospace Forecasts, Fiscal Years 2003-2014.

Notes: An active aircraft is one that has a current registration and was flown at least one hour during the calendar year.

Lawrence J. TIMMERMAN AIRPORT

Exhibit 2A
U.S. ACTIVE GENERAL AVIATION AIRCRAFT FORECASTS

County, northeastern Waukesha County, southern Ozaukee County, and southeastern Washington County. However, the service areas for other regional airports overlap the same area.

FORECASTING APPROACH

The development of aviation forecasts proceeds through both analytical and judgmental processes. A series of mathematical relationships are tested to establish statistical logic and rationale for projected growth. However, the judgement of the forecaster, based upon professional experience, knowledge of the aviation industry and the local situation, is important in the final subjective determination of the preferred forecast.

It is important to note that, despite the analysis and professional judgement that goes into forecasting, one should not assume a high level of confidence in forecasts that extend beyond five years. Facility and financial planning usually require at least a ten-year preview, since it often takes more than five years to complete a major facility development program. Therefore, it is important to use forecasts which do not result in overestimates of revenue-generating capabilities or under-estimates of facilities needed to meet public (user) needs.

A wide range of factors are known to influence the aviation industry and can have significant impacts on the extent and nature of air service provided in both the local and national market. Technological advances in aviation have historically altered, and will continue to change the growth rates in aviation demand over time. The most obvious example is the impact of jet aircraft on the aviation industry, which resulted in a growth rate that far exceeded expectations. Such changes are difficult, if not impossible to predict, and there is simply no mathematical way to estimate their impacts. Using a broad spectrum of local, regional and national socio-economic and aviation information, and analyzing the most current aviation trends, forecasts are presented in the following sections.

AVIATION ACTIVITY FORECASTS

The importance of air transportation to Milwaukee County and its surrounding environs cannot be overstated. Ground transportation from the Milwaukee County area to most major metropolitan areas is available using the Interstate Highway system, however, these options often involve extended drive and travel times. This leaves air transportation as the most efficient and economical means of accessing regional and national markets. The need for airport facilities serving the Milwaukee County area can best be determined by accounting for forecasts of future aviation demand. Therefore, the remainder of this chapter will present the forecasts for airport users, and includes:

- Based Aircraft
- Based Aircraft Fleet Mix
- Annual Operations
- Peak Activity
- Annual Instrument Approaches

The proper planning of a facility of any type must begin with a definition of the demand that it can reasonably expect to accommodate over a specified period. For the Lawrence J. Timmerman Airport, this involves the development of a set of forecasts that best define the potential for future aviation demand. These forecasts will be used as a basis for determining the types and sizes of facilities required to accommodate the aviation needs of the Milwaukee County area through the year 2023.

BASED AIRCRAFT PROJECTIONS

The number of based aircraft is the most basic indicator of general aviation demand. By first developing a forecast of based aircraft, the growth of the other indicators can be projected based upon this growth and other factors characteristic to the airport and the area it serves.

The number of aircraft based at an airport is somewhat dependent upon the nature and magnitude of aircraft ownership in the local service area. Therefore, the process of developing forecasts for based aircraft was begun with a review of historical aircraft registrations in Milwaukee, Waukesha, Washington, and Ozaukee Counties. Historical aircraft registration information was obtained from the FAA Census of U.S. Civil Aircraft and State and County Listing of Aircraft Registrations. The number of aircraft registered in the four counties in January 2004 was 1,168, which was a 4.4% increase over the four-county total of 1,119 aircraft in 1997. A review of aircraft registrations in April 2007 indicated that this figure has remained unchanged.

The number of aircraft based at the airport has declined slightly since the planning study was initiated in 1997. However, the mix has transitioned into heavier aircraft over this time period. In 1997, the 142 based aircraft consisted of the following mix: 114 single-engine, 27 twin-engine piston, and 1 jet. By early 2007, the 128 based aircraft consisted of 107 single-engine, 14 multi-engine, 3 jets, and 4 rotorcraft.

While a review of figures submitted to the FAA for Form 5010-1 (Master Record) publication indicates that the number of aircraft may have continued to grow through the late 1980's and early 1990's before declining (a total of 164 were reported in 1990), the total recorded by SEWRPC in 1993 was 113. Since 2003, the basing level has been steady.

The first step in developing forecasts for based aircraft involved a review of active aircraft in the U.S. and FAA forecasts. The drop in aircraft at Timmerman Airport in the early 1990's mirrors trends at the national level. For future years, the FAA is assuming a modest growth rate of 0.8% through the planning period. This same growth has been assumed for Timmerman Airport. The analysis is summarized in **Table 2A**.

TABLE 2A
Based Aircraft Forecast
Lawrence J. Timmerman Airport

Year	Registered Aircraft[1]	U.S. Active Aircraft[2]	Based Aircraft Timmerman Airport[3]
Historical			
1990	1,092	203,400	164
1993	1,073	183,600	113
1997	1,119	192,400	142
2003	1,168	209,600	127
2007	1,168	220,845	128
Forecast			
2013	–	228,000	134
2018	–	252,400	140
2023	–	262,600	145
2028	–	273,300	150

1 Total registered aircraft in the four counties of Milwaukee, Ozaukee, Waukesha, and Washington. Source: Census of U.S. Civil Aircraft and State and County Listing of Aircraft Registrations.

2 FAA Aerospace Forecasts, FY 2003-2014 and FAA-Long Range Aerospace Forecasts.

3 Sources: FAA Master Record (5010-1) for 1990, SEWRPC for 1993, inventory counts taken in July 1997, January 2004, and April 2007.

The long-term trend for general aviation (summarized in previous sections of this chapter) is once again for positive growth, and the Milwaukee area should experience some of this growth. Therefore, the projections which have been developed reflect increasing aircraft in the service area and growth in total aircraft, although the net increase is only 22 aircraft. The FAA, using a 2005 base year of 104 aircraft in their *Terminal Area Forecast*, has projected that based aircraft would increase to 120 by 2025. This represents an annual growth rate of 0.7%. This projection has been included on **Exhibit 2B** with the preferred forecast, summarizing the based aircraft projections.

BASED AIRCRAFT FLEET MIX PROJECTION

The fleet mix is evaluated for the purpose of projecting adequate sizing for hangars and other facilities. The previous paragraphs summarized the change which has occurred at the airport in fleet mix over the past 16

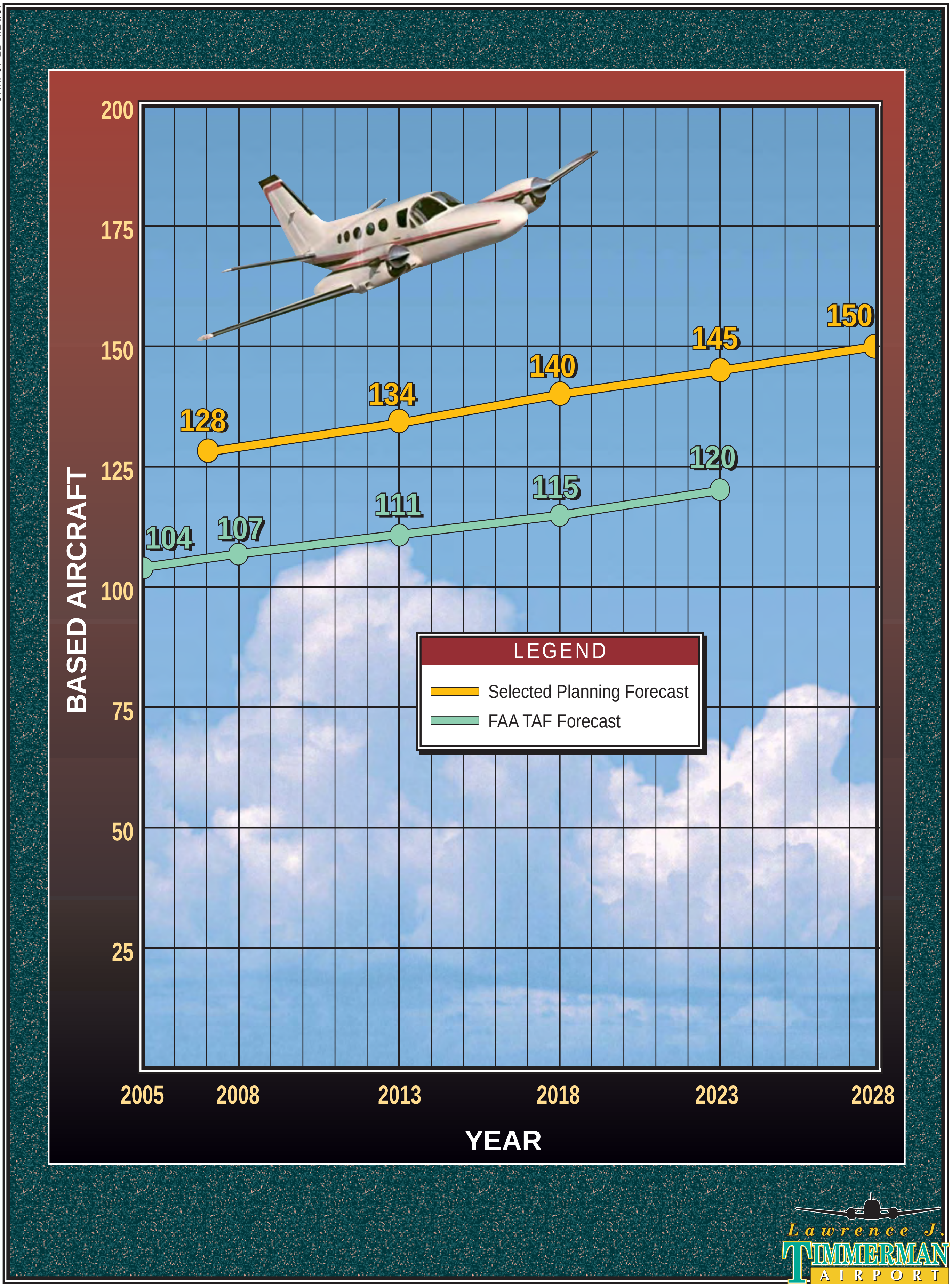


Exhibit 2B
BASED AIRCRAFT FORECASTS

years: aircraft with larger wingspans and faster approach speeds are basing at the airport and using the facility. Twin-engine aircraft (both piston or turbine powered) represent 13 percent of the current mix. The general trend in the U.S. is towards a larger percentage of sophisticated aircraft and helicopters in the fleet mix, and a reduction in the percentage of single and twin-engine piston aircraft. Growth within each category was determined by comparison with national projections, which reflect current aircraft in production. The fleet mix for existing and future years has been reflected in **Table 2B** and on **Exhibit 2C.**

TABLE 2B
Based Aircraft Fleet Mix
Lawrence J. Timmerman Airport

Year	Total	Single Engine	Multi-Engine	Jet	Rotorcraft
2007	128	107	14	3	4
Forecast					
2013	134	107	17	5	5
2018	140	111	17	6	6
2023	145	112	17	8	8
2028	150	113	17	10	10

ANNUAL OPERATIONS

There are two types of operations at an airport: local and itinerant. A local operation is a take-off or landing performed by an aircraft that operates within site of the airport, or which executes simulated approaches or touch-and-go operations at the airport. Itinerant operations are those performed by aircraft with a specific origin or destination away from the airport. Generally, local operations are characterized by training operations. Typically, itinerant operations increase with business and industrial use since business aircraft are used primarily to carry people from one location to another.

In 2006, 47 percent of the total operations at Timmerman Airport were recorded as local operations. This is a higher level than recorded in previous years. In 2004, the percentage was 39.% and in 2005, it was 43%. There are an insignificant number of military operations recorded on the airport, as represented in **Table 1A** in the last chapter. However, information collected in recent years indicates a higher number of air taxi (F.A.R. Part 135) operations than reported on air traffic records. This is believed to be attributable to a lack of reporting on the aircraft tag (I.D.) which assists the controller in recording the aircraft as a "for hire" operation. The trend in total operations since 1961 was presented in **Exhibit 1B**, and generally reflects the

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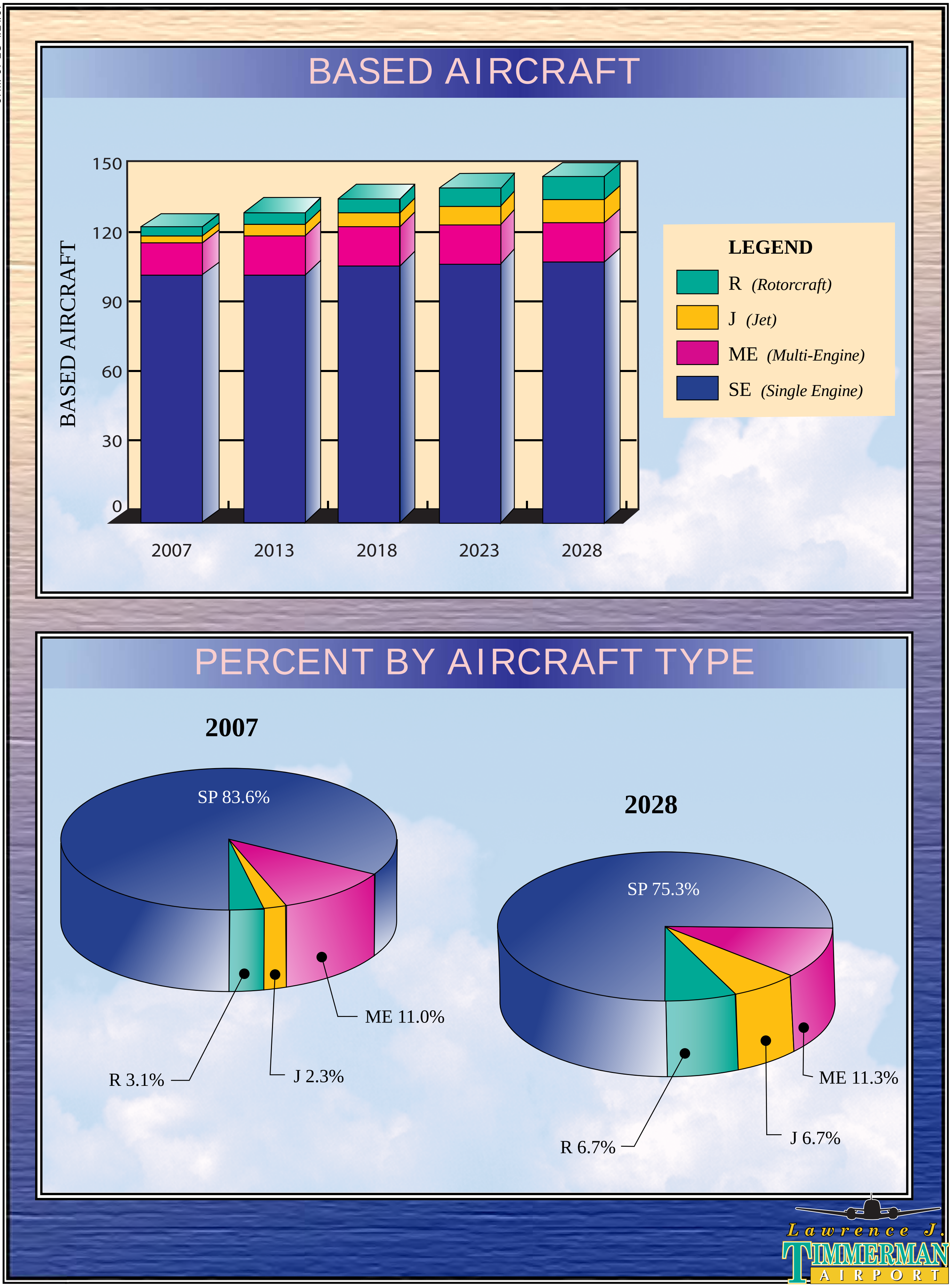

Exhibit 2C
BASED AIRCRAFT FLEET MIX

trend in general aviation activity nationally, with peaks established in the late 1970's and declines in the early 1980's and through the 1990's and 2000's.

The FAA has projected growth in aircraft and utilization over the next twelve years, as outlined in preceding paragraphs of this chapter. As a reliever to General Mitchell International Airport, Timmerman Airport plays an important role for business and corporate users on the near north side of Milwaukee, and as a training facility. Therefore, by its location and current role, it is expected to reflect the growth in aircraft and activity experienced nationally. The continuing trend in the use of general aviation aircraft towards business and corporate uses is reflected in the mix of aircraft basing at Timmerman Airport, and the type of hangars constructed on the airport in recent years. The FAA projects the average number of hours flown by general aviation aircraft to increase slightly over the next twelve years. The utilization rate at Timmerman has recently declined and has not been increased in the forecast years. The percentage of local operations (to total operations) is expected at 45 percent through the forecast period. The operations forecast has been summarized in **Table 2C** and on **Exhibit 2D**. The average annual growth rate for total operations is 0.7 percent.

TABLE 2C
Annual Operations Forecast
Lawrence J. Timmerman Airport

Year	Based Aircraft	Operations per Based Aircraft Ratio	Total Annual Operations	Local Operations
Actual				
2006	128	414	53,010	24,945
Forecast				
2013	134	414	56,000	25,000
2018	140	414	58,000	26,000
2023	145	414	60,000	27,000
2028	150	414	62,000	28,000

PEAKING CHARACTERISTICS

Many airport facility needs are related to the levels of activity during peak periods. The periods used in developing facility requirements for this study are as follows:

- **Peak Month** - The calendar month when peak aircraft operations occur.

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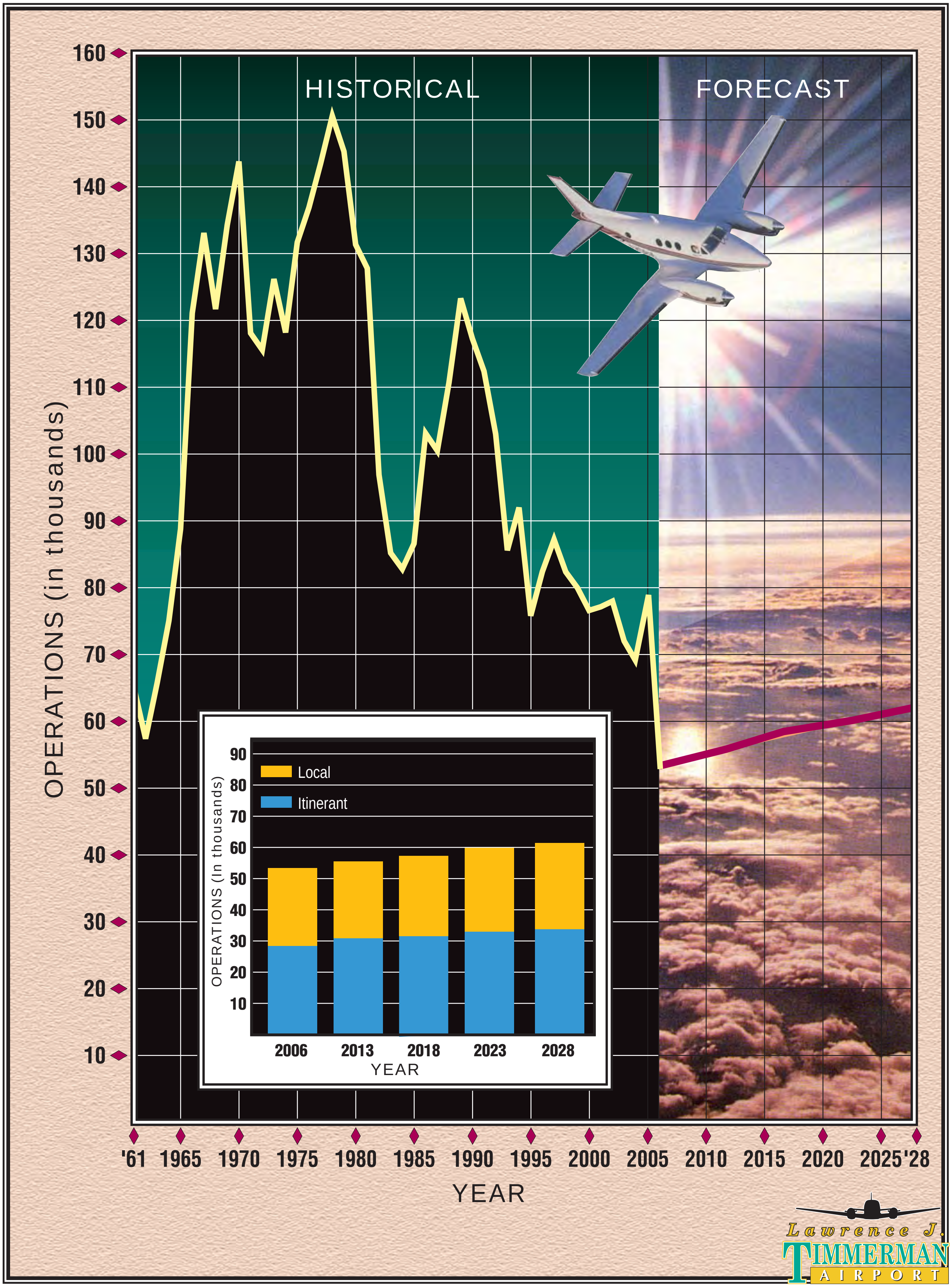

Exhibit 2D
ANNUAL OPERATIONS FORECAST

- **Design Day -** The average day in the peak month. Normally this indicator is easily derived by dividing the peak month operations by the number of days in a month.

- **Busy Day -** The busy day of a typical week in the peak month. This descriptor is used primarily to determine apron space requirements.

- **Design Hour -** The peak hour within the design day.

It is important to note that only the peak month is an absolute peak within a given year. All other peak periods will be exceeded at various times during the year. However, they do represent reasonable planning standards that can be applied without overbuilding or being too restrictive. According to operational data recorded by the air traffic control tower, the peak month for operations in 2006 was June, with 10.8 percent of total annual operations. For forecasting purposes, an 11.0 percent peaking factor was used for the peak month calculations.

Calculation of the busy day is important when calculating future apron requirements. Typically, busy days are figured at 25 percent above the average day in the peak month. Therefore, a factor of 1.25 has been applied to the average (design) day figures to provide a busy day operations number. Comparing this number to daily logs maintained by the control tower, the busy day number was exceeded six times during the peak month. Since actual hourly peak information was not available, it was estimated at 15 percent of the design day operations. The peaking characteristics are summarized in **Table 2D**.

ANNUAL INSTRUMENT APPROACHES

Forecasts of annual instrument approaches (AIAs) provide guidance in determining an airport's requirements for navigational aids. An instrument approach as defined by the FAA is "an approach to an airport with the intent to land by an aircraft in accordance with an Instrument Flight Rule (IFR) flight plan, when visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude."

Available data on instrument approaches was obtained from the FAA. In 2003, 334 AIAs were reported by the FAA. This represented 5.2% of the total instrument operations (6,422). AIAs for future years were calculated at 5.2% of forecasts for instrument operations as reflected in FAA's *Terminal Area Forecasts* (TAF).

SUMMARY

This chapter has provided forecasts for each sector of aviation demand. These forecasts are essential to the effective analysis of future facility requirements. The next step in the study is to assess the capacity of existing facilities to accommodate forecast demand and determine which facilities will need to be improved to meet these demands. The aviation demand forecasts have been summarized in **Table 2E**.

TABLE 2D
Forecast of Peak Activity
Lawrence J. Timmerman Airport

	Actual 2006	Forecasts			
		2013	2018	2023	2028
Annual Operations	53,010	56,000	58,000	60,000	62,000
Peak Month (11%)	5,712	6,160	6,380	6,600	6,820
Design Day (P.M. ÷ 30)	190	205	213	220	227
Busy Day (D.D. x 1.25)	240	260	266	275	284
Design Hour (D.D. x 0.15)	36	39	40	41	43

TABLE 2E
Forecasts Summary
Lawrence J. Timmerman Airport

	Actual 2006	Forecasts			
		2013	2018	2023	2028
Annual Operations					
Itinerant	28,065	31,000	32,000	33,000	34,000
Local	24,945	25,000	26,000	27,000	28,000
Total	53,010	56,000	58,000	60,000	62,000
Based Aircraft	128	134	140	145	150
Annual Instrument Approaches (2003 actual)	334	322	343	364	385

Lawrence J. TIMMERMAN AIRPORT

Chapter Three

FACILITY REQUIREMENTS

Chapter Three

FACILITY REQUIREMENTS

In the previous chapter, future levels of aviation demand were established for Timmerman Airport. The next step in the master planning process is to examine the capability of existing airport facilities to accommodate projected demand. This chapter will evaluate the capability of the airfield to meet projected operations and determine the future requirements for general aviation hangars, apron, administration area, and various support facilities (e.g. fueling, aircraft rescue/firefighting facilities, and airport maintenance).

Once deficiencies in airport facilities are identified, a more specific analysis of the sizing and timing of required facilities can be made. Requirements will be discussed within short-, intermediate-, and long-term planning horizons, which correspond to the five, ten, and twenty-year time frames. However, when viewing

the facility needs, more emphasis should be placed on planning facilities at the demand levels identified, rather than a specific time frame, thus ensuring that facilities are developed as the need arises.

In planning for future facilities, several factors must be considered: flexibility of the plans, staging of development, potential impacts on the environment, and funding sources. Some of the future facilities will be eligible for federal or state grant participation. It is important to carefully examine both the need for these facilities and their eligibility for funding assistance. The analysis of overall facility needs for the airport are described in the following sections. Upon identifying these requirements, alternatives for facility development will be evaluated in the following chapter. The alternatives evaluation will be used to determine the most functional and efficient means for implementing future improvements to Timmerman Airport.

AIRSIDE FACILITIES

Airside facilities include those facilities that are related to the arrival, departure, and ground movement of aircraft. These facilities include:

- ***Runways***
- ***Taxiways***
- ***Airfield marking, lighting, and signage***
- ***Navigation and approach aids***

AIRFIELD CAPACITY

An airport's airfield capacity is expressed in terms of its annual service volume. Annual service volume is a reasonable estimate of the maximum level of aircraft operations that can be accommodated in a year. Annual service volume accounts for variations in runway use, aircraft mix, and weather conditions which naturally occur throughout the year. The airport's annual service volume was examined utilizing Federal Aviation Administration (FAA) Advisory Circular (AC) *150/5060-5, Airport Capacity and Delay*.

Factors Affecting Annual Service Volume

Exhibit 3A graphically presents the various factors included in the calculation of an airport's annual service volume. These include: the airfield characteristics, meteorological conditions, aircraft mix, and demand characteristics (aircraft operations). These factors are described below.

- AIRFIELD CHARACTERISTICS

The layout of the runways and taxiways directly affects an airfield's capacity. This not only includes the location and orientation of the runways, but the percent of time that a particular runway or combination of runways is in use and the length, width, weight bearing capacity, and instrument approach capability of each runway at the airport. These factors determine which type of aircraft may operate on the runway and if operations can occur during poor weather conditions.

- RUNWAY CONFIGURATION

The existing runway configuration includes two sets of intersecting runways: Runways 15-33 and 4-22, with a hard-surface and turf runway in each orientation. Since they intersect, simultaneous operations are limited (e.g. a take-off on one runway and a landing on the other runway to each parallel runway set). In addition, the turf runways are open only during the warmer months (May through October).

- RUNWAY USE

Runway use is normally dictated by wind conditions. The direction of take-offs and landings is generally

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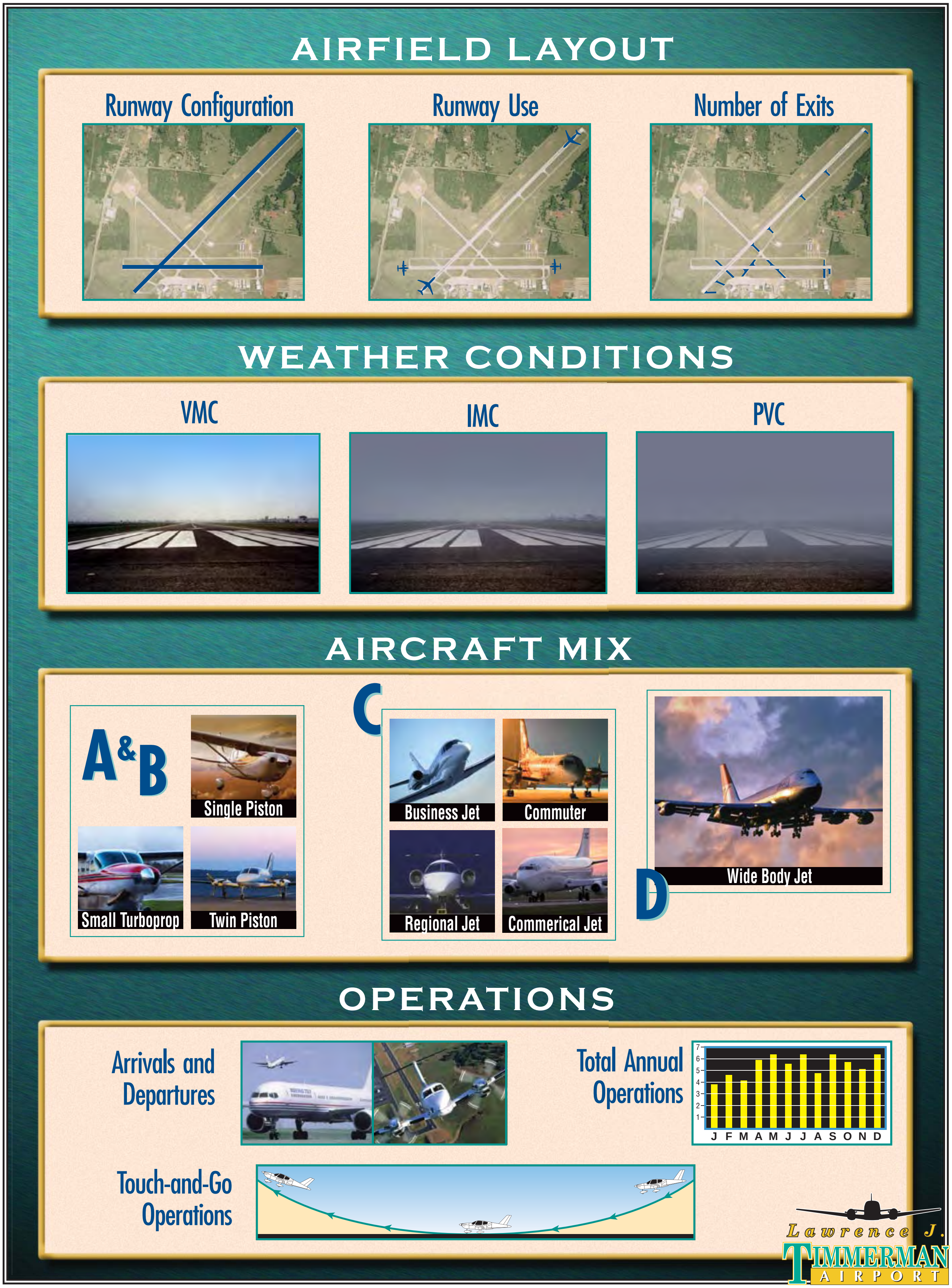


Exhibit 3A
FACTORS INFLUENCING
ANNUAL SERVICE VOLUME

determined by the speed and direction of wind. It is generally safest for aircraft to take-off and land into the wind, avoiding crosswind (wind that is blowing perpendicular to the travel of the aircraft) or tailwind components during these operations. Prevailing winds during the summer are from the southwest, while winds through the winter months are from the west-northwest. Prevailing winds from April through June are generally from the north-northeast. Wind coverage summaries have been provided in **Exhibit 3B**.

The existing length of Runway 15L-33R enables this runway to accommodate a fuller range of aircraft than Runway 4R-22L. Runways 15L and 4L support non-precision instrument approaches to the airport. Therefore, during poor weather conditions, either of the two runways are available for use.

- EXIT TAXIWAYS

Exit taxiways have an impact on airfield capacity since the number and location of exits directly determines the occupancy time of an aircraft on the runway. The airfield capacity analysis gives credit to exits located within a prescribed range from a runway's threshold. This range is based upon the mix index of the aircraft that use the runway. The exits must be at least 750 feet apart (and 2,000 to 4,000 feet from the threshold) to count as separate exits. Under this criteria Runways 33R, 4L, and 22R are credited with two exits each and Runway 15L is credited with one.

- METEOROLOGICAL CONDITIONS

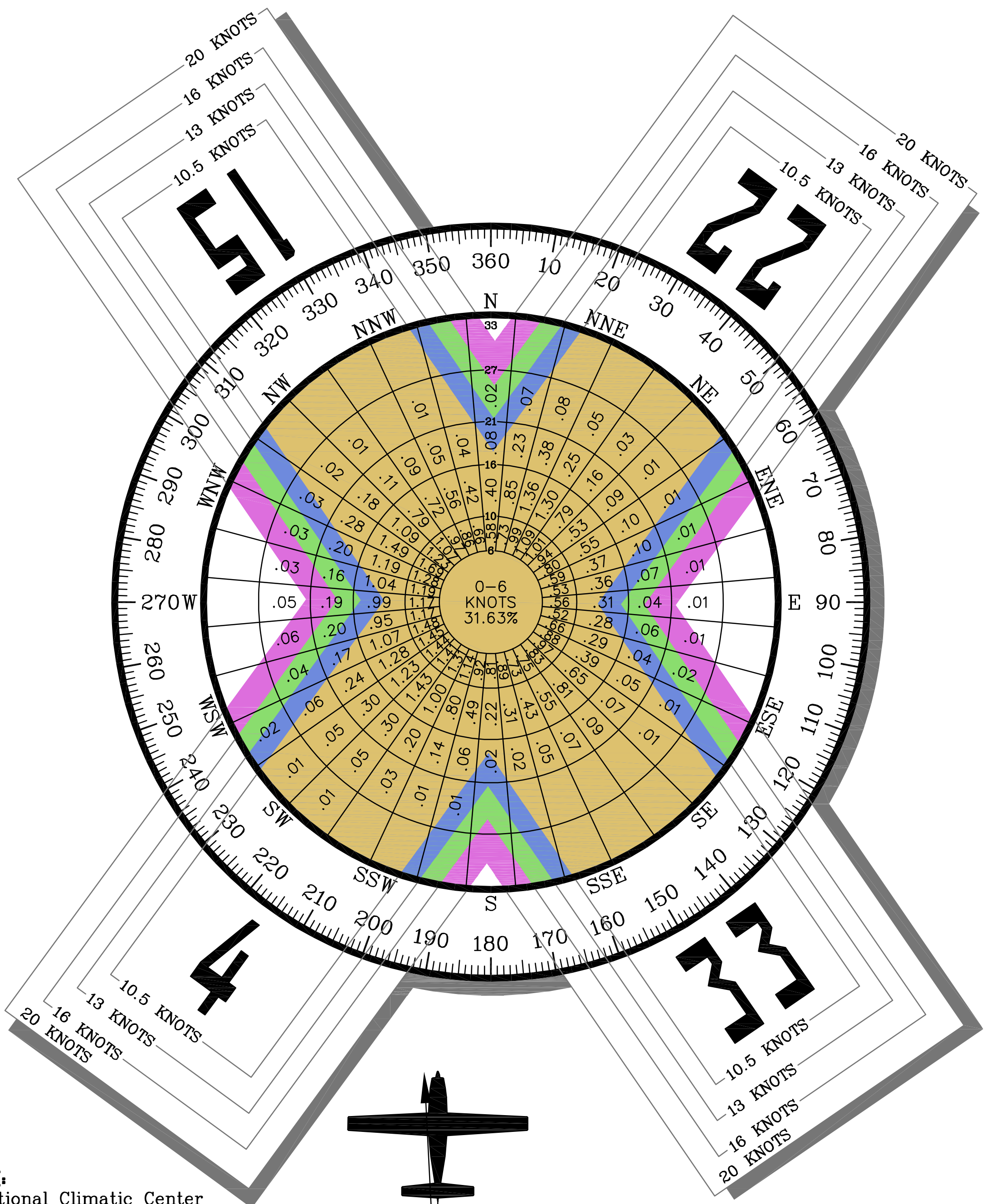
Weather conditions can have a significant affect on airfield capacity. Airport capacity is usually highest in clear weather, when flight visibility is at its best. Airfield capacity is diminished as weather conditions deteriorate and cloud ceilings and visibility are reduced. As weather conditions deteriorate, the spacing of aircraft must increase to provide allowable margins of safety. The increased distance between aircraft reduces the number of aircraft which can operate at the airport during any given period. This consequently reduces overall airfield capacity.

There are three categories of meteorological conditions, each defined by the reported cloud ceiling and flight visibility. Visual Flight Rule (VFR) conditions exist whenever the cloud ceiling is greater than 1,000 feet above ground level, and visibility is greater than three statute miles. VFR flight conditions permit pilots to approach, land, or take-off by visual reference and to see and avoid other aircraft.

Instrument Flight Rule (IFR) conditions exist when the reported ceiling is less than 1,000 feet above ground level and/or visibility is less than three statute miles. Under IFR conditions pilots must rely on instruments for navigation and guidance to the runway. Other aircraft cannot be seen and safe separation between aircraft must be assured solely by following air traffic control rules and

ALL WEATHER WIND COVERAGE

Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 4-22	*86.42%*	*92.34%*	*97.89%*	*99.53%*
Runway 15-33	*82.32%*	*89.77%*	*96.61%*	*99.10%*
Combined	*96.97%*	*99.12%*	*99.75%*	*99.96%*



SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Lawrence J Timmerman Airport (MWC)
Milwaukee, Wisconsin

OBSERVATIONS:
82,159 All Weather Observations
1994-2003

NORTH

Magnetic Variance
02° 59' West (August 2005)
Annual Rate of Change
05' West (August 2005)

Lawrence J. TIMMERMAN AIRPORT

Exhibit 3B
WIND COVERAGE

procedures. As mentioned, this leads to increased distances between aircraft which diminishes airfield capacity.

Poor Visibility Conditions (PVC) exist when the cloud ceiling and/or visibility is less than cloud ceiling and visibility minimums prescribed by the instrument approach procedures for the airport. PVC conditions exist at Timmerman Airport when the cloud ceiling and visibility is below the minimums established for the non-precision approaches to Runways 15L and 4L. Effectively, the airport is closed to arrivals when cloud ceilings are less than 500 feet above the ground and visibility is less than one mile.

According to data recorded at the airport from 1994 through 2003, VFR conditions have occurred approximately 89.1 percent of the time, whereas IFR conditions have occurred 9.4 percent of the time and PVC conditions have occurred 1.5 percent of the time. The FAA capacity model disregards weather conditions that occur less than 2 percent of the time. Therefore, PVC weather conditions have been included as part of IFR weather conditions in determining airfield capacity for Timmerman Airport.

- AIRCRAFT MIX

Aircraft mix refers to the speed, size, and flight characteristics of aircraft operating at the airport. As the mix of aircraft operating at an airport increases to include larger aircraft, airfield capacity begins to diminish. This is due to larger separation distances that must be maintained between aircraft of different speeds and sizes.

Aircraft mix for the capacity analysis is defined in terms of four aircraft classes. Classes A and B consist of single and multi-engine aircraft weighing less than 12,500 pounds. Aircraft within these classifications are primarily associated with general aviation operations. Class C consists of multi-engine aircraft weighing between 12,500 and 300,000 pounds. This is a broad classification that includes business jets and larger aircraft (only a few of which are applicable to Timmerman Airport).

For the capacity analysis, the percentage of Class C aircraft operating at the airport is critical in determining the annual service volume as these classes include the larger and faster aircraft in the operational mix. The existing and projected operational fleet mix for the airport is summarized in **Table 3A**. Consistent with projections prepared in the previous chapter, the operational fleet mix at the airport is expected to slightly increase its percentage of Class C aircraft as the business and corporate use of general aviation aircraft increases at the airport. The percentage of Class C aircraft is higher during IFR conditions since some general aviation operations are suspended during poor weather conditions.

TABLE 3A
Aircraft Operational Mix

Weather	Year	A & B	C
VFR (Visual)	Current Conditions	96.5%	3.5%
	Short Term	93.5%	6.5%
	Intermediate Term	92.0%	8.0%
	Long Term	89.0%	11.0%
IFR (Instrument)	Current Conditions	75.0%	25.0%
	Short Term	70.0%	30.0%
	Intermediate Term	65.0%	35.0%
	Long Term	60.0%	40.0%

DEMAND CHARACTERISTICS

Operations, not only the total number of annual operations but the manner in which they are conducted, have an important effect on airfield capacity. Peak operational periods, touch-and-go operations, and the percent of arrivals impact the number of annual operations that can be conducted at the airport.

PEAK PERIOD OPERATIONS

Average daily operations and average peak hour operations during the peak month are important in the calculation of an airport's annual service volume. These operational levels were calculated in Chapter Two for existing and forecast years.

TOUCH-AND-GO OPERATIONS

A touch-and-go operation involves an aircraft making a landing and an immediate take-off without coming to a full stop or exiting the runway. These operations are normally associated with training operations and are included in local operations data recorded by the air traffic control tower. Touch-and-go activity is counted as two operations since there is an arrival and a departure involved. A high percentage of touch-and-go traffic normally results in a higher operational capacity because one landing and one take-off occurs within a shorter time than individual operations. This category accounts for 45 percent of annual operations.

PERCENT ARRIVALS

The percentage of arrivals as they relate to the total operations in the design hour is important in determining airfield capacity. Under most circumstances, the lower the percentage of arrivals, the higher the hourly capacity. However, except in unique circumstances, the aircraft arrival-departure split is typically 50-50. At Timmerman Airport, traffic information indicated no major deviation from this pattern, and arrivals were estimated to account for 50 percent of design period operations.

CALCULATION OF ANNUAL SERVICE VOLUME

The preceding information was used in conjunction with the airfield capacity methodology developed by the FAA to determine airfield capacity for Timmerman Airport.

HOURLY RUNWAY CAPACITY

In consideration of the existing and forecast aircraft mix, and additional factors, the hourly capacity of each runway configuration was computed. The use of parallel runways during VFR weather conditions (May through October) results in the highest hourly capacity of the airfield (243 operations). During IFR conditions, only a single runway can be used for aircraft arrivals. Therefore, the hourly capacity of the runway system in IFR weather is considerably less than during VFR conditions and is calculated at 58 operations per hour.

As the mix of aircraft operating at an airport changes to include a greater utilization of Class C aircraft, the hourly capacity of the runway system is also reduced. This is because larger aircraft require longer utilization of the runway for take-offs and landings, and because the greater approach speeds of the aircraft require increased separation. This contributes to a slight decline in the hourly capacity of the runway system over the planning period.

ANNUAL SERVICE VOLUME

Once the weighted hourly capacity is known, the annual service volume can be determined. Annual service volume is calculated by the following equation:

Annual service volume = C x D x H	
C =	weighted hourly capacity
D =	ratio of annual demand to average daily demand during the peak month
H =	ratio of average daily demand to average peak hour demand during the peak month

The analysis has been weighted to account for the higher capacity available from May through October when the turf runways are available. Following this formula, the current annual service volume for Timmerman Airport has been estimated at 268,000 operations. The increasing percentage of Class C aircraft over the planning period will contribute to a slight decline in the annual service volume, lowering it to 262,000 operations by the end of the planning period.

CONCLUSION

Table 3B summarizes annual service volume values, delay, and percentages of capacity. **Exhibit 3C** compares annual service volume to existing and forecast operational levels. The 2006 total of 53,010 operations represented 19.8% of the existing annual service volume. By the end of the planning period, total annual operations are expected to represent 23.7% of annual service volume.

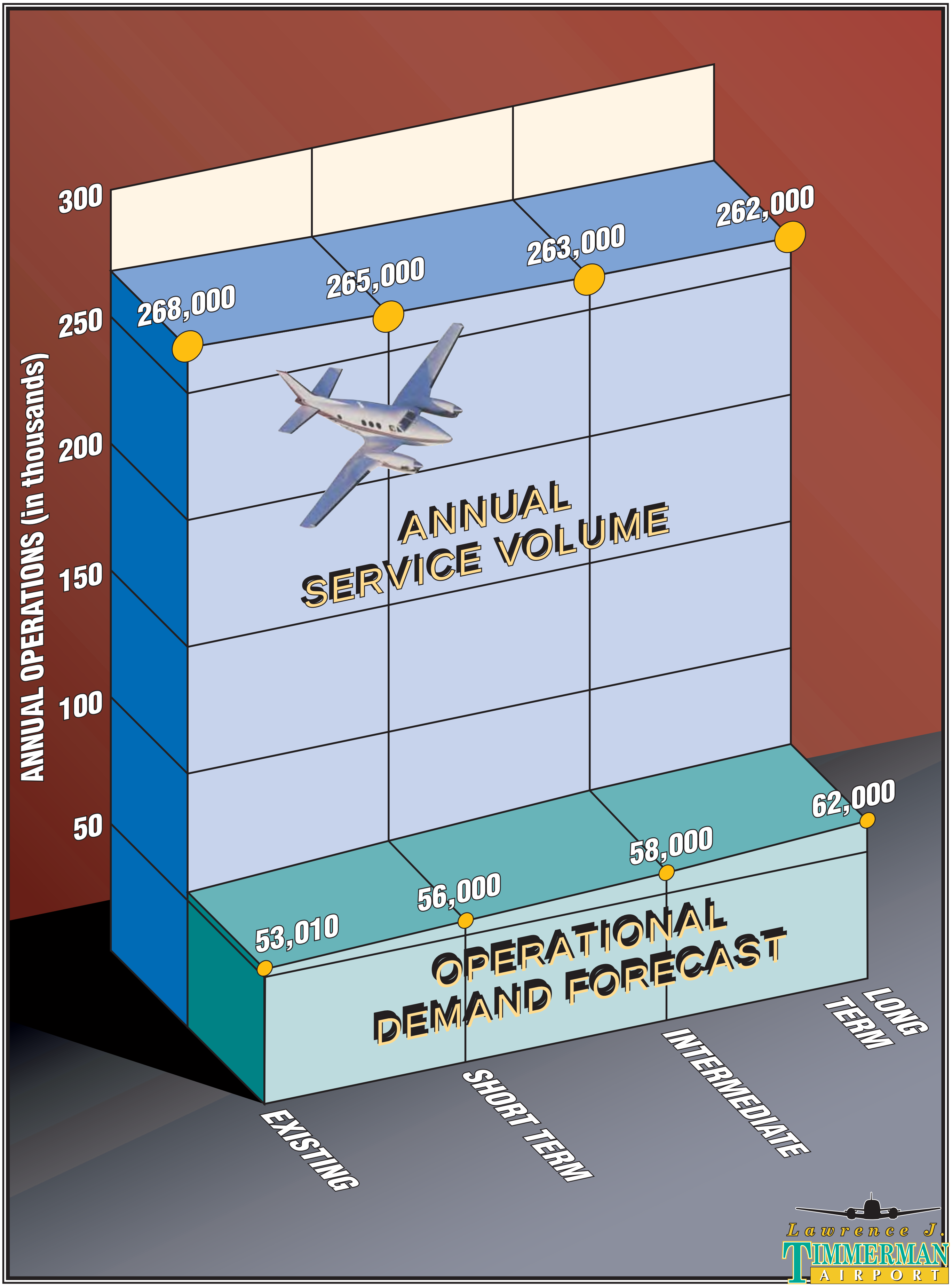


Exhibit 3C
AIRFIELD DEMAND/CAPACITY

TABLE 3B Annual Service Volume Summary	Annual Operations	Weighted Hourly Capacity	Annual Service Volume	Percent Capacity
2006 Conditions	53,010	118	268,000	19.8%
Short Term	56,000	117	265,000	21.1%
Intermediate Term	58,000	116	263,000	22.1%
Long Term	62,000	115	262,000	23.7%

FAA Order 5090.3B, *Field Formulation of the National Plan of Integrated Airport Systems* (NPIAS), indicates that improvements for airfield capacity purposes should be considered when operations reach 60 percent of the annual service volume. Therefore, no capacity enhancements are necessary to service forecast demands.

RUNWAY ORIENTATION

The runway system at the airport includes intersecting Runways 15-33 and 4-22. The existing system minimizes the percentage of time that strong crosswind conditions prohibit operations, as evidenced by a review of the weather summaries obtained from the National Climatic Data Center in Asheville, North Carolina, and summarized in **Exhibit 3B**.

FAA Advisory Circular *150/5300-13, Airport Design*, recommends 95 percent coverage for crosswinds not exceeding 10.5 knots (for small aircraft weighing less than 12,500 pounds) and from 13 to 20 knots for various general aviation and commercial aircraft weighing over 12,500 pounds. As evidenced in the exhibit, both runway orientations are needed to ensure the FAA recommended wind coverage during all weather conditions and at wind speeds of 10.5 and 13 knots.

PHYSICAL PLANNING CRITERIA

The Federal Aviation Administration (FAA) has established criteria for use in the sizing and design of airfield facilities. The selection of appropriate FAA design standards for the development of airfield facilities is based upon the characteristics of the aircraft currently using (or projected to use) the airport. Establishing correct design standards is very important, since they are used to plan separation distances between facilities which could be costly to relocate at a later date.

The most important characteristics in airfield planning are the approach speed and the wingspan of the critical design aircraft anticipated to use the airport now or in the future. An aircraft's approach speed is based upon 1.3 times its stall speed in the landing configuration at the particular aircraft's maximum certificated weight.

The five approach categories used in airport planning are as follows:

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 second basic design criteria relates to the size of an airplane. The airplane design criteria relates to the size of an airplane. The airplane design group (ADG) is based upon wingspan. The six 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.

FAA Advisory Circular 150/5300-13, *Airport Design*, identifies a coding system which is used to relate airport design criteria to the operational and physical characteristics of the airplanes intended to operate at the airport. The Airport Reference Code (ARC) reflects two components: the approach speed category and the airplane design group, as previously defined. Each of these components influence various separation standards on the runway/ taxiway system and the sizing of various critical areas. The FAA recommends designing airport functional elements to meet the requirements of the most demanding aircraft. In examining the mix of aircraft utilizing Timmerman Airport, turboprop and turbo-fan aircraft are presently defining the critical approach speed category (B) and the airplane design group (II).

While the potential exists for aircraft with higher approach speeds or wider wingspans to use the facility in the future, there do not appear to be adequate numbers to justify an airport designation above B-II at this time. **Table 3C** summarizes the physical planning criteria for Timmerman Airport using the B-II category. The output reflects wingspan and undercarriage width for the Cessna Citation Excel aircraft, which is considered the design aircraft for separation standards and runway/ taxiway width requirements.

TABLE 3C
Physical Planning Criteria

Airport Design Airplane and Airport Data:		
Aircraft Approach Category B		
Airplane Design Group II		
Airplane wingspan		55.7 feet
Primary runway end approach visibility minimums are not lower than 1 mile		
Other runway end approach visibility minimums are not lower than 1 mile		
Airplane undercarriage width (1.15 x main gear track)		20.24 feet
Airport elevation		745 feet
Runway and Taxiway Width and Clearance Standard Dimensions:		
Runway centerline to parallel runway centerline simultaneous operations when wake turbulence is not treated as a factor:		
VFR operations with no intervening taxiway		700 feet
VFR operations with one intervening taxiway		700 feet
VFR operations with two intervening taxiways		700 feet
IFR approach and departure with approach to near threshold 2,500 feet less 100 feet for each 500 feet of threshold stagger to a minimum of 1,000 feet.		
Runway centerline to parallel runway centerline simultaneous operations when wake turbulence is treated as a factor:		
VFR operations		2,500 feet
IFR departures		2,500 feet
IFR approach and departure with approach to near threshold		2,500 feet
IFR approach and departure with approach to far threshold 2,500 feet plus 100 feet for each 500 feet of threshold stagger.		
IFR approaches		3,400 feet
Runway centerline to parallel taxiway/taxilane centerline	227.9	240 feet
Runway centerline to edge of aircraft parking	250.0	250 feet
Runway width		75 feet
Runway shoulder width		10 feet
Runway blast pad width		95 feet
Runway blast pad length		150 feet
Runway safety area width		150 feet
Runway safety area length beyond each runway end or stopway end whichever is greater		300 feet
Runway object free area width		500 feet
Runway object free area length beyond each runway end or stopway end whichever is greater		300 feet
Clearway width		500 feet
Stopway width		75 feet
Obstacle free zone (OFZ):		
Runway OFZ width		400 feet
Runway OFZ length beyond each runway end		200 feet

TABLE 3C (Continued)
Physical Planning Criteria

Obstacle free zone (OFZ):	
Inner-approach OFZ width	400 feet
Inner-approach OFZ length beyond approach light system	200 feet
Inner-approach OFZ slope from 200 feet beyond threshold	50:1
Inner-transitional OFZ slope	0:1
Runway protection zone at the primary runway end:	
Width 200 feet from runway end	500 feet
Width 1,200 feet from runway end	700 feet
Length	1,000 feet
Runway protection zone at other runway end:	
Width 200 feet from runway end	500 feet
Width 1,200 feet from runway end	700 feet
Length	1,000 feet
Departure runway protection zone:	
Width 200 feet from the far end of TORA	500 feet
Width 1,200 feet from the far end of TORA	700 feet
Length	1,000 feet
Threshold surface at primary runway end:	
Distance out from threshold to start of surface	0 feet
Width of surface at start of trapezoidal section	400 feet
Width of surface at end of trapezoidal section	1,000 feet
Length of trapezoidal section	1,500 feet
Length of rectangular section	8,500 feet
Slope of surface	20:1
Threshold surface at other runway end:	
Distance out from threshold to start of surface	0 feet
Width of surface at start of trapezoidal section	400 feet
Width of surface at end of trapezoidal section	1,000 feet
Length of trapezoidal section	1,500 feet
Length of rectangular section	8,500 feet
Slope of surface	20:1

Taxiway centerline to parallel taxiway/taxilane centerline	76.8	105 feet
Taxiway centerline to fixed or movable object	49.0	65.5 feet
Taxilane centerline to parallel taxilane centerline	71.3	97 feet
Taxilane centerline to fixed or movable object	43.5	57.5 feet
Taxiway width	35.3	35 feet
Taxiway shoulder width		10 feet
Taxiway safety area width	55.7	79 feet
Taxiway object free area width	97.9	131 feet
Taxilane object free area width	86.9	115 feet
Taxiway edge safety margin		75 feet
Taxiway wingtip clearance	21.1	26 feet
Taxilane wingtip clearance	15.6	18 feet

Source: Airport Design, Version 4.2D, FAA.

RUNWAY LENGTH REQUIREMENTS

Runway length requirements are based upon five primary elements: airport elevation, the mean maximum daily temperature of the hottest month, runway gradient, the critical aircraft type expected to use the runway, and the stage length of the longest non-stop trip destination.

Aircraft performance declines as elevation, temperature, and runway gradient factors increase. The local airport elevation is 745 feet above mean sea level (MSL) and the mean maximum daily temperature in the hottest month (July) is 81.1 degrees (F).

Corporate aircraft fly within the upper midwest region and to points beyond. The critical based jet which is recording the highest annual operations is the Cessna Citation Excel. Over the past six months, this aircraft recorded 150 operations, while total jet operations recorded were over 300. A majority of the other jet activity is also in the Citation category.

To evaluate the adequacy of existing runway lengths, a runway length analysis was undertaken using the FAA's design software (Version 4.2D) and more specific information on characteristics of the Citation Excel, Bravo, CJ2, and Falcon 10. With the Citation Excel being the critical aircraft, the primary runway (15L-33R) length should be planned for 4,400 feet for takeoffs and 4,300 feet for landing (wet runway conditions).

TAXIWAY REQUIREMENTS

Taxiways are primarily constructed to facilitate aircraft movements to and from the runway system. Parallel taxiways greatly enhance airfield capacity and are essential to aircraft movement on the airfield. The paved runways have full length parallel taxiways and connecting taxiways on each runway which provide exit opportunities at no greater than 1,300 feet (greatest distance on Runway 15L).

The type and frequency of runway entrance/exit taxiways can affect the efficiency and capacity of the runway system. Right-angled exits require an aircraft to be nearly stopped before it can exit the runway. Acute-angled exits allow aircraft to slow to a safe speed, without stopping, before exiting the runway. Only right-angled exits are currently available on the airfield. Acute-angled exits do not appear to be required.

There are holding bays at 15L, 33R, and 4L. Holding bays allow aircraft to bypass other aircraft which are waiting to depart. Runway 22R does not actually have a holding bay, but abuts the parking apron, which provides the same function.

MARKING, LIGHTING, AND SIGNAGE

Visual directions to pilots on the airfield are provided by pavement marking, lighting, and directional signage. FAA Advisory Circular *150/5340-1H*,

TABLE 3D
Runway Length Requirements

Airport and Runway Data:

Airport elevation	745 feet
Mean daily maximum temperature of the hottest month	81.1 F
Maximum difference in runway centerline elevation	10 feet
Wet runways	

Runway Lengths Recommended for Airport Design:

Small airplanes with approach speeds of less than 30 knots	320 feet
Small airplanes with approach speeds of less than 50 knots	860 feet
Small airplanes with less than 10 passenger seats	
75 percent of these small airplanes (e.g., Cessna 172, Piper Arrow)	2,660 feet
95 percent of these small airplanes (e.g., Baron, Bonanza, Aztec)	3,190 feet
100 percent of these small airplanes (e.g., Chieftain, Cessna 340)	3,800 feet
Small airplanes with 10 or more passenger seats (e.g., King Air 200)	4,250 feet

Representative Business Jets	Weight (lbs.)	Takeoff Required*	Landing Required (Wet)
Cessna Citation Excel	20,000	4,345	4,324
Falcon 10	18,740	5,421	3,739
Cessna Bravo	14,800	4,357	4,324
Cessna CJ2	12,375	4,179	4,310

Sources: FAA Design Software, Version 4.2D, and Aircraft Manufacturers.
* Data adjusted for local elevation, temperatures, and runway gradient.

Marking of Paved Areas on Airports is used as guidance for the marking of pavements. The non-precision runway markings identify runway centerline, aiming point (only on Runway 15L-33R), threshold/ designation, and edge stripes. Hold lines are painted on the connecting taxiways at 200 feet from the centerline of the runway.

Medium intensity lighting is provided along the hard-surfaced runways and taxiways. Runway threshold lighting identifies each runway end and runway end identifier lights (REIL) are provided on Runways 15L, 33R, 4L, and 22R. During periods when the control tower is closed, the airfield lighting may be activated with radio control. In order to activate the system, the pilot must key his or her microphone with the radio on 120.5 MHz. This system has three available intensities of light. If the highest intensity is desired, the microphone must be keyed seven times in five seconds; medium intensity requires five times in five seconds; and lowest intensity is selected by keying the microphone three times in five seconds.

Visual approach slope indicators are available on each (hard surfaced) runway approach. Airfield signage is provided on runways, taxiways, and ramps consistent with FAA standards.

A localizer approach is available to Runway 15L and VOR/GPS approaches are available to Runways 15L and 4L. No approach lights are available on either approach.

NAVIGATIONAL AIDS

With the advent of global positioning system (GPS) navigation, approaches are being defined using visibility minimums which have traditionally been associated with only instrument landing systems. GPS technology is providing airports with the means to gain instrument approach capability at a moderate cost. Approaches are being defined as precision instrument approach procedures with vertical guidance, or non-precision approach. However, to take advantage of precision GPS approaches, the airport must meet minimum standards as defined in AC 150/5300-13, Appendix 16, which has been attached to this report. Potential approach upgrades will be discussed in Chapter Four.

LANDSIDE FACILITIES

Landside facilities include those associated with the general aviation terminal, general aviation hangars and ramp, and aviation support facilities (such as firefighting equipment, fuel storage, vehicle parking, and airport maintenance). The requirements for these facilities have been outlined on the following pages.

GENERAL AVIATION

This analysis evaluates the space requirements for general aviation hangars and apron, using the forecasts for based aircraft and peaking factors presented within the forecasts chapter. Current demand is being met with a combination of smaller individual hangars and larger clearspan hangars, and aircraft parking apron. These facilities are located in two different areas on the airfield (as previously defined in the inventory chapter), although the majority of facilities are on the north side.

Utilization of hangar space varies as a function of local climate, security, and owner preferences. The trend in general aviation aircraft, whether single or multi-engine, is in more sophisticated (and consequently more expensive) aircraft. Therefore, the owner must protect his or her investment. Several hangars have been built on the airfield since 1995 to support aircraft storage requirements. Tie-down positions are also available for locally based aircraft, although all locally-based aircraft were in storage hangars in early 2004.

Hangaring requirements have been projected using the local preferences for hangars by single and multi-engine operators and application of current planning standards: 1,200 square feet per single-engine aircraft and 2,000 square feet per multi-engine aircraft (inclusive of piston and turbine aircraft). Areas for aircraft maintenance have been estimated by adding an additional 20 % to the total hangar requirement.

Parking apron has been projected using planning standards established for itinerant aircraft. A planning standard of 670 square yards per aircraft has been used to project transient ramp requirements. The FAA methodology for projecting transient ramp requirements is based upon the number of itinerant busy day operations. The number of transient positions are figured at 20 percent of the itinerant busy day operations.

The general aviation ramp and apron requirements have been summarized in **Table 3F**. Since the general aviation requirements are sensitive to growth in aircraft, mix, and local owner preferences, the needs have been expressed for the short-, intermediate-, and long-term planning horizons. These correspond to five, ten, and twenty-year planning horizons. The general aviation requirements have also been summarized in **Exhibit 3D**.

AIRCRAFT RESCUE AND FIREFIGHTING (ARFF)

The airport is not required to have aircraft rescue and firefighting equipment on the site, since they do not have scheduled flights and do not operate as a Part 139 airport. However, an off-airport fire station for the City of Milwaukee (Appleton Ave. Station) is located immediately north of the C.A.P. hangar, facing onto Appleton Avenue.

AIRPORT MAINTENANCE

The Milwaukee County maintenance building is located on the north side of the airfield, with convenient access to the airfield and landside facilities. The area offers expansion potential for the 4,700-square foot building, as future needs dictate.

FUEL STORAGE

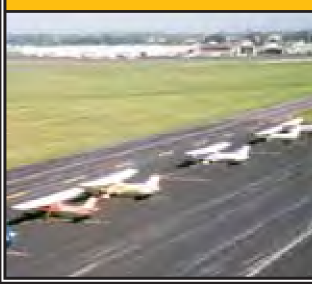
A fuel farm has been constructed northwest of the T-hangars. A total above-ground capacity of 30,000 gallons (15,000 gallons for Jet-A, 15,000 for LL Avgas) is available. Two trucks are used to dispense Jet-A and two trucks dispense LL Avgas. Future requirements will most likely be dictated by corporate aviation requirements. Generally, fuel tanks should be of adequate capacity to accept a full refueling tanker, which is approximately 8,000 gallons, while maintaining a reasonable level of fuel in the storage tank.

VEHICLE PARKING

Industry standards suggest that a vehicle parking position should be provided for each 1,000 square feet of hangar space. Based upon long-term hangar requirements, the airport should provide a total of 262 parking spaces, which is the equivalent of 11,650 square yards of paved area.

97MP07-3D-2/10/04

	CURRENTLY AVAILABLE	CURRENT NEED	SHORT TERM NEED	INTERMEDIATE TERM NEED	LONG TERM NEED
HANGAR AREA					
HANGARED AIRCRAFT:					
Single-Engine	101	101	104	107	112
Multi-Engine	26	26	30	33	42
Total Positions	127	127	134	140	154
Hangar Area (sq. ft.)	147,000	173,200	184,800	194,400	218,400
Maintenance Area (sq. ft.)	18,000	34,600	37,000	38,800	43,600
Total Hangar Area (sq. ft.)	165,000	207,800	221,800	233,200	262,000
GENERAL AVIATION APRON AREA					
TRANSIENT AIRCRAFT APRON:					
Positions	51	43	48	49	55
Apron Area (sq. yds.)	20,800	28,800	32,200	32,800	36,900



Lawrence J. TIMMERMAN AIRPORT

Exhibit 3D
GENERAL AVIATION REQUIREMENTS

TABLE 3E
General Aviation Requirements
Lawrence J. Timmerman Airport

	Currently Available	Current Need	Short-Term Need	Intermediate Need	Long-Term Need
Hangared Aircraft:					
Single-Engine	101	101	104	107	112
Multi-Engine/Rotor	26	26	30	33	42
Total Positions	127	127	134	140	154
Hangar Area (sq. ft.)	147,000	173,200	184,800	194,400	218,400
Maintenance Area (sq. ft.)	18,000	34,600	37,000	38,800	43,600
Total Hangar Area (sq. ft.)	165,000	207,800	221,800	233,200	262,000
Transient Aircraft Apron:					
Positions	51	43	48	49	55
Apron Area (sq. yds.)	20,800	28,800	32,200	32,800	36,900

SUMMARY

Several airside and landside facilities evaluated in this chapter will need to be expanded to meet future needs. The following chapter will consider alternatives which are available for placement of the facilities on the airfield, and provide the basis for a master plan concept.

Lawrence J. Timmerman Airport

Chapter Four

ALTERNATIVES

ALTERNATIVES

In the previous chapter, the facility needs over a twenty-year planning period were identified. In this chapter, a series of airport development alternatives will be presented for comparison which meet airfield, landside, and on-airport land use development considerations, subsequently resulting in a master plan concept for the future development of L.J. Timmerman Airport.

The alternatives presented in this chapter provide a series of options for meeting short- and long-term needs. The alternatives were revisited in early 2004, after initial reviews in late 1997 and early 1998. Revised design standards (as appropriate) were applied to the evaluation. Since the level of general aviation activity can vary from forecast levels, flexibility must be considered in the plan.

Since the combination of alternatives can nearly be endless, only alternatives which appear to be feasible have been considered. The alternatives which have been considered will be preliminary in nature until reviewed by the Milwaukee County staff, FAA, and Wisconsin Bureau of Aeronautics. Upon completion of their reviews, a master planning concept will be refined into detailed airport layout plans and a financial program.

While the evaluation of airport development alternatives may always include the "no action" and "no build" alternatives, this will eventually result in a reduction in the quality of services provided at L. J. Timmerman Airport, and potentially affect the economic growth in the area. However, the final decision with regard to pursuing a particular development plan which meets the needs of general aviation users rests with Milwaukee County.

While this study does not directly deal with the potential relocation of services to other airports, this option also exists. The convenience of the local facility, combined with the economic and environmental costs of facility relocation, generally combine to favor the continuation of existing site development. It is possible to relocate, or encourage the relocation of certain services. For example, training activity could be encouraged to go to other airports. However, if such activity relocated to an airport which does not have adequate capacity, it would contribute to costly delays to other users (this is especially true if the activity relocated to General Mitchell International Airport). Therefore, the master planning process must attempt to deal with the facility needs which have been identified in the previous chapter, providing a logical decision path which Milwaukee County can follow in meeting projected needs.

BACKGROUND

The last master plan was completed in 1984, at a time when activity had declined from the highs of the late 70s, and the general aviation industry was entrenched in what would become a decade-long recession. While the levels of operations have fluctuated over the years, and the based aircraft numbers are slightly below the levels of the early 80s, there has continued to be a demand for storage hangars (more recently to handle larger twin-engine piston and turboprop aircraft) and use of the facility for training. While the existing runway length is adequate for most general aviation aircraft below 12,500 pounds, turboprop or turbofan aircraft are more restricted. The previous chapter has confirmed that the primary runway (15L-33R) should be planned for 4,400 feet for takeoff and 4,300 feet for landing under wet runway conditions.

While the airport has not attracted aviation-related industrial-commercial development onto airport property, the surrounding area is heavily developed in residential, commercial, and light industrial uses. The airport is closely bordered by heavily used roadways on most sides, which restrict potential expansion of airport boundaries.

INITIAL DEVELOPMENT CONSIDERATIONS

Upon completion of the facility needs evaluation, a series of airport development considerations were prepared. These have been summarized in **Exhibit 4A**. While many of these development considerations reflect projects or topics which are demand driven, several are more general in nature but remain important considerations in the master planning effort.

The on-airport land use considerations include "highest and best use" evaluations, and the impact of FAA regulations on land acquired with FAA grants. This analysis has been included at the request of Milwaukee County to consider the alternative of re-use of land for non-aviation purposes. Information has been researched on federal and state grants received over the past twenty years, and the portions of existing property acquired with

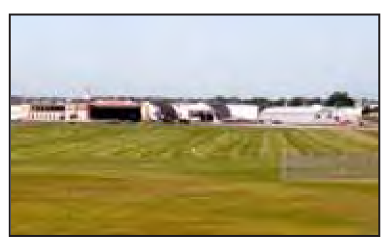
AIRFIELD CONSIDERATIONS

- Examine the possibility of providing 4,400 feet of runway length while maintaining full runway safety area and object free areas on Runway 15L-33R.
- Examine the need for maintaining all pavement areas on the airfield (runways, taxiways, and aprons).
- Evaluate existing approaches and the potential to improve approaches to provide lower visibility minimums using global positioning system (GPS).
- Verify continued need for turf runways, and potential transition to hard-surfaced runways.
- Verify ability of airfield to serve design code designated in facility requirements chapter (B-II).
- Verify the location and potential need for additional exit taxiways.
- Verify the need for additional lighting, signing, or navigational aids.

LANDSIDE CONSIDERATIONS

- Evaluate locations for future nested (T) hangar development, and access to hangars.
- Evaluate locations for individual corporate hangar development, and access to hangars.
- Evaluate expansion capabilities for large hangar development, incorporating future requirements for expanded maintenance areas.
- Evaluate locations for expansion of landside support functions, including fuel farm, maintenance area, and auto parking.
- Evaluate locations for consolidated auto parking which reduce conflicts between surface traffic and aircraft while also minimizing walking distance between parking lots and hangars.

ON-AIRPORT LAND USE CONSIDERATIONS



- Evaluate the highest and best use for future airport properties.
- Evaluate the potential impact of FAA regulations and existing leases on the future use of airport property.

Lawrence J. TIMMERMAN AIRPORT

Exhibit 4A
ALTERNATIVE DEVELOPMENT CONSIDERATIONS

federal funds. (This analysis was not updated in early 2004.)

AIRFIELD ALTERNATIVES

At the present time, Runways 15L and 4L support instrument approaches, although the published visibility minimums and cloud ceilings do not support approaches when minimums are below one mile and ceilings are below 515 feet. Based upon weather summaries published in the last chapter, this results in the airport being unavailable to traffic less than five percent of the time. With the transition from current ground-based navigational systems to satellite assisted approaches, airports will have the potential to achieve lower visibility approaches, without the need to install costly ILS ground-based equipment for each runway approach. In fact, only wide area augmentation systems (WAAS) will be required to obtain CAT I approaches (½-mile visibility and 200-ft. ceilings), with adequate runway protection zone, safety areas, object free areas, clear approach surfaces, and runway edge and approach lighting. Each of these latter requirements present the greatest challenge for L. J. Timmerman Airport. (Note: The FAA commissioned the WAAS in July 2003. However, approaches to CAT I minimums are not anticipated by the FAA for at least another decade. The best that can be anticipated is approaches to 250 feet in 3/4-mile visibility.)

In the last chapter, it was concluded that the current runway system meets the long-term need for airfield capacity. However, the last airport layout plan (supported by the 1984 study) reflected the conversion of turf runways to hard-surfaced runways. With the current and projected mix of traffic for L. J. Timmerman Airport, projected operational levels, and the excellent condition of the current turf runways during the summer months, it does not appear necessary to continue to recommend hard surfaces for these runways, which are generally needed only for peak periods in the summer months when greater training activity is undertaken. However, it is strongly recommended that the turf runways continue to be maintained throughout the planning period.

Runway length requirement is a function of the critical aircraft using the airfield. At this time, the critical aircraft is the Cessna Citation Excel, which falls within the B-II design category. The runway length evaluations undertaken in the last chapter support a need for 4,400 feet of runway for takeoff and 4,300 feet for landing, under wet runway conditions. It is only necessary to satisfy this length on Runway 15L-33R.

When the last airport layout plan was completed for the airport several years ago, the flare ratios on the RPZs varied, although the inner approach widths were the same. Since that time, the FAA has standardized the size of the RPZ for airports serving B-II aircraft, with approaches not lower than one mile. Therefore, each of the hard-surfaced runway approaches has the identical RPZ. Only the turf runways have a smaller RPZ, which is half the width of the other RPZs (and starts at the threshold).

A total of 12 residential units fall within the RPZ for Runway 15L, while another half dozen units are within the RPZ for Runway 4L. The approach to 33R has only two houses inside the zone, while Runway 22R overlays portions of several buildings. Milwaukee County has obtained easements over properties in the approach to Runway 22L and a property in the approach to Runway 4L.

Pursuant to Terminal Instrument Procedures (TERPS), to establish a visibility approach of 3/4-mile, no obstacle can penetrate the 20:1 slope (which starts 200 feet from the landing threshold and extends 10,000 feet into the approach). The existing approaches to the hard-surfaced runways do not clear all objects on a 20:1 approach. Runway 15L clears at 23:1, while 33R clears at 15:1; 4L clears at 17:1, while 22R clears at 18:1 (based upon current airport master records).

Several alternatives were examined for achieving 4,400 feet of useable length on Runway 15L-33R: 1) shifting the runway northeasterly, 2) realigning the runway (16-34), and 3) adding pavement to each end of the existing runway. A fourth alternative was examined which adds pavement only to the southeast end of the runway and provides 4,400 feet of runway in one direction only. These alternatives were examined under the assumption that visibility minimums would remain greater than 3/4-mile. The affect of lowering visibility minimums below 3/4-mile will be addressed following the presentation of the alternatives.

AIRFIELD ALTERNATIVE A

Alternative A assumes that a new runway is shifted northeasterly and constructed over the alignment of Taxiway B, improving the approach to Runway 15L and pulling approach and departure surfaces away from residential areas on the west side of the airport. A new parallel taxiway is reflected at 240 feet from the runway centerline (per FAA design standards). The alternative reduces itinerant ramp on the north and east sides of the airfield, but does not affect any existing hangars. The control tower becomes a penetration to FAR Part 77 surfaces, but not the obstacle free zone. While maintaining runway safety and object free areas at each runway end, clearances over Swan Road and Hampton Avenue may limit the use of pavement on the southeast end (landing thresholds may need to be displaced). The localizer antenna will need to be relocated, or an offset approach established to Runway 15L. This alternative provides the opportunity to add additional runway length on the northwest end, although any extension beyond 250 feet will require the relocation of two ballfields. This alternative will meet the runway length requirement for both takeoff and landing modes.

AIRFIELD ALTERNATIVE B

Alternative B involves the construction of a new runway and parallel taxiway, but on a slightly different alignment (16-34). The southeast end of Runway 15L-33R remains at the same location, while the northwest end moves easterly, to improve the approach to Runway 15L and pull approach and departure surfaces away from residential areas on the west side of the airport. The ballfields may need to be relocated, although the obstacle free area only extends over the southernmost field. While this alternative affects itinerant ramp on the north side of the airfield, it will not affect ramp on the east side, and maintains greater separation with the control tower. The localizer will require realignment (but not relocation). By pivoting the runway into a new alignment, the existing turf runway in the northwest-southeast alignment (15R-33L) will also need to be realigned to remain parallel. This alternative will meet the runway length requirement for both takeoff and landing modes.

AIRFIELD ALTERNATIVE C

Alternative C involves the addition of pavement at each end of the existing runway to create greater takeoff and landing lengths. At each runway end, pavement has been extended, limited by the size of the object free area (OFA): 300 feet at the northwest end and 100 feet at the southeast end. The northwest end is limited by the perimeter fence and existing housing on the west side, while the southeast end is limited by the location of the localizer antenna and equipment building. Extension of a stopway offers no gain in useable pavement, since the OFA must be extended beyond the end of the stopway. Full-strength runway (with extended parallel taxiway), makes more economic sense than a stopway. However, extension of pavement to the northwest will be costly (because of dropping terrain) and places the runway closer to existing residential areas. Alternative C assumes that the landing threshold on Runway 33R will remain unchanged, while the landing threshold for Runway 15L will move 100 feet to the northwest (thus maintaining 4,300 feet for landing in wet runway conditions). A full 4,500 feet is available for takeoff in each direction, slightly exceeding the runway requirement of 4,400 feet.

AIRFIELD ALTERNATIVE D

Alternative D extends pavement into the RSA and OFA (of Runway 33R) on the southeast end of the runway to reduce the cost of an extension on the northwest end. However, the pavement will be limited in its use. A full 300 feet of runway and parallel taxiway extension has been shown on the southeast end of the runway, providing 4,400 feet for takeoff on Runway 33R. However, takeoff distance on Runway 15L will only increase to 4,200 feet since the RSA and OFA must be maintained at the runway end. Landing distance on Runway 33R remains unchanged at 4,100 feet, while landing distance on Runway 15L increases to 4,200 feet.

AIRFIELD ALTERNATIVES REFINEMENT

Following a presentation of the alternatives to the Technical Advisory Committee (TAC) on September 9, 2004, the consultant was asked to add two alternatives for comparative purposes: a hybrid of Alternatives C and D (which became Alternative E) and a "do nothing" which became Alternative F. In addition, the consultant was asked to prepare an airfield alternatives matrix, comparing the costs, benefits, and constraints of each alternative. This matrix (**Exhibit 4B**) was in turn distributed to the TAC in late fall 2004, and the TAC was asked to rate the six alternatives (3 points for first choice, 2 points for second choice, and 1 point for third choice). The results were as follows:

- Alternative E - 33 points,
- Alternative C - 26 points,
- Alternative B - 16 points,
- Alternative D - 6 points,
- Alternative A - 3 points, and,
- Alternative F - 0.

The consultant was then asked to refine the alternatives analysis for Alternatives E and C.

The refinement of the final two alternatives has consisted of an aircraft noise exposure analysis. In addition, each of the alternatives were refined on airport layout drawings with topographic information, and the following dimensional information updated: runway protection zones, threshold siting surfaces, runway end coordinates, runway safety areas, runway object free areas, runway obstacle free zones, with enlargements of inner approach areas for each of the runway ends being considered for pavement extensions. In addition, the enlargements provide the opportunity to examine the proximity of residential areas adjacent to the airport property. Additional obstruction information will be collected after a final concept is selected.

The aircraft noise analysis was prepared to assess aircraft noise at Lawrence J. Timmerman Airport based on existing and two alternative configurations for Runway 15L-33R. Alternative C consists of a 300-foot extension to Runway 15L (northwest) and a 100-foot extension to Runway 33R (southeast). Alternative E consists of a 300-foot extension to Runway 15L and a 300-foot extension to Runway 33R. The following discussion describes the methodology, input assumptions, and results the of aircraft noise analysis.

Aircraft Noise Analysis

The standard methodology for analyzing the prevailing noise conditions at airports involves the use of a computer simulation model. The Federal Aviation Administration (FAA) has approved the Integrated Noise Model (INM) for developing noise exposure contours at civilian airports.

The INM is designed as a conservative planning tool, tending to slightly overstate noise. The model and its database are periodically updated based on the philosophy that each version should err on the side of over-prediction while each subsequent update moves

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ALTERNATIVE A

COSTS (in millions $)

Grading/Paving	$2.84
Lighting/Marking	.14
Navigational Aids	.53
Total	**$3.51**

RUNWAY AVAILABLE

RUNWAY	TAKEOFF	LANDING
15L	4,400'	4,400'
33R	4,400'	4,400'

Benefits: Improves 15L Approach and Runway Available
Moves RPZ off of homes - Northwest

Constraints: Costs, Limits expansion of hangars - North
Impact to ball fields
Part 77 conflicts - Tower

ALTERNATIVE B

COSTS (in millions $)

Grading/Paving	$2.94
Lighting/Marking	.14
Navigational Aids	.48
Total	**$3.56**

RUNWAY AVAILABLE

RUNWAY	TAKEOFF	LANDING
15L	4,400'	4,400'
33R	4,400'	4,400'

Benefits: Improves 15L Approach and Runway Available
Moves RPZ off of homes - Northwest

Constraints: Costs, Limits expansion of hangars - North
Impact to ball fields

ALTERNATIVE C

COSTS (in millions $)

Grading/Paving	$.81
Lighting/Marking	.25
Navigational Aids	.48
Total	**$1.54**

RUNWAY AVAILABLE

RUNWAY	TAKEOFF	LANDING
15L	4,500'	4,300'
33R	4,500'	4,400'

Benefits: Improves 15L Approach and Runway Available

Constraints: Places runway closer to residential - Northwest
Landing distance available limited by safety area

ALTERNATIVE D

COSTS (in millions $)

Grading/Paving	$.23
Lighting/Marking	.25
Navigational Aids	.48
Total	**$.96**

RUNWAY AVAILABLE

RUNWAY	TAKEOFF	LANDING
15L	4,200'	4,200'
33R	4,400'	4,100'

Benefits: Improves 15L Approach and Runway Available (limited)

Constraints: Takeoff distance only improves to the Northwest
Landing distance available limited by safety area

ALTERNATIVE E

COSTS (in millions $)

Grading/Paving	$.96
Lighting/Marking	.25
Navigational Aids	.48
Total	**$1.69**

RUNWAY AVAILABLE

RUNWAY	TAKEOFF	LANDING
15L	4,500'	4,300'
33R	4,700'	4,400'

Benefits: Improves 15L Approach and Runway Available in both directions

Constraints: Places runway closer to residential - Northwest

ALTERNATIVE F

RUNWAY AVAILABLE

RUNWAY	TAKEOFF	LANDING
15L	4,106'	4,106'
33R	4,106'	4,106'

LEGEND

- Ultimate Pavement
- Object Free Area (OFA)
- Runway Protection Zone (RPZ)

Lawrence J. TIMMERMAN AIRPORT

Exhibit 4B
AIRFIELD ALTERNATIVES MATRIX

closer to reality. Version 6.1 is the most current version of the INM at this time. It is the version used for the noise analysis described in this chapter.

INM describes aircraft noise in *Yearly Day-Night Average Sound Level* (DNL). DNL accounts for the increased sensitivity to noise at night (10:00 p.m. to 7:00 a.m.) and is the metric preferred by the FAA, Environmental Protection Agency (EPA), and Department of Housing and Urban Development (HUD), among others, as an appropriate measure of cumulative noise exposure.

DNL is defined as the average A-weighted sound level as measured in decibels during a 24-hour period. A 10-decibel weighting is applied to noise events occurring during the nighttime hours. DNL is a summation metric which allows for objective analysis and can describe noise exposure comprehensively over a large area. In addition to being widely accepted, the primary benefit of using the DNL metric is that it accounts for the average community response to noise as determined by the actual number and types of noise events and the time of day they occur.

The INM works by defining a network of grid points at ground level around the airport. It then selects the shortest distance from each grid point to each flight track and computes the noise exposure for each aircraft operation, by aircraft type and engine thrust level, along each flight track. Corrections are applied for air-to-ground acoustical attenuation, acoustical shielding of the aircraft engines by the aircraft itself, and aircraft speed variations. The noise exposure levels for each aircraft are then summed at each grid location. The cumulative noise exposure levels at all grid points are then used to develop noise exposure contours for selected values. Noise contours are then plotted on a base map of the airport environs using the DNL metrics.

In addition to the mathematical procedures defined in the model, the INM has another very important element. This is a database containing tables correlating noise, thrust settings, and flight profiles for most of the civilian aircraft, and many common military aircraft, operating in the United States. This database, often referred to as the noise curve data, has been developed under FAA guidance based on rigorous noise monitoring in controlled settings. In fact, the INM database was developed through more than a decade of research including extensive field measurements of more than 10,000 aircraft operations. The database also includes performance data for each aircraft to allow for the computation of airport-specific flight profiles (rates of climb and descent).

- INM INPUT

A variety of user-supplied input data is required to use the INM. This includes the airport elevation, average annual temperature, a mathematical definition of the airport runways, the mathematical description of ground tracks above which aircraft fly, and the assignment of specific aircraft with specific engine types at specific takeoff weights to individual flight tracks. In addition, aircraft not included in the model's database may be defined for modeling, subject to FAA approval.

For the purposes of this analysis, computer input files were prepared for the existing (2005) noise condition without planned airfield changes at Lawrence J. Timmerman Airport. Alternative C noise contours were developed with a 300-foot extension to Runway 15L and a 100-foot extension to Runway 33R. Alternative E noise contours were developed with a 300-foot extension to Runway 15L and a 300-foot extension to Runway 33R.

- Operations And Fleet Mix

The number of aircraft operating at the airport on an average day is the result of a compilation of all recorded operations during the base period divided by the number of days in the period. The distribution of these operations among various categories, users, and types of aircraft is part of the basic input data required for the model. Operational and fleet mix shown in **Table 4A** is based on operational information in the Strategic Development and Airport Master Plan Study.

TABLE 4A
Annual Operations by type
Lawrence J. Timmerman Airport

	INM Designator	Existing	Alternative C	Alternative E
GENERAL AVIATION (Itinerant)				
Single Engine Piston Variable Pitch	GASEPV	17,556	17,556	17,556
Single Engine Piston Fixed Pitch	GASEPF	17,556	17,556	17,556
Twin-Engine Piston Fixed Pitch	BEC58P	7,022	7,022	7,022
Turboprop	CNA441	2,304	2,304	2,304
Business Jet	MU3001	878	878	878
Helicopter	JRNGR	329	329	329
Subtotal		45,645	45,645	45,645
GENERAL AVIATION (Local)				
Single Engine Piston Variable Pitch	GASEPV	17,556	17,556	17,556
Single Engine Piston Fixed Pitch	GASEPF	17,556	17,556	17,556
Twin-Engine Piston Fixed Pitch	BEC58P	7,023	7,023	7,023
Subtotal		42,135	42,135	42,135
TOTAL ANNUAL OPERATIONS		87,780	87,780	87,780

Source: Strategic Development and Airport Master Plan Study.

- Database Selection

For the general aviation aircraft, the FAA has published a Pre-Approved List of Aircraft Substitutions. The list indicates that the general aviation single engine fixed pitch propeller and variable pitched models, the GASEPF and GASEPV, represent a broad range of single engine piston general aviation aircraft. The list recommends the use of BEC58P for the light twin-engine piston aircraft. The CNA441 was used to represent the small turboprop aircraft. The MU3001 was used to model the range of the business jets at the airport. The JRNGR was used to model the range of helicopters at the airport. All substitutions are in accordance with the Pre-Approved Substitution List and are commensurate with published FAA guidelines.

- Time-Of-Day

The time-of-day at which operations occur is important as input to the INM due to the penalty weighting of night-time (10:00 p.m. to 7:00 a.m.) operations. In calculating airport noise exposure, one nighttime operation is equivalent to ten daytime operations. General aviation nighttime operations were assumed to occur approximately five percent of the time.

- Runway Use

The use of a specific runway is typically influenced by runway length and wind direction. The preferred runway for business jet and turboprop operations is 15L-33R. The runway use percentages assumed for both the existing and alternatives analysis are summarized in **Table 4B**.

TABLE 4B
Runway Use

Runway	Business Jet & Turboprop	Single and Multi-Engine Piston
ARRIVALS		
15L	36.7%	7.65%
33R	63.3%	21.0%
15R	0.0%	2.55%
33L	0.0%	7.0%
04L	0.0%	19.2%
22R	0.0%	27.15%
04R	0.0%	6.4%
22L	0.0%	9.05%
DEPARTURES		
15L	63.3%	21.0%
33R	36.7%	7.65%
15R	0.0%	7.0%
33L	0.0%	2.55%
04L	0.0%	27.15%
22R	0.0%	19.2%
04R	0.0%	9.05%
22L	0.0%	6.4%

- Flight Tracks

Consolidated flight tracks which describe the average flight route corridors that lead to and from Lawrence J. Timmerman Airport were developed. The consolidated flight tracks are based upon experience at general aviation airports similar to Lawrence J. Timmerman Airport. Although the consolidated flight tracks appear as distinct paths, they actually represent average flight routes and illustrate the areas of the surrounding community where aircraft operations can be expected most often. Air traffic density generally increases nearer the airport as it is funneled to and dispersed from the runway system. The consolidated tracks were developed to reflect these common patterns and to account for the inevitable flight track dispersions around the airport.

- Flight Profiles

INM Version 6.1 was used in this analysis to compute the takeoff profiles based on the user-supplied airport elevation and the average annual temperature entries in the input batch. At Lawrence J. Timmerman Airport, the elevation is 745 feet and the average annual temperature is 47.0 degrees Fahrenheit (F). If other than standard conditions (temperature of 59 degrees F and elevations of zero feet mean sea levels [MSL]) are specified by the user, the profile generator automatically computes the takeoff profiles using the airplane performance coefficients and the equations in the Society of Automotive Engineers Aerospace Information Report 1845 (SAE/AIR 1845).

Results Of Noise Analysis

Output data selected for calculation by the INM were annual average noise contours in DNL. This section presents the results of the contour analysis without the project and with the project noise exposure conditions, as developed from the Integrated Noise Model. **Table 4C** summarizes the area within each set of contours. The federal government, including the FAA, has identified the 65 DNL contour as the threshold of incompatibility.

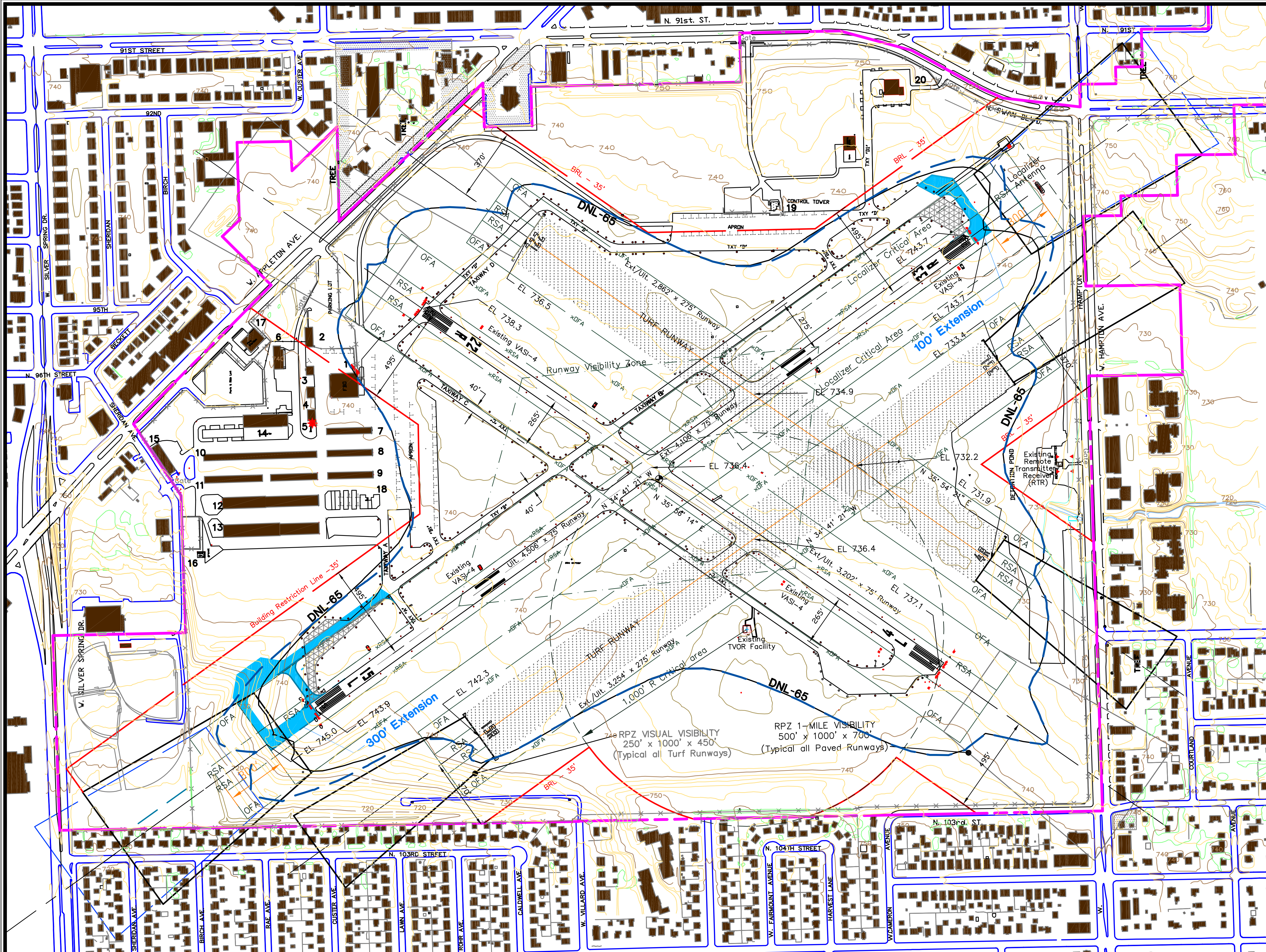
TABLE 4C
Comparative Areas of Noise Exposure (Square Miles)
Lawrence J. Timmerman Airport

DNL Contour	Existing	Alternative C	Alternative E
55	1.82	1.80	1.80
60	0.73	0.73	0.73
65	0.32	0.33	0.33
70	0.17	0.17	0.18
75	0.06	0.06	0.06

- Alternative C
  Noise Exposure Contours

Exhibit 4C presents the plotted results of the INM contour analysis for Alternative C using input data as previously described. The surface areas falling within the contours are shown in **Table 4C**.

The Alternative C DNL noise exposure contours are similar in shape to the



RUNWAY PROTECTION ZONES

EXT./ULT.	BASE	LENGTH	OUTER WIDTH
RUNWAY 15L	500'	1,000'	700'
RUNWAY 33R	500'	1,000'	700'
RUNWAY 4L	500'	1,000'	700'
RUNWAY 22R	500'	1,000'	700'
RUNWAY 15R	250'	1,000'	450'
RUNWAY 33L	250'	1,000'	450'
RUNWAY 4R	250'	1,000'	450'
RUNWAY 22L	250'	1,000'	450'

RSA	EXISTING		ULTIMATE	
Runway Safety Area	WIDTH	LENGTH	WIDTH	LENGTH
BEYOND RUNWAY 15L	150'	300'	150'	300'
BEYOND RUNWAY 33R	150'	300'	150'	300'
BEYOND RUNWAY 4L	150'	300'	150'	300'
BEYOND RUNWAY 22R	150'	300'	150'	300'
BEYOND RUNWAY 15R	120'	240'	120'	240'
BEYOND RUNWAY 33L	120'	240'	120'	240'
BEYOND RUNWAY 4R	120'	240'	120'	240'
BEYOND RUNWAY 22L	120'	240'	120'	240'

OFA	EXISTING		ULTIMATE	
Object Free Area	WIDTH	LENGTH	WIDTH	LENGTH
BEYOND RUNWAY 15L	500'	300'	500'	300'
BEYOND RUNWAY 33R	500'	300'	500'	300'
BEYOND RUNWAY 4L	500'	300'	500'	300'
BEYOND RUNWAY 22R	500'	300'	500'	300'
BEYOND RUNWAY 15R	400'	240'	400'	240'
BEYOND RUNWAY 33L	400'	240'	400'	240'
BEYOND RUNWAY 4R	400'	240'	400'	240'
BEYOND RUNWAY 22L	400'	240'	400'	240'

Existing Building
Existing Property Line
Future Pavement
Current Noise Contours (DNL)
Alt-C Noise Contours (DNL)
Future Abandon Pavement

NORTH

0 500 1000
SCALE IN FEET

Lawrence J. TIMMERMAN AIRPORT

Exhibit 4C
AIRFIELD ALTERNATIVE C

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Coffman Associates-LDJ mwc-4C_alt_C.dwg Wednesday March 26 2008 10:23am existing contours. However, due to the 300-foot extension of Runway 15L and the 100-foot extension to Runway 33R the contours have increased in size along Runway 15L-33R. The 65, 70 and 75 DNL contours remain on airport property.

- Alternative E
  Noise Exposure Contours

Exhibit 4D presents the plotted results of the INM contour analysis for Alternative E using input data as previously described. The surface areas falling within the contours are shown in **Table 4C**.

The Alternative E DNL noise exposure contours are similar in shape to the Existing contours. However, due to the 300-foot extension of Runway 15L and the 300-foot extension to Runway 33R the contours have increased in size along Runway 15L-33R. The 65, 70 and 75 DNL contours remain on airport property.

AIRFIELD ALTERNATIVES SUMMARY

Exhibits 4C and **4D** depict future pavement, including taxiways and possible placement of the run-up aprons. Neither alternative will create the need to relocate other airport facilities or navigational aids other than runway lighting and visual approach aids. However, the 300-foot pavement extension on the northwest end of the runway will relocate the runway protection zone (RPZ) over additional residential properties. The existing RPZ encompasses 12 houses, while a relocated RPZ will encompass 27 houses. The size of the RPZ remains unchanged for this approach if it is not published with lower than one-mile visibility minimums. It will increase in size (from 13.77 to 48.978 acres) if published approaches drop below one-mile to as low as 3/4-mile. On the southeast end of Runway 15L-33R, only two houses are located inside the existing RPZ. With either one of the alternatives, the relocated RPZ will encompass five houses.

The FAA offers the following guidance with regard to RPZs in Advisory Circular 5300-13, **Airport Design**: "Land uses prohibited from the RPZ are residences and places of public assembly....Where it is determined to be impracticable for the airport owner to acquire and plan the land uses within the entire RPZ, the RPZ land use standards have recommendation status for that portion of the RPZ not controlled by the airport owner." Therefore, while residences are prohibited from the RPZ, acquisition may not be required. The FAA (through the Wisconsin Bureau of Aeronautics) offers financial assistance for the purchase of properties falling inside RPZs.

Alternative C provides full RSA/OFA on the southeast end of the runway, allowing full use of the runway in both directions. However, under Alternative E, the final 200 feet of pavement will not be available for arrival/departure calculations on Runway 15L, and will need to be marked and lighted as such. Full RSA/OFA is available on the

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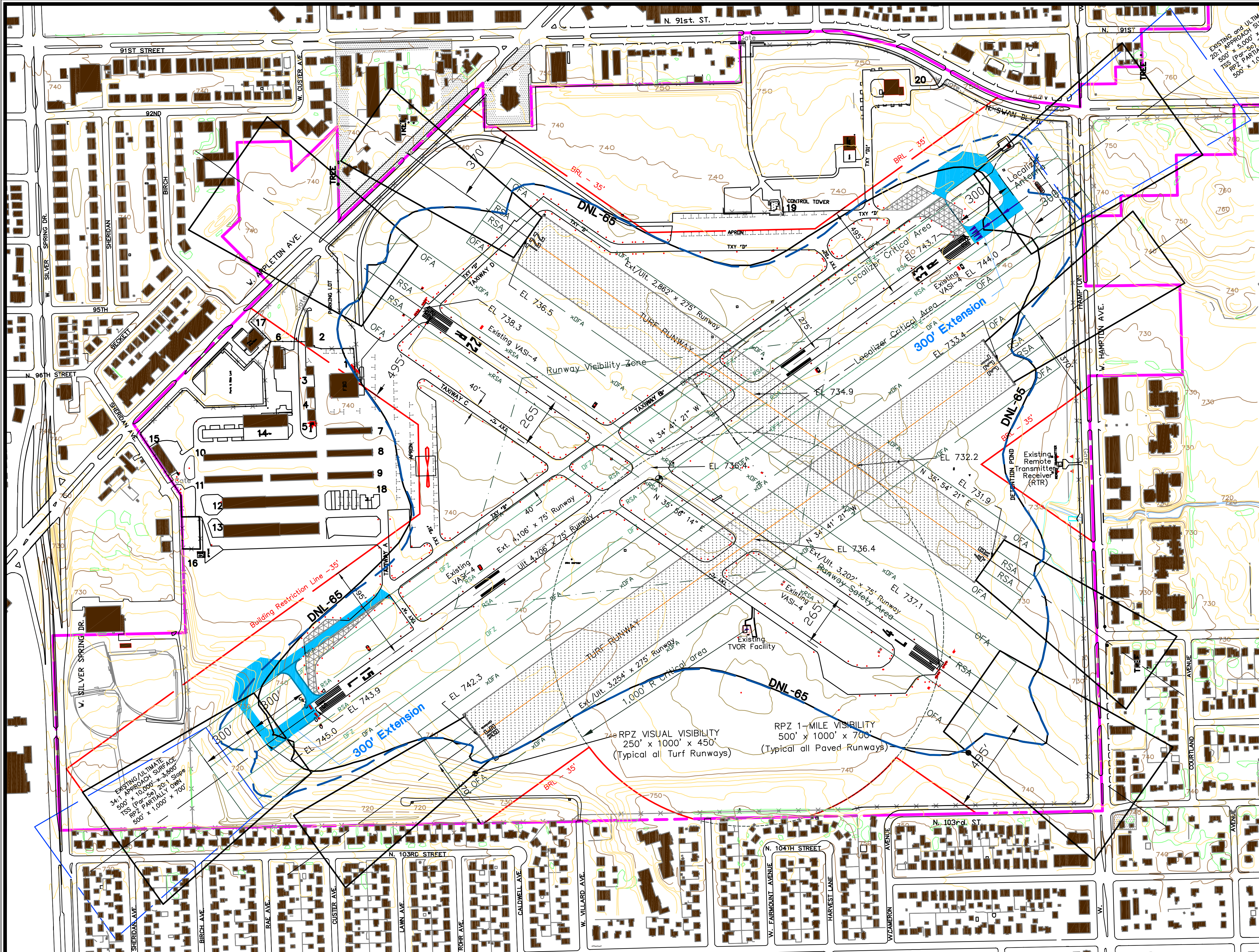

RUNWAY PROTECTION ZONES			
EXT./ULT.	BASE	LENGTH	OUTER WIDTH
RUNWAY 15L	500'	1,000'	700'
RUNWAY 33R	500'	1,000'	700'
RUNWAY 4L	500'	1,000'	700'
RUNWAY 22R	500'	1,000'	700'
RUNWAY 15R	250'	1,000'	450'
RUNWAY 33L	250'	1,000'	450'
RUNWAY 4R	250'	1,000'	450'
RUNWAY 22L	250'	1,000'	450'

RSA	EXISTING		ULTIMATE	
Runway Safety Area	WIDTH	LENGTH	WIDTH	LENGTH
BEYOND RUNWAY 15L	150'	300'	150'	300'
BEYOND RUNWAY 33R	150'	300'	150'	300'
BEYOND RUNWAY 4L	150'	300'	150'	300'
BEYOND RUNWAY 22R	150'	300'	150'	300'
BEYOND RUNWAY 15R	120'	240'	120'	240'
BEYOND RUNWAY 33L	120'	240'	120'	240'
BEYOND RUNWAY 4R	120'	240'	120'	240'
BEYOND RUNWAY 22L	120'	240'	120'	240'

OFA	EXISTING		ULTIMATE	
Object Free Area	WIDTH	LENGTH	WIDTH	LENGTH
BEYOND RUNWAY 15L	500'	300'	500'	300'
BEYOND RUNWAY 33R	500'	300'	500'	300'
BEYOND RUNWAY 4L	500'	300'	500'	300'
BEYOND RUNWAY 22R	500'	300'	500'	300'
BEYOND RUNWAY 15R	400'	240'	400'	240'
BEYOND RUNWAY 33L	400'	240'	400'	240'
BEYOND RUNWAY 4R	400'	240'	400'	240'
BEYOND RUNWAY 22L	400'	240'	400'	240'

Existing Building
Existing Property Line
Future Pavement
Current Noise Contours (DNL)
Alt-E Noise Contours (DNL)
Future Abandon Pavement

NORTH

0 500 1000
SCALE IN FEET

Lawrence J. TIMMERMAN AIRPORT

Exhibit 4D
AIRFIELD ALTERNATIVE E

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northwest end of the runway in each of the alternatives.

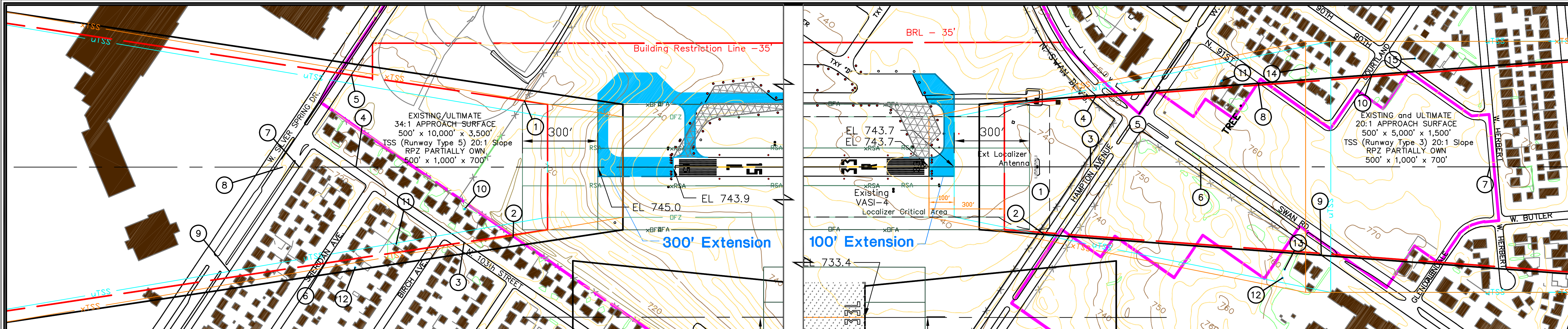
Exhibits 4E and **4F** depict enlargements of the runway ends in plan and profile views for each alternative. Obstruction information and road locations along runway centerline and RPZs are noted. The threshold siting surface (TSS) is used when obstructions in the runway approach create a potential need to relocate the landing threshold. Alternative E is depicted with a 300-foot landing threshold displacement (maintaining the landing threshold at the existing threshold). All obstruction information will be verified before layout drawings are finalized.

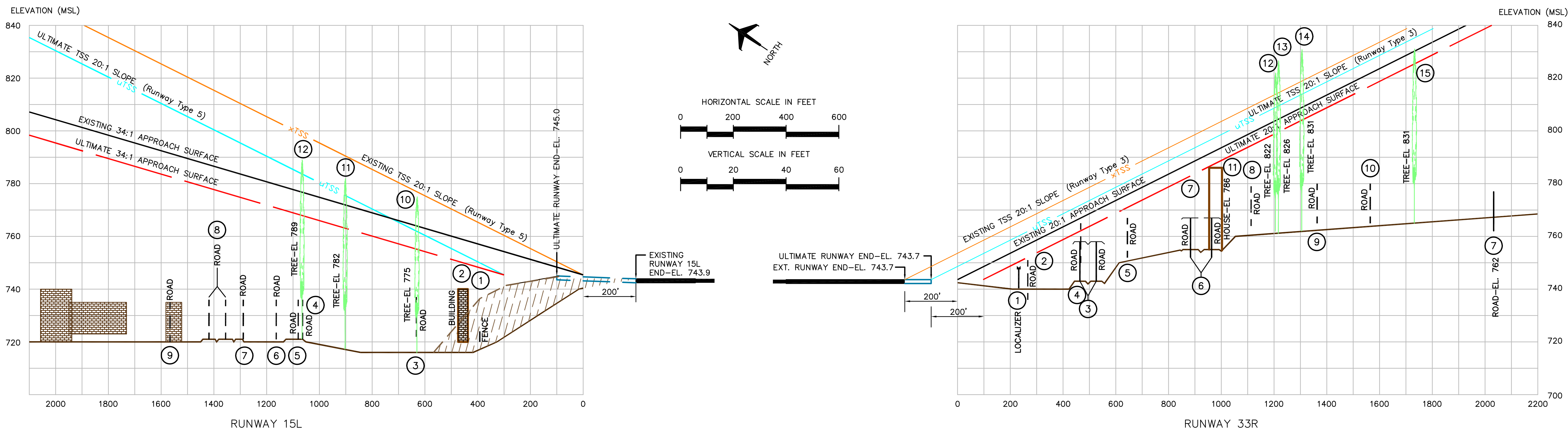
The maximum grade change allowed in the last one-quarter of a runway is 0.8 percent. On the northwest end of Runway 15L-33R, the runway elevation increases to the highest point on the airfield (745.4). This complicates the ability to change the grade quickly in the 300-foot pavement extension, although it can probably be lowered by 2.4 feet (743.0). Beyond the runway end, the grade drops 30 feet in about 600 feet. The maximum longitudinal grade change allowed for the first 200 feet beyond the runway end is 3 percent (737.0), increasing to 5 percent through the remainder of the safety area (732.0). Therefore, beyond the end of the safety area, the grade must continue to transition to match existing grades in the area (720.0). Additional analysis will need to be given to this grade change and its potential affect on stormwater drainage in the immediate area.

While Alternatives C and E do not present significant differences when compared to each other, Alternative E provides a greater margin of safety for aircraft operating on the airfield at minimal added cost. The noise evaluation favors Alternative E (but only slightly). Alternative E will offer advantages during construction by allowing additional pavement to be constructed at the southeast end of the runway prior to the more difficult construction on the northwest end. For these reasons, it appears that *the most prudent and feasible alternative for the airport is Alternative E.*

OTHER DESIGN CONSIDERATIONS

Current design standards require that the physical layout of facilities and size of protection zones increase if visibility minimums for an approach drop below 3/4-mile. Currently, the published approaches are at one-mile visibility minimums. The following standards will apply:





RUNWAY 15L-33R INNER APPROACH SURFACES AND PROFILES

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from existing runway end elevations and existing approach surfaces, unless otherwise noted.

RUNWAY 15L OBSTRUCTION TABLE					
Object Description	Object Elevation	Obstructed Part 77 Surface	Object Penetration	TSS (RT 5) 20:1 SLOPE	Proposed Object Disposition
10 TREE	775 MSL	34:1 APPROACH	20'	13'	TRIM/REMOVE
11 TREE	782 MSL	34:1 APPROACH	19'	7'	TRIM/REMOVE
12 TREE	789 MSL	34:1 APPROACH	21'	6'	TRIM/REMOVE

RUNWAY 33R OBSTRUCTION TABLE					
Object Description	Object Elevation	Obstructed Part 77 Surface	Object Penetration	TSS (RT 3) 20:1 SLOPE	Proposed Object Disposition
4 N. SWAN ROAD	765 MSL	20:1 APPROACH SURFACE	3'	CLEAR	ULTIMATE DISPLACED THRESHOLD
12 TREE	822 MSL	20:1 APPROACH SURFACE	Outside of Surface	13'	TRIM/REMOVE
13 TREE	826 MSL	20:1 APPROACH SURFACE	Outside of Surface	17'	TRIM/REMOVE
14 TREE	831 MSL	20:1 APPROACH SURFACE	Outside of Surface	17'	TRIM/REMOVE
15 TREE	831 MSL	20:1 APPROACH SURFACE	Outside of Surface	CLEAR	NO ACTON

AIRFIELD ALTERNATIVE C

Lawrence J. TIMMERMAN AIRPORT

Exhibit 4E

INNER PORTION OF RUNWAY 15L-33R-ALTERNATIVE C

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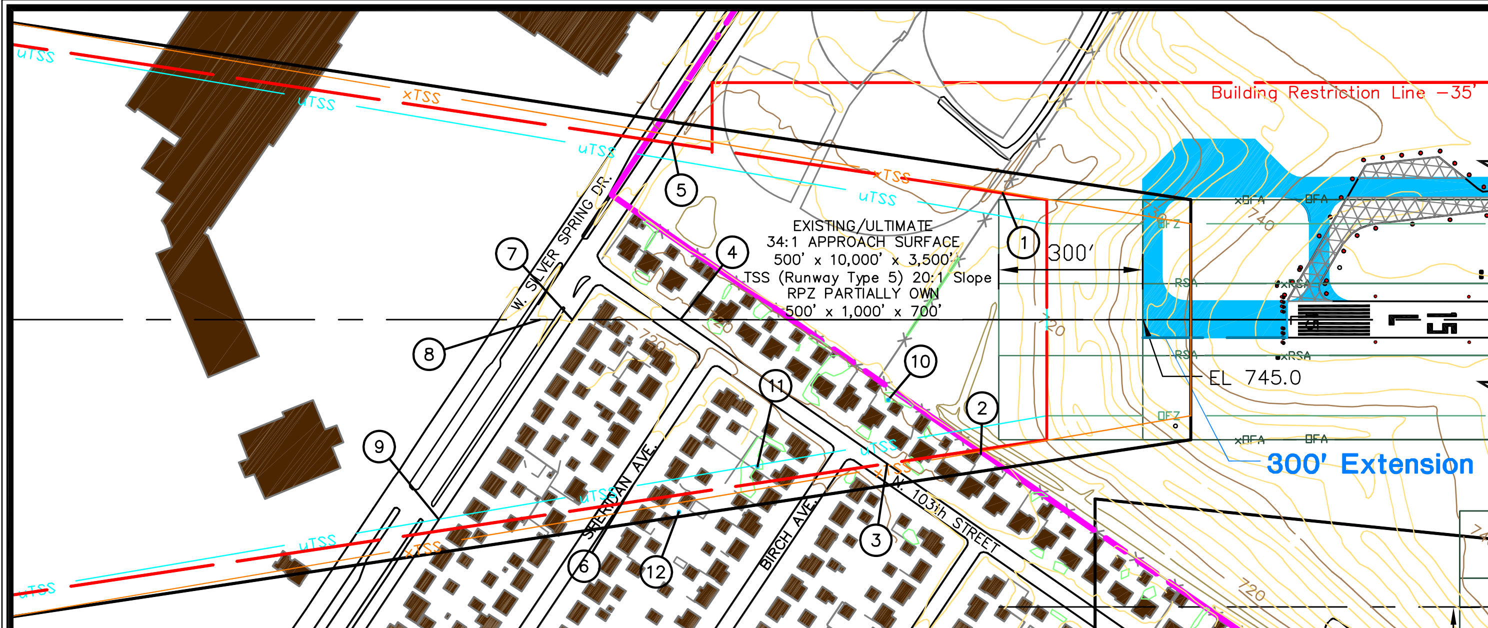

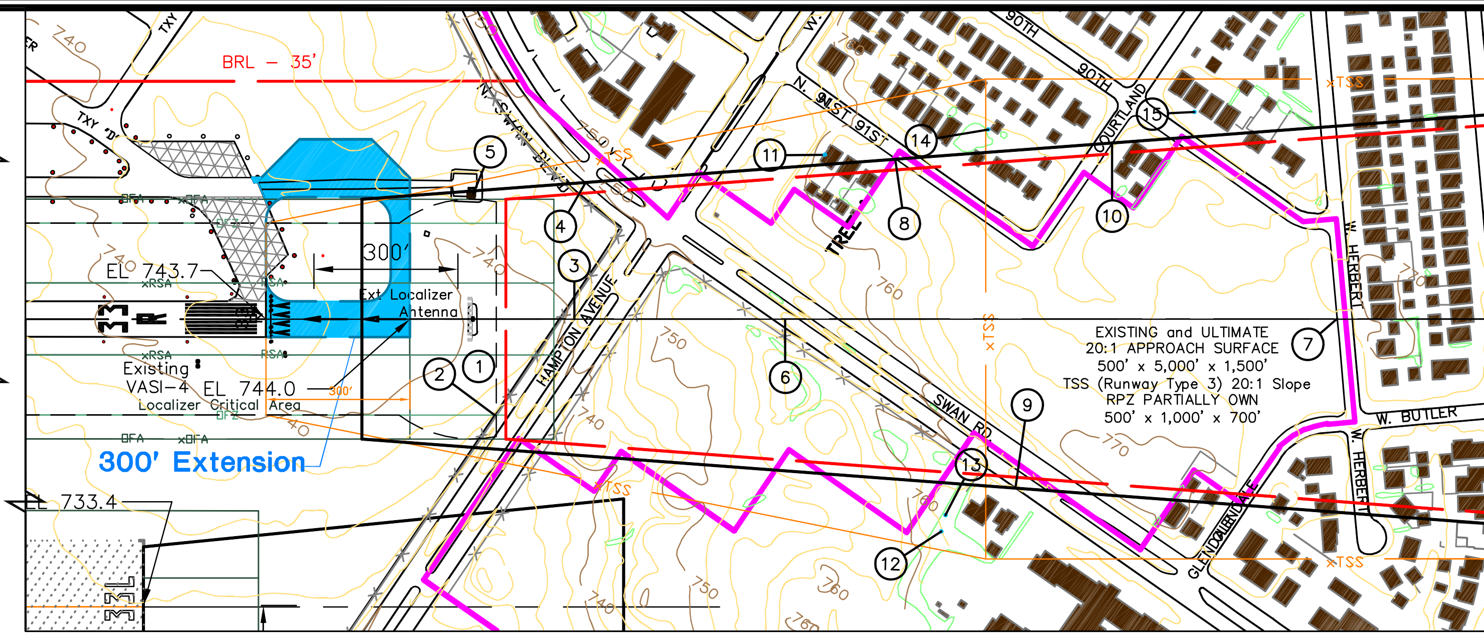

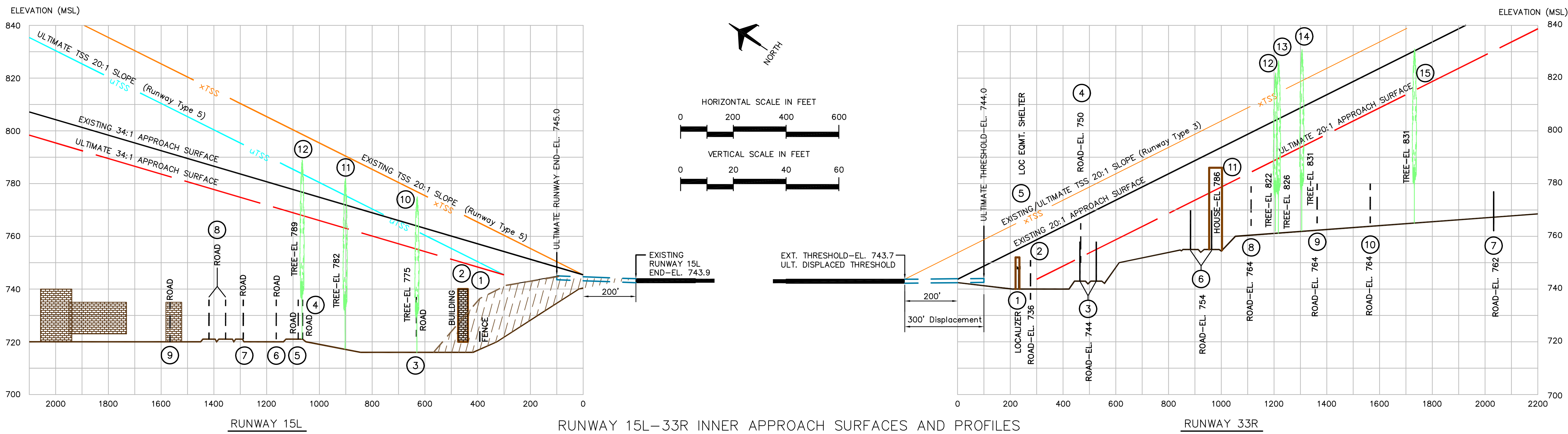

RUNWAY 15L–33R INNER APPROACH SURFACES AND PROFILES

RUNWAY 33R OBSTRUCTION TABLE					
Object Description	Object Elevation	Obstructed Part 77 Surface	Object Penetration	TSS (RT 3) 20:1 SLOPE	Proposed Object Disposition
1 LOCALIZER	ESTIMATE 8' AGL	PRIMARY SURFACE	8'	CLEAR	ULTIMATE DISPLACED THRESHOLD
2 HAMPTON AVENUE	765 MSL	PRIMARY SURFACE	7.4'	CLEAR	ULTIMATE DISPLACED THRESHOLD
3 HAMPTON AVENUE	765 MSL	20:1 APPROACH SURFACE	6'	CLEAR	ULTIMATE DISPLACED THRESHOLD
4 N. SWAN ROAD	765 MSL	20:1 APPROACH SURFACE	13'	CLEAR	ULTIMATE DISPLACED THRESHOLD
11 HOUSE	786 MSL	20:1 APPROACH SURFACE	10'	CLEAR	ULTIMATE DISPLACED THRESHOLD
12 TREE	822 MSL	20:1 APPROACH SURFACE	33'	9'	TRIM/REMOVE
13 TREE	826 MSL	20:1 APPROACH SURFACE	37'	13'	TRIM/REMOVE
14 TREE	831 MSL	20:1 APPROACH SURFACE	37'	13'	TRIM/REMOVE
15 TREE	831 MSL	20:1 APPROACH SURFACE	16'	CLEAR	TRIM/REMOVE

RUNWAY 15L OBSTRUCTION TABLE					
Object Description	Object Elevation	Obstructed Part 77 Surface	Object Penetration	TSS (RT 5) 20:1 SLOPE	Proposed Object Disposition
10 TREE	775 MSL	34:1 APPROACH	21'	13'	TRIM/REMOVE
11 TREE	782 MSL	34:1 APPROACH	19'	7'	TRIM/REMOVE
12 TREE	789 MSL	34:1 APPROACH	21'	6'	TRIM/REMOVE

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from existing runway end elevations and existing approach surfaces, unless otherwise noted.

AIRFIELD ALTERNATIVE E

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Lawrence J. TIMMERMAN AIRPORT

Exhibit 4F
INNER PORTION OF RUNWAY 15L-33R ALTERNATIVE E

	$ 3/4 mile	< 3/4 mile
Runway-Taxiway Separation	240 ft.	300 ft.
Distance to Aircraft Parking Area	250 ft.	400 ft.
Runway Protection Zone (ft.) @ 1 mile	1,000 x 500 x 700[1]	2,500 x 1,000 x 1,750
(Length x Inner Width x Outer Width)		
Runway Width	75 ft.	100 ft.
Safety Area Width	150 ft.	300 ft.
Safety Area Length	300 ft.	600 ft.
(Beyond Runway End)		
Object Free Area Width	500 ft.	800 ft.
(OFA Length Beyond Runway End)	300 ft.	600 ft.
Obstacle Free Zone - Width (> 12,500 lb.)	400 ft.	400 ft.
(OFZ Extension Beyond Runway)	200 ft.	500 ft.

[1] @ 3/4 mile, the RPZ increases to 1,700 x 1,000 x 1,510 ft.

Lowering visibility minimums will have a noticeable impact on physical layout, protection zone sizes, and safety areas. In fact, lowering minimums to 3/4 mile will increase the acreage within each RPZ from 13.77 to 48.978 acres, while lowering to ½ mile increases the acreage within each RPZ to 78.914 acres. However, it may be possible to lower decision heights for approaches without affecting the design standards. For example, AC 150/5300-13 provides a checklist for minimum requirements which has been included as **Appendix B**. It would appear that the airport has the potential to meet requirements for improved decision heights without changes to standards being applied to the airfield, and without the addition of approach lights. Therefore, every effort should be made through this planning effort to meet the runway design standards as they are being applied, to create the opportunity for improvements to published approaches.

The airport perimeter road in the approach to Runway 22R penetrates the OFA, and should be relocated closer to the fence. This will place the road alignment over a portion of the parking lot which currently falls inside the fence. It may be necessary to realign a short section of the fence to provide adequate space for the road.

A review of existing pavements on the airfield indicates that all runway, taxiway, and apron areas should be maintained, unless the selected master plan concept recommends a reconfiguration of existing facilities. Therefore, consideration will be given to retention of existing pavements throughout the remainder of the planning effort.

The lighting, signing, and navigational aids, while adequate for existing operations, should be updated and/or replaced with newer equipment. This applies to VASI equipment and runway edge lighting.

LANDSIDE ALTERNATIVES

The analysis of landside alternatives has included an evaluation of potential areas for development of nested T-hangars, clearspan hangars, and conventional hangars (for both storage and maintenance activities). The age of existing structures may require that new facilities be constructed to replace existing units; therefore, consideration should be given to redevelopment of the existing landside facilities to improve vehicular access and parking, provide a mixture of hangar sizes which meet the wingspan and tail clearance requirements of today's aircraft, and provide efficient access to taxiways and airfield facilities. Consideration should also be given to providing areas for the establishment of individual corporate hangars or hangar/office combinations on the airfield, since this has become more prevalent at many general aviation airports. Landside support facilities, such as maintenance areas and fuel storage facilities, should continue to be considered for adequate expansion potential.

The requirements analysis in the last chapter resulted in a need to provide a net increase of 27 aircraft storage positions through the planning period, and 25,000 square feet of maintenance area (or an area comparable to the main hangar on the airfield). Area for additional hangar storage on the north side of the airfield is somewhat limited, although adequate area exists west of the current hangars to support two additional nested hangar rows if it is assumed that the area does not need to be reserved for a glide slope antenna (this would seem unlikely with the current transition to GPS approaches and other considerations which have been presented in the preceding paragraphs). As depicted in Alternative A (on **Exhibit 4G)**, the hangars should remain 500 feet from the centerline of Runway 15L-33R. It is assumed that these hangars should be of similar size to the M/N or O/P-row hangars. Adequate area can be reserved to allow for expansion of the fuel farm. Also depicted is the addition of three units on the G-row. It is assumed in Alternative A that some of the older hangars may eventually be removed, although if the quonsets are removed in addition to the metal hangars, the alternative will net little additional hangar storage space. If the south metal hangars are removed (rows A-F), then an area can be established for another large maintenance hangar. However, this alternative does not solve the problem of somewhat remote automobile parking (east of the main hangar). Therefore, another alternative was considered which assumes a more significant redevelopment of the hangar area.

Alternative B (also depicted on **Exhibit 4G**) reflects a new entrance into the general aviation facilities on the north side of the airfield, just south of the maintenance facilities. The alternative would require the removal of all older metal and masonry hangars, providing the potential for a divided roadway into a new FBO complex, terminating in a 250-space parking lot. This would consolidate automobile parking while segregating it from aircraft traffic. The main hangar could continue to be used for maintenance or aircraft storage, and the alternative would provide an opportunity for other large hangar development along the edge of the itinerant parking ramp. All of the newer storage hangars would be preserved (N-P rows, and G row), while

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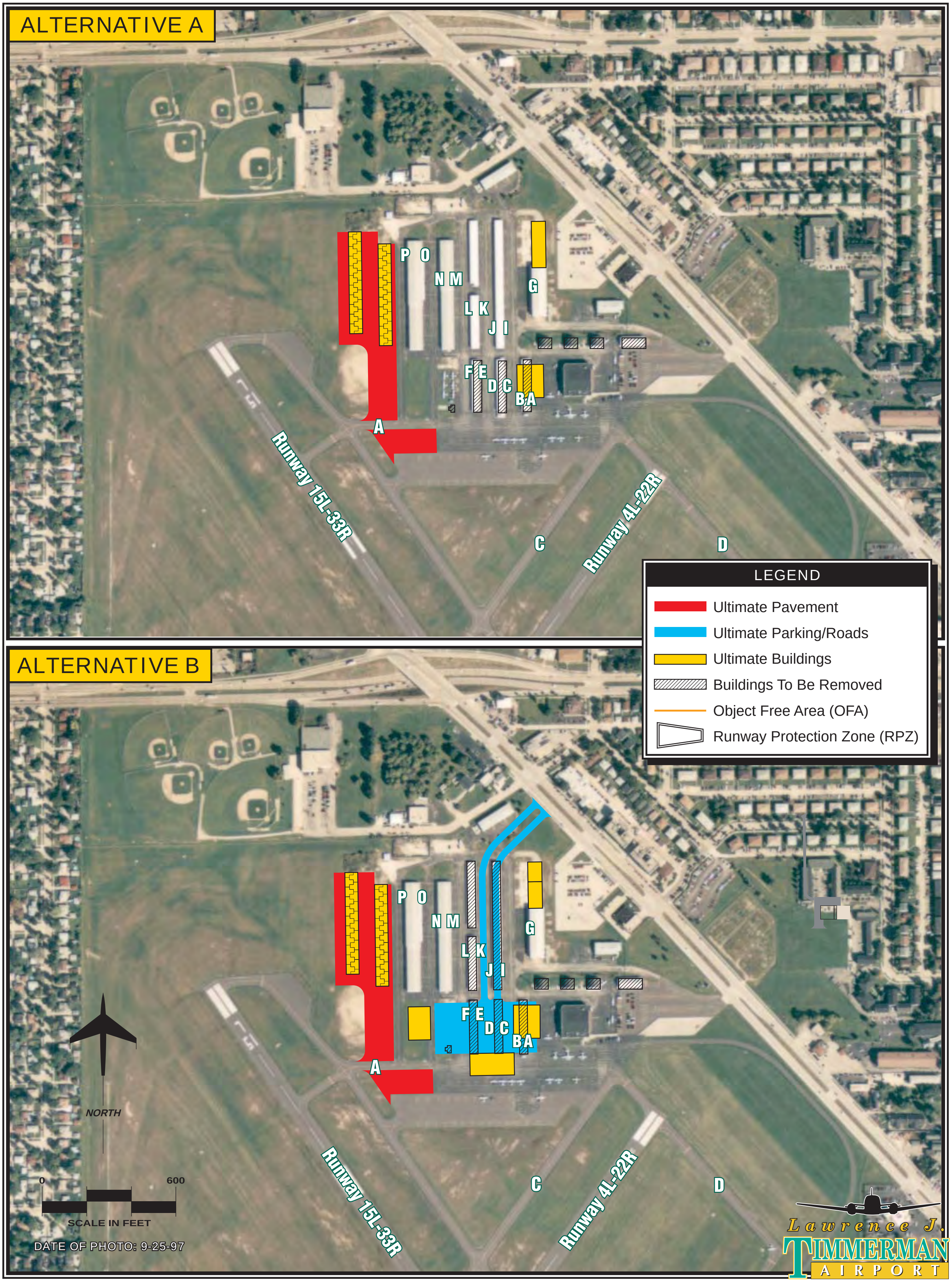

Exhibit 4G
LANDSIDE ALTERNATIVES A & B

providing an opportunity for additional storage hangars on either side of the entrance road. The storage hangar to the east side of the G-row hangars would eliminate a portion of the "park and ride" lot. While providing more new hangar space than Alternative A, it would not totally satisfy the 20-year demand; therefore, options were examined for the future development of land areas on the east side of the airfield.

Previous planning has recommended that future hangars be constructed in this area. However, since the area has little development at this time, several options are available for the potential development of the area. Nested T-hangars could be developed in either a north-south or east-west alignment in this area, although wintry conditions favor north-south alignments to allow the benefit of the sun to provide some "de-icing" benefits against hangar doors. The area on the east side could be accessed by the existing road which leads to the control tower and ramp from N. 91st Street.

Alternative C (depicted on **Exhibit 4H**) provides four 20-unit nested T-hangars to one side of the entrance road, conventional hangars on either side of the control tower (facing the ramp), and an extension of this ramp to the north. A larger hangar could be added in front of the existing hangar, and individual development sites with taxiway access could be provided to take full opportunity of the site. Depending upon the density of the development, as many as 120-150 aircraft could potentially be based in this area equivalent to basing numbers handled presently on the north side of the airfield. This would well exceed the capacity needed over a 20 or 25-year period, but offer long-term development potential on the site, with the opportunity to market sites to individuals or companies, providing additional land lease revenues to the County.

Alternative D (also depicted on **Exhibit 4H**) also provides an assortment of nested hangars, conventional hangars, and lease sites, although the nested hangars have been located north of the control tower. This provides the opportunity to develop a greater number of nested hangars, and (since the hangars consist of shorter rows) to phase the development of these hangars a little more slowly. It maintains areas on either side of the control tower for individual hangar development (fronting the ramp), with individual parcels for lease located south and east of the control tower.

The other quadrants of the airport (south and west) are not available for hangar development due to clearance areas along the runways and critical areas around navigational facilities. Although the VOR-DME facilities (located on the west side and part of FAA's ground-based navigational system) may be phased out in the future, and replaced entirely by GPS, there have been recent indications that a skeletal VOR system may be retained as a "back-up" to GPS. Consequently, the 1,000-foot radius around this facility, within which no structures are to be constructed, should remain in place on the airport layout plan for the foreseeable future.

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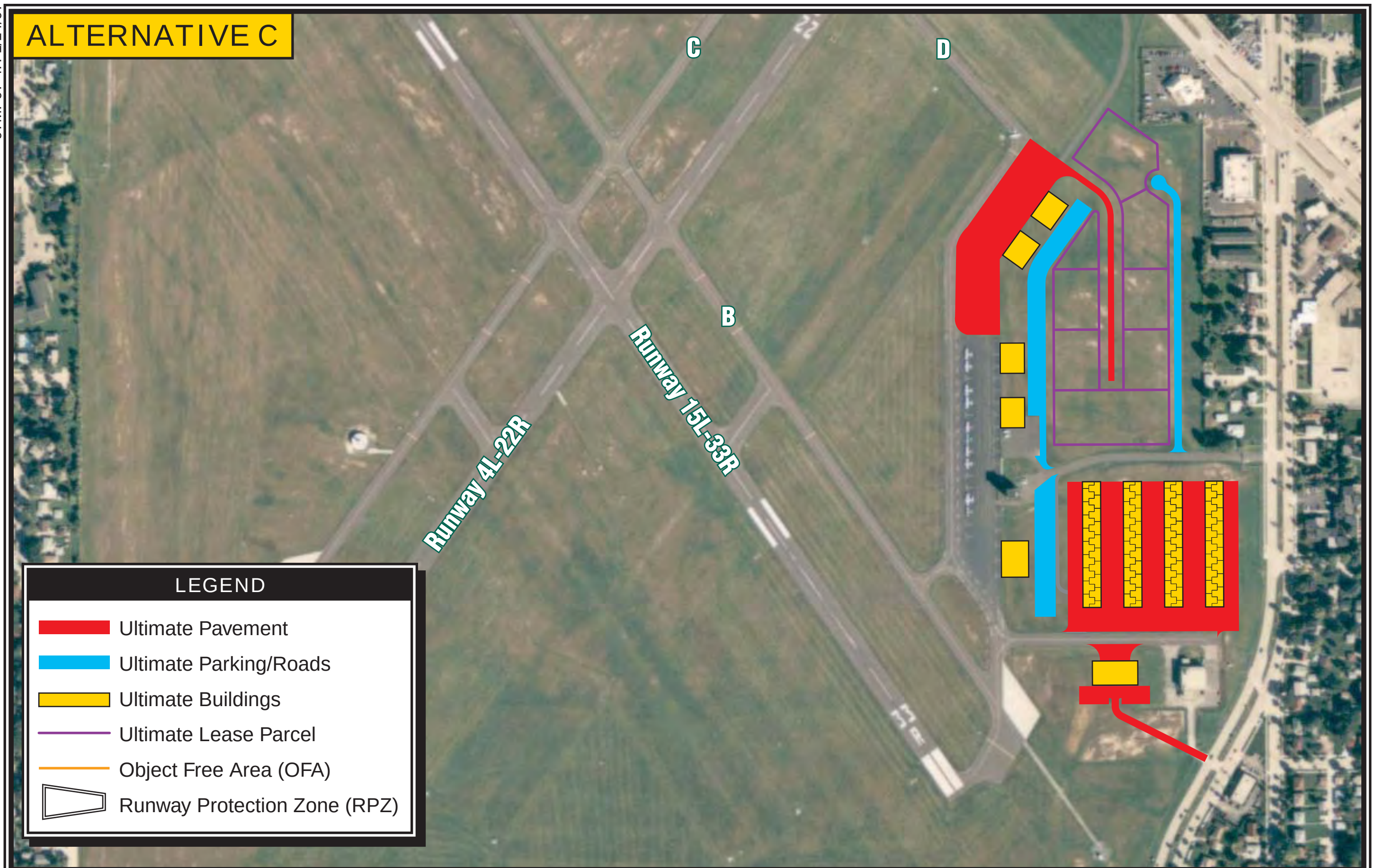

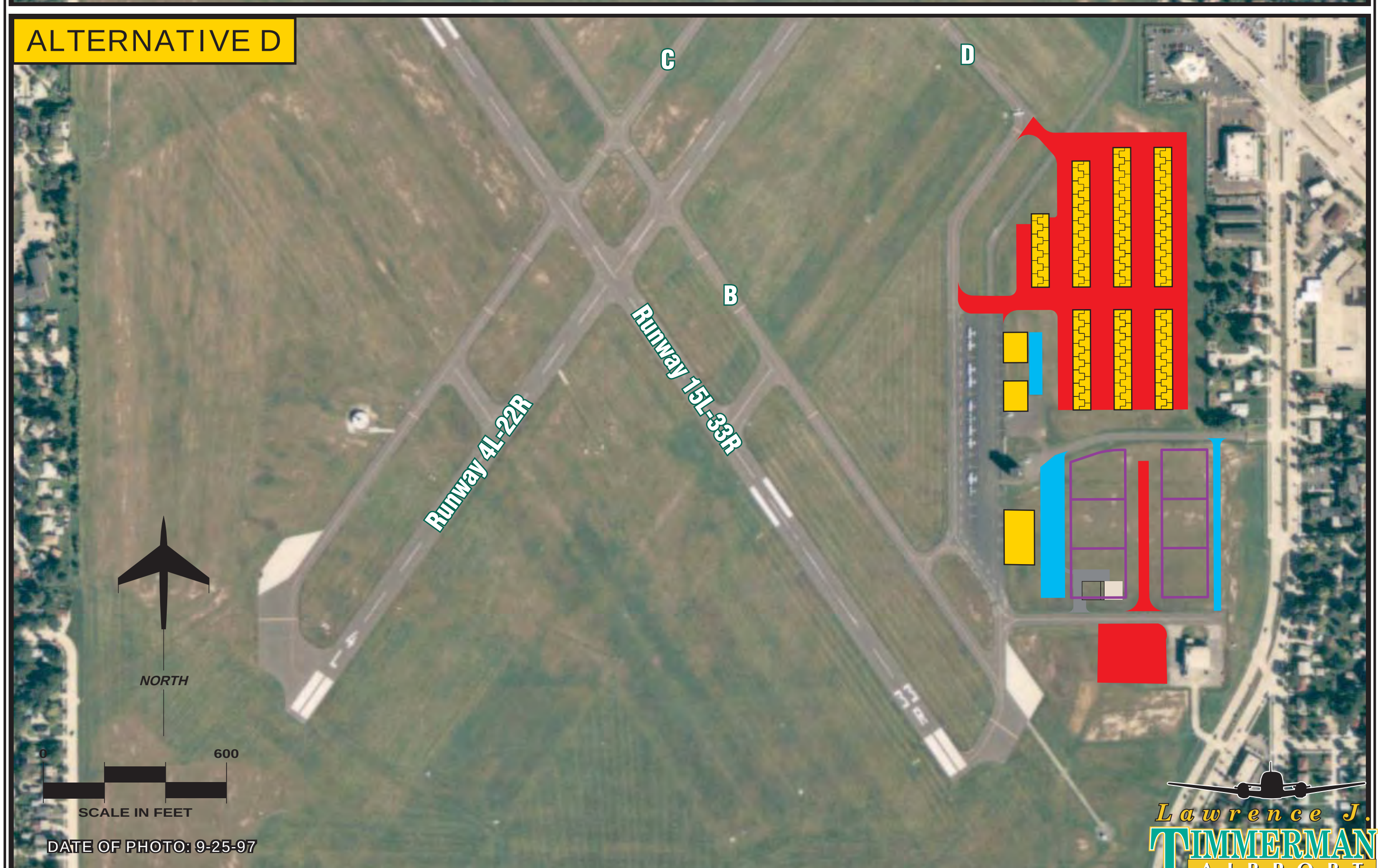

Lawrence J. TIMMERMAN AIRPORT

Exhibit 4H
LANDSIDE ALTERNATIVES C & D

The current locations utilized for fuel storage and maintenance activities appear to be well located to provide easy access to the airfield, while also providing efficient vehicular approaches. Areas should be maintained adjacent to these facilities to allow for expansion of facilities. However, should Alternative B be given consideration for future facility development, it may be necessary to eventually relocate the maintenance building and storage area. An option would be to relocate these facilities east of the main hangar if parking facilities are centralized in a new location.

AIRPORT LAND USE ANALYSIS

In formulating airport land use development alternatives, it is necessary to evaluate the impact of FAA regulations on land acquired with FAA grants, the conditions under which the County accepts federal and state grants, and the highest and best use of available property in terms of location, facilities available, functional capabilities, compatibility with airport operations, and revenue potential. The highest and best use analysis can involve the alternative of total re-use of available land for non-aviation purposes.

FEDERAL AND STATE FUNDING PARTICIPATION AND LAND USE POLICIES *(Originally prepared in 1997-98)*

Since 1974, Milwaukee County has received $1,882,850 in federal funds and $279,425 in state funds for pavement work, signing, and lighting at L.J. Timmerman Airport (refer to **Table 4D**). In addition, federal funds have been used to acquire the majority of airport property (according to the current Exhibit "A" property map, federal funds were used to reimburse Milwaukee County for the original acquisition of the airport in 1947).

In receiving these funds, Milwaukee County has made a number of airport owner assurances to the United States of America and State of Wisconsin regarding the present and future use of L. J. Timmerman Airport. Some of these (which are contained in FAA's Compliance Handbook) may constrain policy maker's choices, as follows:

- Unlike development grants (with 20-year expirations), assurances remain in effect permanently for land acquired with FAAP, ADAP, or AIP assistance. Such land can be used only for aeronautical purposes unless released by the FAA.
- Surplus or non-aeronautical parcels may be disposed of with FAA approval. Return must be at "fair market value" as of the date of the release, and proceeds must be returned for aero-nautical development purposes at the airport.
- Airport land, regardless of source of acquisition, must be treated the same as that acquired through Federal assistance if shown on the approved airport layout plan (ALP) or Exhibit "A" as used for aeronautical purposes. Changes made to non-aeronautical uses may be approved by FAA if, in their judgment, aeronautical functioning

of the airport is not impaired. The FAA will not approve a change to an ALP where a non-aeronautical property usage option would result in the reduction of an airport's ability to meet aeronautical need.

TABLE 4D
Federal and State Funding Participation (since 1974)
Lawrence J. Timmerman Airport

			Funding Source		
Project	**Year**	**Total**	**Federal**	**State**	**Local**
Runway Overlays (ADAP 01)	1974	$219,200	$164,400	$27,400	$27,400
Taxiway Overlay/Obstruction Removal (ADAP 02)	1975	$280,000	$252,000	$14,000	$14,000
Apron/Taxiway Overlays (AIP 01)	1983	$260,000	$234,000	$13,000	$13,000
Reconstruct Taxiways Overlay Hangar Area Seal Coat Runway 4L-22R Seal Coat Runway 15L-33R (AIP 02)	1985	$200,500	$180,450	$10,025	$10,025
Expand Apron Install Taxiway Guidance Signs (AIP 03)	1988	$200,000	$180,000	$10,000	$10,000
Runway/Taxiway Re-lighting (AIP 04)	1991	$400,000	$360,000	$20,000	$20,000
Seal Coat Runways/Taxiways (AIP 05)	1992	$344,000	$310,000	$17,000	$17,000
Relocate Taxiway Signs Expand Run-up Aprons/33R & 4L Pavement Repairs/Seal Coat Apron & Hangar Taxiways (AIP 06)	1993	$538,000	$202,000	$168,000	$168,000
Totals		$2,441,700	$1,882,850	$279,425	$279,425

Source: Milwaukee County records

- Actions by an airport sponsor ignoring or defying FAA regulations or not in keeping with an approved ALP may result in the sponsor being found in default or non-compliance with obligations, and therefore ineligible for further grants, and possibly liable for reimbursement of past assistance.

AIRPORT LAND LEASES

The current airport land leases are limited, since most of the existing hangar facilities are leased to the fixed base operator, Gran-Aire. Their leasehold (according to the 1994 appraisal report) includes a 25.08-acre site consisting of approximately 209,200 square feet of unimproved land, 881,140 square feet of improved ramp area, a 20,018 square foot main terminal/office/ hangar building, a 4,020 square foot metal storage hangar, three 2,292 square foot Quonset hangars, a new 14,320 square foot storage/corporate hangar, eight individual nested T-hangar buildings providing 101 units, and a 2,200 square foot fuel farm. (Note: the square footages for buildings vary somewhat from those reported in the first chapter).

Also located on the north side of the airfield is the 5,100 square foot Civil Air Patrol (C.A.P.) hangar and the 4,700 square foot County maintenance building. A 6,200 square foot hangar on the east side is currently vacant. The 6,290 square foot control tower building has four floors, in addition to the tower cab.

The lease agreement with Gran-Aire was written with an initial five-year term, ending June 30, 2001, with four additional five-year options. Annual rate adjustments are based on the increase or decrease in the Consumer Price Index (all urban consumers) for the Milwaukee area as published by the U.S. Department of Labor, or the national replacement or successor index as readjusted to the base month. In addition to fixed rentals, Gran-Aire is to pay 50 percent of any restaurant rentals or fee collected, 75 percent of any landing fees collected, five cents per gallon for aviation gasoline and turbine fuels delivered to fuel tanks, and six cents per gallon for all aviation oils delivered to the leased premises.

The C.A.P. pays $1 per year for 13,200 square feet of land, a storage hangar, and 820 square feet of office space on the second floor of the control tower building. This lease specifies that it is in consideration of the C.A.P.'s value to the community.

Metro Flying Club is on a month-to-month lease, for 24,760 square feet of land upon which their aircraft are parked. This area is immediately west of the E/F metal hangar row.

The land area upon which the vacant hangar on the east side of the airfield is located was covered under an agreement which originated in 1987 and expired in 1992, with three additional five-year options. The lease included annual CPI adjustments. The leased area included 32,000 square feet of land.

The U.S. Government leases 2,510 square feet of space in the control tower on an annual basis, with year-to-year renewal options. The U.S. Department of Commerce has a license for use of real property for the purpose of installation, operation, maintenance, repair, replacement, and removal of Automated Surface Observing System (ASOS) equipment. The U.S. Government also has a lease for the

TVOR, RT, VASI, RBC, REIL, and Localizer on the airfield.

HIGHEST AND BEST USE CONSIDERATIONS

In general, a governmental body, as trustee of the public's property and assets, is obligated to put those resources to use in a manner beneficial to the interests of its consistency. In the case of real property, this is usually defined as "highest and best use" of the land with the conceptual goal of maximizing the benefits to the public asset's owners. There are numerous factors and circumstances to be considered when determining the appropriate parameters for defining "highest and best use". By definition, "highest and best use" is a "legal and perceived most profitable use, based on forecast market demand and associated risk, providing the maximum benefits, monetary and/or other, for the longest period of time". (Rams, 1974). This same reference goes on to state that . . . "The definition is broad enough to include matters of highest and best use for cases involving owner-user and charitable and/or public facilities. The concept of 'maximum benefits' does not mean dollars per se; rather, the benefits can include important items such as amenities, service, function, and other aspects peculiar to a given use-location."

Another textbook definition adds the perspective that "highest and best use" is achieved . . . "When land is being put to its most logical and productive use. Such factors as beauty and utility to the surrounding community are considered, as well as the highest income it can bring the owner." (Gross, 1978). Still another definition states . . . "Implied within these definitions is recognition of the contribution of that specific use to community environment or to community development goals in addition to wealth maximization or individual property owners." (Boyce, 1981).

There are three basic theoretical approaches to achieving "highest and best use", and an informed policy decision may identify as appropriate any one or a combination of these. The first two consider only economic rates of return; that is, the use which will yield the greatest financial income to the property owner. The third addresses non-economic benefits accruing to a selected usage.

The first and most fundamental concept is that of the highest and best use of land *as though vacant*. This concept is the one which underlies virtually all economic studies of real estate. It simply asks, "regardless of what is there, what could and should be there to develop the land to its highest and best use?" Essentially then, the most basic economic analysis for potential rate of return on real property is to determine what usage . . . of any legal and reasonable kind . . . would provide the greatest net dollar gain to the property owner. This approach considers only the attributes of the raw land in its given size, shape, location and natural condition and the various usages which could locate on that land. It does not consider current usage or improvements (if any) on the property. Non-economic factors, such as compatibility with other adjacent uses, are considered only to the extent required by zoning regulations or other restrictions. This type of analysis is more often reserved for vacant land (or property to be redeveloped totally) where restrictions and potential conflicts are absent or minimal and where the development options are numerous and varied. The maximum rate of return is the "bottom line" and thus exclusively determines the highest and best use in this approach.

A second concept of highest and best use is that of the highest and best use *of improved real estate.* In this concept one considers the existence of buildings and improvements to the land and determines the most likely and profitable use of land and improvements. This concept is less fundamental than the first because it is conditioned upon the existence of the improvements; since they are considered to be less long-lasting than land, this type of highest and best use is more transitory than the first. On the other hand, it recognizes that current usage and improvements may be appropriate indicators for redevelopment of obsolete portions or initial development of the same or similar uses on any remaining unimproved land. This theory, like the preceding one, is based upon economics, but differs in acknowledging the practical reality that existing uses . . . while perhaps not hypothetically the most lucrative . . . have been established for a purpose and are meeting a need. Furthermore, such uses are self-sustaining economically or they would be replaced by others which would be. Therefore, the objective of this approach is to define those uses which will *enhance economic returns within the context of the existing situation*, consistent with existing approved activities at the location and compatible with off-site environs as well. The property owner should proceed to improve the value of and returns from the land, assuming probable future conditions, the practical limitations imposed and the realistic opportunities provided.

The third concept of highest and best use is that of a *community highest and best use.* This concept is normally applied to non-revenue-producing elements of a community such as parks, schools, courthouses, and other public buildings. The idea is that land may have a different private sector highest and best use, but it is in the general welfare or interest for said land to be used for community good. Not only does the land not remain idle, but the usage can enhance the overall quality of life for the community's inhabitants. The fundamental differences between this approach and the two preceding are that benefits accruing to the selected use are not quantifiable and that sheer dollars are not the only criterion by which to evaluate a satisfactory return on investment. Economics is but one consideration to be weighed along with public purpose and necessity in some cases.

Before the "highest and best use" for a given property can be defined, the appropriate measure for determining that value must first be established. This presents an opportunity for Milwaukee County officials to make a policy decision on *the objective.* A combination of concepts may be employed, either by applying the different criteria to different portions of a property, or through blending the approaches within a hybrid formula. This approach can lead to creative compatible combinations or joint uses subject to different rate of return evaluation criteria, such as the possibility of a combination aircraft hangar/office building. Judgment is the key.

The first highest and best use concept may be applied to L. J. Timmerman Airport as a general proposition as it relates to the growth patterns and trends of the local area. Conceptually studying the land area as though it were vacant and ready for development, there would appear to be ample demand to support offices, commercial or light industrial uses, and/or related activities. Based upon property appraisals undertaken by Hodges, McArthur & Dunn, P.C. in December 1994, the 25-acre site leased by the FBO was given a unit value of $30,000 per acre ($0.69 per square foot). Based upon a 10 percent rate of return, this would provide ground rents of $0.06/sq. ft./year. The airport has a total area of 420 acres. Values per parcel would vary, based upon location and size. However, this offers a general idea of possible value, without regard to secondary benefits which might be achieved by one or more specific land uses.

To apply the second highest and best use concept to L. J. Timmerman Airport requires analysis of each land element leased, the structures thereon, and consideration of these facilities as a part of the Airport. If off-airport uses can and will competitively pay a higher price for the facilities, then such uses become the "highest and best". If the nature of the facilities are so airport-related that the highest price to be paid is from more normal airport tenants, then they are the higher and better users.

Because of the special purpose design of many facilities at L.J. Timmerman Airport, and as long as the facility is maintained in its present configuration as an airport, then airport related users are the most likely users for most of the Airport's facilities. Tenants and prospective tenants likely do not have an ability to pay rents which would be competitive with off-airport uses (nor can aviation-dependent businesses relocate away from direct airfield access) due to the economic differences between the aviation market and general off-airport market. Thus, highest and best use under this concept (if it can be applied to L. J. Timmerman), is extremely complex and suffers from the problems of potential unfairness among tenant situations.

The third highest and best use concept is not typically applied to the revenue-generating facilities of an airport, though it may be applied to certain individual elements which are necessary for the overall public use but not income-generating. Favored rent . . . for instance, $1 per year for the C.A.P. . . or other concession positions are commonly said to be "subsidies from normal market rents". To be applied, the concept must have a legal foundation in the community and frequently requires legislation, public hearings, votes and/or other citizen involvement in its enactment.

To identify the specific type of land use desired also requires addressing expectations or intentions regarding a property's general role or function. This can take the form either of a mere assumption about the probable course of future events or a deliberate policy decision to set the course of events. In the case of this study . . . is L.J. Timmerman likely to remain an airport? Should it remain an airport?

These issues are addressed in the following discussions.

FUTURE LAND USE SCENARIOS

The purpose of alternative future land use scenarios is to delve into relationships between land use needs within and outside L.J. Timmerman Airport to identify a series of foreseeable possibilities. Hopefully, scenarios can aid in identifying factors for consideration in establishing policies and in making land use decisions.

Four basic scenarios will be explored. First is the possibility of exclusive use of L.J. Timmerman Airport for airport and airport-related uses. Second is the reverse of that . . . use of L.J. Timmerman Airport for exclusively non-airport uses. The third scenario explores a random mix of airport and non-airport uses, and the fourth discusses the possibility of concentrations of land use activities.

A major consideration of all airport development scenarios is the necessity to provide adequate automobile parking. Parking requirements are particularly germaine to this analysis, as different land uses result in different parking demands. The fact that auto parking requirements for some types of usage are more land intensive than for other uses, and thus reduce the amount of land available for a selected primary use, must be among the factors to be weighed in choosing a course for the most efficient and effective use of L. J. Timmerman's property resources.

Exclusive use of L.J. Timmerman Airport as an airport: This is the current situation. Current land use is exclusively in aviation or aviation support use. This scenario does not correspond to the first highest and best use concept, but it does qualify under the second concept. Thus, such a policy would make full utilization of the Airport as an airport and would preclude uses not dependent upon or supporting aviation, even if land in excess of aviation needs were available.

This scenario has the advantage of making the maximum amount of land available for airport-related uses. However, a dilemma is how to overcome the lower rents produced by airport uses when a "higher and better" return may be produced by other uses. Continued use of L.J. Timmerman Airport as an airport also does not solve the noise and safety problems associated with aviation uses.

This scenario makes the fullest use of all facilities at the Airport which are aviation-related and probably requires the least immediate capital outlay. Long range capital and operating cost may be higher, but capital costs for airfield rehabilitation are eligible for federal and state participation. To be fully effective, this scenario requires that policy be developed to provide for future expansion of key tenants and for groupings of compatible development, reducing infrastructure costs, noise, congestion, or other hazards or problems associated with their mutual proximity.

Exclusive use of L.J. Timmerman Airport for non-airport uses: The most drastic of the four scenarios, this scenario clearly permits the land area to be available to meet the first test of highest and best use, but it is less clear that such a development would be in the long range best interests of the community.

It would require the relocation of all aviation users to existing airports in other locations. It would create business hardships unless accomplished at the end of their existing lease term. The scenario would also eliminate a major general aviation reliever airport from the Milwaukee area.

With regard to use of the land area for entirely non-aviation uses, if properly designed and developed for uses compatible with the surrounding area, it could potentially have a significant contribution on the local area. Absorption of the entire land area may not be immediate, but recent development trends would appear to indicate a potential market for this amount of land area. A potential problem could arise from the private sector with perceived unfair competition from the public sector...especially if areas were to be developed in commercial/light industrial park uses.

Random mix of alternative land uses at L.J. Timmerman Airport: This scenario envisions that airport uses would continue and other non-aviation uses would be combined with them without regard to special attempts to concentrate non-aviation uses. This scenario is most comparable to the current situation. However, to allow a random situation to occur without directional guidance represents poor planning.

Under this scenario, it would be necessary to make land use and tenant decisions based upon the needs of the time and the anticipated benefits to be afforded by acceptance of each tenant. It is possible to mix policies which could provide for future change to one of the other scenarios, but individual decisions would be made based upon whatever policies for the future may exist and the fit of the situation at that time to those policies.

This scenario has the advantage of preserving the areas for airport use so long as non-aviation leases are maintained as short-term leases. Thus, to the extent that prospective airport uses are not available for given areas, land may still be income-producing while it is being held for future land use decisions.

This scenario combines the first and second highest and best use concepts, rather than centering on just one, but has the least benefit from comprehensive planning of any alternative.

Concentration of land use activities at L.J. Timmerman Airport: This scenario contemplates policies and procedures which would lead to the grouping of related land uses at the Airport. This type of procedure permits continued use of L.J. Timmerman Airport as an airport and, if done on a coordinated basis, could bring new activities to the Airport which could enhance existing tenants. It has the advantage of minimizing capital outlay from the public sector while capitalizing on existing facilities and preserving long-range options.

Policies directed towards land use grouping can provide for flexibility in aviation and non-aviation related land use and enhance the operations of existing and likely future aviation uses. For example, the development of individual corporate hangars with offices attached can improve both public and private revenues if properly mixed. It illustrates potential expansion of aviation-related facilities with other land uses, and how intelligent land use mixes can be mutually supporting.

THE OUTLOOK FOR L. J. TIMMERMAN AIRPORT

In addition to maintaining L.J. Timmerman Airport as an airport, Milwaukee County could conceivably put its property to other uses. The land could be sold off for any purposes allowed under applicable zoning regulations, or, all or parts of it could be leased for any purpose allowed under Milwaukee County Codes. However, in light of the factors discussed so far in this study, and because of other important considerations such as those outlined below, it is recommended that Milwaukee County reaffirm their support for L.J. Timmerman Airport as an airport, dedicate its property and other resources for aeronautical purposes, and continue operating the Airport in response to the citizens' needs for public air transportation. In anticipation of such a policy, the remainder of this study process will be conducted under the assumption that the general land use of L. J. Timmerman Airport will remain that of an airport. The reasons for this assumption are as follows:

- Milwaukee County has substantial investment in airport facilities, many of which could not be economically converted to any other use. For example, without further improvements, most hangars would be suitable only for general warehousing; area for area, yielding less than for aircraft storage, and without other substantial user fees paid by operators of aircraft.

- Tenants depending upon L.J. Timmerman's aviation facilities, have substantial investments in plant and equipment, and realistically these cannot be relocated to another airport.

- FAA grant assurances stipulate that the Airport will be maintained as such for at least 20 years after the most recent development grant, and these assurances remain in effect permanently for land acquired with federal assistance. Airport land, regardless of source of acquisition, can be used only for aeronautical purposes if shown on an approved airport layout plan (ALP) or Exhibit "A" (property map). Changes made to non-aeronautical uses may be approved by FAA only if (in their judgment) the aeronautical functioning of the airport is not impaired. FAA will not approve a change to an ALP where a non-aeronautical property usage option would result in the reduction of an airport's ability to meet existing or forecast aviation demands.

- If an option to close L. J. Timmerman Airport were chosen, the FAA release to Milwaukee County would obligate it to return all proceeds of the land at current fair market value for development purposes of L.J. Timmerman's replacement airport (s) and/or the needs of the area's aviation system. A replacement airport would have to be in operation before the property could be released, requiring the sponsor or others to front the costs of its development.

- Milwaukee County has a historical policy of meeting its obligation to provide and support L.J. Timmerman Airport much the same as County roads or other public works.

In keeping with the recommended continuation of L.J. Timmerman Airport's airport role, future land use strategies for the property should be formulated within that context, and in a manner which will enhance both the Airport's function and Milwaukee County's investment therein. Therefore, the second, or optimum use as improved, is recommended as the most appropriate measure for determining the highest and best use for this property.

SUMMARY

The process utilized in assessing airside and landside development alternatives involved a detailed analysis of long-term requirements and growth potential. Current airport design standards were reflected in the analysis of runway pavement extensions, with consideration given to current safety areas required by the FAA in the runway approaches. As design standards are modified in the future, revisions may need to be made in the plan, which could affect development options.

Upon review of this draft report by Milwaukee County, the FAA, and Wisconsin Bureau of Aeronautics, a final master planning report will be developed which is designed to fulfill demands for the 20-year planning period covered by the plan. As any good long-range planning tool, it should remain flexible to unique opportunities which may be presented to the Airport.

Lawrence J. TIMMERMAN AIRPORT

Chapter Five

RECOMMENDED PLAN

RECOMMENDED PLAN

The planning process for the Strategic Development and Airport Master Plan Study has included several analytic efforts in the previous chapters, intended to project potential aviation demand, establish airside and landside facility needs, and evaluate options for improving the airport to meet those airside and landside facility needs. The planning process, thus far, has included the presentation of draft materials to the Technical Advisory Committee (TAC) and Milwaukee County. A plan for the future use of L.J. Timmerman Airport has evolved considering their input. The purpose of this chapter is to describe in narrative and graphic form, the final plan.

The implementation of the Aviation and Transportation Security Act of 2001 will need to be closely monitored by Milwaukee County throughout the implementation of this plan. This law established the Transportation Security Administration (TSA) to administer transportation security nationally, including general aviation security. This plan has anticipated the potential for greater security scrutiny in the future at general aviation airports, especially those general aviation airports serving aircraft greater than 12,500 pounds.

The TSA has already implemented security provisions for air charter operations with aircraft over 12,500 pounds. For L.J. Timmerman Airport, the planned security enhancements focus on limiting vehicle and pedestrian access to the apron areas and aircraft operational areas.

AIRFIELD PLAN

Exhibit 5A graphically depicts the proposed airside and landside improvements at L.J. Timmerman Airport. The following text summarizes the elements of the airfield plan.

AIRFIELD DESIGN STANDARDS

The FAA (Federal Aviation Administration) has established a variety of design criterion to define the physical dimensions of runways and taxiways and the imaginary surfaces surrounding them that protect the safe operation of aircraft at the airport. FAA design standards also define the separation criteria for the placement of landside facilities. As discussed previously in Chapter Three, FAA design criteria is a function of the critical design aircraft's (the most demanding aircraft or "family" of aircraft which will conduct 500 or more operations (take-offs and landings) per year at the airport) wingspan and approach speed, and in some cases, the runway approach visibility minimums. The FAA has established the Airport Reference Code (ARC) to relate these factors to airfield design standards.

L.J. Timmerman Airport is currently used by a wide range of general aviation piston-powered and turbine powered aircraft. These aircraft range from ARC A-I to ARC B-II, with occasional use by aircraft in higher ARCs. General aviation business jets are the most demanding aircraft to operate at the airport, due to their larger wingspans and higher approach speeds when compared with the remaining types of aircraft operating at the airport. For the plan, business jets within Approach Category B and ADG II are expected to comprise the critical design aircraft through the planning period. **Table 5A** summarizes the ultimate ARC B-II airfield safety and facility dimensions for Runway 15L-33R, which defines the airfield ARC design standards. These standards were considered in the planned improvements of the existing airport site, to be discussed in greater detail later within this chapter.

AIRSIDE DEVELOPMENT

The airside plan includes pavement extensions as defined by Alternative E in Chapter Four, to provide a longer primary runway on the airfield. This plan includes a 300-foot pavement extension to Runway 15L and a 300-foot pavement extension to Runway 33R. Parallel taxiway B will be extended to the runway end, and runup aprons will be provided at each of the extended taxiways. The landing threshold locations will remain unchanged, resulting in displaced landing thresholds of 300 feet. The final 200 feet of pavement on the southeast runway end will not be available for arrival/departure calculations on Runway 15L (for safety area) and the pavement will need to be marked and lighted as such. Full safety areas will be available on the northwest end of the runway.

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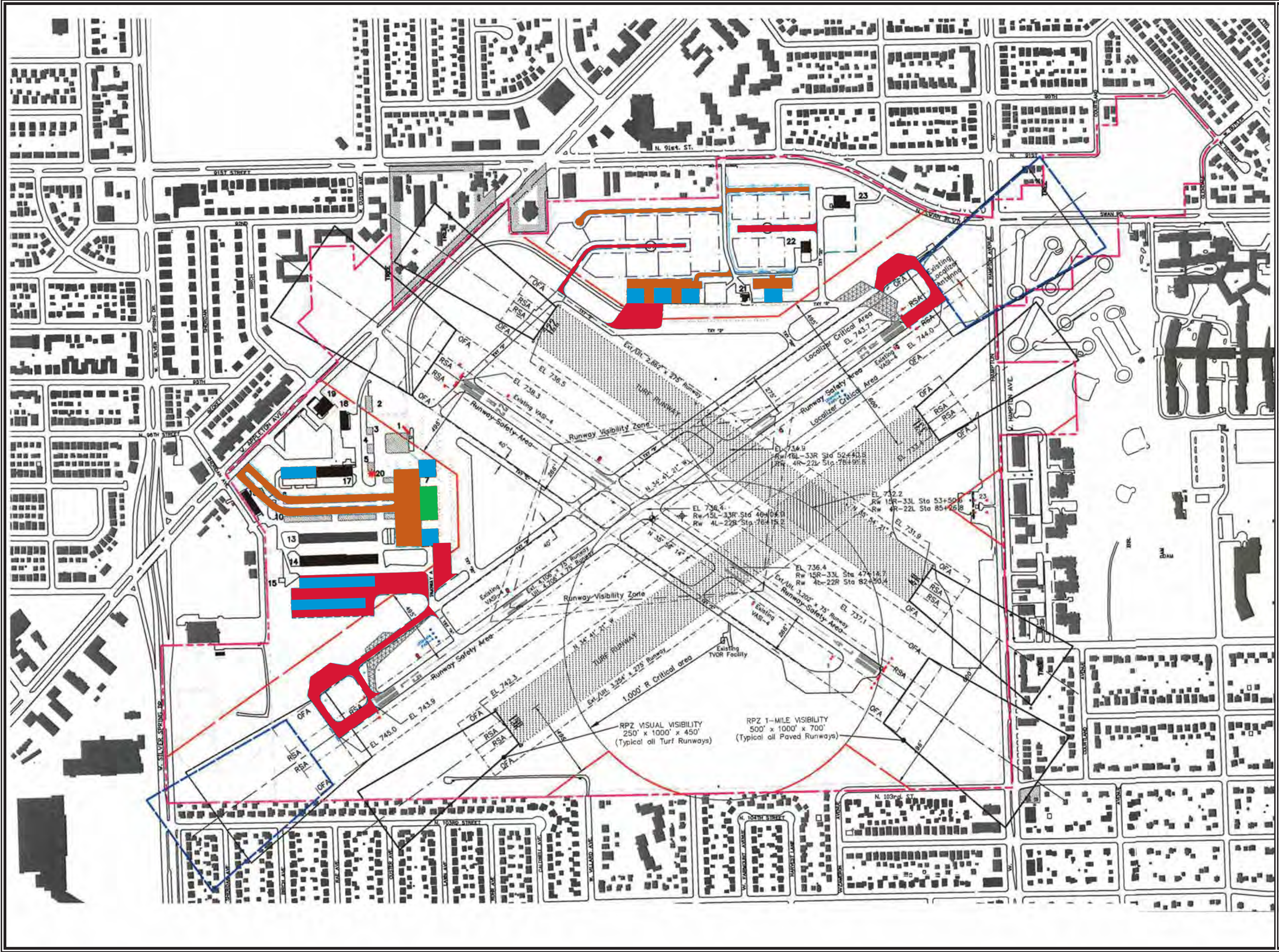


LEGEND

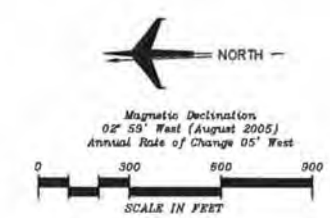
EXISTING	ULTIMATE	DESCRIPTION
		AIRPORT PROPERTY LINE
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
		AVIGATION EASEMENT
		BUILDING CONSTRUCTION
		BUILDING RESTRICTION LINE (BRL)
		DRAINAGE
		PAVEMENT CONSTRUCTION
		FENCING
VASI-4	PAPI-4	VISUAL APPROACH PATH INDICATORS
		RUNWAY THRESHOLD and END LIGHTS
		SECTION CORNER
		TOPOGRAPHIC GROUND CONTOURS (1997 Mapping)
		WIND INDICATOR

BUILDINGS/FACILITIES

EXISTING	DESCRIPTION	ELEVATION
1	ADMINISTRATION/TERMINAL BUILDING	775 MSL
2	SCHWARTZBURG HANGAR	– MSL
3	QUONSET (EAST)	– MSL
4	QUONSET (MIDDLE)	– MSL
5	QUONSET (WEST)	– MSL
6	NORTH MASONRY T-HANGAR "I" AND "J" ROW	– MSL
7	SOUTH METAL T-HANGAR "A" AND "B" ROW	– MSL
8	SOUTH METAL T-HANGAR "C" AND "D" ROW	– MSL
9	SOUTH METAL T-HANGAR "E" AND "F" ROW	– MSL
10	NORTH MASONRY T-HANGAR "K" AND "L" ROW	– MSL
11	T-HANGAR	– MSL
12	METRO FLYING CLUB	– MSL
13	T-HANGAR "M" AND "N" ROW	– MSL
14	T-HANGAR "O" AND "P" ROW	– MSL
15	FUEL FACILITY	– MSL
16	COUNTY MAINTENANCE BUILDING	– MSL
17	CLEARSPAN HANGAR "G" ROW	– MSL
18	CIVIL AIR PATROL HANGAR	– MSL
19	FIRE STATION	882 MSL
20	AIRPORT ROTATING BEACON	– MSL
21	AIR TRAFFIC CONTROL TOWER (ATCT floor EL 874)	– MSL
22	SHERIFF'S HANGAR	– MSL
23	VACANT HANGAR	– MSL
24	Remote Transmitter/Receiver (RTR)	– MSL

LEGEND

- New Airfield Pavement
- Hangars
- Terminal/Hangar
- New Road/Parking



Lawrence J. TIMMERMAN AIRPORT

Exhibit 5A
MASTER PLAN CONCEPT

TABLE 5A **Planned Airfield Safety and Facility Dimensions (in feet)** **Runway 15L-33R**	**Runway 15L-33R**
Airport Reference Code (ARC)	B-II
Approach Visibility Minimums	1 mile non-precision
Runway	
Width	75
Length	4,706
Runway Safety Area (RSA)	
Width	150
Length Beyond Runway End	300
Object Free Area (OFA)	
Width	500
Length Beyond Runway End	300
Obstacle Free Zone (OFZ)	
Width	400
Length Beyond Runway End	200
Runway Centerline To:	
Hold Line	200 (actual)
Parallel Taxiway Centerline	275 (actual)
Edge of Aircraft Parking	340 (actual)
Runway Protection Zone (RPZ)	
Inner Width	500
Outer Width	700
Length	1,000
Approach Obstacle Clearance	20:1
Taxiways	
Width	40 (Actual)
Safety Area Width	79
Object Free Area Width	131
Taxiway Centerline To:	
Parallel Taxiway/Taxilane	105
Fixed or Moveable Object	65.5
Taxilanes	
Taxilane Centerline To:	
Parallel Taxilane Centerline	97
Fixed or Moveable Object	57.5
Taxilane Object Free Area	115

Source: FAA Advisory Circular 150/5300-13, *Airport Design*, FAR Part 77, *Objects Affecting Navigable Airspace*, FAA Advisory Circular 150/5340-1J, *Marking Of Paved Areas On Airports*

LANDSIDE DEVELOPMENT

The plan for the north side of the airfield includes a new entrance into the general aviation facilities from W. Appleton Ave. To provide adequate right-of-way, the plan will require the removal of older metal and masonry hangars, providing the potential for a divided roadway into the fixed base operator (FBO) complex. A new vehicular parking lot will be constructed to serve future FBO facilities, and to segregate vehicular and aircraft traffic. The larger hangar development will face south onto the main transient apron. All of the newer storage hangars will be preserved, and additional space for nested hangars will be provided.

Additional aircraft facilities (for aircraft storage and/or businesses), will be provided on the east side of the airfield. Larger hangars will front onto the tower ramp, while smaller individual hangars will be constructed on individual land leases (ranging from 0.5-1.5 acres in size). Access taxiways will be extended from Taxiways D and D1, while roadways will be developed from the existing entrance on N. 91st St.

The hangars fronting the tower ramp have been depicted at 8,000 square feet, although exact sizing will depend on tenant needs.

CAPITAL IMPROVEMENT PROGRAM

Table 5B summarizes the capital improvements which are required to implement the development plan. An estimate of federal and state funding eligibility has been included with each project, although these amounts are not guaranteed through the funding program. Projects reflecting only total cost assume third party financing. The current federal program is scheduled to expire in 2007 (refer to following paragraphs).

Due to the conceptual nature of a planning document, implementation of capital improvement projects should occur only after further refinement of their design and costs through engineering and/or architectural analyses. Capital costs in **Table 5B** should be viewed only as estimates subject to further refinement during design.

TABLE 5B
Airport Capital Improvement Projects
L.J. Timmerman Airport

Projects	Total	AIP	State	Local
1. Environmental Documentation	$150,000	$142,000	$4,000	$4,000
2. Grading, Pavement, Lighting (Runway 15L-33R Ext.)	1,690,000	1,605,000	43,000	43,000
3. New Nested Hangars – North Ramp	3,120,000	--	--	--
4. Pavement – North Ramp	800,000	760,000	20,000	20,000
5. Complete G – Row Hangars	780,000	--	--	--
6. Remove Older Hangars – North Ramp	330,000	314,000	8,000	8,000
7. Construct New Entrance Road	1,200,000	1,140,000	30,000	30,000
8. Construct New Vehicle Parking	390,000	370,000	10,000	10,000
9. Large Hangar Development – N. Ramp	2,730,000	--	--	--
10. Roadway Extensions – Tower Ramp	318,000	302,000	8,000	8,000
11. Taxiway Extensions – Tower Ramp	185,000	176,000	4,500	4,500
12. Apron Expansion	460,000	436,000	11,500	11,500
13. Hangar Development – Tower Ramp	1,920,000	--	--	--
14. Security Fencing	60,000	57,000	1,500	1,500
15. Pavement Rehabilitation	2,600,000	2,470,000	65,000	65,000
Totals	$16,733,000	$7,772,000	$205,500	$205,500

CAPITAL IMPROVEMENTS FUNDING

Financing of the capital improvements will not rely exclusively on Milwaukee County. Capital funding of projects is available through the Airport Improvement Program (AIP), as administered in Wisconsin (a block grant state) by the Federal Aviation Administration and the Wisconsin DOT (WisDOT) and through state financial aid. Wisconsin is one of ten states that receive financial aid through the federal block grant program.

FEDERAL GRANTS

Through federal legislation over the years, various grants-in-aid programs have been established to develop and maintain a system of public airports throughout the United States. The purpose of this system and its federally-based funding is to maintain national defense and promote interstate commerce. The most recent legislation is the *Vision 100 – Century of Aviation Reauthorization Act*, passed by both houses of Congress in October 2003.

Vision 100 is a four-year bill covering FAA fiscal years 2004, 2005, 2006, and 2007. *Vision 100* authorized funding levels of $3.4 billion in 2004, increasing $1 billion annually until reaching $3.7 billion in 2007 (appropriations have fallen below authorized levels in each of the last four years).

The source for federal funding of airports is the Aviation Trust Fund. The Aviation Trust Fund was established in 1970 to provide funding for aviation capital investment programs (aviation development, facilities and equipment, and research and development). The Trust Fund also finances the operation of the FAA. It is funded by user fees, taxes on airline tickets, aviation fuel, and various aircraft parts.

Proceeds from the Aviation Trust Fund are distributed each year by the FAA, from appropriations by Congress. A portion of the annual distribution is to primary commercial service airports, based upon enplanement levels. Commercial service airports enplaning more than 10,000 passengers annually are provided a $1,000,000 annual entitlement. For eligible general aviation airports, *Vision 100* provides up to $150,000 of funding each year. As a general aviation reliever airport, L.J. Timmerman Airport is eligible for the entitlement based upon projects identified in the five-year capital program.

After meeting entitlement obligations, the remaining Airport Improvement Program (AIP) funds are distributed by the FAA, based upon the priority of the project for which they have requested federal assistance through discretionary apportionments. A national priority ranking system is used to evaluate and rank each airport project. Those projects with the highest priority are given preference in funding.

Airport development that meets the FAA's eligibility requirements can receive 95 percent federal funding. Property acquisition, airfield improvements, aprons, perimeter service roads, and access road improvements are examples of eligible items. General aviation terminal buildings are not generally eligible. *Vision 100* does provide for the Secretary of Transportation to decide to fund revenue-generating developments such as hangars and fuel facilities, which have historically not been eligible for federal funding. *Vision 100* limits this funding eligibility to nonprimary airports such as L.J. Timmerman Airport. *Vision 100* also requires the Secretary of Transportation to determine that adequate provisions have been made to finance airside needs at the airport, prior to an airport receiving funding for revenue generating development.

STATE AID TO AIRPORTS

In support of the state airport program, the State of Wisconsin also participates in the development of airport improvements through the Wisconsin Department of Transportation (WisDOT), Bureau of Aeronautics. The airport improvement funds are appropriated from the state's unified transportation fund. Aviation user fees from the aircraft registration tax, general aviation fuel tax, and airline property tax assist in funding the state's share.

WisDOT is very active in airport improvement projects, acting as the agent for the airport sponsor where state and federal airport improvement funds are involved. Under the state program, an airport can receive funding for one-half of the local share of projects receiving federal AIP funding. The State can also provide 80 percent funding for eligible airside projects not involving federal aid and 50 percent funding for landside development projects. In some cases, the WisDOT will fund key eligible projects when federal funding is not forthcoming. The state cannot participate in the funding of hangars or fuel facilities, and is limited to a maximum of $500,000 for eligible buildings.

The Wisconsin Department of Transportation has also established an Advance Land Acquisition Loan Program. This program was established to loan state funds to eligible airport sponsors for acquisition of land essential for airport development. The loan is repaid when the FAA reimburses the sponsor with a grant.

LOCAL FUNDING

The balance of project costs, after consideration has been given to grants, must be funded through local resources. Assuming federal and state funding, this essentially equates to 2.5 percent of the project costs if all eligible FAA and WisDOT funds are available.

There are several alternatives for local finance options for future development at the airport, including airport revenues, direct funding from Milwaukee County, bonds, and leasehold financing. These strategies could be used to fund the local matching share, or complete the project if grant funding cannot be arranged.

The capital improvement program has assumed that hangar development would be completed privately. Under this type of development, Milwaukee County would complete the necessary infrastructure improvements that are grant-eligible.

Final decisions on funding of improvements will require additional review by Milwaukee County, WisDOT, and tenants.

Lawrence J. TIMMERMAN AIRPORT

Appendix A

GLOSSARY AND ABBREVIATIONS

Glossary of Terms

ABOVE GROUND LEVEL: The elevation of a point or surface above the ground.

ACCELERATE-STOP DISTANCE AVAILABLE (ASDA): See declared distances.

ADVISORY CIRCULAR: External publications issued by the FAA consisting of non-regulatory material providing for the recommendations relative to a policy, guidance and information relative to a specific aviation subject.

AIR CARRIER: An operator which: (1) performs at least five round trips per week between two or more points and publishes flight schedules which specify the times, days of the week, and places between which such flights are performed; or (2) transports mail by air pursuant to a current contract with the U.S. Postal Service. Certified in accordance with Federal Aviation Regulation (FAR) Parts 121 and 127.

AIRCRAFT: A transportation vehicle that is used or intended for use for flight.

AIRCRAFT APPROACH CATEGORY: An alphabetic classification of aircraft based upon 1.3 times the stall speed in a landing configuration at their maximum certified landing weight.

AIRCRAFT OPERATION: The landing, takeoff, or touch-and-go procedure by an aircraft on a runway at an airport.

AIRCRAFT OPERATIONS AREA: A restricted and secure area on the airport property designed to protect all aspects related to aircraft operations.

AIRCRAFT OWNERS AND PILOTS ASSOCIATION: A private organization serving the interests and needs of general aviation pilots and aircraft owners.

AIRCRAFT APPROACH CATEGORY: A grouping of aircraft based on 1.3 times the stall speed in their landing configuration at their maximum certificated landing weight. The categories are as follows:

- *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 greater than 166 knots.

AIRCRAFT RESCUE AND FIRE FIGHTING: A facility located at an airport that provides emergency vehicles, extinguishing agents, and personnel responsible for minimizing the impacts of an aircraft accident or incident.

AIRFIELD: The portion of an airport which contains the facilities necessary for the operation of aircraft.

AIRLINE HUB: An airport at which an airline concentrates a significant portion of its activity and which often has a significant amount of connecting traffic.

AIRPLANE DESIGN GROUP (ADG): A grouping of aircraft based upon wingspan. The 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 or greater.

AIRPORT AUTHORITY: A quasi-governmental public organization responsible for setting the policies governing the management and operation of an airport or system of airports under its jurisdiction.

AIRPORT BEACON: A navigational aid located at an airport which displays a rotating light beam to identify whether an airport is lighted.

AIRPORT CAPITAL IMPROVEMENT PLAN: The planning program used by the Federal Aviation Administration to identify, prioritize, and distribute funds for airport development and the needs of the National Airspace System to meet specified national goals and objectives.

AIRPORT ELEVATION: The highest point on the runway system at an airport expressed in feet above mean sea level (MSL).

AIRPORT LAYOUT DRAWING (ALD): The drawing of the airport showing the layout of existing and proposed airport facilities.

AIRPORT MASTER PLAN: The planner's concept of the long-term development of an airport.

AIRPORT MOVEMENT AREA SAFETY SYSTEM: A system that provides automated alerts and warnings of potential runway incursions or other hazardous aircraft movement events.

AIRPORT OBSTRUCTION CHART: A scaled drawing depicting the Federal Aviation Regulation (FAR) Part 77 surfaces, a representation of objects that penetrate these surfaces, runway, taxiway, and ramp areas, navigational aids, buildings, roads and other detail in the vicinity of an an airport.

AIRPORT REFERENCE CODE (ARC): A coding system used to relate airport design criteria to the operational (Aircraft Approach Category) to the physical characteristics (Airplane Design Group) of the airplanes intended to operate at the airport.

AIRPORT REFERENCE POINT (ARP): The latitude and longitude of the approximate center of the airport.

AIRPORT SPONSOR: The entity that is legally responsible for the management and operation of an airport, including the fulfillment of the requirements of laws and regulations related thereto.

AIRPORT SURFACE DETECTION EQUIPMENT: A radar system that provides air traffic controllers with a visual representation of the movement of aircraft and other vehicles on the ground on the airfield at an airport.

AIRPORT SURVEILLANCE RADAR: The primary radar located at an airport or in an air traffic control terminal area that receives a signal at an antenna and transmits the signal to air traffic control display equipment defining the location of aircraft in the air. The signal provides only the azimuth and range of aircraft from the location of the antenna.

AIRPORT TRAFFIC CONTROL TOWER (ATCT): A central operations facility in the terminal air traffic control system, consisting of a tower, including an associated instrument flight rule (IFR) room if radar equipped, using air/ground communications and/or radar, visual signaling and other devices to provide safe and expeditious movement of terminal air traffic.

AIR ROUTE TRAFFIC CONTROL CENTER: A facility which provides enroute air traffic control service to aircraft operating on an IFR flight plan within controlled airspace over a large, multi-state region.

AIRSIDE: The portion of an airport that contains the facilities necessary for the operation of aircraft.

AIRSPACE: The volume of space above the surface of the ground that is provided for the operation of aircraft.

AIR TAXI: An air carrier certificated in accordance with FAR Part 121 and FAR Part 135 and authorized to provide, on demand, public transportation of persons and property by aircraft. Generally operates small aircraft "for hire" for specific trips.

AIR TRAFFIC CONTROL: A service operated by an appropriate organization for the purpose of providing for the safe, orderly, and expeditious flow of air traffic.

AIR ROUTE TRAFFIC CONTROL CENTER (ARTCC): A facility established to provide air traffic control service to aircraft operating on an IFR flight plan within controlled airspace and principally during the enroute phase of flight.

AIR TRAFFIC HUB: A categorization of commercial service airports or group of commercial service airports in a metropolitan or urban area based upon the proportion of annual national enplanements existing at the airport or airports. The categories are large hub, medium hub, small hub, or non-hub. It forms the basis for the apportionment of entitlement funds.

AIR TRANSPORT ASSOCIATION OF AMERICA: An organization consisting of the principal U.S. airlines that represents the interests of the airline industry on major aviation issues before federal, state, and local government bodies. It promotes air transportation safety by coordinating industry and governmental safety programs and it serves as a focal point for industry efforts to standardize practices and enhance the efficiency of the air transportation system.

ALERT AREA: See special-use airspace.

ALTITUDE: The vertical distance measured in feet above mean sea level.

ANNUAL INSTRUMENT APPROACH (AIA): An approach to an airport with the intent to land by an aircraft in accordance with an IFR flight plan when visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude.

APPROACH LIGHTING SYSTEM (ALS): An airport lighting facility which provides visual guidance to landing aircraft by radiating light beams by which the pilot aligns the aircraft with the extended centerline of the runway on his final approach and landing.

APPROACH MINIMUMS: The altitude below which an aircraft may not descend while on an IFR approach unless the pilot has the runway in sight.

APPROACH SURFACE: An imaginary obstruction limiting surface defined in FAR Part 77 which is longitudinally centered on an extended runway centerline and extends outward and upward from the primary surface at each end of a runway at a designated slope and distance based upon the type of available or planned approach by aircraft to a runway.

APRON: A specified portion of the airfield used for passenger, cargo or freight loading and unloading, aircraft parking, and the refueling, maintenance and servicing of aircraft.

AREA NAVIGATION: The air navigation procedure that provides the capability to establish and maintain a flight path on an arbitrary course that remains within the coverage area of navigational sources being used.

AUTOMATED TERMINAL INFORMATION SERVICE (ATIS): The continuous broadcast of recorded non-control information at towered airports. Information typically includes wind speed, direction, and runway in use.

AUTOMATED SURFACE OBSERVATION SYSTEM (ASOS): A reporting system that provides frequent airport ground surface weather observation data through digitized voice broadcasts and printed reports.

AUTOMATED WEATHER OBSERVATION STATION (AWOS): Equipment used to automatically record weather conditions (i.e. cloud height, visibility, wind speed and direction, temperature, dewpoint, etc.)

AUTOMATIC DIRECTION FINDER (ADF): An aircraft radio navigation system which senses and indicates the direction to a non-directional radio beacon (NDB) ground transmitter.

AVIGATION EASEMENT: A contractual right or a property interest in land over which a right of unobstructed flight in the airspace is established.

AZIMUTH: Horizontal direction expressed as the angular distance between true north and the direction of a fixed point (as the observer's heading).

BASE LEG: A flight path at right angles to the landing runway off its approach end. The base leg normally extends from the downwind leg to the intersection of the extended runway centerline. See "traffic pattern."

BASED AIRCRAFT: The general aviation aircraft that use a specific airport as a home base.

BEARING: The horizontal direction to or from any point, usually measured clockwise from true north or magnetic north.

BLAST FENCE: A barrier used to divert or dissipate jet blast or propeller wash.

BLAST PAD: A prepared surface adjacent to the end of a runway for the purpose of eliminating the erosion of the ground surface by the wind forces produced by airplanes at the initiation of takeoff operations.

BUILDING RESTRICTION LINE (BRL): A line which identifies suitable building area locations on the airport.

CAPITAL IMPROVEMENT PLAN: The planning program used by the Federal Aviation Administration to identify, prioritize, and distribute Airport Improvement Program funds for airport development and the needs of the National Airspace System to meet specified national goals and objectives.

CARGO SERVICE AIRPORT: An airport served by aircraft providing air transportation of property only, including mail, with an annual aggregate landed weight of at least 100,000,000 pounds.

CATEGORY I: An Instrument Landing System (ILS) that provides acceptable guidance information to an aircraft from the coverage limits of the ILS to the point at which the localizer course line intersects the glide path at a decision height of 100 feet above the horizontal plane containing the runway threshold.

CATEGORY II: An ILS that provides acceptable guidance information to an aircraft from the coverage limits of the ILS to the point at which the localizer course line intersects the glide path at a decision height of 50 feet above the horizontal plane containing the runway threshold.

CATEGORY III: An ILS that provides acceptable guidance information to a pilot from the coverage limits of the ILS with no decision height specified above the horizontal plane containing the runway threshold.

CEILING: The height above the ground surface to the location of the lowest layer of clouds which is reported as either broken or overcast.

CIRCLING APPROACH: A maneuver initiated by the pilot to align the aircraft with the runway for landing when flying a predetermined circling instrument approach under IFR.

CLASS A AIRSPACE: See Controlled Airspace.

CLASS B AIRSPACE: See Controlled Airspace.

CLASS C AIRSPACE: See Controlled Airspace.

CLASS D AIRSPACE: See Controlled Airspace.

CLASS E AIRSPACE: See Controlled Airspace.

CLASS G AIRSPACE: See Controlled Airspace.

CLEAR ZONE: See Runway Protection Zone.

COMMERCIAL SERVICE AIRPORT: A public airport providing scheduled passenger service that enplanes at least 2,500 annual passengers.

COMMON TRAFFIC ADVISORY FREQUENCY: A radio frequency identified in the appropriate aeronautical chart which is designated for the purpose of transmitting airport advisory information and procedures while operating to or from an uncontrolled airport.

COMPASS LOCATOR (LOM): A low power, low/medium frequency radio-beacon installed in conjunction with the instrument landing system at one or two of the marker sites.

CONICAL SURFACE: An imaginary obstruction-limiting surface defined in FAR Part 77 that extends from the edge of the horizontal surface outward and upward at a slope of 20 to 1 for a horizontal distance of 4,000 feet.

CONTROLLED AIRPORT: An airport that has an operating airport traffic control tower.

CONTROLLED AIRSPACE: Airspace of defined dimensions within which air traffic control services are provided to instrument flight rules (IFR) and visual flight rules (VFR) flights in accordance with the airspace classification. Controlled airspace in the United States is designated as follows:

- *CLASS A:* Generally, the airspace from 18,000 feet mean sea level (MSL) up to but not including flight level FL600. All persons must operate their aircraft under IFR.

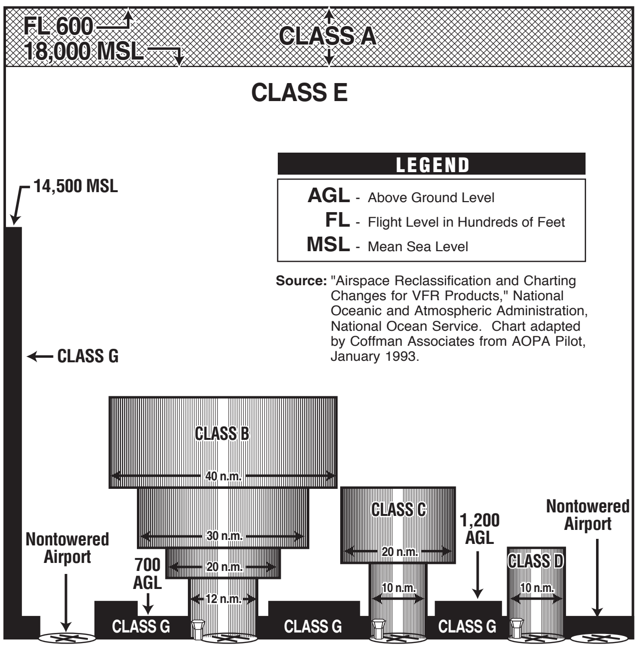
- *CLASS B:* Generally, the airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports. The configuration of Class B airspace is unique to each airport, but typically consists of two or more layers of air space and is designed to contain all published instrument approach procedures to the airport. An air traffic control clearance is required for all aircraft to operate in the area.

- *CLASS C:* Generally, the airspace from the surface to 4,000 feet above the airport elevation (charted as MSL) surrounding those airports that have an operational control tower and radar approach control and are served by a qualifying number of IFR operations or passenger enplanements. Although individually tailored for each airport, Class C airspace typically consists of a surface area with a five nautical mile (nm) radius and an outer area with a 10 nautical mile radius that extends from 1,200 feet to 4,000 feet above the airport elevation. Two-way radio communication is required for all aircraft.

- *CLASS D:* Generally, that airspace from the surface to 2,500 feet above the air port elevation (charted as MSL) surrounding those airports that have an operational control tower. Class D airspace is individually tailored and configured to encompass published instrument approach proce dures. Unless otherwise authorized, all persons must establish two-way radio communication.

- *CLASS E:* Generally, controlled airspace that is not classified as Class A, B, C, or D. Class E airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. When designated as a surface area, the airspace will be configured to contain all instrument procedures. Class E airspace encompasses all Victor Airways. Only aircraft following instrument flight rules are required to establish two-way radio communication with air traffic control.

- *CLASS G:* Generally, that airspace not classified as Class A, B, C, D, or E. Class G airspace is uncontrolled for all aircraft. Class G airspace extends from the surface to the overlying Class E airspace.



CONTROLLED FIRING AREA: See special-use airspace.

CROSSWIND: A wind that is not parallel to a runway centerline or to the intended flight path of an aircraft.

CROSSWIND COMPONENT: The component of wind that is at a right angle to the runway centerline or the intended flight path of an aircraft.

CROSSWIND LEG: A flight path at right angles to the landing runway off its upwind end. See "traffic pattern."

DECIBEL: A unit of noise representing a level relative to a reference of a sound pressure 20 micro newtons per square meter.

DECISION HEIGHT: The height above the end of the runway surface at which a decision must be made by a pilot during the ILS or Precision Approach Radar approach to either continue the approach or to execute a missed approach.

DECLARED DISTANCES: The distances declared available for the airplane's takeoff runway, takeoff distance, accelerate-stop distance, and landing distance requirements. The distances are:

- *TAKEOFF RUNWAY AVAILABLE (TORA):* The runway length declared available and suitable for the ground run of an airplane taking off;

- *TAKEOFF DISTANCE AVAILABLE (TODA):* The TORA plus the length of any remaining runway and/or clear way beyond the far end of the TORA;

- *ACCELERATE-STOP DISTANCE AVAILABLE (ASDA):* The runway plus stopway length declared available for the acceleration and deceleration of an aircraft aborting a takeoff; and

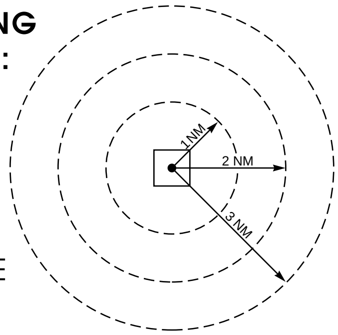
- *LANDING DISTANCE AVAILABLE (LDA):* The runway length declared available and suitable for landing.

DEPARTMENT OF TRANSPORTATION: The cabinet level federal government organization consisting of modal operating agencies, such as the Federal Aviation Administration, which was established to promote the coordination of federal transportation programs and to act as a focal point for research and development efforts in transportation.

DISCRETIONARY FUNDS: Federal grant funds that may be appropriated to an airport based upon designation by the Secretary of Transportation or Congress to meet a specified national priority such as enhancing capacity, safety, and security, or mitigating noise.

DISPLACED THRESHOLD: A threshold that is located at a point on the runway other than the designated beginning of the runway.

DISTANCE MEASURING EQUIPMENT (DME): Equipment (airborne and ground) used to measure, in nautical miles, the slant range distance of an aircraft from the DME navigational aid.



DNL: The 24-hour average sound level, in A-weighted decibels, obtained after the addition of ten decibels to sound levels for the periods between 10 p.m. and 7 a.m. as averaged over a span of one year. It is the FAA standard metric for determining the cumulative exposure of individuals to noise.

DOWNWIND LEG: A flight path parallel to the landing runway in the direction opposite to landing. The downwind leg normally extends between the crosswind leg and the base leg. Also see "traffic pattern."

EASEMENT: The legal right of one party to use a portion of the total rights in real estate owned by another party. This may include the right of passage over, on, or below the property; certain air rights above the property, including view rights; and the rights to any specified form of development or activity, as well as any other legal rights in the property that may be specified in the easement document.

ELEVATION: The vertical distance measured in feet above mean sea level.

ENPLANED PASSENGERS: The total number of revenue passengers boarding aircraft, including originating, stop-over, and transfer passengers, in scheduled and non-scheduled services.

ENPLANEMENT: The boarding of a passenger, cargo, freight, or mail on an aircraft at an airport.

ENTITLEMENT: Federal funds for which a commercial service airport may be eligible based upon its annual passenger enplanements.

ENVIRONMENTAL ASSESSMENT (EA): An environmental analysis performed pursuant to the National Environmental Policy Act to determine whether an action would significantly affect the environment and thus require a more detailed environmental impact statement.

ENVIRONMENTAL AUDIT: An assessment of the current status of a party's compliance with applicable environmental requirements of a party's environmental compliance policies, practices, and controls.

ENVIRONMENTAL IMPACT STATEMENT (EIS): A document required of federal agencies by the National Environmental Policy Act for major projects ar legislative proposals affecting the environment. It is a tool for decision-making describing the positive and negative effects of a proposed action and citing alternative actions.

ESSENTIAL AIR SERVICE: A federal program which guarantees air carrier service to selected small cities by providing subsidies as needed to prevent these cities from such service.

FEDERAL AVIATION REGULATIONS: The general and permanent rules established by the executive departments and agencies of the Federal Government for aviation, which are published in the Federal Register. These are the aviation subset of the Code of Federal Regulations.

FINAL APPROACH: A flight path in the direction of landing along the extended runway centerline. The final approach normally extends from the base leg to the runway. See "traffic pattern."

FINDING OF NO SIGNIFICANT IMPACT (FONSI): A public document prepared by a Federal agency that presents the rationale why a proposed action will not have a significant effect on the environment and for which an environmental impact statement will not be prepared.

FIXED BASE OPERATOR (FBO): A provider of services to users of an airport. Such services include, but are not limited to, hangaring, fueling, flight training, repair, and maintenance.

FLIGHT LEVEL: A designation for altitude within controlled airspace.

FLIGHT SERVICE STATION: An operations facility in the national flight advisory system which utilizes data interchange facilities for the collection and dissemination of Notices to Airmen, weather, and administrative data and which provides pre-flight and in-flight advisory services to pilots through air and ground based communication facilities.

FRANGIBLE NAVAID: A navigational aid which retains its structural integrity and stiffness up to a designated maximum load, but on impact from a greater load, breaks, distorts, or yields in such a manner as to present the minimum hazard to aircraft.

GENERAL AVIATION: That portion of civil aviation which encompasses all facets of aviation except air carriers holding a certificate of convenience and necessity, and large aircraft commercial operators.

GLIDESLOPE (GS): Provides vertical guidance for aircraft during approach and landing. The glideslope consists of the following:

1. Electronic components emitting signals which provide vertical guidance by reference to airborne instruments during instrument approaches such as ILS; or

2. Visual ground aids, such as VASI, which provide vertical guidance for VFR approach or for the visual portion of an instrument approach and landing.

GLOBAL POSITIONING SYSTEM (GPS): A system of 24 satellites used as reference points to enable navigators equipped with GPS receivers to determine their latitude, longitude, and altitude.

GROUND ACCESS: The transportation system on and around the airport that provides access to and from the airport by ground transportation vehicles for passengers, employees, cargo, freight, and airport services.

HELIPAD: A designated area for the takeoff, landing, and parking of helicopters.

HIGH INTENSITY RUNWAY LIGHTS: The highest classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

HIGH-SPEED EXIT TAXIWAY: A long radius taxiway designed to expedite aircraft turning off the runway after landing (at speeds to 60 knots), thus reducing runway occupancy time.

HORIZONTAL SURFACE: An imaginary obstruction-limiting surface defined in FAR Part 77 that is specified as a portion of a horizontal plane surrounding a runway located 150 feet above the established airport elevation. The specific horizontal dimensions of this surface are a function of the types of approaches existing or planned for the runway.

INSTRUMENT APPROACH PROCEDURE: A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing, or to a point from which a landing may be made visually.

INSTRUMENT FLIGHT RULES (IFR): Procedures for the conduct of flight in weather conditions below Visual Flight Rules weather minimums. The term IFR is often also used to define weather conditions and the type of flight plan under which an aircraft is operating.

INSTRUMENT LANDING SYSTEM (ILS): A precision instrument approach system which normally consists of the following electronic components and visual aids:

1. Localizer.
2. Glide Slope.
3. Outer Marker.
4. Middle Marker.
5. Approach Lights.

INSTRUMENT METEOROLOGICAL CONDITIONS: Meteorological conditions expressed in terms of specific visibility and ceiling conditions that are less than the minimums specified for visual meteorological conditions.

ITINERANT OPERATIONS: Operations by aircraft that are not based at a specified airport.

KNOTS: A unit of speed length used in navigation that is equivalent to the number of nautical miles traveled in one hour.

LANDSIDE: The portion of an airport that provides the facilities necessary for the processing of passengers, cargo, freight, and ground transportation vehicles.

LANDING DISTANCE AVAILABLE (LDA): See declared distances.

LARGE AIRPLANE: An airplane that has a maximum certified takeoff weight in excess of 12,500 pounds.

LOCAL AREA AUGMENTATION SYSTEM: A differential GPS system that provides localized measurement correction signals to the basic GPS signals to improve navigational accuracy, integrity, continuity, and availability.

LOCAL OPERATIONS: Aircraft operations performed by aircraft that are based at the airport and that operate in the local traffic pattern or within sight of the airport, that are known to be departing for or arriving from flights in local practice areas within a prescribed distance from the airport, or that execute simulated instrument approaches at the airport.

LOCAL TRAFFIC: Aircraft operating in the traffic pattern or within sight of the tower, or aircraft known to be departing or arriving from the local practice areas, or aircraft executing practice instrument approach procedures. Typically, this includes touch-and-go training operations.

LOCALIZER: The component of an ILS which provides course guidance to the runway.

LOCALIZER TYPE DIRECTIONAL AID (LDA): A facility of comparable utility and accuracy to a localizer, but is not part of a complete ILS and is not aligned with the runway.

LONG RANGE NAVIGATION SYSTEM (LORAN): Long range navigation is an electronic navigational aid which determines aircraft position and speed by measuring the difference in the time of reception of synchronized pulse signals from two fixed transmitters. Loran is used for enroute navigation.

LOW INTENSITY RUNWAY LIGHTS: The lowest classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

MEDIUM INTENSITY RUNWAY LIGHTS: The middle classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

MICROWAVE LANDING SYSTEM (MLS): An instrument approach and landing system that provides precision guidance in azimuth, elevation, and distance measurement.

MILITARY OPERATIONS: Aircraft operations that are performed in military aircraft.

MILITARY OPERATIONS AREA (MOA): See special-use airspace.

MILITARY TRAINING ROUTE: An air route depicted on aeronautical charts for the conduct of military flight training at speeds above 250 knots.

MISSED APPROACH COURSE (MAC): The flight route to be followed if, after an instrument approach, a landing is not affected, and occurring normally:

1. When the aircraft has descended to the decision height and has not established visual contact; or

2. When directed by air traffic control to pull up or to go around again.

MOVEMENT AREA: The runways, taxiways, and other areas of an airport which are utilized for taxiing/hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading ramps and parking areas. At those airports with a tower, air traffic control clearance is required for entry onto the movement area.

NATIONAL AIRSPACE SYSTEM: The network of air traffic control facilities, air traffic control areas, and navigational facilities through the U.S.

NATIONAL PLAN OF INTEGRATED AIRPORT SYSTEMS: The national airport system plan developed by the Secretary of Transportation on a biannual basis for the development of public use airports to meet national air transportation needs.

NATIONAL TRANSPORTATION SAFETY BOARD: A federal government organization established to investigate and determine the probable cause of transportation accidents, to recommend equipment and procedures to enhance transportation safety, and to review on appeal the suspension or revocation of any certificates or licenses issued by the Secretary of Transportation.

NAUTICAL MILE: A unit of length used in navigation which is equivalent to the distance spanned by one minute of arc in latitude, that is, 1,852 meters or 6,076 feet. It is equivalent to approximately 1.15 statute mile.

NAVAID: A term used to describe any electrical or visual air navigational aids, lights, signs, and associated supporting equipment (i.e. PAPI, VASI, ILS, etc.)

NOISE CONTOUR: A continuous line on a map of the airport vicinity connecting all points of the same noise exposure level.

NON-DIRECTIONAL BEACON (NDB): A beacon transmitting nondirectional signals whereby the pilot of an aircraft equipped with direction finding equipment can determine his or her bearing to and from the radio beacon and home on, or track to, the station. When the radio beacon is installed in conjunction with the Instrument Landing System marker, it is normally called a Compass Locator.

NON-PRECISION APPROACH PROCEDURE: A standard instrument approach procedure in which no electronic glide slope is provided, such as VOR, TACAN, NDB, or LOC.

NOTICE TO AIRMEN: A notice containing information concerning the establishment, condition, or change in any component of or hazard in the National Airspace System, the timely knowledge of which is considered essential to personnel concerned with flight operations.

OBJECT FREE AREA (OFA): An area on the ground centered on a runway, taxiway, or taxilane centerline provided to enhance the safety of aircraft operations by having the area free of objects, except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes.

OBSTACLE FREE ZONE (OFZ): The airspace below 150 feet above the established airport elevation and along the runway and extended runway centerline that is required to be kept clear of all objects, except for frangible visual NAVAIDs that need to be located in the OFZ because of their function,
in order to provide clearance for aircraft landing or taking off from the runway, and for missed approaches.

OPERATION: A take-off or a landing.

OUTER MARKER (OM): An ILS navigation facility in the terminal area navigation system located four to seven miles from the runway edge on the extended centerline, indicating to the pilot that he/she is passing over the facility and can begin final approach.

PILOT CONTROLLED LIGHTING: Runway lighting systems at an airport that are controlled by activating the microphone of a pilot on a specified radio frequency.

PRECISION APPROACH: A standard instrument approach procedure which provides runway alignment and glide slope (descent) information. It is categorized as follows:

- *CATEGORY I (CAT I):* A precision approach which provides for approaches with a decision height of not less than 200 feet and visibility not less than 1/2 mile or Runway Visual Range (RVR) 2400 (RVR 1800) with operative touchdown zone and runway centerline lights.

- *CATEGORY II (CAT II):* A precision approach which provides for approaches with a decision height of not less than 100 feet and visibility not less than 1200 feet RVR.

- *CATEGORY III (CAT III):* A precision approach which provides for approaches with minima less than Category II.

PRECISION APPROACH PATH INDICATOR (PAPI): A lighting system providing visual approach slope guidance to aircraft during a landing approach. It is similar to a VASI but provides a sharper transition between the colored indicator lights.

PRECISION APPROACH RADAR: A radar facility in the terminal air traffic control system used to detect and display with a high degree of accuracy the direction, range, and elevation of an aircraft on the final approach to a runway.

PRECISION OBJECT FREE AREA (POFA): An area centered on the extended runway centerline, beginning at the runway threshold and extending behind the runway threshold that is 200 feet long by 800 feet wide. The POFA is a clearing standard which requires the POFA to be kept clear of above ground objects protruding above the runway safety area edge elevation (except for frangible NAVAIDS). The POFA applies to all new authorized instrument approach procedures with less than 3/4 mile visibility.

PRIMARY AIRPORT: A commercial service airport that enplanes at least 10,000 annual passengers.

PRIMARY SURFACE: An imaginary obstruction limiting surface defined in FAR Part 77 that is specified as a rectangular surface longitudinally centered about a runway. The specific dimensions of this surface are a function of the types of approaches existing or planned for the runway.

PROHIBITED AREA: See special-use airspace.

PVC: Poor visibility and ceiling. Used in determining Annual Sevice Volume. PVC conditions exist when the cloud ceiling is less than 500 feet and visibility is less than one mile.

RADIAL: A navigational signal generated by a Very High Frequency Omni-directional Range or VORTAC station that is measured as an azimuth from the station.

REGRESSION ANALYSIS: A statistical technique that seeks to identify and quantify the relationships between factors associated with a forecast.

REMOTE COMMUNICATIONS OUTLET (RCO): An unstaffed transmitter receiver/facility remotely controlled by air traffic personnel. RCOs serve flight service stations (FSSs). RCOs were established to provide ground-to-ground communications between air traffic control specialists and pilots at satellite airports for delivering enroute clearances, issuing departure authorizations, and acknowledging instrument flight rules cancellations or departure/landing times.

REMOTE TRANSMITTER/RECEIVER (RTR): See remote communications outlet. RTRs serve ARTCCs.

RELIEVER AIRPORT: An airport to serve general aviation aircraft which might otherwise use a congested air-carrier served airport.

RESTRICTED AREA: See special-use airspace.

RNAV: Area navigation - airborne equipment which permits flights over determined tracks within prescribed accuracy tolerances without the need to overfly ground-based navigation facilities. Used enroute and for approaches to an airport.

RUNWAY: A defined rectangular area on an airport prepared for aircraft landing and takeoff. Runways are normally numbered in relation to their magnetic direction, rounded off to the nearest 10 degrees. For example, a runway with a magnetic heading of 180 would be designated Runway 18. The runway heading on the opposite end of the runway is 180 degrees from that runway end. For example, the opposite runway heading for Runway 18 would be Runway 36 (magnetic heading of 360). Aircraft can takeoff or land from either end of a runway, depending upon wind direction.

RUNWAY ALIGNMENT INDICATOR LIGHT: A series of high intensity sequentially flashing lights installed on the extended centerline of the runway usually in conjunction with an approach lighting system.

RUNWAY END IDENTIFIER LIGHTS (REIL): Two synchronized flashing lights, one on each side of the runway threshold, which provide rapid and positive identification of the approach end of a particular runway.

RUNWAY GRADIENT: The average slope, measured in percent, between the two ends of a runway.

RUNWAY PROTECTION ZONE (RPZ): An area off the runway end to enhance the protection of people and property on the ground. The RPZ is trapezoidal in shape. Its dimensions are determined by the aircraft approach speed and runway approach type and minima.

RUNWAY SAFETY AREA (RSA): A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway.

RUNWAY VISIBILITY ZONE (RVZ): An area on the airport to be kept clear of permanent objects so that there is an unobstructed line-of-site from any point five feet above the runway centerline to any point five feet above an intersecting runway centerline.

RUNWAY VISUAL RANGE (RVR): An instrumentally derived value, in feet, representing the horizontal distance a pilot can see down the runway from the runway end.

SCOPE: The document that identifies and defines the tasks, emphasis, and level of effort associated with a project or study.

SEGMENTED CIRCLE: A system of visual indicators designed to provide traffic pattern information at airports without operating control towers.

SHOULDER: An area adjacent to the edge of paved runways, taxiways, or aprons providing a transition between the pavement and the adjacent surface; support for aircraft running off the pavement; enhanced drainage; and blast protection. The shoulder does not necessarily need to be paved.

SLANT-RANGE DISTANCE: The straight line distance between an aircraft and a point on the ground.

SMALL AIRPLANE: An airplane that has a maximum certified takeoff weight of up to 12,500 pounds.

SPECIAL-USE AIRSPACE: Airspace of defined dimensions identified by a surface area wherein activities must be confined because of their nature and/or wherein limitations may be imposed upon aircraft operations that are not a part of those activities. Special-use airspace classifications include:

- *ALERT AREA:* Airspace which may contain a high volume of pilot training activities or an unusual type of aerial activity, neither of which is hazardous to aircraft.

- *CONTROLLED FIRING AREA:* Airspace wherein activities are conducted under conditions so controlled as to eliminate hazards to nonparticipating aircraft and to ensure the safety of persons or property on the ground.

- *MILITARY OPERATIONS AREA (MOA):* Designated airspace with defined vertical and lateral dimensions established outside Class A airspace to separate/segregate certain military activities from instrument flight rule (IFR) traffic and to identify for visual flight rule (VFR) traffic where these activities are conducted.

- *PROHIBITED AREA:* Designated airspace within which the flight of aircraft is prohibited.

- *RESTRICTED AREA:* Airspace designated under Federal Aviation Regulation (FAR) 73, within which the flight of aircraft, while not wholly prohibited, is subject to restriction. Most restricted areas are designated joint use. When not in use by the using agency, IFR/VFR operations can be authorized by the controlling air traffic control facility.

- *WARNING AREA:* Airspace which may contain hazards to nonparticipating aircraft.

STANDARD INSTRUMENT DEPARTURE (SID): A preplanned coded air traffic control IFR departure routing, preprinted for pilot use in graphic and textual form only.

STANDARD TERMINAL ARRIVAL (STAR): A preplanned coded air traffic control IFR arrival routing, preprinted for pilot use in graphic and textual or textual form only.

STOP-AND-GO: A procedure wherein an aircraft will land, make a complete stop on the runway, and then commence a takeoff from that point. A stop-and-go is recorded as two operations: one operation for the landing and one operation for the takeoff.

STOPWAY: An area beyond the end of a takeoff runway that is designed to support an aircraft during an aborted takeoff without causing structural damage to the aircraft. It is not to be used for takeoff, landing, or taxiing by aircraft.

STRAIGHT-IN LANDING/APPROACH: A landing made on a runway aligned within 30 degrees of the final approach course following completion of an instrument approach.

TACTICAL AIR NAVIGATION (TACAN): An ultra-high frequency electronic air navigation system which provides suitably-equipped aircraft a continuous indication of bearing and distance to the TACAN station.

TAKEOFF RUNWAY AVAILABLE (TORA): See declared distances.

TAKEOFF DISTANCE AVAILABLE (TODA): See declared distances.

TAXILANE: The portion of the aircraft parking area used for access between taxiways and aircraft parking positions.

TAXIWAY: A defined path established for the taxiing of aircraft from one part of an airport to another.

TAXIWAY SAFETY AREA (TSA): A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway.

TERMINAL INSTRUMENT PROCEDURES: Published flight procedures for conducting instrument approaches to runways under instrument meteorological conditions.

TERMINAL RADAR APPROACH CONTROL: An element of the air traffic control system responsible for monitoring the en-route and terminal segment of air traffic in the airspace surrounding airports with moderate to high-levels of air traffic.

TETRAHEDRON: A device used as a landing direction indicator. The small end of the tetrahedron points in the direction of landing.

THRESHOLD: The beginning of that portion of the runway available for landing. In some instances the landing threshold may be displaced.

TOUCH-AND-GO: An operation by an aircraft that lands and departs on a runway without stopping or exiting the runway. A touch-and-go is recorded as two operations: one operation for the landing and one operation for the takeoff.

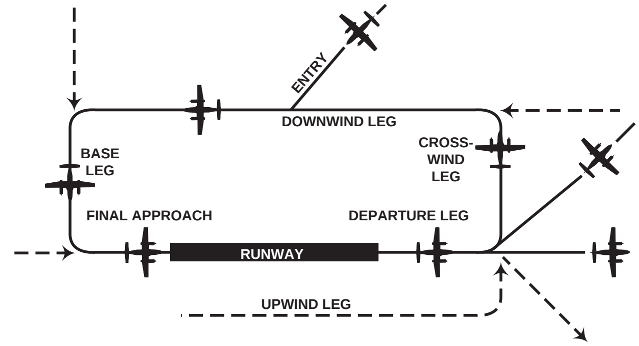
TOUCHDOWN: The point at which a landing aircraft makes contact with the runway surface.

TOUCHDOWN ZONE (TDZ): The first 3,000 feet of the runway beginning at the threshold.

TOUCHDOWN ZONE ELEVATION (TDZE): The highest elevation in the touchdown zone.

TOUCHDOWN ZONE (TDZ) LIGHTING: Two rows of transverse light bars located symmetrically about the runway centerline normally at 100-foot intervals. The basic system extends 3,000 feet along the runway.

TRAFFIC PATTERN: The traffic flow that is prescribed for aircraft landing at or taking off from an airport. The components of a typical traffic pattern are the upwind leg, crosswind leg, downwind leg, base leg, and final approach.

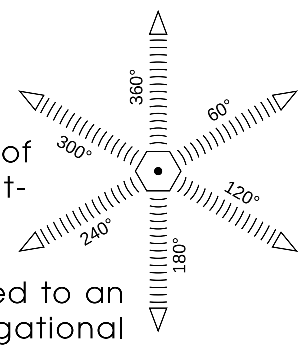


UNCONTROLLED AIRPORT: An airport without an air traffic control tower at which the control of Visual Flight Rules traffic is not exercised.

UNCONTROLLED AIRSPACE: Airspace within which aircraft are not subject to air traffic control.

UNIVERSAL COMMUNICATION (UNICOM): A nongovernment communication facility which may provide airport information at certain airports. Locations and frequencies of UNICOM's are shown on aeronautical charts and publications.

UPWIND LEG: A flight path parallel to the landing runway in the direction of landing. See "traffic pattern."



VECTOR: A heading issued to an aircraft to provide navigational guidance by radar.

VERY HIGH FREQUENCY/ OMNIDIRECTIONAL RANGE STATION (VOR): A ground-based electronic navigation aid transmitting very high frequency navigation signals, 360 degrees in azimuth, oriented from magnetic north. Used as the basis for navigation in the national airspace system. The VOR periodically identifies itself by Morse Code and may have an additional voice identification feature.

VERY HIGH FREQUENCY OMNI-DIRECTIONAL RANGE STATION/ TACTICAL AIR NAVIGATION (VORTAC): A navigation aid providing VOR azimuth, TACAN azimuth, and TACAN distance-measuring equipment (DME) at one site.

VICTOR AIRWAY: A control area or portion thereof established in the form of a corridor, the centerline of which is defined by radio navigational aids.

VISUAL APPROACH: An approach wherein an aircraft on an IFR flight plan, operating in VFR conditions under the control of an air traffic control facility and having an air traffic control authorization, may proceed to the airport of destination in VFR conditions.

VISUAL APPROACH SLOPE INDICATOR (VASI): An airport lighting facility providing vertical visual approach slope guidance to aircraft during approach to landing by radiating a directional pattern of high intensity red and white focused light beams which indicate to the pilot that he is on path if he sees red/white, above path if white/white, and below path if red/red. Some airports serving large aircraft have three-bar VASI's which provide two visual guide paths to the same runway.

VISUAL FLIGHT RULES (VFR): Rules that govern the procedures for conducting flight under visual conditions. The term VFR is also used in the United States to indicate weather conditions that are equal to or greater than minimum VFR requirements. In addition, it is used by pilots and controllers to indicate type of flight plan.

VISUAL METEOROLOGICAL CONDITIONS: Meteorological conditions expressed in terms of specific visibility and ceiling conditions which are equal to or greater than the threshold values for instrument meteorological conditions.

VOR: See "Very High Frequency Omnidirectional Range Station."

VORTAC: See "Very High Frequency Omnidirectional Range Station/Tactical Air Navigation."

WARNING AREA: See special-use airspace.

WIDE AREA AUGMENTATION SYSTEM: An enhancement of the Global Positioning System that includes integrity broadcasts, differential corrections, and additional ranging signals for the purpose of providing the accuracy, integrity, availability, and continuity required to support all phases of flight.

Abbreviations

AC: advisory circular

ADF: automatic direction finder

ADG: airplane design group

AFSS: automated flight service station

AGL: above ground level

AIA: annual instrument approach

AIP: Airport Improvement Program

AIR-21: Wendell H. Ford Aviation Investment and Reform Act for the 21st Century

ALS: approach lighting system

ALSF-1: standard 2,400-foot high intensity approach lighting system with sequenced flashers (CAT I configuration)

ALSF-2: standard 2,400-foot high intensity approach lighting system with sequenced flashers (CAT II configuration)

APV: instrument approach procedure with vertical guidance

ARC: airport reference code

ARFF: aircraft rescue and firefighting

ARP: airport reference point

ARTCC: air route traffic control center

ASDA: accelerate-stop distance available

ASR: airport surveillance radar

ASOS: automated surface observation station

ATCT: airport traffic control tower

ATIS: automated terminal information service

AVGAS: aviation gasoline - typically 100 low lead (100LL)

AWOS: automated weather observation station

BRL: building restriction line

CFR: Code of Federal Regulations

CIP: capital improvement program

DME: distance measuring equipment

DNL: day-night noise level

DWL: runway weight bearing capacity for aircraft with dual-wheel type landing gear

DTWL: runway weight bearing capacity fo aircraft with dual-tandem type landing gear

FAA: Federal Aviation Administration

FAR: Federal Aviation Regulation

FBO: fixed base operator
FY: fiscal year

GPS: global positioning system

GS: glide slope

HIRL: high intensity runway edge lighting

IFR: instrument flight rules (FAR Part 91)

ILS: instrument landing system

IM: inner marker

LDA: localizer type directional aid

LDA: landing distance available

LIRL: low intensity runway edge lighting

LMM: compass locator at middle marker

LOC: ILS localizer

LOM: compass locator at ILS outer marker

LORAN: long range navigation

MALS: medium intensity approach lighting system

MALSR: medium intensity approach lighting system with runway alignment indicator lights

MIRL: medium intensity runway edge lighting

MITL: medium intensity taxiway edge lighting

MLS: microwave landing system

MM: middle marker

MOA: military operations area

MSL: mean sea level

NAVAID: navigational aid

NDB: nondirectional radio beacon

NM: nautical mile (6,076 .1 feet)

NPES: National Pollutant Discharge Elimination System

NPIAS: National Plan of Integrated Airport Systems

NPRM: notice of proposed rulemaking

ODALS: omnidirectional approach lighting system

OFA: object free area

OFZ: obstacle free zone

OM: outer marker

PAC: planning advisory committee

PAPI: precision approach path indicator

PFC: porous friction course

PFC: passenger facility charge

PCL: pilot-controlled lighting

PIW: public information workshop

PLASI: pulsating visual approach slope indicator

POFA: precision object free area

PVASI: pulsating/steady visual approach slope indicator

PVC: Poor visibility and ceiling.

RCO: remote communications outlet

REIL: runway end identifier lighting

RNAV: area navigation

RPZ: runway protection zone

RSA: Runway Safety Area

RTR: remote transmitter/receiver

RVR: runway visibility range

RVZ: runway visibility zone

SALS: short approach lighting system

SASP: state aviation system plan

SEL: sound exposure level
SID: standard instrument departure

SM: statute mile (5,280 feet)

SRE: snow removal equipment

SSALF: simplified short approach lighting system with sequenced flashers

SSALR: simplified short approach lighting system with runway alignment indicator lights

STAR: standard terminal arrival route

SWL: runway weight bearing capacity for aircraft with single-wheel type landing gear

STWL: runway weight bearing capacity for aircraft with single-wheel tandem type landing gear

TACAN: tactical air navigational aid

TDZ: touchdown zone

TDZE: touchdown zone elevation

TAF: Federal Aviation Administration (FAA) Terminal Area Forecast

TODA: takeoff distance available

TORA: takeoff runway available

TRACON: terminal radar approach control

VASI: visual approach slope indicator

VFR: visual flight rules (FAR Part 91)

VHF: very high frequency

VOR: very high frequency omni-directional range

VORTAC: VOR and TACAN collocated

Lawrence J.
TIMMERMAN
AIRPORT

Appendix B

NEW INSTRUMENT APPROACH PROCEDURES

Appendix 16. NEW INSTRUMENT APPROACH PROCEDURES

1. BACKGROUND. This appendix applies to the establishment of new authorized instrument approach procedures. For purposes of this appendix, an Instrument Approach Procedure (IAP) amendment or the establishment of a Global Positioning System (GPS) instrument procedure "overlaying" an existing authorized instrument procedure does not constitute a new procedure. However, a significant reduction in minima (i.e. ¼ mile reduction in visibility and/or 50 foot reduction in decision altitude or minimum descent altitude) would constitute a new procedure.

a. This appendix identifies airport landing surface requirements to assist airport sponsors in their evaluation and preparation of the airport landing surface to support new instrument approach procedures. It also lists the airport data provided by the procedure sponsor that the FAA needs to conduct the airport airspace analysis specified in FAA Order 7400.2, *Procedures for Handling Airspace Matters*. The airport must be acceptable for IFR operations based on an Airport Airspace Analysis (AAA), under FAA Order 7400.2.

b. FAA Order 8260, *TERPS*, reflects the contents of this appendix as the minimum airport landing surface requirements that must be met prior to the establishment of instrument approach procedures at a public use airport. This order also references other FAA requirements, such as a safety analysis to determine the need for approach lighting and other visual enhancements to mitigate the effects of a difficult approach environment. This is a consideration regardless of whether or not a reduction in approach minimums is desired. Airport sponsors are always encouraged to consider an approach lighting system to enhance the safety of an instrument procedure. In the absence of any identified benefits or safety enhancement from an approach light system, sponsors should at least consider installing lower cost visual guidance aids such as REIL or PAPI.

c. The tables provided in this appendix are for planning purposes only and should be used in conjunction with the rest of the document. All pertinent requirements within this AC and other FAA documents, as well as local siting conditions, ultimately will determine the lowest minimums obtainable.

2. INTRODUCTION. To be authorized a new instrument approach procedure, the runway must have an instrument runway designation. Instrument runways are runway end specific. The runway end designation is based on the findings of an AAA study (Refer to Order 7400.2). In addition, the instrument runway designation for the desired minimums must be depicted on the FAA-approved ALP. If not depicted, a change to the ALP is required. As part of the ALP approval process, the FAA will conduct an AAA study to determine the runway's acceptability for the desired minimums.

3. ACTION. The airport landing surface must meet the standards specified in tables A16-1 A through C, for each specified runway, direction and have adequate airspace to support the instrument approach procedure. When requesting an instrument procedure, the sponsor must specify the runway direction, the desired approach minimums, whether circling approach procedures are desired, and the survey needed to support the procedure. For all obligated National Plan of Integrated Airport Systems (NPIAS) airports, the sponsor must also provide a copy of the FAA-approved ALP showing the instrument procedure(s) requested. An ALP is also recommended for all other airports.

4. DEFINITIONS.

a. Precision Approach. An instrument approach procedure providing course and vertical path guidance conforming to ILS, or MLS, precision system performance standards contained in ICAO annex 10. Table A16-1A defines the requirements for ILS, LAAS, WAAS, MLS, and other precision systems.

b. Approach Procedure with Vertical Guidance (APV). An instrument approach procedure providing course and vertical path guidance that does not conform to ILS or MLS system performance standards contained in ICAO annex 10, or a precision approach system that does not meet TERPS alignment criteria. Table A16-1B defines the requirements for WAAS and authorized barometric VNAV.

c. Nonprecision Approach. An instrument approach procedure providing course guidance without vertical path guidance. Table A16-3C defines the requirements for VOR, NDB, LDA, GPS (TS0-129) or other authorized RNAV system.

Table A16-1A. Precision Instrument Approach Requirements.

Visibility Minimums[1]	<3/4 statute mile	< 1-statute mile
Height Above Touchdown (HAT)[2]	200	
TERPS Glidepath Qualification Surface (GQS)[3]	Table A2-1, Row 7, Criteria, and Appendix 2, par. 5a Clear	
TERPS precision "W" surfaces[4]	Clear	See Note 5
TERPS Paragraph 251	34:1 Clear	20:1 Clear
Precision Obstacle Free Zone (POFZ) 200 x 800[6]	Required	Not Required
Airport Layout Plan[7]	Required	
Minimum Runway Length	4,200 ft (1,280 m) (Paved)	
Runway Markings (See AC 150/5340-1)	Precision	Nonprecision
Holding Position Signs & Markings (See AC 150/5340-1 and AC 150/5340-18)	Precision	Nonprecision
Runway Edge Lights[8]	HIRL / MIRL	
Parallel Taxiway[9]	Required	
Approach Lights[10]	MALSR, SSALR, or ALSF	Recommended
Runway Design Standards; e.g., Obstacle Free Zone (OFZ)[11]	< 3/4-statute mile approach visibility minimums	≥ 3/4-statute mile approach visibility minimums
Threshold Siting Criteria To Be Met[12]	Table A2-1, Row 9, Criteria	Table A2-1, Row 8, Criteria
Survey Required for Lowest Minima	Table A16-2, Row 10, Criteria	Table A16-2, Row 9, Criteria

1. Visibility minimums are subject to application of FAA Order 8260.3 (TERPS) and associated orders or this table, whichever are higher.
2. The HAT indicated is for planning purposes only. Actual obtainable HAT is determined by TERPS.
3. The GQS is applicable to approach procedures providing vertical path guidance. It limits the magnitude of penetration of the obstruction clearance surfaces overlying the final approach course. The intent is to provide a descent path from DA to landing free of obstructions that could destabilize the established glidepath angle. The GQS is centered on a course from the DA point to the runway threshold. Its width is equal to the precision "W" surface at DA, and tapers uniformly to a width 100 feet from the runway edges. If the GQS is penetrated, vertical guidance instrument approach procedures (ILS/MLS/WAAS/LAAS/Baro-VNAV) are not authorized
4. The "W" surface is applicable to precision approach procedures. It is a sloping obstruction clearance surface (OCS) overlying the final approach course centerline. The surface slope varies with glidepath angle. The "W" surface must be clear to achieve lowest precision minimums. Surface slope varies with glide path angle, 102/angle; e.g., for optimum 3° glide path 34:1 surface must be clear.
5. If the W surface is penetrated, HAT and visibility will be increased as required by TERPS.
6. This is a new airport surface (see paragraph 306). .
7. An ALP is only required for airports in the NPIAS; it is recommended for all others.
8. Runway edge lighting is required for night minimums. High intensity lights are required for RVR-based minimums.
9. A parallel taxiway must lead to the threshold and, with airplanes on centerline, keep the airplanes outside the OFZ.
10. To achieve lower visibility minimums based on credit for lighting, a TERPS specified approach light system is required.
11. Indicates what chart should be followed in the related chapters of this document.
12. Circling procedures to a secondary runway from the primary approach will not be authorized when the secondary runway does not meet threshold siting (reference Appendix 2), OFZ (reference paragraph 306) criteria, and TERPS Order paragraph 251 criteria.

Table A16-1B. Approach Procedure With Vertical Guidance (APV-RNP) Approach Requirements

Visibility Minimums[1]	< 3/4-statute mile	< 1-statute mile	1-statute mile	>1-statute mile[14]
Height Above Touchdown (HAT)[2]	250	300	350	400
TERPS Glidepath Qualification Surface (GQS)[3]	Table A2-1, Row 7, Criteria, and Appendix 2, par. 5a Clear			
TERPS Paragraph 251	34:1 clear	20:1 clear	20:1 clear, or penetrations lighted for night minimums (See AC 70/7460-1)	
Precision Obstacle Free Zone (POFZ) 200 x 800[4]	Required	Recommended		
Airport Layout Plan[5]	Required			
Minimum Runway Length	4,200 ft (1,280 m) (Paved)	3,200 ft (975 m)[6] (Paved)	3,200 ft (975 m)[6,7]	
Runway Markings (See AC 150/5340-1)	Nonprecision (Precision Recommended)		Nonprecision[7]	
Holding Position Signs & Markings (See AC 150/5340-1 and AC 150/5340-18)	Nonprecision *(Precision Recommended)*		Nonprecision[7]	
Runway Edge Lights[8]	HIRL / MIRL		MIRL/LIRL	
Parallel Taxiway [9]	Required		Recommended	
Approach Lights[10]	*Required[11]*		Recommended	
Runway Design Standards; e.g., Obstacle Free Zone (OFZ) [12]	APV OFZ Required			
Threshold Siting Criteria To Be Met [13]	Table A2-1, Row 4 and 9, Criteria		Appendix 2, Table A2-1, Lines 4 and 8, Criteria	
Survey Required for Lowest Minima	Table A16-2, Row 6, Criteria			

1. Visibility minimums are subject to the application of FAA Order 8260.3 (TERPS) and associated orders or this table, whichever is higher.
2. The HAT indicated is for planning purposes only. Actual obtainable HAT is determined by TERPS.
3. The GQS is applicable to approach procedures providing vertical path guidance. It limits the magnitude of penetration of the obstruction clearance surfaces overlying the final approach course. The intent is to provide a descent path from DA to landing free of obstructions that could destabilize the established glidepath angle. The GQS is centered on a course from the DA point to the runway threshold. Its width is equal to the precision "W" surface at DA, and tapers uniformly to a width 100 feet from the runway edges. If the GQS is penetrated, vertical guidance instrument approach procedures (ILS/MLS/WAAS/LAAS/Baro-VNAV) are not authorized
4. This is a new airport surface (see paragraph 306)
5. An ALP is only required for obligated airports in the NPIAS; it is recommended for all others.
6. Runways less than 3,200 feet are protected by 14 CFR Part 77 to a lesser extent (77.23(a)(2) is not applicable for runways less than 3,200 feet). However runways as short as 2400 feet could support an instrument approach provided the lowest HAT is based on clearing any 200-foot obstacle within the final approach segment.
7. Unpaved runways require case-by-case evaluation by regional Flight Standards personnel.
8. Runway edge lighting is required for night minimums. High intensity lights are required for RVR-based minimums.
9. A parallel taxiway must lead to the threshold and, with airplanes on centerline, keep the airplanes outside the OFZ.
10. To achieve lower visibility minimums based on credit for lighting, a TERPS specified approach light system is required.
11. ODALS, MALS, SSALS are acceptable. For LPV based minima approach lights are recommended not required.
12. Indicates what chart should be followed in the related chapters in this document.
13. Circling procedures to a secondary runway from the primary approach will not be authorized when the secondary runway does not meet threshold siting (reference Appendix 2), OFZ (reference paragraph 306) and TERPS paragraph 251 criteria.
14. For circling requirements, see Table 16-1C.

Table A16-1C. Nonprecision Approach Requirements

Visibility Minimums[1]	< 3/4-statute mile	< 1-statute mile	1-statute mile	>1-statute mile	Circling
Height Above Touchdown [2]	300	340	400	450	Varies
TERPS Paragraph 251	34:1 clear	20:1 clear	20:1 clear or penetrations lighted for night minimums (See AC 70/7460-1)		
Airport Layout Plan[3]	Required				Recommended
Minimum Runway Length	4,200 ft (1,280 m) (Paved)	3,200 ft (975 m)[4] (Paved)	3,200 ft (975 m)[4,5]		
Runway Markings (See AC 150/5340-1)	Precision	Nonprecision[5]			Visual (Basic)[5]
Holding Position Signs & Markings (See AC 150/5340-1 and AC 150/5340-18)	Precision	Nonprecision			Visual (Basic)[5]
Runway Edge Lights[6]	HIRL / MIRL		MIRL / LIRL		MIRL / LIRL (Required only for night minima)
Parallel Taxiway [7]	Required		Recommended		
Approach Lights[8]	MALSR, SSALR, or ALSF Required	Required [9]	Recommended[9]		Not Required
Runway Design Standards, e.g. Obstacle Free Zone (OFZ)[10]	<3/4-statute mile approach visibility minimums	≥ 3/4-statute mile approach visibility minimums			Not Required
Threshold Siting Criteria To Be Met [11]	Table A2-1, Row 9, Criteria	Table A2-1, Row 8, Criteria	Table A2-1, Row 1–5, Criteria		Table A2-1, Row 1–2, Criteria
Survey Required for Lowest Minima	Table A16-2, Row 5, Criteria	Table A16-2, Row 4, Criteria	Table A16-2, Row 3, Criteria		Table A16-2, Row 1,2,3, Criteria

1. Visibility minimums are subject to the application of FAA Order 8260.3 (TERPS) and associated orders or this table, whichever is higher.
2. The Height Above Touchdown (HAT) indicated is for planning purposes only. Actual obtainable HAT is determined by TERPS.
3. An ALP is only required for obligated airports in the NPIAS; it is recommended for all others.
4. Runways less than 3,200 feet are protected by 14 CFR Part 77 to a lesser extent. However runways as short as 2400 feet could support an instrument approach provided the lowest HAT is based on clearing any 200-foot obstacle within the final approach segment.
5. Unpaved runways require case-by-case evaluation by regional Flight Standards personnel.
6. Runway edge lighting is required for night minimums. High intensity lights are required for RVR-based minimums.
7. A parallel taxiway must lead to the threshold and, with airplanes on centerline, keep the airplanes outside the OFZ.
8. To achieve lower visibility minimums based on credit for lighting, a TERPS specified approach lighting system is required.
9. ODALS, MALS, SSALS, SALS are acceptable.
10. Indicates what chart should be followed in the related chapters in this document.
11. Circling procedures to a secondary runway from the primary approach will not be authorized when the secondary runway does not meet threshold siting (reference Appendix 2), OFZ (reference paragraph 306), and TERPS Order, 8260.3 paragraph 251, criteria.

Table A16-2. Survey Requirements for Instrument Approach Procedures

The table indicates the acceptable runway obstruction survey needed to support an instrument approach procedure. For a complete description of the survey types and associated requirements, refer to AC 150/5300-18.

		Runway Survey Type								
	Approach	None	AV	BV	ANP	C	SUPLC	D	ANAPC	PIR
1	Night Circling			X	X	X	X	X	X	X
2	Non-Precision Approach ≥ 1SM, Day Only	X	X	X	X	X	X	X	X	X
3	Non-Precision Approach ≥ 1SM				X	X	X	X	X	X
4	Non-Precision Approach < 1SM					X	X	X	X	X
5	Non-Precision Approach < ¾ SM								X	X
6	NPV Approach ≥ ¾ SM							X	X	X
7	NPV Approach < ¾ SM								X	X
8	Precision CAT I Approach < 1SM							X	X	X
9	Precision CAT I Approach < ¾ SM								X	X
10	Precision CAT II Approach									X
11	Precision CAT III Approach									X

Note:
An "X" in each column for a given Approach (1 through 11) denotes a survey that is acceptable to support that approach. As shown, multiple surveys may support the approach, however the "X" farthest to the left indicates the minimum survey needed.

Runway survey types from FAA No. 405, Standards for Aeronautical Surveys and Related Products:

AV - FAR77 Visual Approach - Utility runway, includes approach and primary surfaces only.
BV - FAR77 Visual Approach, includes approach and primary surfaces only.
ANP - FAR77 Nonprecision Approach - Utility runway, includes approach and primary surfaces only.
C - FAR77 Nonprecision Approach - Visibility minimums greater than 3/4 mile includes approach and primary surfaces only.
SUPLC - C Approach underlying a BV approach, includes approach and primary surfaces only.
D - FAR77 Nonprecision Approach - Visibility minimums as low as 3/4 mile includes approach and primary surfaces only.
ANAPC - Area Navigation Approach - Precision, conventional landing, includes approach, primary, transition, and missed approach surfaces.
PIR - FAR77 Precision Instrument Approach, includes approach and primary surfaces only.

Lawrence J. TIMMERMAN AIRPORT

Appendix C

AIRPORT LAYOUT PLAN DRAWING

Appendix C
AIRPORT LAYOUT PLAN DRAWINGS

Per Federal Aviation Administration (FAA) and Wisconsin DOT requirements, an official Airport Layout Drawing (ALD) has been developed for Lawrence J. Timmerman Airport. The ALD graphically presents the existing and ultimate airport layout. The ALD is used, in part by the FAA, to determine funding eligibility for future development projects.

The ALD was prepared on a computer-aided drafting system for future ease of use. The computerized plan set provides detailed information of existing and future facility layout on multiple layers that permit the user to focus in on any section of the airport at a desirable scale. The plan can be used as base information for design, and can be easily updated in the future to reflect new development and more detail concerning existing conditions, as made available through design surveys.

A number of related drawings which depict the ultimate airspace and landside development are included with the ALD. The following provides a brief discussion of the additional drawings included with the ALD:

Terminal Facilities Drawing - The terminal facilities drawing provides greater detail concerning landside improvements on the north and east sides of the airfield. The drawing provides a detailed view of the roadway, taxiway, and hangar development as proposed in the plan.

Inner Portion of the Approach Surface Drawings - The Inner Portion of the Approach Surface Drawings are scaled drawings of the runway protection zone (RPZ), runway safety area (RSA), obstacle free zone (OFZ), and object free area (OFA) for each runway end. A plan and profile view of each RPZ is provided to facilitate identification of obstructions that lie within these safety areas. Detailed obstruction and facility data is provided to identify planned improvements and the disposition of obstructions (as appropriate).

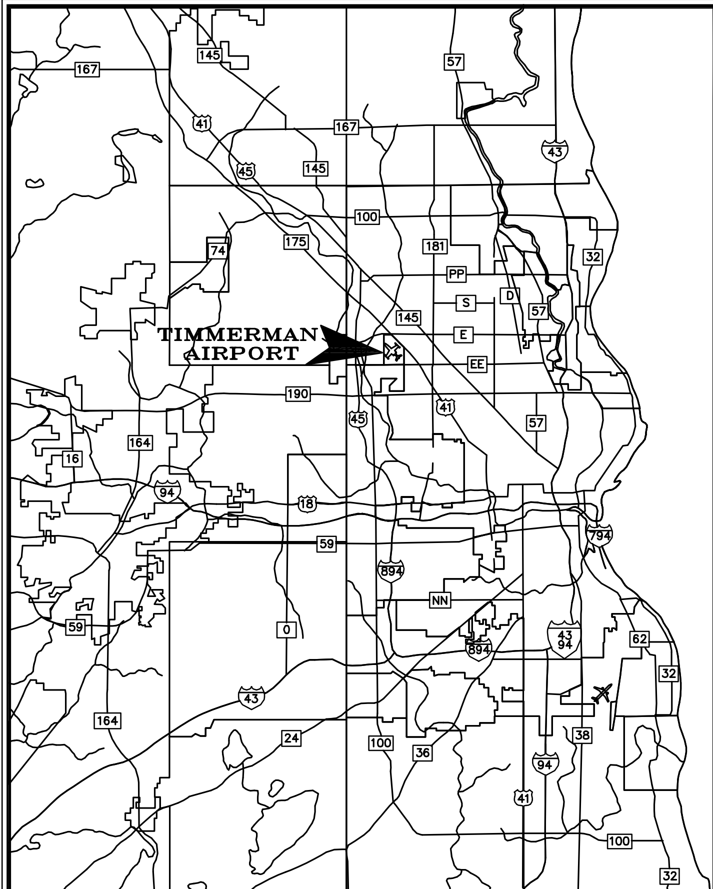
Airport Property Map (Exhibit A) - The Property Map provides information on the acquisition of all land tracts under the control of Milwaukee County. The land inventory table identifies the date of acquisition, funding source, location, property interest, and acreage. A metes and bounds description of the airport perimeter is provided on the drawing.

Airport Land Use Drawing - The Airport Land Use Drawing is a graphic depiction of the land use recommendations. When development is proposed, it should be directed to the appropriate land use area depicted on this plan. The existing and future 65 DNL noise exposure contour is also depicted.

Airport Airspace Drawing - The Airport Airspace Drawing is a graphic depiction of Federal Aviation Regulations (F.A.R.) Part 77, *Objects Affecting Navigable Airspace*, regulatory criterion. The Airport Airspace Drawing is intended to aid local authorities in determining if proposed development could present a hazard to the aircraft and obstruct the approach path to a runway end. This plan should be coordinated with local land use planners.

Approach Zone Profiles and Runway Profile Drawings - These drawings provide profile views of the F.A.R. Part 77 and Threshold Siting Surface (TSS) approach surfaces for each runway end. A composite profile of the extended ground line is depicted. Obstructions and clearances over roads and railroads are shown as appropriate.

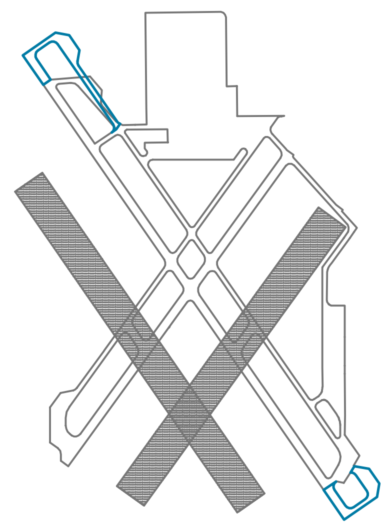
Plotted @ 1:200



STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION
BUREAU OF AERONAUTICS

AIRPORT LAYOUT DRAWINGS
LAWRENCE J. TIMMERMAN AIRPORT
MILWAUKEE COUNTY, WISCONSIN

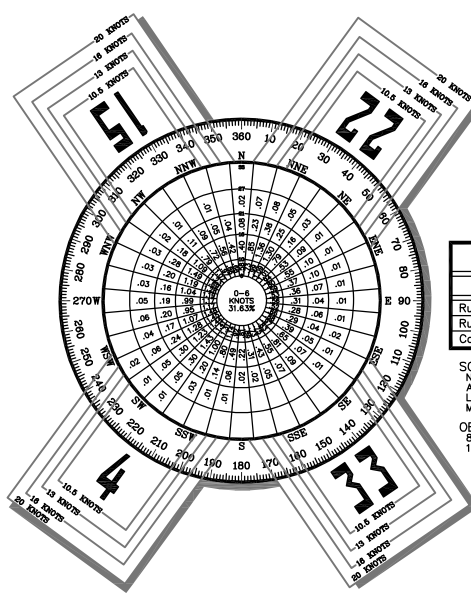
INDEX OF DRAWINGS



AIRPORT DATA

CITY: Milwaukee, Wisconsin		COUNTY: Milwaukee County	
RANGE: 21 East TOWNSHIP: 7, 8 North		CIVIL TOWNSHIP: Milwaukee	

LAWRENCE J. TIMMERMAN AIRPORT		EXISTING	ULTIMATE
AIRPORT CLASSIFICATION		General Aviation	General Aviation
AIRPORT REFERENCE CODE		B–II	B–II
AIRPORT ELEVATION (NAVD88)		745.0 MSL	745.0 MSL
MEAN MAXIMUM TEMPERATURE OF HOTTEST MONTH		81.1° F (July)	81.1° F (July)
AIRPORT REFERENCE POINT (NAD83)	Latitude	43° 06' 37.40" N	43° 06' 37.482" N
http://avnwww.jccbi.gov/datasheet/	Longitude	88° 02' 03.90" W	88° 02' 03.881" W
AIRPORT and TERMINAL NAVIGATIONAL AIDS		LOC (15L) VOR or GPS (15L) VOR or GPS (4L) Rotating Beacon	LOC (15L) VOR or GPS (15L) VOR or GPS (4L) Rotating Beacon
GPS APPROACH/RUNWAYS		4L and 15L	4L and 15L



RUNWAY COORDINATES (NAD 83) (NAVD-88)

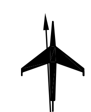
RUNWAY		EXISTING	ULTIMATE
RUNWAY 15L–EL. 743.9 ULTIMATE RW 15L–EL. 745.0	Latitude	43° 06' 56.950" N	43° 06' 59.395" N
	Longitude	88° 02' 19.030" W	88° 02' 21.315" W
RUNWAY 15L–EL. 743.9 300' DISPLACED THRESHOLD	Latitude	NONE	43° 06' 56.950" N
	Longitude	NONE	88° 02' 19.030" W
RUNWAY 33R–EL. 743.7 ULTIMATE RW 33R–EL. 744.0	Latitude	43° 06' 23.490" N	43° 06' 21.045" N
	Longitude	88° 01' 47.750" W	88° 01' 45.465" W
RUNWAY 33R–EL. 743.7 300' DISPLACED THRESHOLD	Latitude	NONE	43° 06' 23.490" N
	Longitude	NONE	88° 01' 47.750" W
RUNWAY 4L–EL. 737.1	Latitude	43° 06' 25.560" N	Same
	Longitude	88° 02' 17.220" W	Same
RUNWAY 22R–EL. 738.3	Latitude	43° 06' 51.090" N	Same
	Longitude	88° 01' 51.750" W	Same
RUNWAY 15R–EL. 742.3	Latitude	43° 06' 48.740" N	Same
	Longitude	88° 02' 21.150" W	Same
RUNWAY 33L–EL. 733.4	Latitude	43° 06' 22.220" N	Same
	Longitude	88° 01' 56.370" W	Same
RUNWAY 4R–EL. 731.9	Latitude	43° 06' 22.900" N	Same
	Longitude	88° 02' 09.860" W	Same
RUNWAY 22L–EL. 736.5	Latitude	43° 06' 45.720" N	Same
	Longitude	88° 01' 47.080" W	Same

ALL WEATHER WIND COVERAGE

Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 4–22	86.42%	92.34%	97.89%	99.53%
Runway 15–33	82.32%	89.77%	96.61%	99.10%
Combined	96.97%	99.12%	99.75%	99.96%

SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Lawrence J Timmerman Airport (MWC)
Milwaukee, Wisconsin

OBSERVATIONS:
82,159 All Weather Observations
1994–2003



Magnetic Declination
02° 59' West (August 2005)
Annual Rate of Change 05' West

RUNWAY DATA

RUNWAY DATA	EXISTING Rw 15L	EXISTING Rw 33R	ULTIMATE Rw 15L	ULTIMATE Rw 33R	EXISTING/ULTIMATE Rw 4L	EXISTING/ULTIMATE Rw 22R	EXISTING/ULTIMATE Rw 15R	EXISTING/ULTIMATE Rw 33L	EXISTING/ULTIMATE Rw 4R	EXISTING/ULTIMATE Rw 22L
AIRCRAFT APPROACH CATEGORY–DESIGN GROUP	B–II		B–II		B–II (Utility)		B–I (Utility)		B–I (Utility)	
APPROACH VISIBILITY MINIMUMS	1–mile	Visual	1–mile	Visual	1–mile	V	Visual	Visual	Visual	Visual
F.A.R. PART 77 CATEGORY	NP	V	NP	V	ANP	BV	AV	AV	AV	AV
RUNWAY DESIGN APPROACH SURFACES	34:1	20:1	34:1	20:1	20:1	20:1	20:1	20:1	20:1	20:1
RUNWAY END SITING REQUIREMENTS (Appendix 2, TSS)	RT5, 20:1	RT3, 20:1	RT5, 20:1	RT3, 20:1	RT5, 20:1	RT3, 20:1	RT2, 20:1	RT2, 20:1	RT2, 20:1	RT2, 20:1
RUNWAY TOUCHDOWN ZONE ELEVATION (IN MSL)	744.9 MSL	744.0 MSL	745.0 MSL	744.0 MSL	739.0 MSL	739.0 MSL	743.7 MSL	743.3 MSL	N/A	N/A
RUNWAY BEARING (Decimal Degrees)	145.589°		145.589°		36.162°		145.602°		36.179°	
RUNWAY OBSTACLE FREE ZONE (BEYOND RUNWAY END)	200'		200'		200'		200'		200'	
RUNWAY OBSTACLE FREE ZONE WIDTH (OFZ)	400'		400'		400'		250'		250'	
RUNWAY THRESHOLD DISPLACEMENT	None		300' (15L), 300' (33R)		None		None		None	
RUNWAY DIMENSIONS	4,106' x 75'		4,706' x 75'		3,202' x 75'		3,254' x 275'		2,862' x 275'	
MAXIMUM RUNWAY ELEVATION (Above MSL)	745.0 MSL		745.0 MSL		739.2 MSL		743.7 MSL		736.5 MSL	
RUNWAY (Low Point)	734.8 MSL		734.8 MSL		736.4 MSL		731.4 MSL		731.3 MSL	
RUNWAY (High Point)	745.0 MSL		745.0 MSL		739.2 MSL		743.7 MSL		736.5 MSL	
RUNWAY SURFACE MATERIAL/SURFACE TREATMENT	ASPHALT		ASPHALT		ASPHALT		TURF		TURF	
RUNWAY PAVEMENT STRENGTH (in LBS.)	30,000 (Single Wheel)		30,000 (Single Wheel)		30,000 (Single Wheel)		N/A		N/A	
RUNWAY EFFECTIVE GRADIENT	0.04%		0.03%		0.05%		0.32%		0.2%	
RUNWAY MARKING	Nonprecision		Nonprecision		Nonprecision		N/A		N/A	
RUNWAY LIGHTING	MIRL		MIRL		MIRL		N/A		N/A	
TAXIWAY LIGHTING	MITL		MITL		MITL		N/A		N/A	
TAXIWAY MARKING	Centerline		Centerline		Centerline		N/A		N/A	
TAXIWAY SURFACE MATERIAL	ASPHALT		ASPHALT		ASPHALT		N/A		N/A	
TAXIWAY WIDTH	35'		35'		35'		N/A		N/A	
TAXIWAY SAFETY AREA WIDTH	79'		79'		79'		N/A		N/A	
TAXIWAY OBJECT FREE AREA WIDTH	131'		131'		131'		N/A		N/A	
RUNWAY ELECTRONIC NAVIGATIONAL AIDS	VOR or GPS (15L) LOCALIZER (15L)		VOR or GPS (15L) LOCALIZER (15L)		VOR or GPS (4L)		None		None	
RUNWAY VISUAL NAVIGATIONAL AIDS	VASI–4 (15L–33R) REIL (15L)		PAPI–4 (15L–33R) REIL (15L)		VASI–4 (4L–22R) REIL (4L–22R)					

Appendix 2, Runway End Siting Requirements (chg 10), Runway Type 1 to 12 (RT5), Threshold Siting Surface (TSS).

DECLARED DISTANCES

DECLARED DISTANCES	EXISTING 15L	EXISTING 33R	ULTIMATE 15L	ULTIMATE 33R	EXISTING/ULTIMATE 4L	EXISTING/ULTIMATE 22R	EXISTING/ULTIMATE 15R	EXISTING/ULTIMATE 33L	EXISTING/ULTIMATE 4R	EXISTING/ULTIMATE 22L
TAKEOFF RUN AVAILABLE (TORA)	4106'	4106'	4506'	4706'	3202'	3202'	3254'	3254'	2862'	2862'
TAKEOFF DISTANCE AVAILABLE (TODA)	4106'	4106'	4506'	4706'	3202'	3202'	3254'	3254'	2862'	2862'
ACCELERATE–STOP DISTANCE AVAILABLE (ASDA)	4106'	4106'	4206'	4406'	3202'	3202'	3254'	3254'	2862'	2862'
LANDING DISTANCE AVAILABLE (LDA)	4106'	4106'	4206'	4406'	3202'	3202'	3254'	3254'	2862'	2862'

DESIGN CRITICAL AIRCRAFT DATA

DESIGN CRITICAL AIRCRAFT DATA	EXISTING RUNWAY 15L–33R	ULTIMATE RUNWAY 15L–33R	EXISTING/ULTIMATE RUNWAY 4L–22R	EXISTING/ULTIMATE RUNWAY 15R–33L	EXISTING/ULTIMATE RUNWAY 4R–22L
AIRCRAFT WEIGHT	15,900 LBS.	15,900 LBS.	15,900 LBS.	< 7,500 LBS.	< 7,500 LBS.
APPROACH SPEED	< 121 KNOTS	< 121 KNOTS	< 121 KNOTS	< 91 KNOTS	< 91 KNOTS
WING SPAN	< 79'	< 79'	< 79'	< 49'	< 49'
TAIL HEIGHT	15'	15'	15'	11.6'	11.6'
AIRPORT REFERENCE CODE	B–II	B–II	B–II	B–I	B–I

No.	REVISIONS	DATE	BY	APP'D.
⚠	–	–	–	–

"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

FEDERAL AVIATION ADMINISTRATION

THE WISCONSIN DEPARTMENT OF TRANSPORTATION, BUREAU OF AERONAUTICS – BOA APPROVES THE AIRPORT LAYOUT PLAN IN ACCORDANCE WITH THE FEDERAL AVIATION ADMINISTRATION BLOCK GRANT AGREEMENT AND SUBJECT TO AIRSPACE CASE

APPROVED:

DAVID M. GREENE, BOA DIRECTOR DATE:

WISCONSIN DEPARTMENT OF TRANSPORTATION
BUREAU OF AERONAUTICS

REVIEWED BY: P.E.
AIRPORT DEVELOPMENT ENGINEER

DATE:

MILWAUKEE COUNTY

APPROVED BY:

C. Barry Bateman
Airport Director

DATE:

SUBMITTED BY:
Coffman Associates
Airport Consultants

APPROVED BY: DATE:

Stephen C. Wagner
PRINCIPAL

No.	REVISIONS	DATE	BY	APP'D.

THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

WISCONSIN DEPARTMENT OF TRANSPORTATION
BUREAU OF AERONAUTICS

TITLE and APPROVAL SHEET

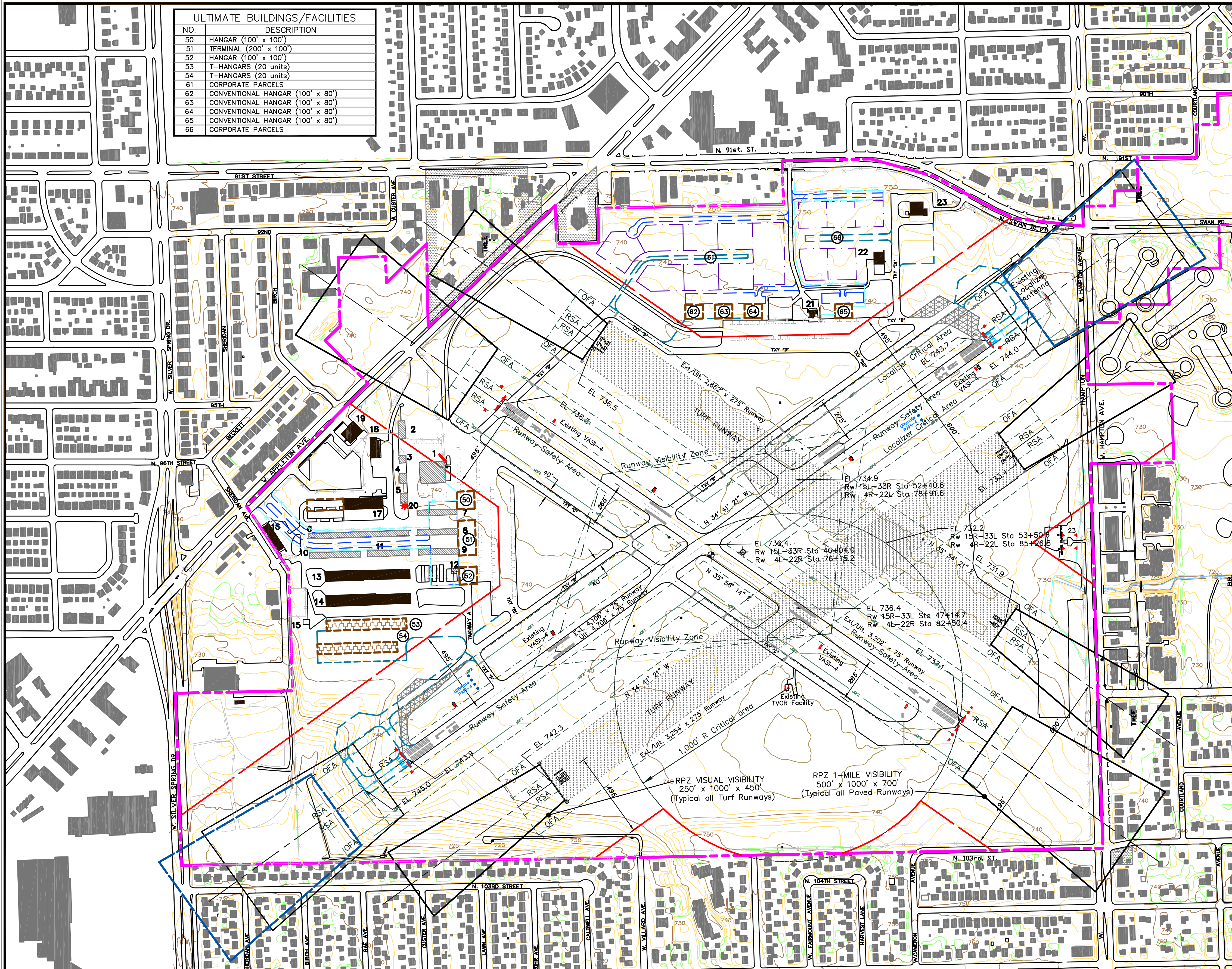
LAWRENCE J. TIMMERMAN AIRPORT
Milwaukee County, Wisconsin

PLANNED BY: Stephen C. Wagner
DETAILED BY: Larry D. Johnson
APPROVED BY: Stephen C. Wagner

March 11, 2008

Coffman Associates
Airport Consultants
www.coffmanassociates.com

Coffman Associates–LDJ mwc_sht1_sht2–alp.dwg Wednesday March 26 2008 10:45am



ULTIMATE BUILDINGS/FACILITIES

NO.	DESCRIPTION
50	HANGAR (100' x 100')
51	TERMINAL (200' x 100')
52	HANGAR (100' x 100')
53	T-HANGARS (20 units)
54	T-HANGARS (20 units)
61	CORPORATE PARCELS
62	CONVENTIONAL HANGAR (100' x 80')
63	CONVENTIONAL HANGAR (100' x 80')
64	CONVENTIONAL HANGAR (100' x 80')
65	CONVENTIONAL HANGAR (100' x 80')
66	CORPORATE PARCELS

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		AIRPORT PROPERTY LINE
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
		AVIGATION EASEMENT
		BUILDING CONSTRUCTION
BRL		BUILDING RESTRICTION LINE (BRL)
		DRAINAGE
		PAVEMENT CONSTRUCTION
		FENCING
VASI-4	PAPI-4	VISUAL APPROACH PATH INDICATORS
		RUNWAY THRESHOLD and END LIGHTS
34 35 / 3 2		SECTION CORNER
1080		TOPOGRAPHIC GROUND CONTOURS (1997 Mapping)
		WIND INDICATOR

BUILDINGS/FACILITIES

EXISTING	DESCRIPTION	ELEVATION
1	ADMINISTRATION/TERMINAL BUILDING	775 MSL
2	SCHWARTZBURG HANGAR	– MSL
3	QUONSET (EAST)	– MSL
4	QUONSET (MIDDLE)	– MSL
5	QUONSET (WEST)	– MSL
6	NORTH MASONRY T-HANGAR "I" AND "J" ROW	– MSL
7	SOUTH METAL T-HANGAR "A" AND "B" ROW	– MSL
8	SOUTH METAL T-HANGAR "C" AND "D" ROW	– MSL
9	SOUTH METAL T-HANGAR "E" AND "F" ROW	– MSL
10	NORTH MASONRY T-HANGAR "K" AND "L" ROW	– MSL
11	T-HANGAR	– MSL
12	METRO FLYING CLUB	– MSL
13	T-HANGAR "M" AND "N" ROW	– MSL
14	T-HANGAR "O" AND "P" ROW	– MSL
15	FUEL FACILITY	– MSL
16	COUNTY MAINTENANCE BUILDING	– MSL
17	CLEARSPAN HANGAR "G" ROW	– MSL
18	CIVIL AIR PATROL HANGAR	– MSL
19	FIRE STATION	882 MSL
20	AIRPORT ROTATING BEACON	– MSL
21	AIR TRAFFIC CONTROL TOWER (ATCT floor EL 874)	– MSL
22	SHERIFF'S HANGAR	– MSL
23	VACANT HANGAR	– MSL
24	Remote Transmitter/Receiver (RTR)	– MSL

MODIFICATIONS OF AIRPORT DESIGN STANDARDS

STANDARD MODIFIED	DESCRIPTION	AIRSPACE CASE NUMBER	APPROVAL DATE
NONE	–	–	–

GENERAL NOTES:

1. Depiction of features and objects, including related elevations and clearances, within the runway protection zones are depicted on the INNER APPROACH SURFACE DRAWING.
2. Details concerning terminal improvements are depicted on the TERMINAL FACILITIES DRAWING.
3. Recommended land uses within the airport environs are depicted on the AIRPORT LAND USE DRAWING.
4. Building Restriction Line (BRL) is established in accordance with F.A.R. Part 77. Building Restriction Line location may vary in accordance with Part 77 criteria, or other clearance standards.
5. OFZ object penetrations, localizer is 127' from Ultimate Runway 33R end.

RUNWAY COORDINATES (NAD 83) (NAVD-88)

RUNWAY	STATION		EXISTING	ULTIMATE
RUNWAY 15L-EL. 743.9 ULTIMATE RW 15L-EL. 745.0	Sta 25+00.0 Sta 22+00.0	Latitude	43° 06' 56.950" N	43° 06' 59.395" N
		Longitude	88° 02' 19.030" W	88° 02' 21.315" W
RUNWAY 15L-EL. 743.9 300' DISPLACED THRESHOLD	Sta 25+00.0	Latitude	NONE	43° 06' 56.950" N
		Longitude	NONE	88° 02' 19.030" W
RUNWAY 33R-EL. 743.7 ULTIMATE RW 33R-EL. 744.0	Sta 66+06.0 Sta 69+06.0	Latitude	43° 06' 23.490" N	43° 06' 21.045" N
		Longitude	88° 01' 47.750" W	88° 01' 45.465" W
RUNWAY 33R-EL. 743.7 300' DISPLACED THRESHOLD	Sta 66+06.0	Latitude	NONE	43° 06' 23.490" N
		Longitude	NONE	88° 01' 47.750" W
RUNWAY 4L-EL. 737.1	Sta 93+62.0	Latitude	43° 06' 25.560" N	Same
		Longitude	88° 02' 17.220" W	Same
RUNWAY 22R-EL. 738.3	Sta 62+00.0	Latitude	43° 06' 51.090" N	Same
		Longitude	88° 01' 51.750" W	Same
RUNWAY 15R-EL. 742.3	Sta 30+00.0	Latitude	43° 06' 48.740" N	Same
		Longitude	88° 02' 21.150" W	Same
RUNWAY 33L-EL. 733.4	Sta 62+54.0	Latitude	43° 06' 22.220" N	Same
		Longitude	88° 01' 56.370" W	Same
RUNWAY 4R-EL. 731.9	Sta 94+02.0	Latitude	43° 06' 22.900" N	Same
		Longitude	88° 02' 09.860" W	Same
RUNWAY 22L-EL. 736.5	Sta 65+00.0	Latitude	43° 06' 45.720" N	Same
		Longitude	88° 01' 47.080" W	Same

THRESHOLD SITING SURFACE OBJECT PENETRATIONS

OBJECT	PENETRATION	DISPOSITION
See Inner Approach Surfaces Drawing		

OBSTACLE FREE ZONE (OFZ) OBJECT PENETRATIONS

OBJECT	PENETRATION	DISPOSITION
15L Existing Localizer	7'	33R Threshold Displaced

APPROVED BY:

C. Barry Bateman
Airport Director
(DATE:)

NORTH

Magnetic Declination
02° 59' West (August 2005)
Annual Rate of Change 05' West

0 300 600 900
SCALE IN FEET

RSA Runway Safety Area	EXISTING LENGTH	EXISTING WIDTH	ULTIMATE LENGTH	ULTIMATE WIDTH
BEYOND RUNWAY 15L	300'	150'	300'	150'
BEYOND RUNWAY 33R	300'	150'	300'	150'
BEYOND RUNWAY 4L	300'	150'	300'	150'
BEYOND RUNWAY 22R	300'	150'	300'	150'
BEYOND RUNWAY 15R	240'	120'	240'	120'
BEYOND RUNWAY 33L	240'	120'	240'	120'
BEYOND RUNWAY 4R	240'	120'	240'	120'
BEYOND RUNWAY 22L	240'	120'	240'	120'

OFA Object Free Area	EXISTING LENGTH	EXISTING WIDTH	ULTIMATE LENGTH	ULTIMATE WIDTH
BEYOND RUNWAY 15L	300'	500'	300'	500'
BEYOND RUNWAY 33R	300'	500'	300'	500'
BEYOND RUNWAY 4L	300'	500'	300'	500'
BEYOND RUNWAY 22R	300'	500'	300'	500'
BEYOND RUNWAY 15R	240'	400'	240'	400'
BEYOND RUNWAY 33L	240'	400'	240'	400'
BEYOND RUNWAY 4R	240'	400'	240'	400'
BEYOND RUNWAY 22L	240'	400'	240'	400'

RUNWAY PROTECTION ZONES

Existing/Ultimate	BASE	LENGTH	OUTER WIDTH
RUNWAY 15L	500'	1,000'	700'
RUNWAY 33R	500'	1,000'	700'
RUNWAY 4L	500'	1,000'	700'
RUNWAY 22R	500'	1,000'	700'
RUNWAY 15R	250'	1,000'	450'
RUNWAY 33L	250'	1,000'	450'
RUNWAY 4R	250'	1,000'	450'
RUNWAY 22L	250'	1,000'	450'

FAR PART-77 APPROACH SURFACE DATA

	EXISTING APPROACH	Ext. SLOPE	ACTUAL	AC 150/5300-13 ch8	ULTIMATE APPROACH	SLOPE	AC 150/5300-13 ch9
RUNWAY 15L	500' x 10,000' x 3500'	34:1	16:1	TSS 20:1, Rw Type 5	500' x 10,000' x 3500'	34:1	TSS 20:1, Rw Type 5
RUNWAY 33R	500' x 5000' x 1500'	20:1	13:1	TSS 20:1, Rw Type 3	500' x 5000' x 1500'	20:1	TSS 20:1, Rw Type 3
RUNWAY 4L	500' x 5000' x 2000'	20:1	16:1	TSS 20:1, Rw Type 5	500' x 5000' x 2000'	20:1	TSS 20:1, Rw Type 5
RUNWAY 22R	500' x 5000' x 1500'	20:1	12:1	TSS 20:1, Rw Type 3	500' x 5000' x 1500'	20:1	TSS 20:1, Rw Type 3
RUNWAY 15R	250' x 5000' x 1250'	20:1	26:1	TSS 20:1, Rw Type 2	250' x 5000' x 1250'	20:1	TSS 20:1, Rw Type 2
RUNWAY 33L	250' x 5000' x 1250'	20:1	17:1	TSS 20:1, Rw Type 2	250' x 5000' x 1250'	20:1	TSS 20:1, Rw Type 2
RUNWAY 4R	250' x 5000' x 1250'	20:1	15:1	TSS 20:1, Rw Type 2	250' x 5000' x 1250'	20:1	TSS 20:1, Rw Type 2
RUNWAY 22L	250' x 5000' x 1250'	20:1	15:1	TSS 20:1, Rw Type 2	250' x 5000' x 1250'	20:1	TSS 20:1, Rw Type 2

No.	REVISIONS	DATE	BY	APP'D.

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WISCONSIN DEPARTMENT OF TRANSPORTATION
BUREAU OF AERONAUTICS

AIRPORT LAYOUT DRAWING

LAWRENCE J. TIMMERMAN AIRPORT
Milwaukee County, Wisconsin

PLANNED BY: Stephen C. Wagner
DETAILED BY: Larry D. Johnson
APPROVED BY: Stephen C. Wagner

March 11, 2008

Coffman Associates
Airport Consultants
www.coffmanassociates.com

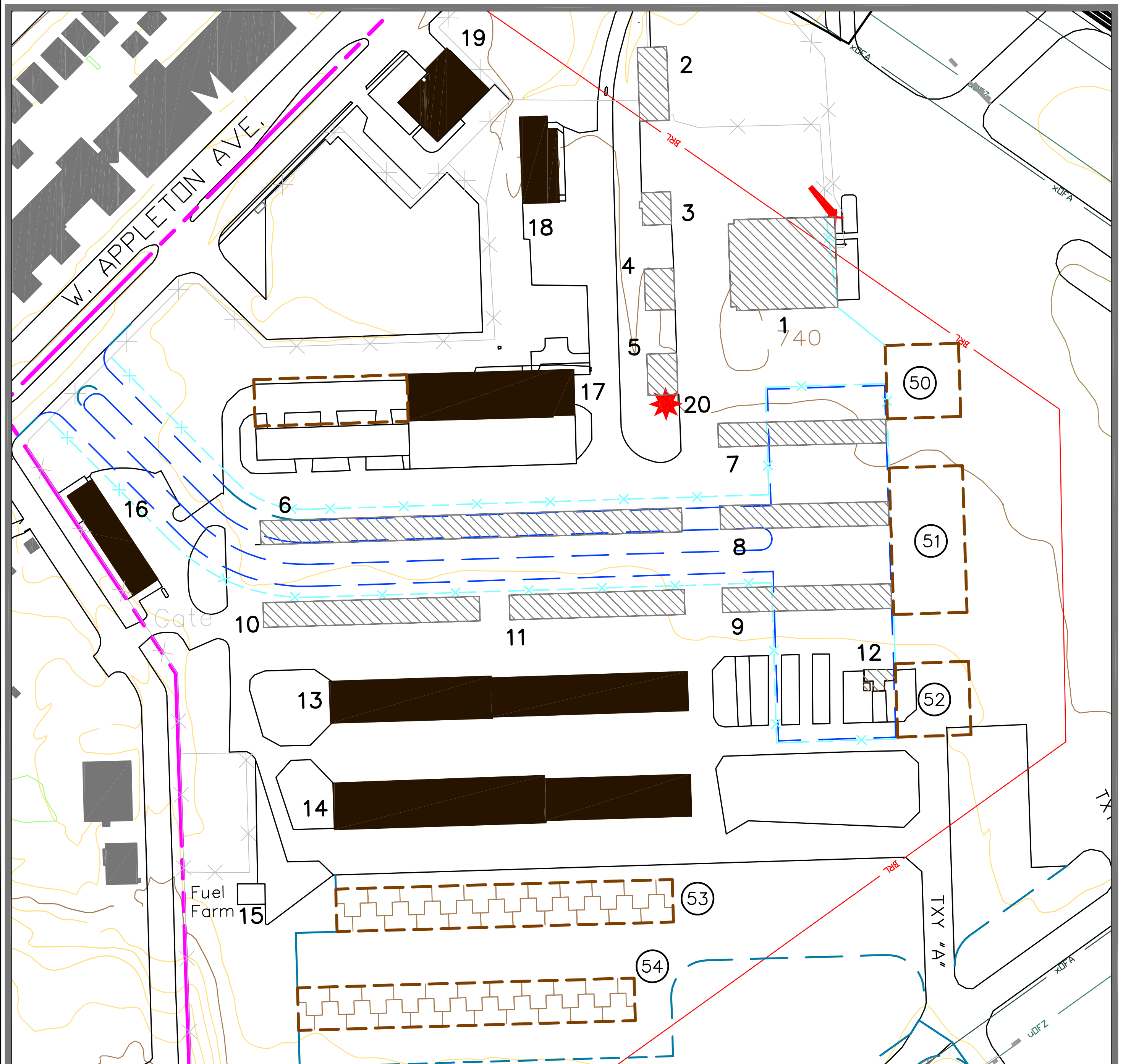
Plotted @ 1:200

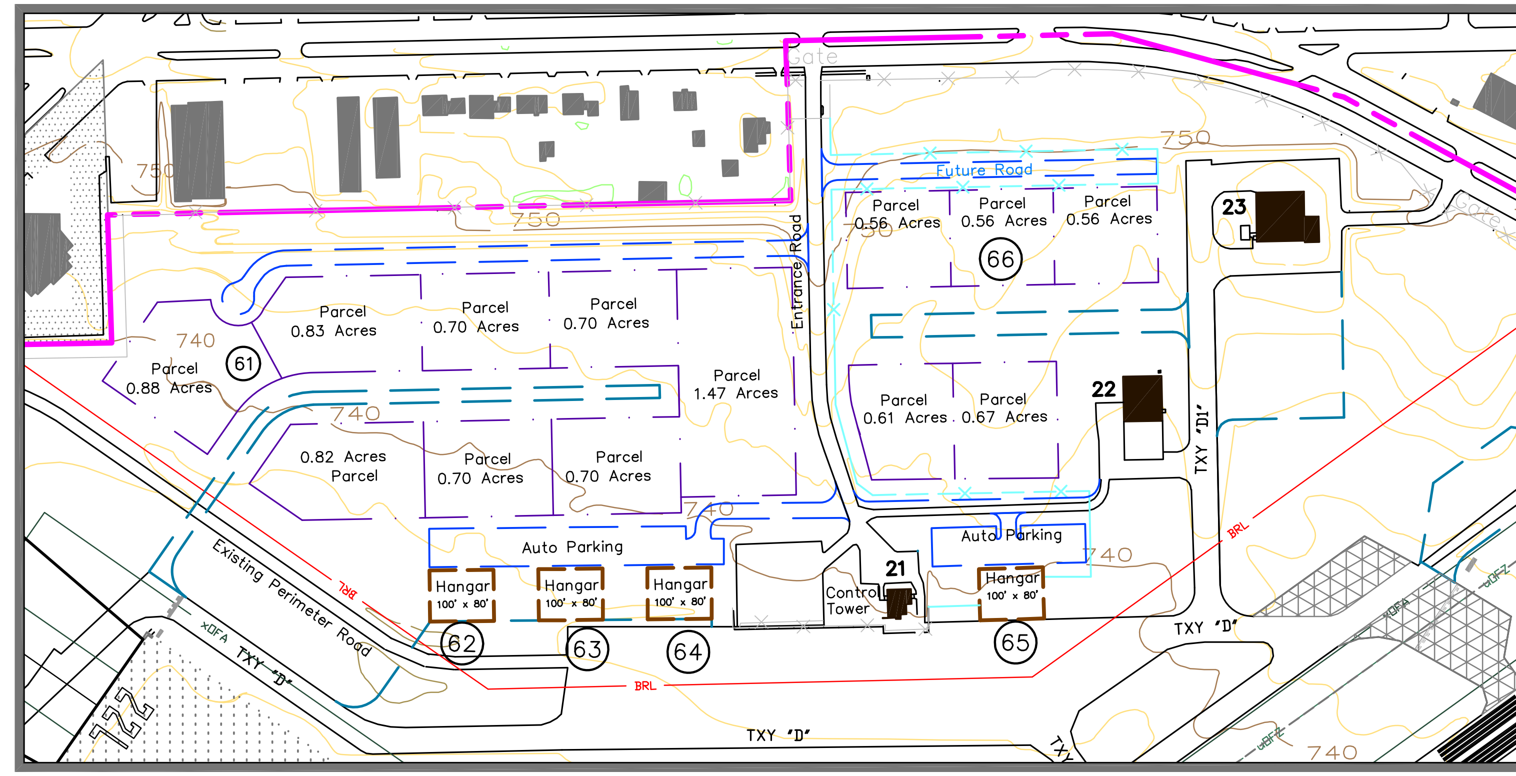
NORTH

TERMINAL AREA

0 100 200 300

SCALE IN FEET





EXISTING BUILDINGS/FACILITIES		
NO.	DESCRIPTION	ELEVATION
1	ADMINISTRATION/TERMINAL BUILDING	775 MSL
2	SCHWARTZBURG HANGAR	– MSL
3	QUONSET (EAST)	– MSL
4	QUONSET (MIDDLE)	– MSL
5	QUONSET (WEST)	– MSL
6	NORTH MASONRY T–HANGAR "I" AND "J" ROW	– MSL
7	SOUTH METAL T–HANGAR "A" AND "B" ROW	– MSL
8	SOUTH METAL T–HANGAR "C" AND "D" ROW	– MSL
9	SOUTH METAL T–HANGAR "E" AND "F" ROW	– MSL
10	NORTH MASONRY T–HANGAR "K" AND "L" ROW	– MSL
11	T–HANGAR	– MSL
12	METRO FLYING CLUB	– MSL
13	T–HANGAR "M" AND "N" ROW	– MSL
14	T–HANGAR "O" AND "P" ROW	– MSL
15	FUEL FACILITY	– MSL
16	COUNTY MAINTENANCE BUILDING	– MSL
17	CLEARSPAN HANGAR "G" ROW	– MSL
18	CIVIL AIR PATROL HANGAR	– MSL
19	FIRE STATION	– MSL
20	AIRPORT ROTATING BEACON	797 MSL
21	AIR TRAFFIC CONTROL TOWER (Floor EL 874)	882 MSL
22	SHERIFF'S HANGAR	– MSL
23	VACANT HANGAR	– MSL

ULTIMATE BUILDINGS/FACILITIES	
NO.	DESCRIPTION
50	HANGAR (100' x 100')
51	TERMINAL (200' x 100')
52	HANGAR (100' x 100')
53	T–HANGARS (20 units)
54	T–HANGARS (20 units)
61	CORPORATE PARCELS
62	CONVENTIONAL HANGAR (100' x 80')
63	CONVENTIONAL HANGAR (100' x 80')
64	CONVENTIONAL HANGAR (100' x 80')
65	CONVENTIONAL HANGAR (100' x 80')
66	CORPORATE PARCELS

NORTH

TOWER RAMP

0 150 300 450

SCALE IN FEET

LEGEND		
EXISTING	ULTIMATE	DESCRIPTION
		ABANDONED PAVEMENT (To Be Removed)
		AIRPORT PROPERTY LINE
		AVIGATION EASEMENT (if applicable)
		BUILDING ABANDONMENT (To Be Removed)
		BUILDING CONSTRUCTION
BRL		BUILDING RESTRICTION LINE (BRL)
		FACILITY CONSTRUCTION
		FENCING
VASI–4	PAPI–4	VISUAL NAVIGATIONAL AIDS INSTALLATION (GVGI)
		RUNWAY THRESHOLD LIGHTS and REIL
34 35 / 3 2		SECTION CORNER
1080		TOPOGRAPHY (1997 Mapping)
		WIND INDICATOR (Lighted)
		CORPORATE PARCELS

No.	REVISIONS	DATE	BY	APP'D.

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WISCONSIN DEPARTMENT OF TRANSPORTATION
BUREAU OF AERONAUTICS

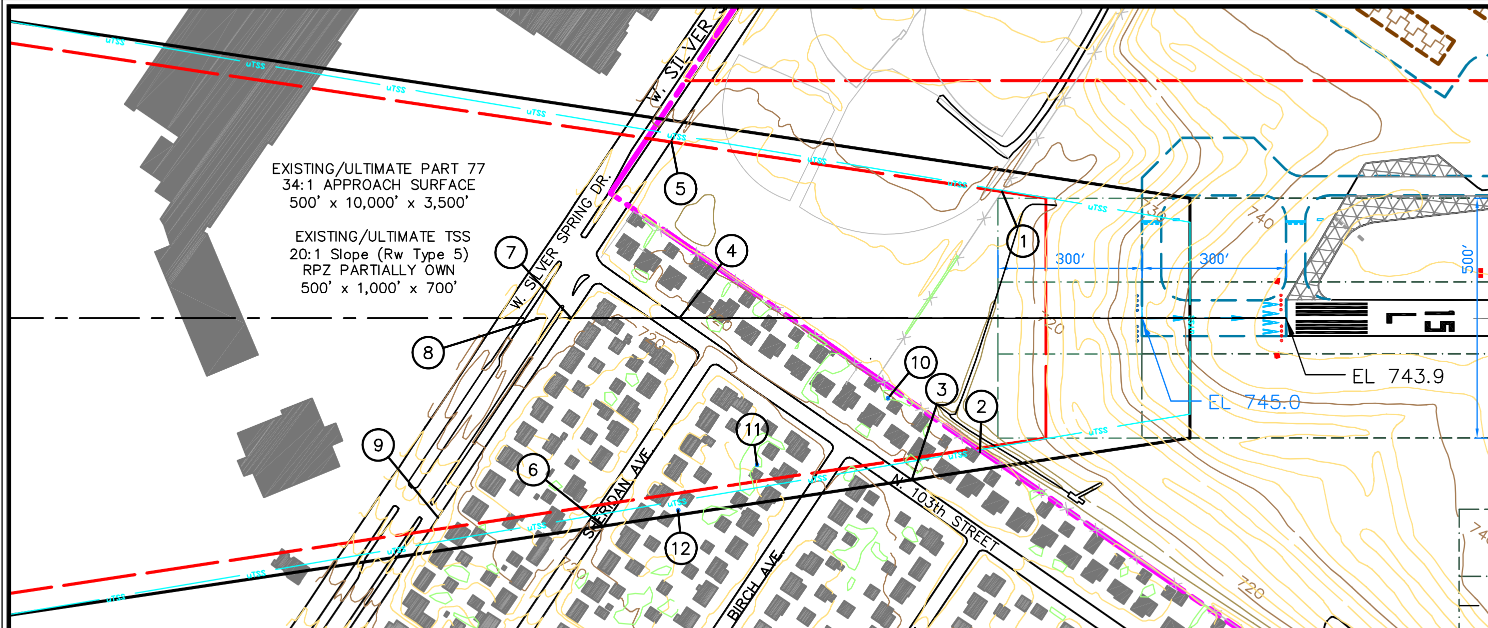
TERMINAL FACILITIES DRAWING

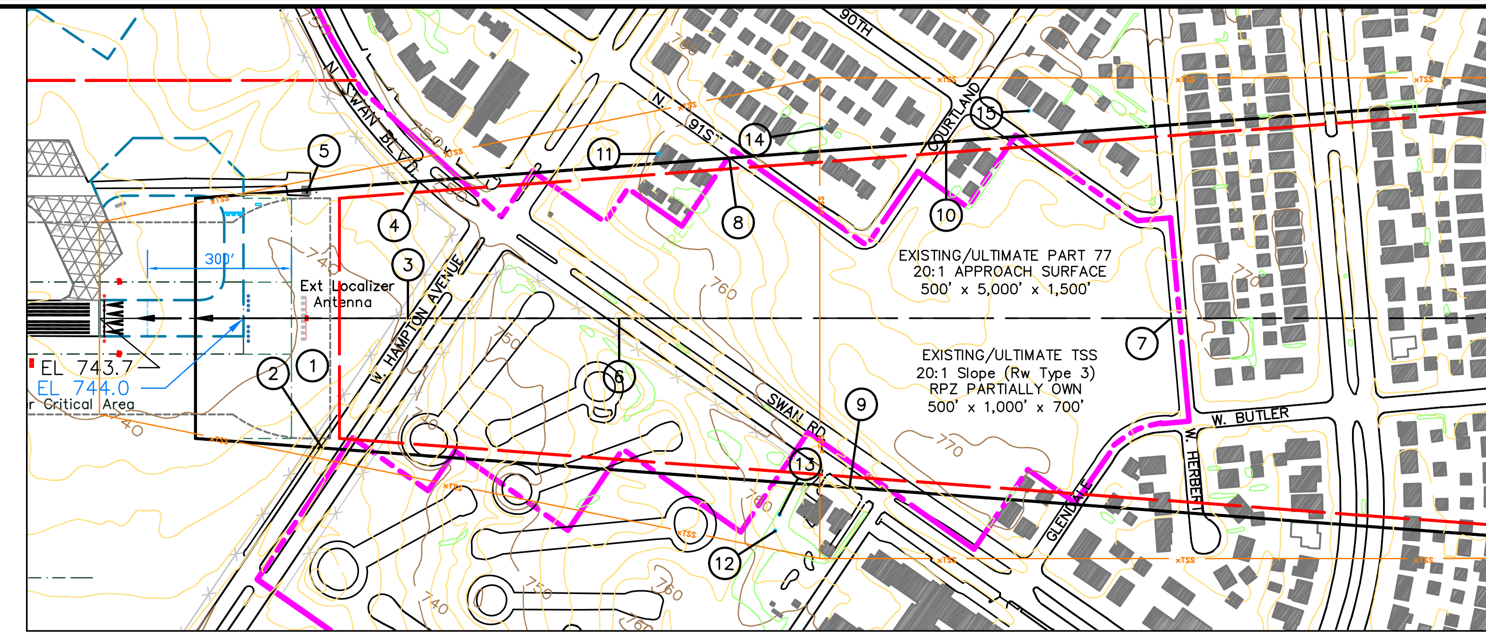
LAWRENCE J. TIMMERMAN AIRPORT
Milwaukee County, Wisconsin

PLANNED BY: Stephen C. Wagner
DETAILED BY: Larry D. Johnson
APPROVED BY: Stephen C. Wagner

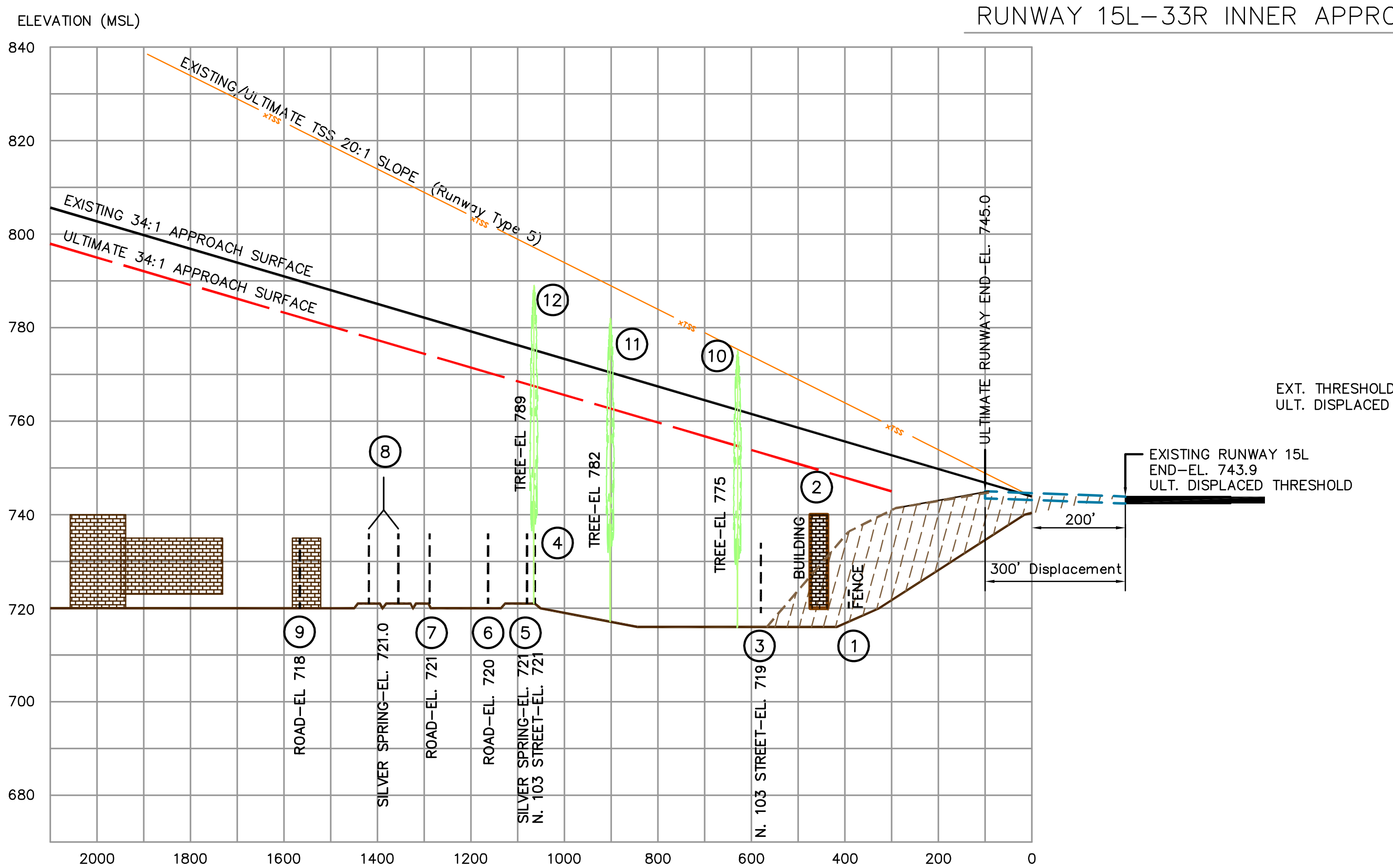
March 11, 2008

Plotted @ 1:400

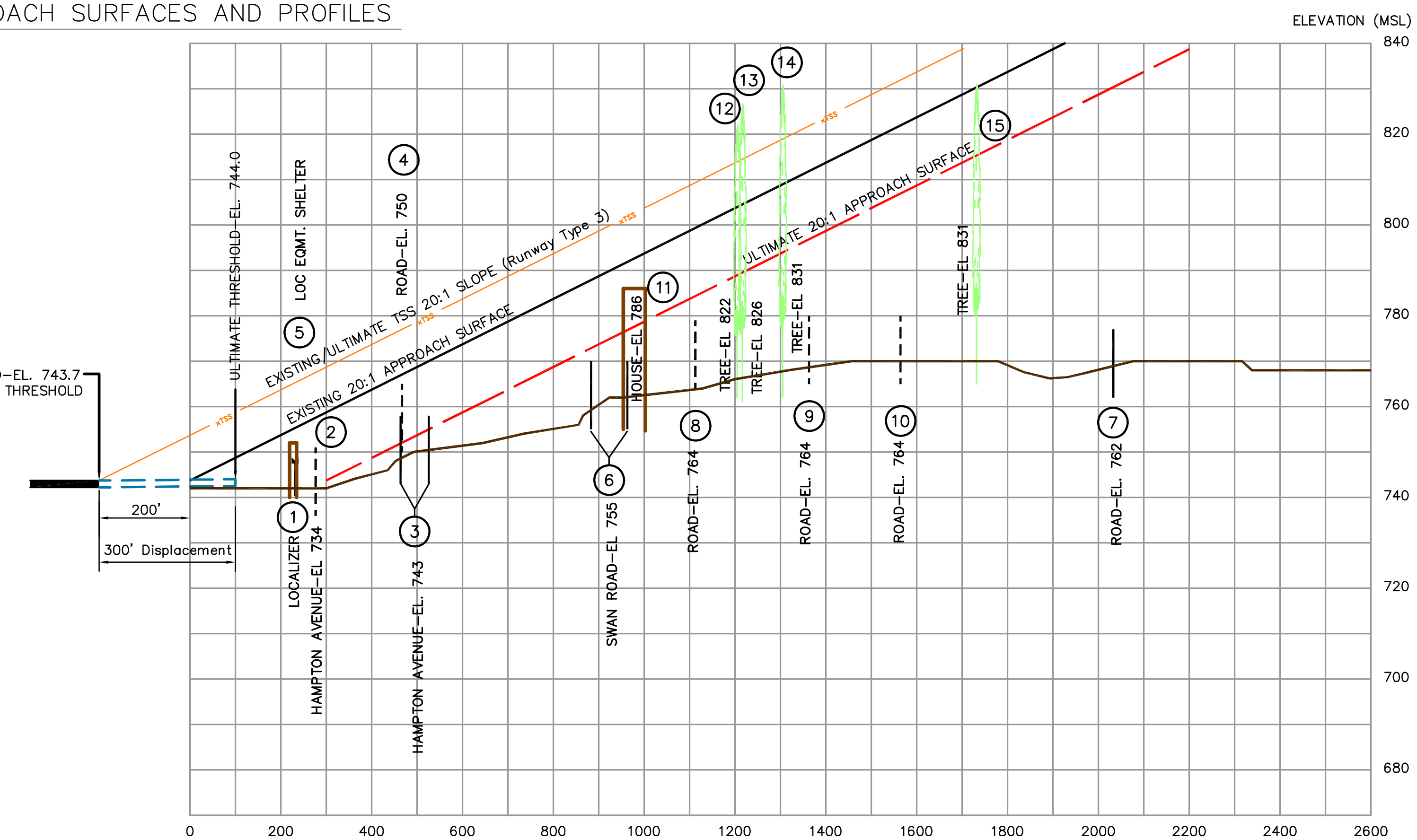




RUNWAY 15L–33R INNER APPROACH SURFACES AND PROFILES



RUNWAY 15L



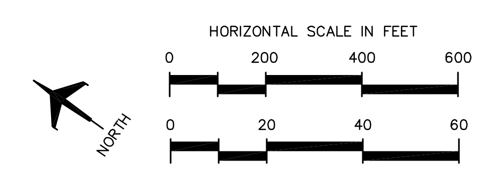
RUNWAY 33R

RUNWAY 15L OBSTRUCTION TABLE					
NO.	Object Description/Elevation	Obstructed Part 77 Surface	Object Penetration	Appendix 2 TSS 20:1 Slope	Proposed Object Disposition
10	TREE–EL 775	34:1 APPROACH	20'	CLEAR	TRIM/REMOVE
11	TREE–EL 782	34:1 APPROACH	19'	CLEAR	TRIM/REMOVE
12	TREE–EL 789	34:1 APPROACH	21'	CLEAR	TRIM/REMOVE

RUNWAY 33R OBSTRUCTION TABLE					
NO.	Object Description/Elevation	Obstructed Part 77 Surface	Object Penetration	Appendix 2 TSS 20:1 Slope	Proposed Object Disposition
1	LOCALIZER–EL. 752	PRIMARY SURFACE	8'	CLEAR	ULTIMATE DISPLACED THRESHOLD
2	HAMPTON AVENUE–EL. 749	PRIMARY SURFACE	7.4'	CLEAR	ULTIMATE DISPLACED THRESHOLD
3	HAMPTON AVENUE–EL. 758	20:1 APPROACH	6'	CLEAR	ULTIMATE DISPLACED THRESHOLD
4	N. SWAN ROAD–EL. 765	20:1 APPROACH	13'	CLEAR	ULTIMATE DISPLACED THRESHOLD
11	HOUSE–EL. 786	20:1 APPROACH	10'	CLEAR	ULTIMATE DISPLACED THRESHOLD
12	TREE–EL. 822	20:1 APPROACH	33'	9'	TRIM/REMOVE
13	TREE–EL. 826	20:1 APPROACH	37'	13'	TRIM/REMOVE
14	TREE–EL. 831	20:1 APPROACH	37'	13'	TRIM/REMOVE
15	TREE–EL. 831	20:1 APPROACH	16'	CLEAR	TRIM/REMOVE

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from existing runway end elevations and existing approach surfaces, unless otherwise noted.
2. Depiction of features and objects within the primary, transitional, and horizontal Part 77 surfaces, is illustrated on the AIRPORT AIRSPACE DRAWING, sheet 11 of these plans.



No.	REVISIONS	DATE	BY	APP'D.

THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

WISCONSIN DEPARTMENT OF TRANSPORTATION
BUREAU OF AERONAUTICS

INNER PORTION OF RUNWAY 15L–33R
ULTIMATE APPROACH SURFACE DRAWING
LAWRENCE J. TIMMERMAN AIRPORT
Milwaukee County, Wisconsin

PLANNED BY: Stephen C. Wagner
DETAILED BY: Larry D. Johnson
APPROVED BY: Stephen C. Wagner

March 11, 2008 SHEET 4 OF 13

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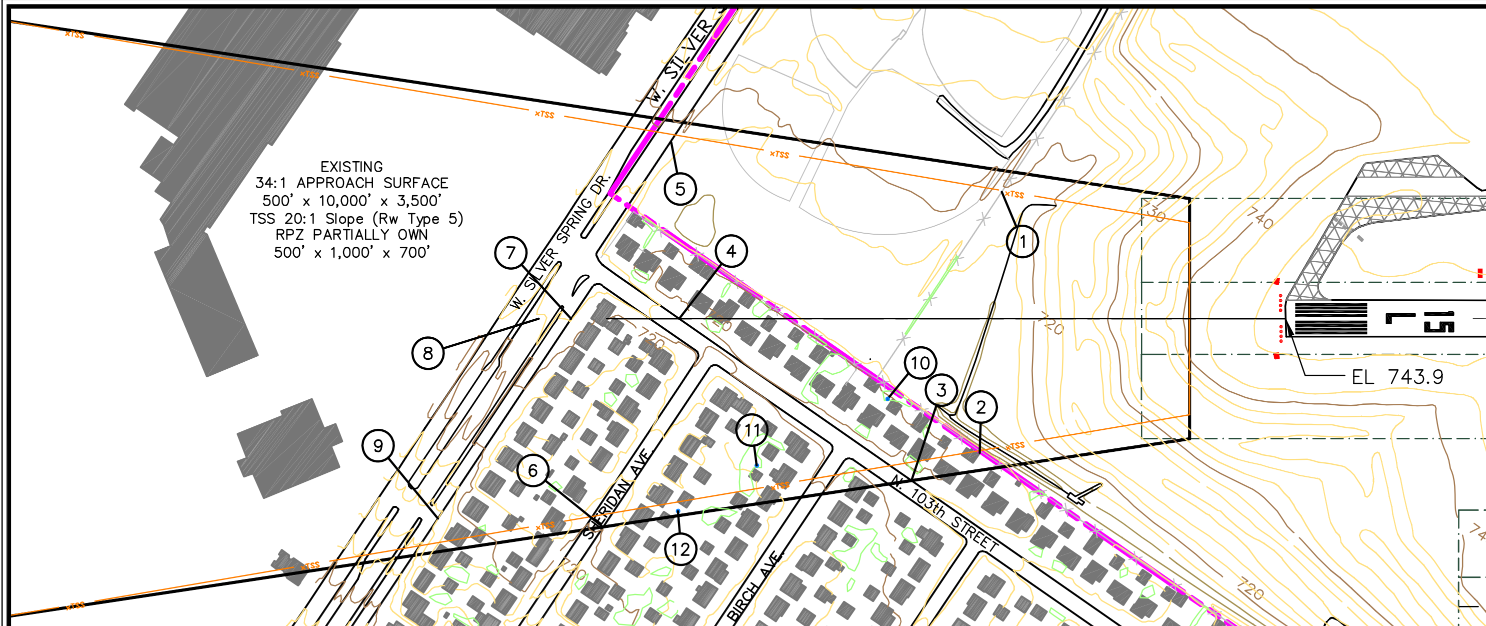
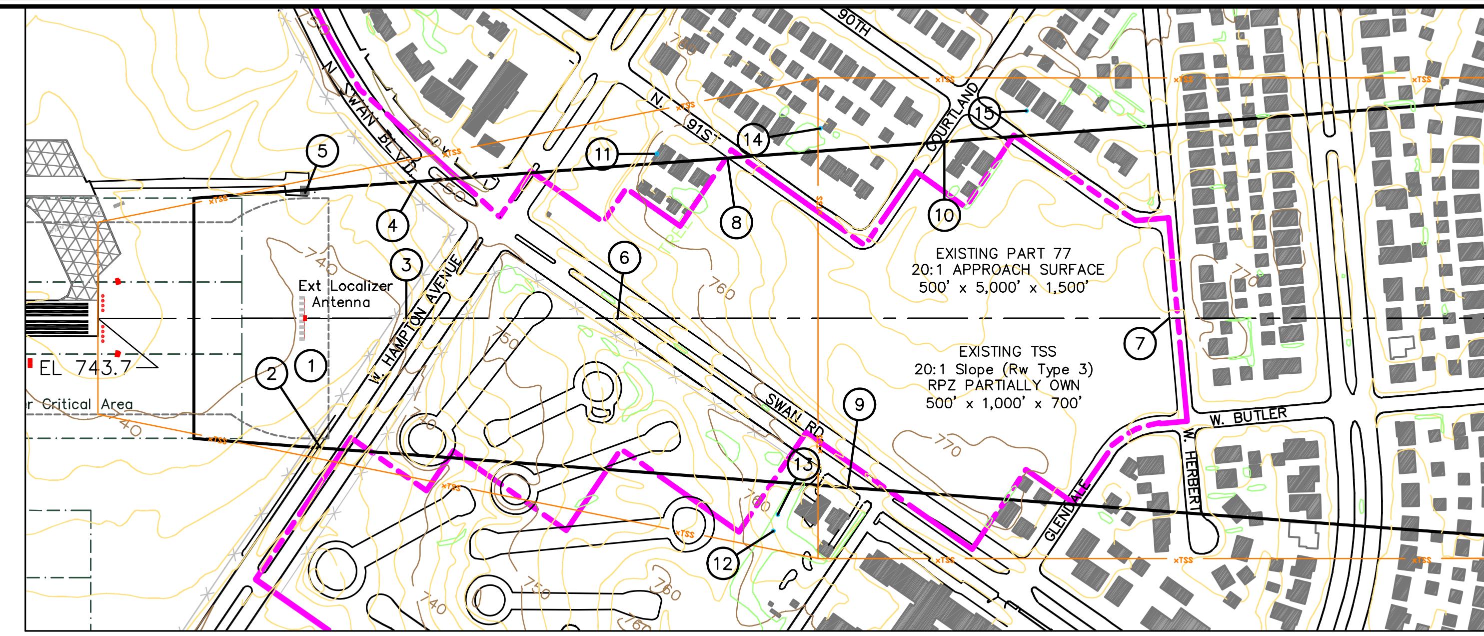
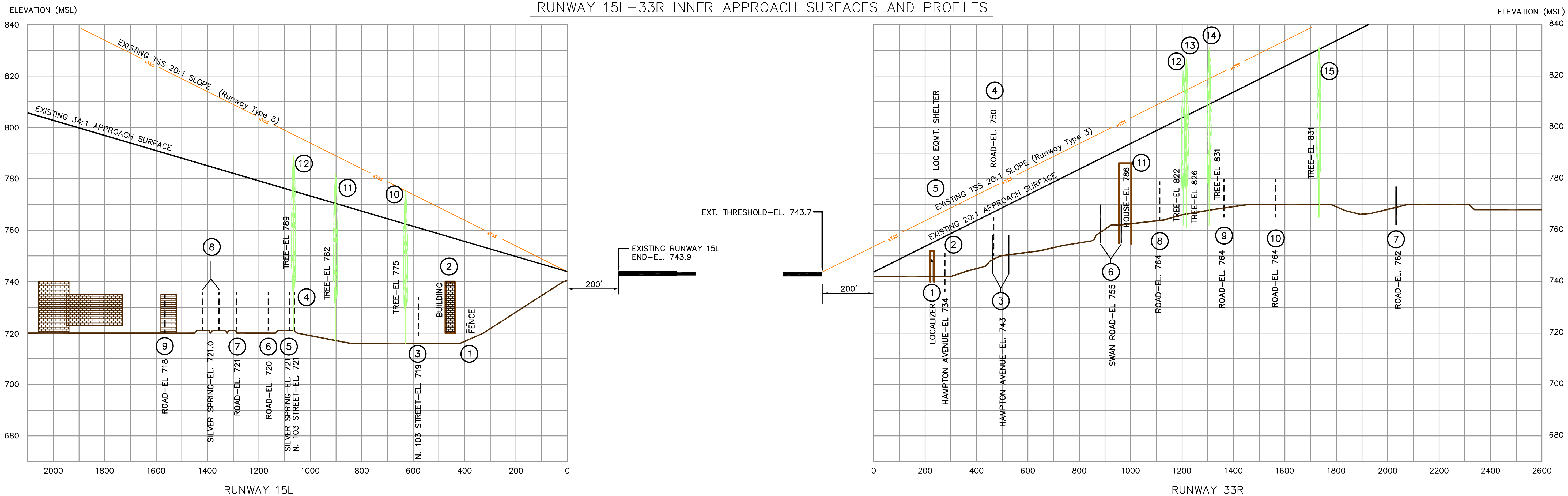




RUNWAY 15L–33R INNER APPROACH SURFACES AND PROFILES



RUNWAY 15L OBSTRUCTION TABLE					
NO.	Object Description/Elevation	Obstructed Part 77 Surface	Object Penetration	Appendix 2 TSS 20:1 Slope	Proposed Object Disposition
10	TREE-EL 775	34:1 APPROACH	13'	CLEAR	TRIM/REMOVE
11	TREE-EL 782	34:1 APPROACH	12'	CLEAR	TRIM/REMOVE
12	TREE-EL 789	34:1 APPROACH	14'	CLEAR	TRIM/REMOVE

RUNWAY 33R OBSTRUCTION TABLE					
NO.	Object Description/Elevation	Obstructed Part 77 Surface	Object Penetration	Appendix 2 TSS 20:1 Slope	Proposed Object Disposition
12	TREE-EL. 822	20:1 APPROACH	18'	8'	TRIM/REMOVE
13	TREE-EL. 826	20:1 APPROACH	21'	11'	TRIM/REMOVE
14	TREE-EL. 831	20:1 APPROACH	22'	12'	TRIM/REMOVE
15	TREE-EL. 831	20:1 APPROACH	1'	CLEAR	TRIM/REMOVE

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from existing runway end elevations and existing approach surfaces, unless otherwise noted.
2. Depiction of features and objects within the primary, transitional, and horizontal Part 77 surfaces, is illustrated on the AIRPORT AIRSPACE DRAWING, sheet 11 of these plans.

HORIZONTAL SCALE IN FEET: 0 200 400 600

VERTICAL SCALE IN FEET: 0 20 40 60

NORTH

No.	REVISIONS	DATE	BY	APP'D.

THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

WISCONSIN DEPARTMENT OF TRANSPORTATION
BUREAU OF AERONAUTICS

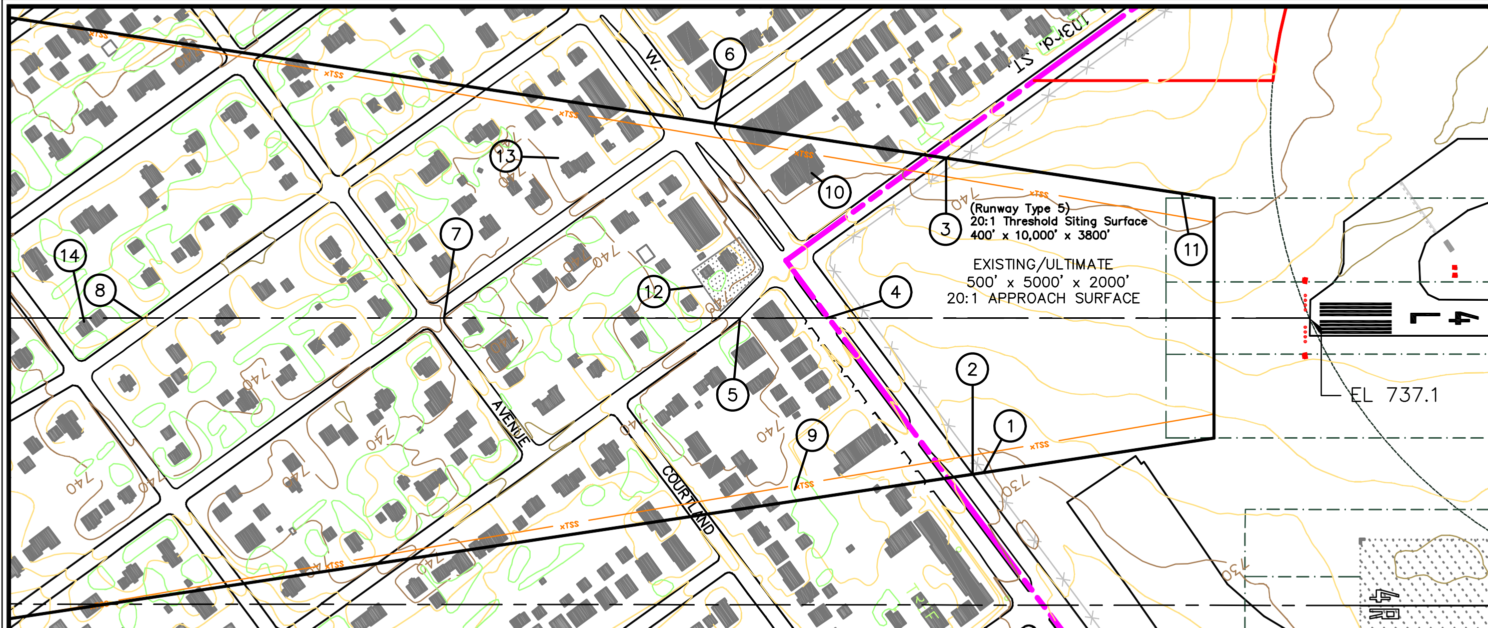
INNER PORTION OF RUNWAY 15L–33R
EXISTING APPROACH SURFACE DRAWING
LAWRENCE J. TIMMERMAN AIRPORT
Milwaukee County, Wisconsin

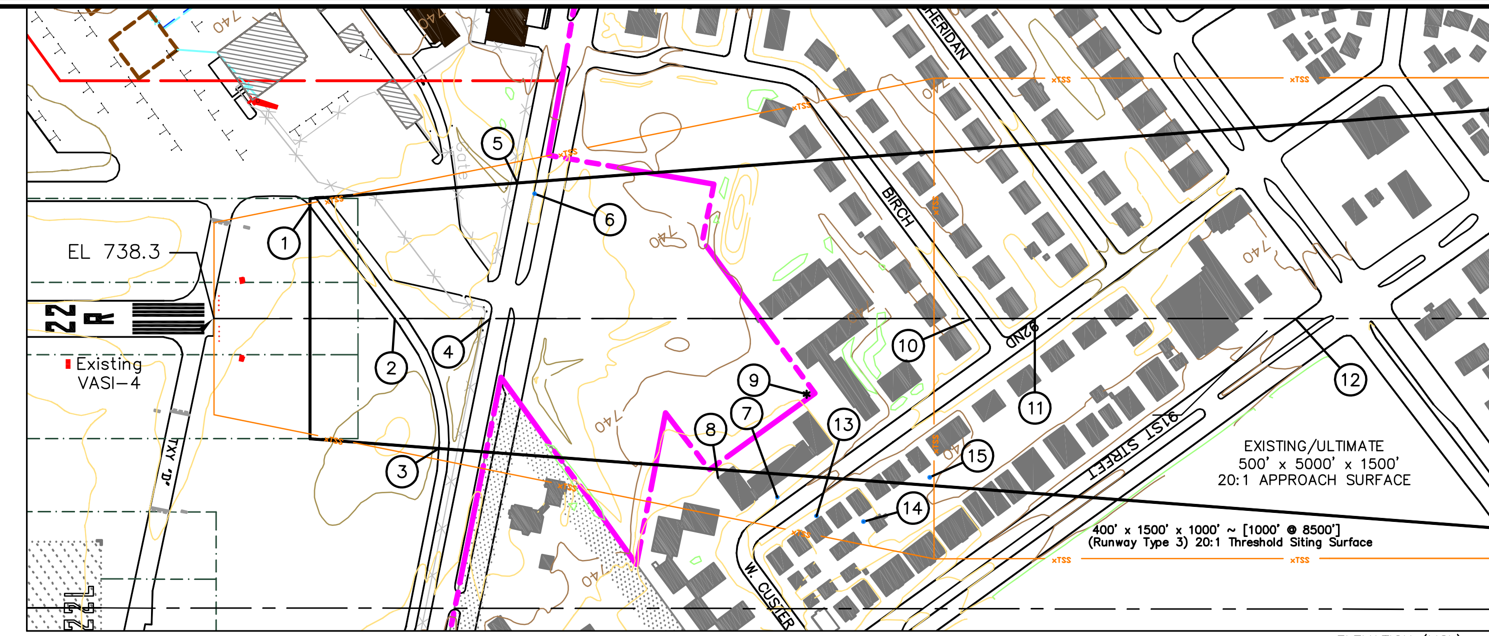
PLANNED BY: Stephen C. Wagner
DETAILED BY: Larry D. Johnson
APPROVED BY: Stephen C. Wagner

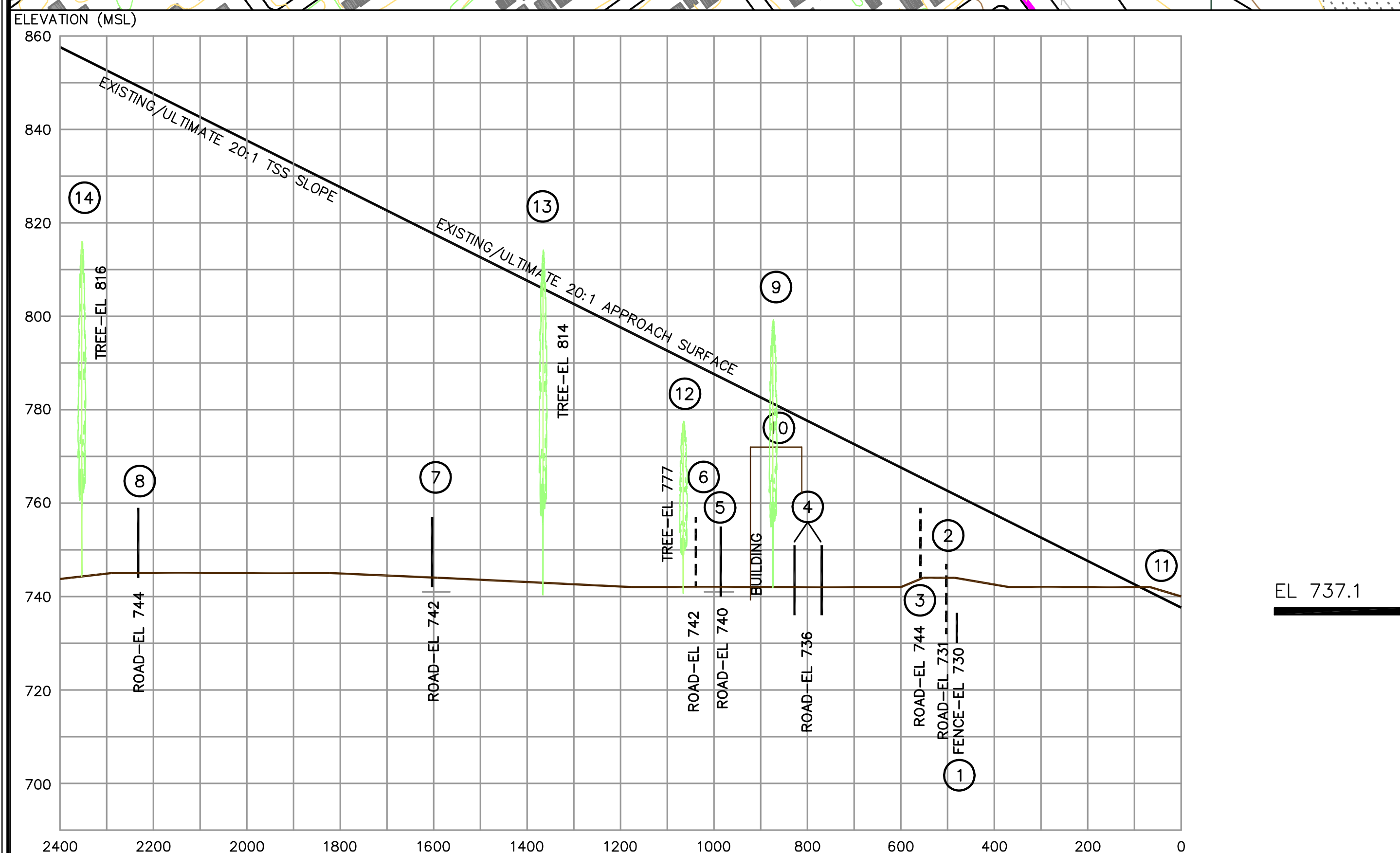
March 11, 2008 SHEET 5 OF 13

Coffman Associates Airport Consultants www.coffmanassociates.com

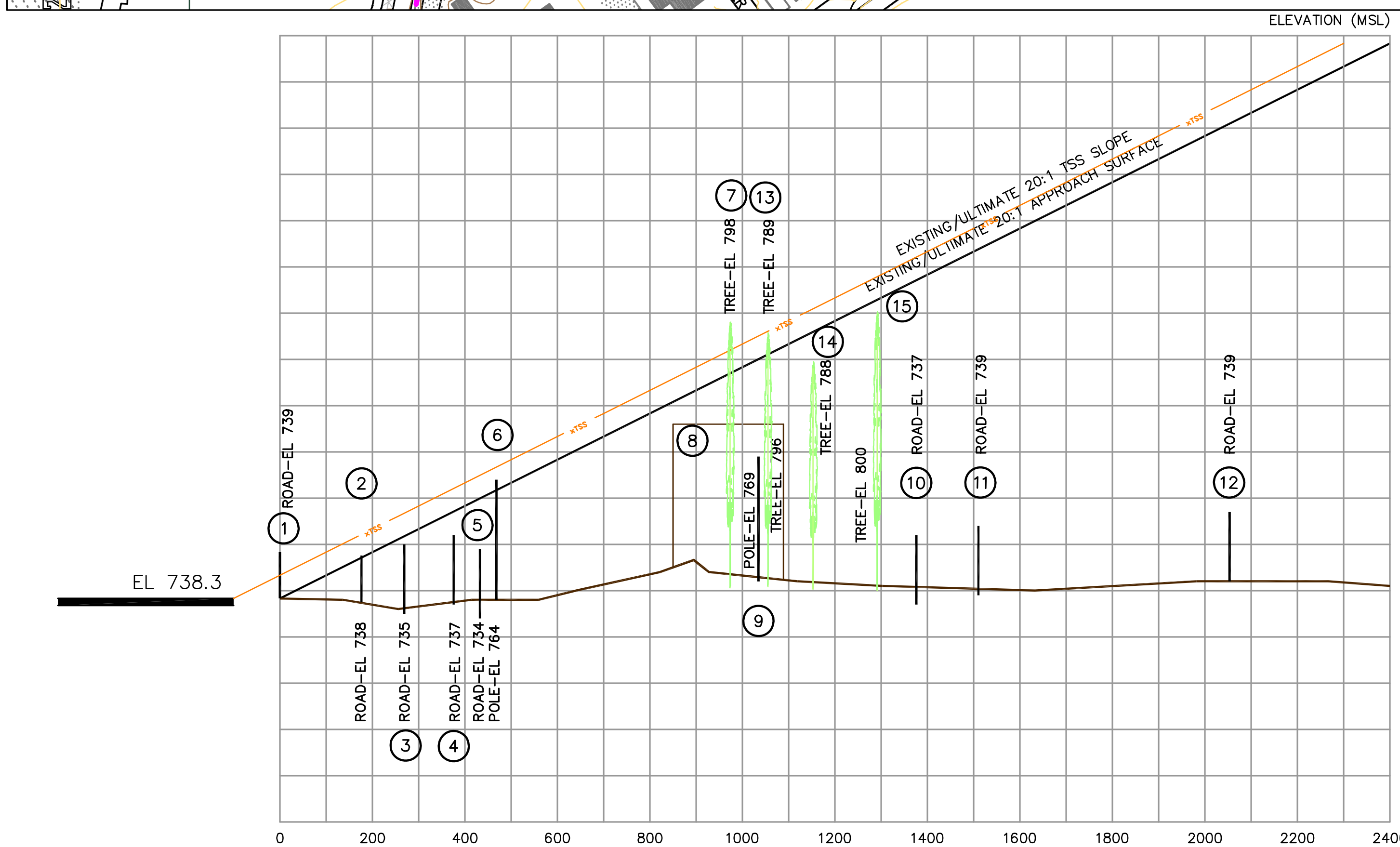
Plotted @ 1:400







RUNWAY 4L



RUNWAY 22R

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from existing runway end elevations and existing approach surfaces, unless otherwise noted.

2. Depiction of features and objects within the primary, transitional, and horizontal Part 77 surfaces, is illustrated on the AIRPORT AIRSPACE DRAWING, sheet 11 of these drawings.

HORIZONTAL SCALE IN FEET: 0 200 400 600

VERTICAL SCALE IN FEET: 0 20 40 60

NORTH

RUNWAY 4L OBSTRUCTION TABLE

NO.	Object Description/Elevation	Obstructed Part 77 Surface	Object Penetration	Appendix 2 TSS 20:1 Slope	Proposed Object Disposition
11	GROUND-EL. 742	20:1 APPROACH	3'	OUTSIDE of TSS	TO BE GRADED
9	TREE-EL. 799	20:1 APPROACH	18'	18'	TRIM/REMOVE
13	TREE-EL. 814	20:1 APPROACH	8'	8'	TRIM/REMOVE

RUNWAY 22R OBSTRUCTION TABLE

NO.	Object Description/Elevation	Obstructed Part 77 Surface	Object Penetration	Appendix 2 TSS 20:1 Slope	Proposed Object Disposition
1	ROAD-EL. 749	20:1 APPROACH	10'	5'	NO ACTION
2	ROAD-EL. 748	20:1 APPROACH	1'	CLEAR	NO ACTION
6	POLE-EL. 764	20:1 APPROACH	2'	CLEAR	TRIM/REMOVE
7	TREE-EL. 798	20:1 APPROACH	10'	5'	TRIM/REMOVE
13	TREE-EL. 796	20:1 APPROACH	4'	CLEAR	TRIM/REMOVE

No.	REVISIONS	DATE	BY	APP'D.

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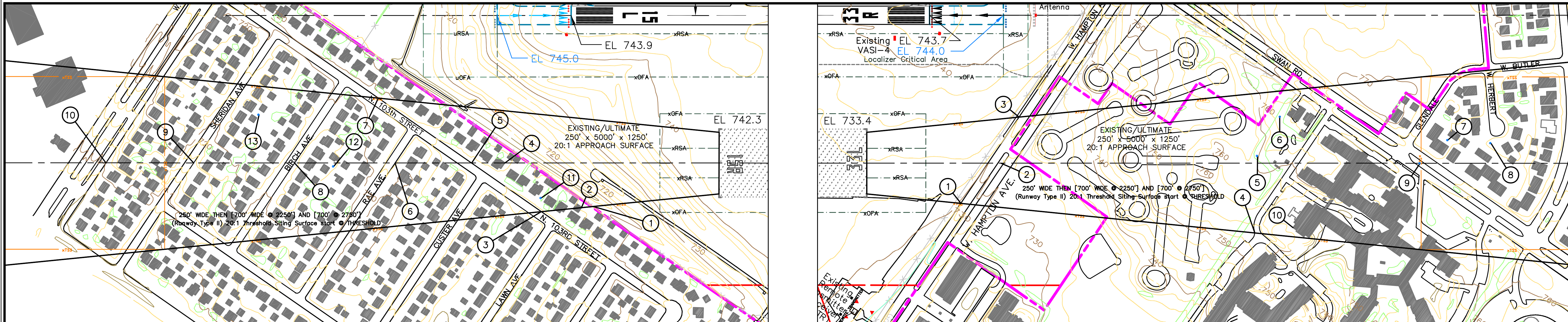
WISCONSIN DEPARTMENT OF TRANSPORTATION
BUREAU OF AERONAUTICS

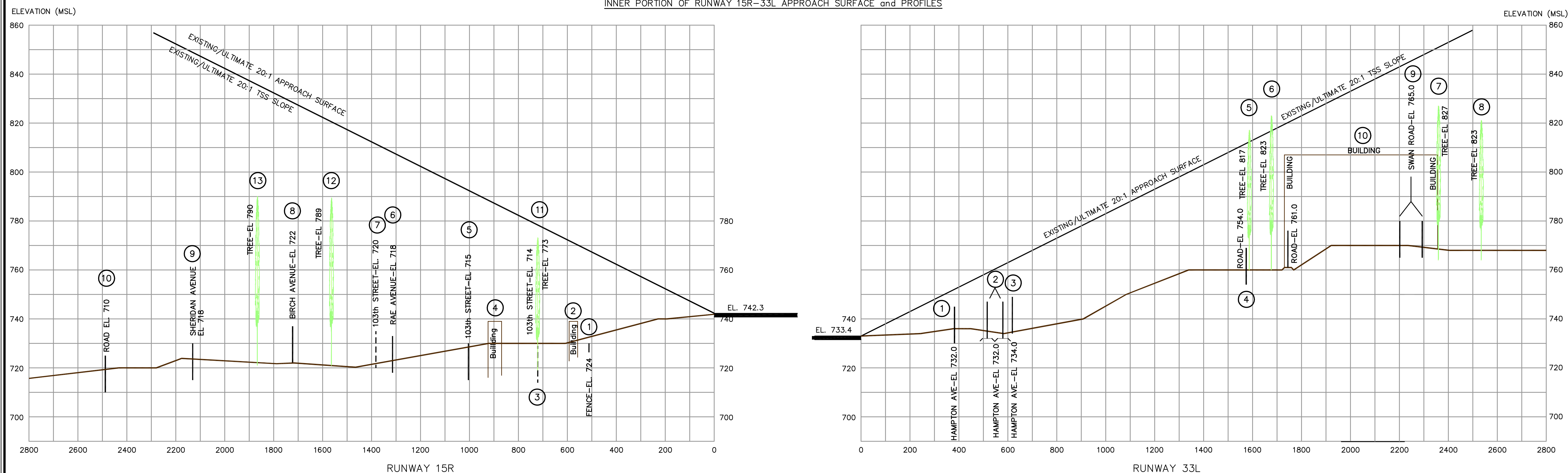
INNER PORTION OF RUNWAY 4L-22R APPROACH SURFACE DRAWING

LAWRENCE J. TIMMERMAN AIRPORT
Milwaukee County, Wisconsin

PLANNED BY: Stephen C. Wagner
DETAILED BY: Larry D. Johnson
APPROVED BY: Stephen C. Wagner
March 11, 2008



INNER PORTION OF RUNWAY 15R-33L APPROACH SURFACE and PROFILES



GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from existing runway end elevations and existing approach surfaces, unless otherwise noted.
2. Depiction of features and objects within the primary, transitional, and horizontal Part 77 surfaces, is illustrated on the AIRPORT AIRSPACE DRAWING, sheet 11 of these plans.

HORIZONTAL SCALE IN FEET: 0, 200, 400, 600

VERTICAL SCALE IN FEET: 0, 20, 40, 60

NORTH

RUNWAY 15R OBSTRUCTION TABLE

NO.	Object Description/Elevation	Obstructed Part 77 Surface	Object Penetration	Appendix 2 TSS 20:1 Slope	Proposed Object Disposition
–	NONE	–	–	–	–

RUNWAY 33L OBSTRUCTION TABLE

NO.	Object Description/Elevation	Obstructed Part 77 Surface	Object Penetration	Appendix 2 TSS 20:1 Slope	Proposed Object Disposition
5	TREE-EL. 817	20:1 APPROACH	5'	5'	TRIM/REMOVE
6	TREE-EL. 823	20:1 APPROACH	6'	6'	TRIM/REMOVE

No.	REVISIONS	DATE	BY	APP'D.

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WISCONSIN DEPARTMENT OF TRANSPORTATION
BUREAU OF AERONAUTICS

INNER PORTION OF RUNWAY 15R-33L APPROACH SURFACE DRAWING

LAWRENCE J. TIMMERMAN AIRPORT
Milwaukee County, Wisconsin

PLANNED BY: Stephen C. Wagner
DETAILED BY: Larry D. Johnson
APPROVED BY: Stephen C. Wagner

March 11, 2008

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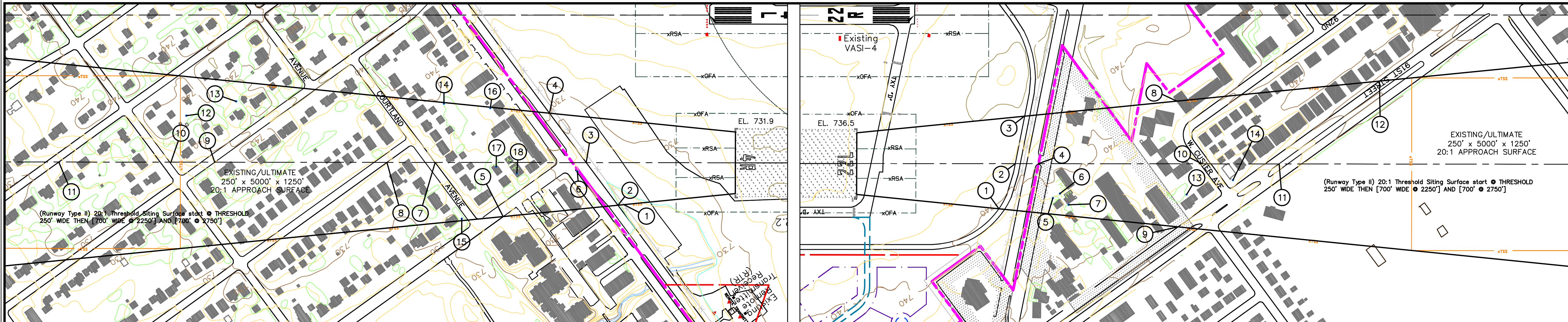
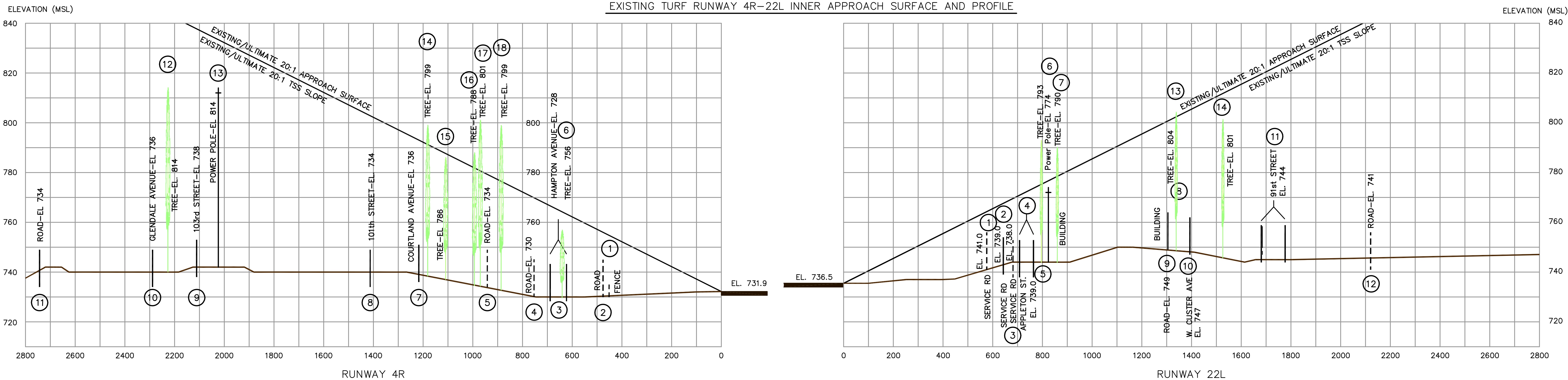
Plotted @ 1:400



EXISTING TURF RUNWAY 4R-22L INNER APPROACH SURFACE AND PROFILE



GENERAL NOTES:

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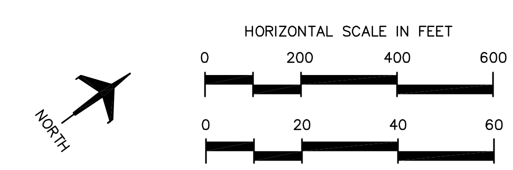

RUNWAY 4R OBSTRUCTION TABLE

NO.	Object Description/Elevation	Obstructed Part 77 Surface	Object Penetration	Appendix 2 TSS 20:1 Slope	Proposed Object Disposition
14	TREE EL 799	20:1 APPROACH	8'	8'	TRIM/REMOVE
16	TREE EL 788	20:1 APPROACH	6'	6'	TRIM/REMOVE within "RPZ"
17	TREE EL 801	20:1 APPROACH	20'	20'	TRIM/REMOVE within "RPZ"
18	TREE EL 799	20:1 APPROACH	22'	22'	TRIM/REMOVE within "RPZ"

RUNWAY 22L OBSTRUCTION TABLE

NO.	Object Description/Elevation	Obstructed Part 77 Surface	Object Penetration	Appendix 2 TSS 20:1 Slope	Proposed Object Disposition
5	TREE EL 793	20:1 APPROACH	18'	18'	TRIM/REMOVE within "RPZ"
7	TREE EL 790	20:1 APPROACH	12'	12'	TRIM/REMOVE within "RPZ"
13	TREE EL 804	20:1 APPROACH	2'	2'	TRIM/REMOVE

No.	REVISIONS	DATE	BY	APP'D.

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WISCONSIN DEPARTMENT OF TRANSPORTATION
BUREAU OF AERONAUTICS

INNER PORTION OF RUNWAY 4R-22L APPROACH SURFACE DRAWING

LAWRENCE J. TIMMERMAN AIRPORT
Milwaukee County, Wisconsin

PLANNED BY: Stephen C. Wagner
DETAILED BY: Larry D. Johnson
APPROVED BY: Stephen C. Wagner

March 11, 2008

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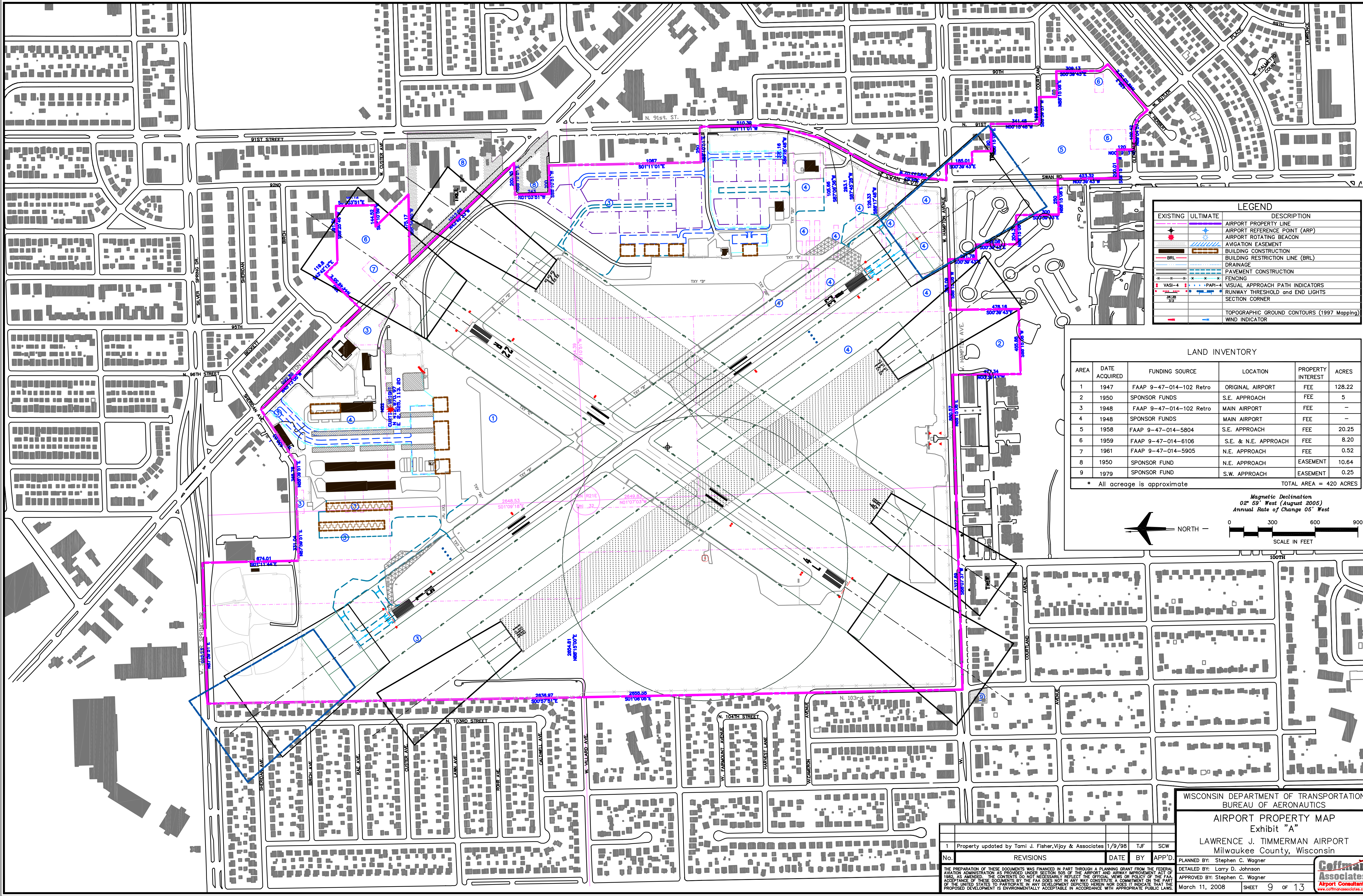
Plotted @ 1:600



LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		AIRPORT PROPERTY LINE
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
		AVIGATION EASEMENT
		BUILDING CONSTRUCTION
BRL		BUILDING RESTRICTION LINE (BRL)
		DRAINAGE
		PAVEMENT CONSTRUCTION
		FENCING
VASI–4	PAPI–4	VISUAL APPROACH PATH INDICATORS
		RUNWAY THRESHOLD and END LIGHTS
34 35 / 3 2		SECTION CORNER
		TOPOGRAPHIC GROUND CONTOURS (1997 Mapping)
		WIND INDICATOR

LAND INVENTORY

AREA	DATE ACQUIRED	FUNDING SOURCE	LOCATION	PROPERTY INTEREST	ACRES
1	1947	FAAP 9–47–014–102 Retro	ORIGINAL AIRPORT	FEE	128.22
2	1950	SPONSOR FUNDS	S.E. APPROACH	FEE	5
3	1948	FAAP 9–47–014–102 Retro	MAIN AIRPORT	FEE	–
4	1948	SPONSOR FUNDS	MAIN AIRPORT	FEE	–
5	1958	FAAP 9–47–014–5804	S.E. APPROACH	FEE	20.25
6	1959	FAAP 9–47–014–6106	S.E. & N.E. APPROACH	FEE	8.20
7	1961	FAAP 9–47–014–5905	N.E. APPROACH	FEE	0.52
8	1950	SPONSOR FUND	N.E. APPROACH	EASEMENT	10.64
9	1979	SPONSOR FUND	S.W. APPROACH	EASEMENT	0.25

* All acreage is approximate — TOTAL AREA = 420 ACRES

Magnetic Declination
02° 59' West (August 2005)
Annual Rate of Change 05' West

NORTH

0 300 600 900
SCALE IN FEET

No.	REVISIONS	DATE	BY	APP'D.
1	Property updated by Tami J. Fisher, Vijay & Associates	1/9/98	TJF	SCW

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WISCONSIN DEPARTMENT OF TRANSPORTATION
BUREAU OF AERONAUTICS

AIRPORT PROPERTY MAP
Exhibit "A"

LAWRENCE J. TIMMERMAN AIRPORT
Milwaukee County, Wisconsin

PLANNED BY: Stephen C. Wagner
DETAILED BY: Larry D. Johnson
APPROVED BY: Stephen C. Wagner

March 11, 2008 — SHEET 9 OF 13

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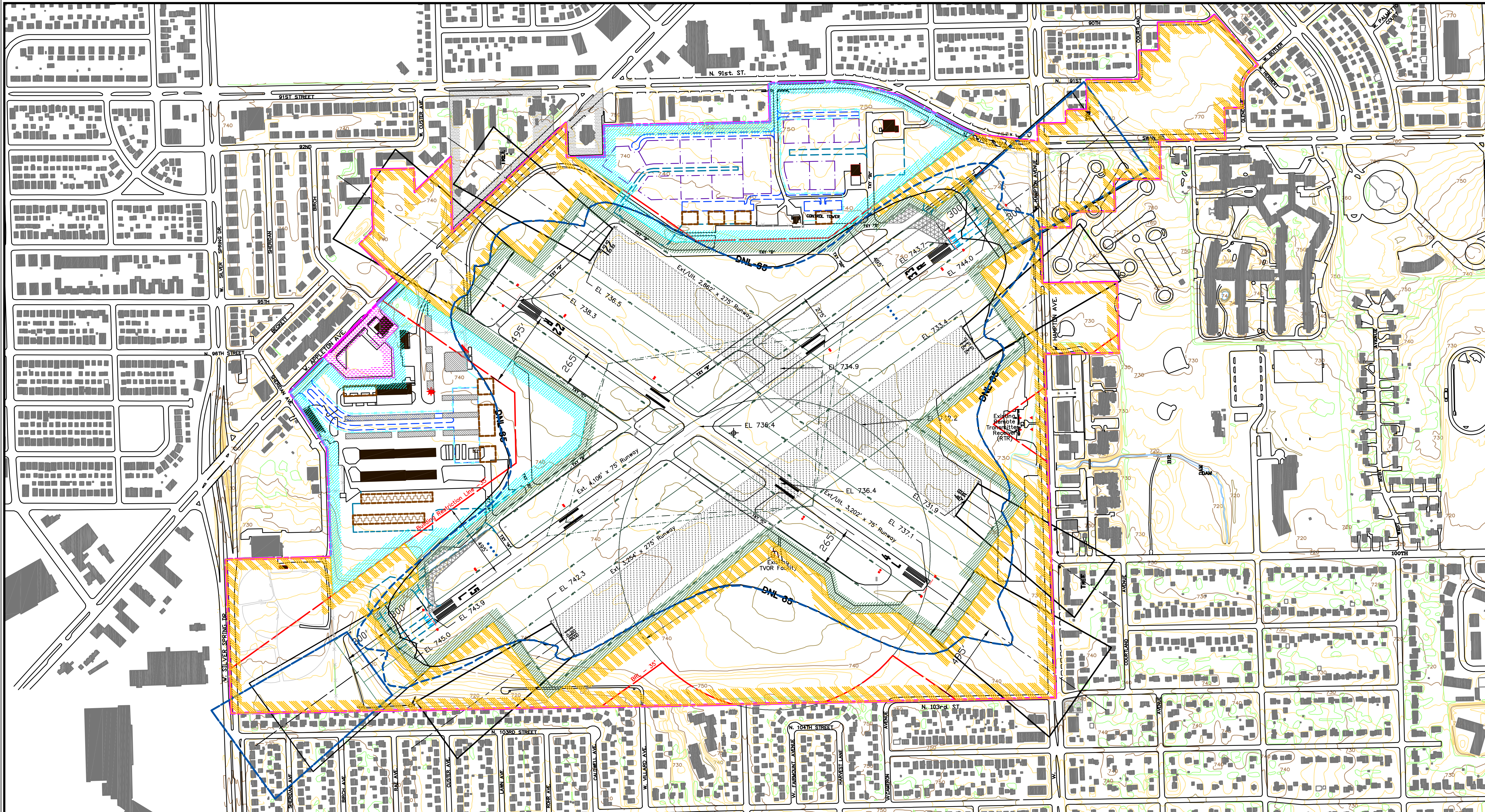
Plotted @ 1:600

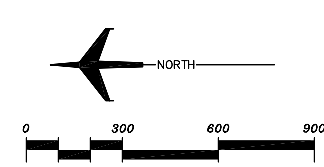


AIRPORT LAND USE LEGEND

- AO — AIRFIELD OPERATIONS
- GA — GENERAL AVIATION FACILITIES
- RS — REVENUE SUPPORT
- UD — UNDEVELOPED/APPROACH BUFFER/ LIMITED RECREATIONAL USES

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		AIRPORT PROPERTY LINE
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
		AVIGATION EASEMENT
		BUILDING CONSTRUCTION
BRL		BUILDING RESTRICTION LINE (BRL)
		DRAINAGE
		PAVEMENT CONSTRUCTION
		FENCING
VASI-4	PAPI-4	VISUAL APPROACH PATH INDICATORS
		RUNWAY THRESHOLD and END LIGHTS
34 35 / 3 2		SECTION CORNER
1080		TOPOGRAPHIC GROUND CONTOURS (1997 Mapping)
		WIND INDICATOR



No.	REVISIONS	DATE	BY	APP'D.

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WISCONSIN DEPARTMENT OF TRANSPORTATION
BUREAU OF AERONAUTICS

AIRPORT LAND USE DRAWING

LAWRENCE J. TIMMERMAN AIRPORT
Milwaukee County, Wisconsin

PLANNED BY: Stephen C. Wagner
DETAILED BY: Larry D. Johnson
APPROVED BY: Stephen C. Wagner
March 11, 2008
SHEET 10 OF 13

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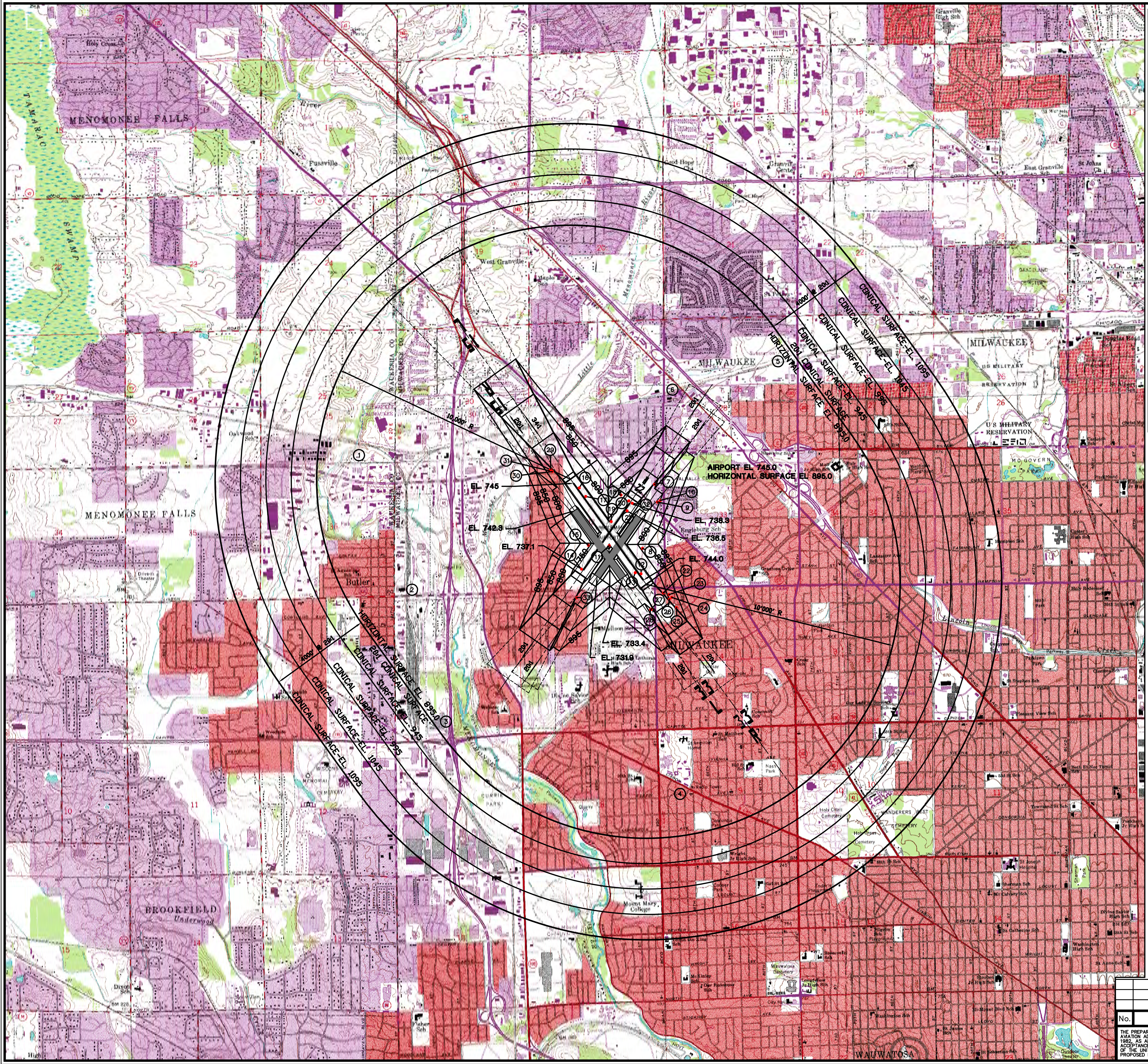
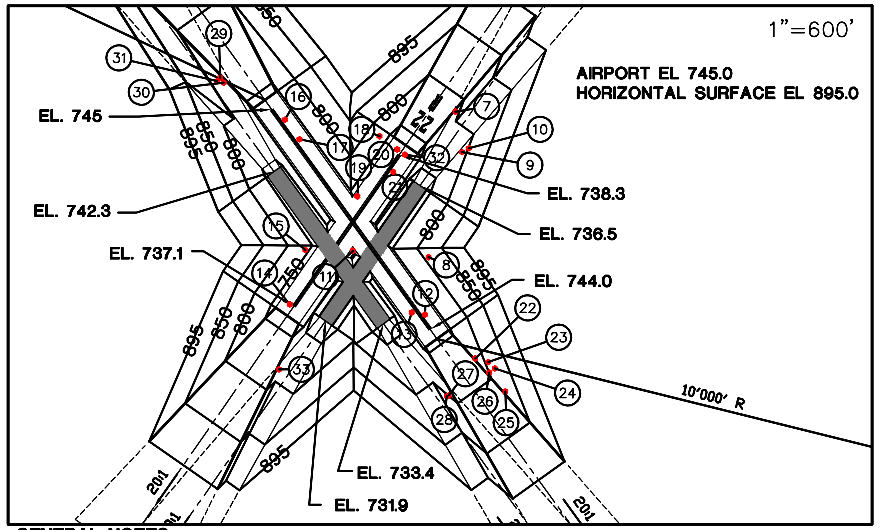
Plotted @ 1:4000



OBSTRUCTION TABLE

Object Description	Elevation	Primary Surface	Outer Approach 20:1	34:1	7:1	Horizontal Surface	Conical Surface	Proposed Object Disposition
1. LT ON TOWER	900 MSL					4.3'		NO ACTION
2. ANT LTD TOWER	885 MSL					CLEAR		NO ACTION
3. STACK	887 MSL					CLEAR		TO BE LIGHTED
4. LTD RADIO TOWER	964 MSL					68.3'		NO ACTION
5. MICRO TOWER	886 MSL					CLEAR		NO ACTION
6. TRANSMISSION TOWER	877 MSL					CLEAR		NO ACTION
7. TREES	798 MSL				11'			TRIM / REMOVE
8. ATCT	822 MSL				13'			NO ACTION
9. TREES	803 MSL				14'			TRIM / REMOVE
10. TREES	811 MSL				11'			TRIM / REMOVE
11. LTD WINDSOCK	764 MSL				21'			NO ACTION
12. SIGN	746 MSL	2'						NO ACTION
13. UTILITY BOX	744 MSL	2'						NO ACTION
14. SIGN	740 MSL	3'						NO ACTION
15. LTD VOR	767 MSL				9'			NO ACTION
16. SIGN	746 MSL	2'						NO ACTION
17. UTILITY BOX	747 MSL	3'						NO ACTION
18. WINDSOCK ON HANGAR	775 MSL				5'			TO BE LIGHTED
19. SIGN	741 MSL	4'						NO ACTION
20. SIGN	742 MSL	3'						NO ACTION
21. UTILITY BOX	741 MSL	3'						NO ACTION
22. HOUSE	786 MSL				6'			TO BE LIGHTED
23. TREES	830 MSL				15'			TRIM / REMOVE
24. TREES	828 MSL				7'			TRIM / REMOVE
25. TREES	831 MSL				12'			TRIM / REMOVE
26. TREES	831 MSL				31'			TRIM / REMOVE
27. TREES	826 MSL				26'			TRIM / REMOVE
28. TREES	822 MSL				10'			TRIM / REMOVE
29. TREES	789 MSL				28'			TRIM / REMOVE
30. TREES	780 MSL				8'			TRIM / REMOVE
31. TREES	790 MSL				7'			TRIM / REMOVE
32. SIGN	742 MSL	3'						NO ACTION
33. TREES	805 MSL				16'			TRIM / REMOVE

1. REQUEST AERONAUTICAL STUDY
2. See the Inner Approach Surface Drawings for close-in obstructions.



GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate runway approach surface, unless otherwise noted.
2. Depiction of features and objects within the Conical, Horizontal, Transitional, and Primary Part 77 surfaces, is illustrated on the AIRPORT AIRSPACE DRAWING, sheet 11 of these plans.
3. Depiction of features and objects within the inner portion of the approach surfaces, is illustrated on the INNER PORTION OF THE RUNWAY APPROACH SURFACE DRAWING, sheets 4, 5, 6, 7 and 8 of these plans.
4. Additional obstruction data is illustrated on National Ocean Survey document OC 5077 dated 1982, AIRPORT OBSTRUCTION CHART.

OBSTRUCTION LEGEND

- OBSTRUCTION
- GROUP or MULTIPLE OBSTRUCTIONS

NORTH

Magnetic Declination
02° 59' West (August 2005)
Annual Rate of Change 05' West

0 2000 4000 6000
SCALE IN FEET

No.	REVISIONS	DATE	BY	APP'D.

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WISCONSIN DEPARTMENT OF TRANSPORTATION
BUREAU OF AERONAUTICS

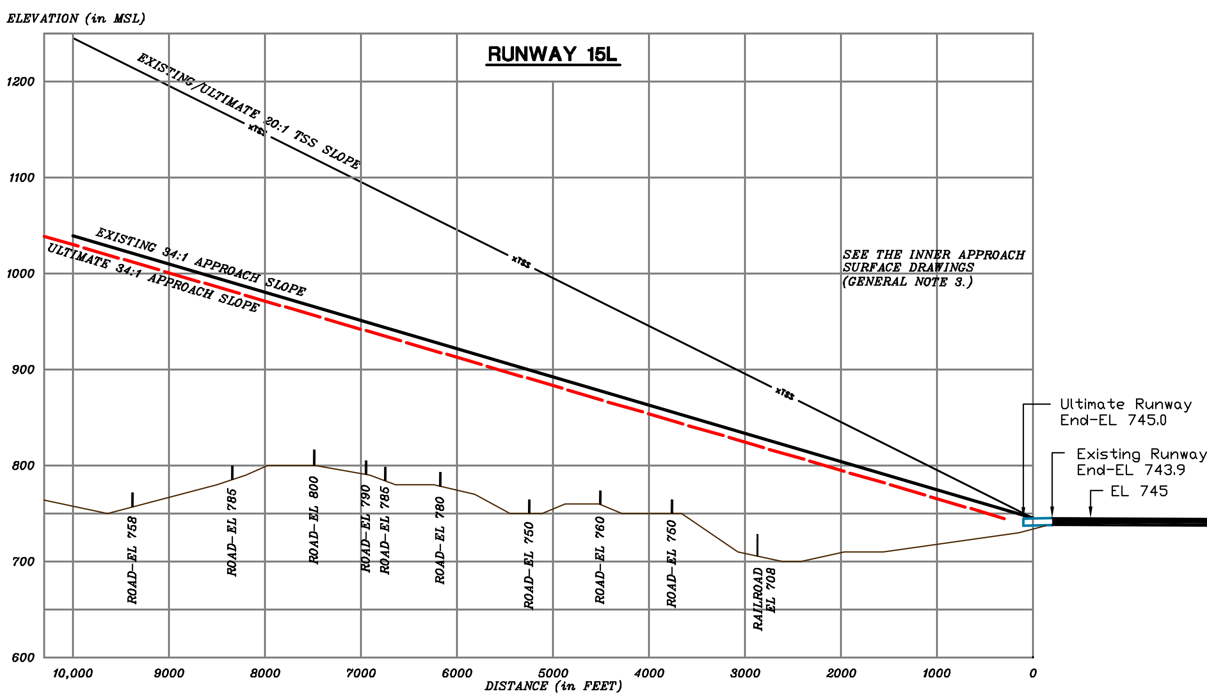
AIRPORT AIRSPACE DRAWING

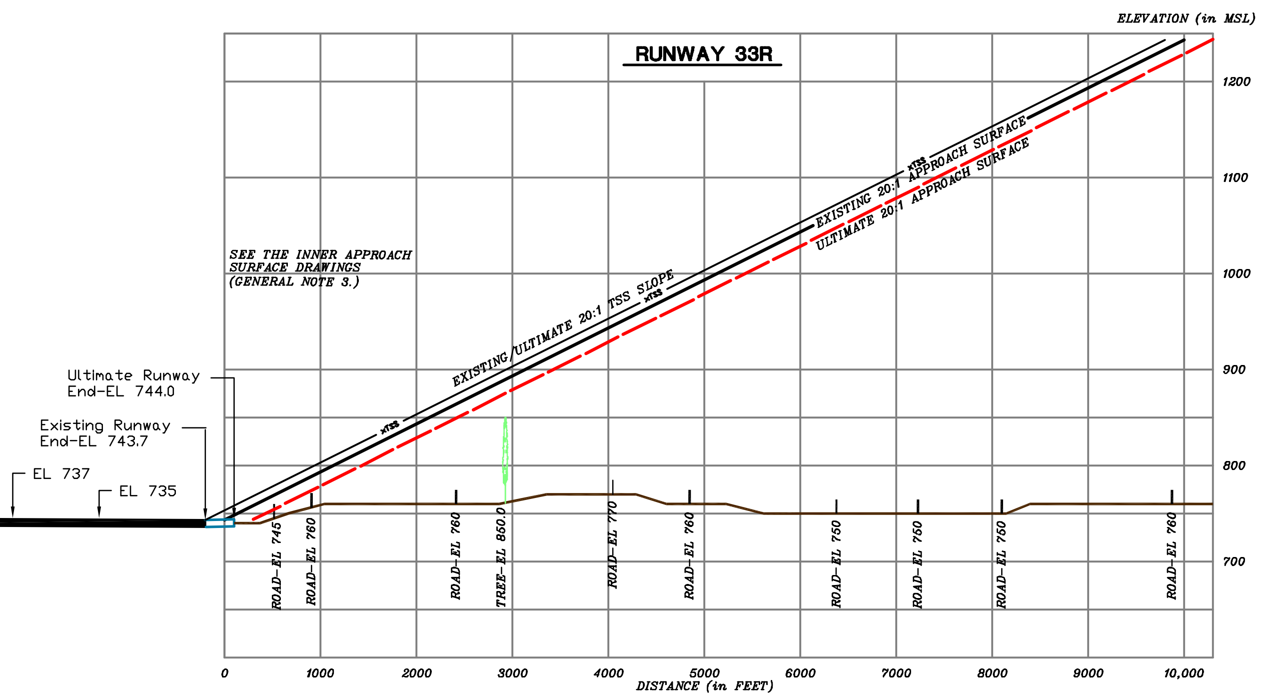
LAWRENCE J. TIMMERMAN AIRPORT
Milwaukee County, Wisconsin

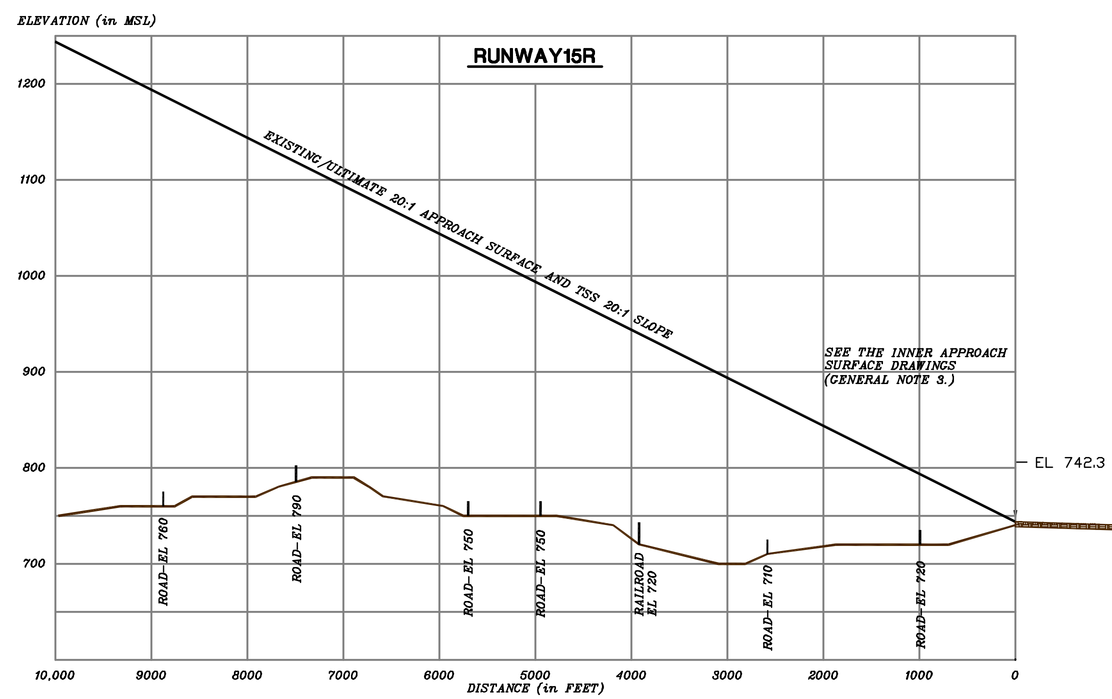
PLANNED BY: Stephen C. Wagner
DETAILED BY: Larry D. Johnson
APPROVED BY: Stephen C. Wagner

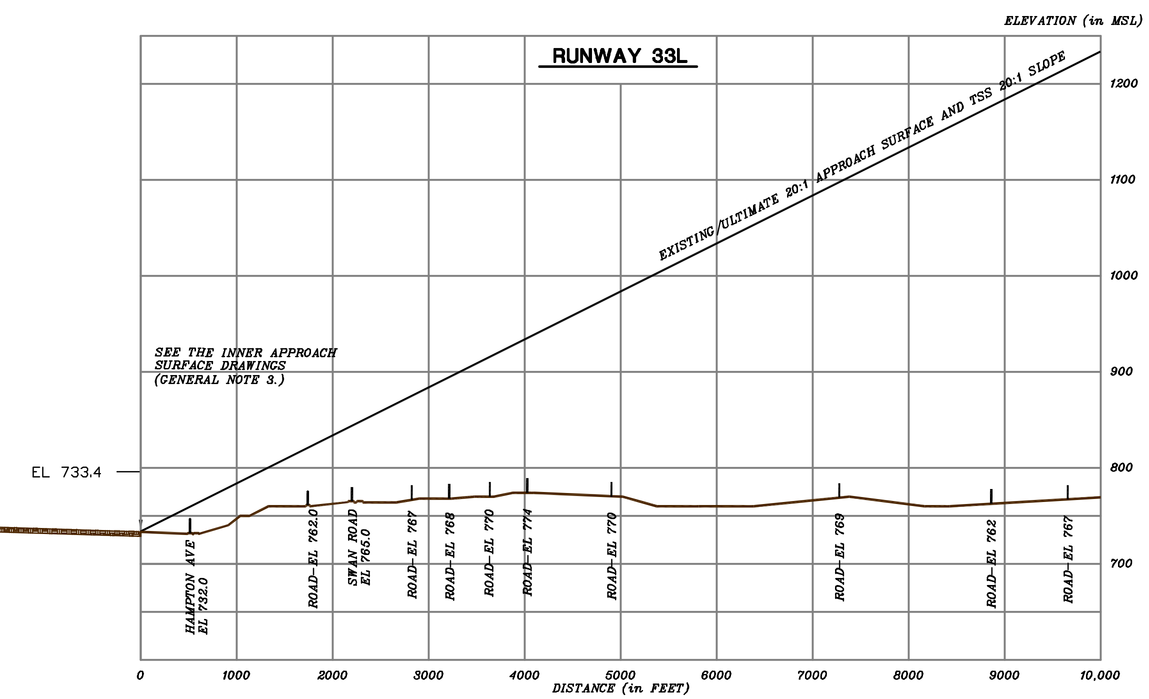
March 11, 2008 | SHEET 11 OF 13

Coffman Associates Airport Consultants www.coffmanassociates.com



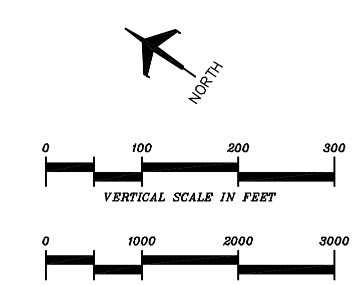






GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate runway approach surface, unless otherwise noted.
2. Depiction of features and objects within the Conical, Horizontal, Transitional, and Primary Part 77 surfaces, is illustrated on the AIRPORT AIRSPACE DRAWING, sheet 11 of these plans.
3. Depiction of features and objects within the inner portion of the approach surfaces, is illustrated on the INNER PORTION OF THE RUNWAY APPROACH SURFACE DRAWING, sheets 4, 5, 6, 7 and 8 of these plans.



OBSTRUCTION TABLE

Object Description	Elevation	Primary Surface	Outer Approach 20:1	34:1	7:1	Horizontal Surface	Conical Surface	Proposed Object Disposition
NONE								

No.	REVISIONS	DATE	BY	APP'D.

THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

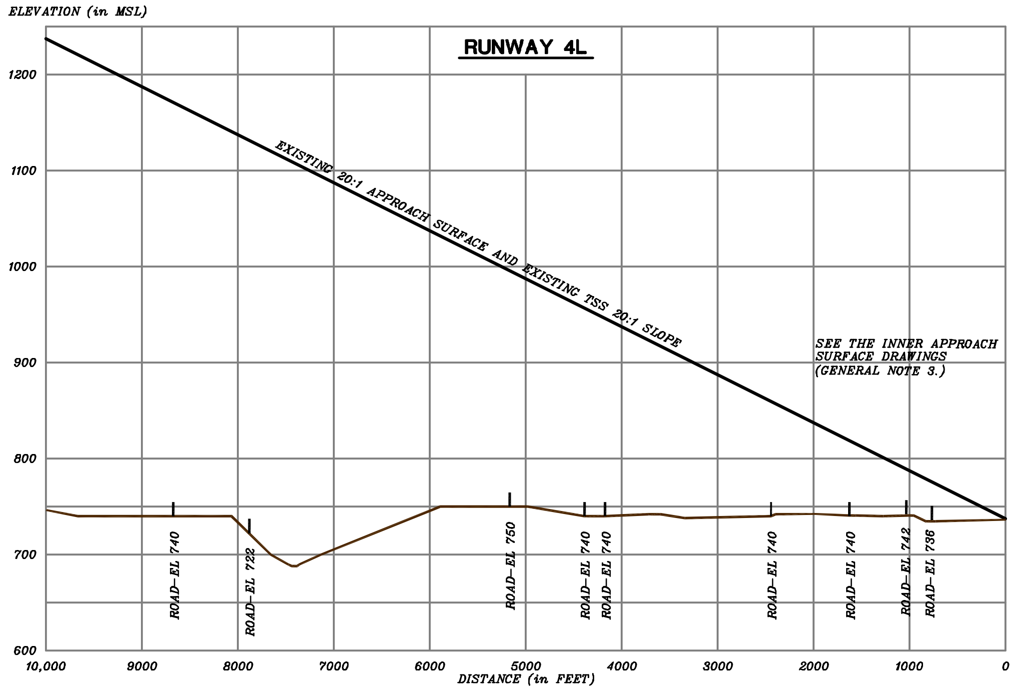
WISCONSIN DEPARTMENT OF TRANSPORTATION
BUREAU OF AERONAUTICS

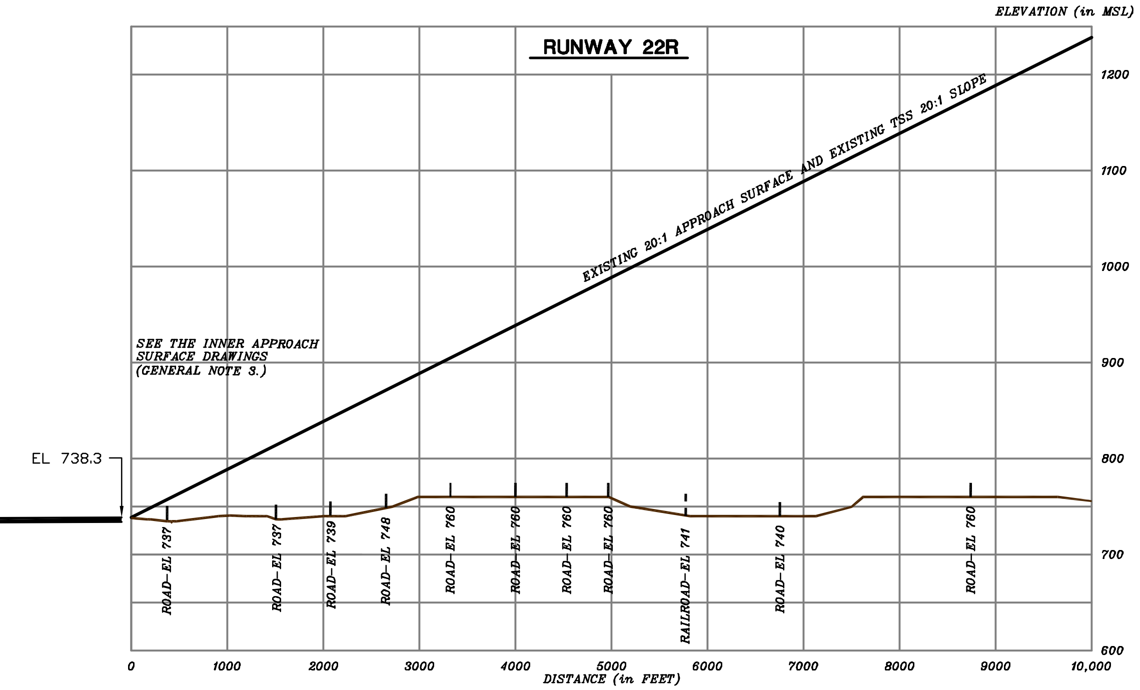
RUNWAY 15–33 APPROACH PROFILES

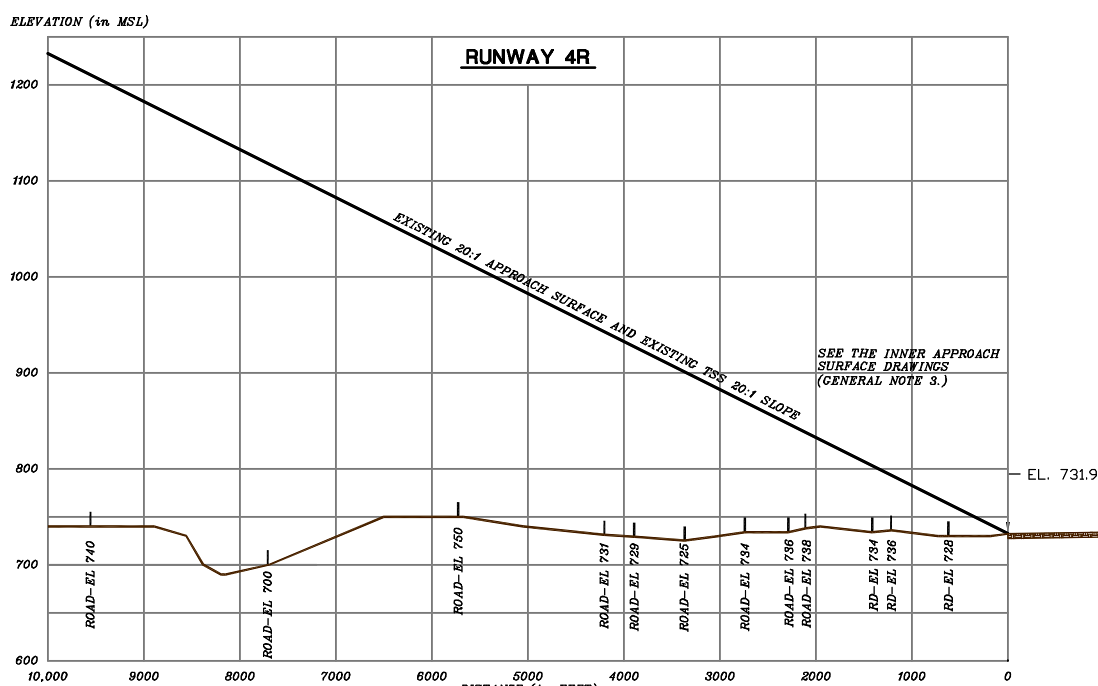
LAWRENCE J. TIMMERMAN AIRPORT
Milwaukee County, Wisconsin

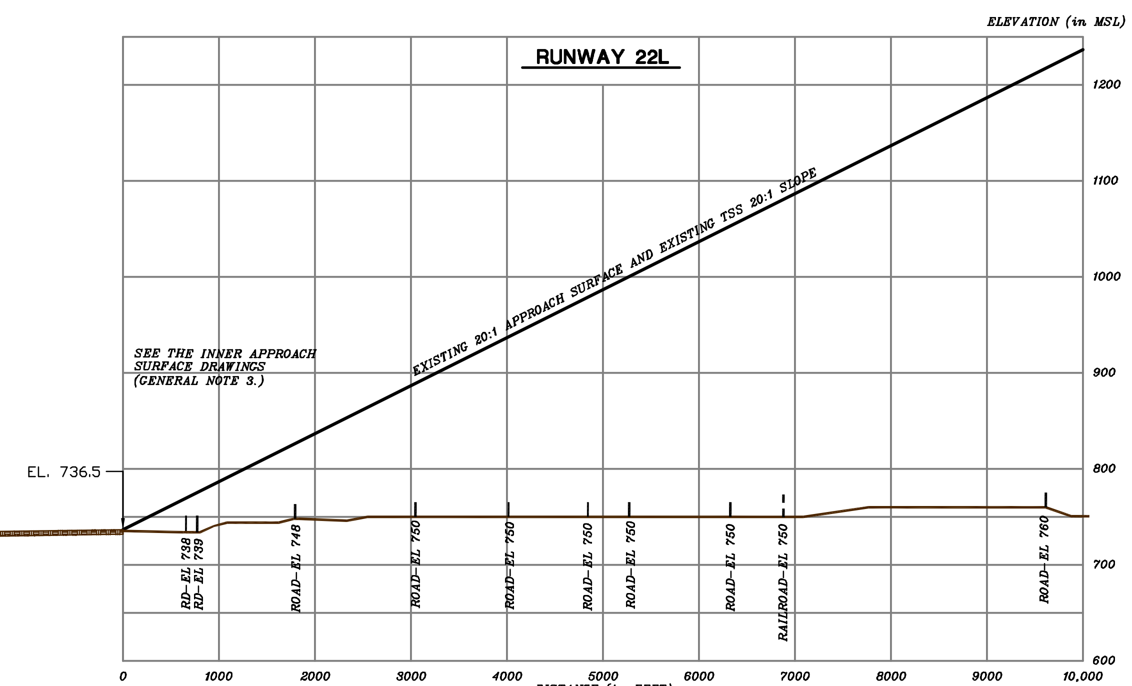
PLANNED BY: Stephen C. Wagner
DETAILED BY: Larry D. Johnson
APPROVED BY: Stephen C. Wagner
March 11, 2008

Coffman Associates
Airport Consultants
www.coffmanassociates.com









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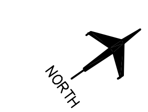

0 100 200 300
VERTICAL SCALE IN FEET

0 1000 2000 3000
HORIZONTAL SCALE IN FEET

OBSTRUCTION TABLE

Object Description	Elevation	Primary Surface	Outer Approach 20:1	Outer Approach 34:1	Outer Approach 7:1	Horizontal Surface	Conical Surface	Proposed Object Disposition
NONE								

No.	REVISIONS	DATE	BY	APP'D.

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WISCONSIN DEPARTMENT OF TRANSPORTATION
BUREAU OF AERONAUTICS

RUNWAY 4-22 APPROACH PROFILES

LAWRENCE J. TIMMERMAN AIRPORT
Milwaukee County, Wisconsin

PLANNED BY: Stephen C. Wagner
DETAILED BY: Larry D. Johnson
APPROVED BY: Stephen C. Wagner

March 11, 2008

Coffman Associates
Airport Consultants
www.coffmanassociates.com

Lawrence J. TIMMERMAN AIRPORT

Appendix D

PUBLIC COMMENTS

MMAC Metropolitan Milwaukee Association of Commerce

Council of Small Business Executives

November 27, 2007

Master Plan for Milwaukee County's Timmerman Airport.

To Whom It May Concern:

The Metropolitan Milwaukee Association of Commerce (MMAC) is a business organization representing 2,000 businesses in the four county region of Milwaukee, Ozaukee, Washington and Waukesha counties.

Airports are very important to the economy of the region and Timmerman is no exception. The master plan alternative E is a good option, which we support. It considers demand, safety, the neighborhood, and the economy.

The MMAC has been actively engaged in air service and airport improvements. We believe Timmerman is a valuable part of the region's infrastructure. The economic impact study demonstrates its importance. The master plan alternative E helps to insure that the current impact is not lost as the airport provides a safer runway and new hangars to accommodate corporate and private aircraft.

Timothy Sheehy
President
Metropolitan Milwaukee Association of Commerce

756 North Milwaukee Street, Milwaukee, Wisconsin 53202

Phone 414-287-4100 Fax 414-271-7753

LAWRENCE J. TIMMERMAN AIRPORT MASTER PLAN

PUBLIC INFORMATION WORKSHOP MEETING COMMENT FORM

Date: Dec. 4, 2007

Please Print Neatly

Place: LaQuinta Inn, Highway 100 & Silver Spring

Optional: Name DAVID MLEKODAY

Address 9215 W. THURSTON – MILW 53225

THE PLAN WAS EXPLAINED TO ME AND I THINK IT MAKES SENSE. TIMMERMAN HAS TO SURVIVE. MY CONCERN HAS ALWAYS BEEN JET AIRCRAFT NOISE.

Mail to:
COFFMAN ASSOCIATES, INC.
237 N.W. Blue Parkway, Suite 100
Lee's Summit, MO 64063 FAX: (816) 524-2575
www.coffmanassociates.com

or email your comments to:
info@mitchellairport.com

LAWRENCE J. TIMMERMAN AIRPORT MASTER PLAN

PUBLIC INFORMATION WORKSHOP MEETING COMMENT FORM

Date: Dec. 4, 2007

Please Print Neatly

Place: LaQuinta Inn, Highway 100 & Silver Spring

Optional: Name JAY RIEGLER

Address 5001 N. 91st.

THE INFORMAITION AT THE WORKSHOP WAS VERY INFORMATIVE AND PRESENTED VERY WELL. I BELEIVE THAT MWC IS PROVIDING QUALITY SERVICE TO THE AVIATION COMMUNITY, AND THAT TIMMERMAN CAN PROVIDE A UNIQUE AIRFIED TO GENERAL AVIATION COMMUNITY. I'M PLEASED WITH THE OVERALL PLANAND SUPPORT IT. 100%

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or email your comments to:
info@mitchellairport.com

LAWRENCE J. TIMMERMAN AIRPORT MASTER PLAN

PUBLIC INFORMATION WORKSHOP MEETING COMMENT FORM

Date: Dec. 4, 2007

Please Print Neatly

Place: LaQuinta Inn, Highway 100 & Silver Spring

Optional: Name John Lotzer

Address 9305 W. Appleton Ave Milw 53225

The City, County, + taxpayers are well served by Timmerman Airport. Not only is it a positive factor in employment in this area it also continues to benefit Mitchell Intnl as a viable reliever airport.

The majority (almost all) of the neighbors surrounding the airport are very positive and supportive of the airport. It is a "green space" and much quieter + neighbor friendly than roads (ie auto traffic is louder than aircraft traffic). Finally w. WAAS certified GPS approaches the airport will better serve the users.

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Lee's Summit, MO 64063 FAX: (816) 524-2575
www.coffmanassociates.com

or email your comments to:
info@mitchellairport.com

PUBLIC INFORMATION WORKSHOP MEETING COMMENT FORM

Date: Dec. 4, 2007

Please Print Neatly

Place: LaQuinta Inn, Highway 100 & Silver Spring

Optional: Name Kathy Christian

Address 8909 W Lawn Ave Milwaukee 53225

Have no problem with the extension of runway.

Presentation was very good all my questions were answered.

Timmerman seemed very concerned with how this will impact the community.

Thank you!

Mail to:
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LAWRENCE J. TIMMERMAN AIRPORT MASTER PLAN

PUBLIC INFORMATION WORKSHOP MEETING COMMENT FORM

Date: Dec. 4, 2007

Please Print Neatly

Place: LaQuinta Inn, Highway 100 & Silver Spring

Optional: Name Herb Zimmers Mooney N6400C

Address 1620 E Dean Rd Milwaukee

Thanks for the information and presentation.

It is very good that there will be improvements at Timmerman airport.

H J Zimmers

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LAWRENCE J. TIMMERMAN AIRPORT MASTER PLAN

PUBLIC INFORMATION WORKSHOP MEETING COMMENT FORM

Date: Dec. 4, 2007

Please Print Neatly

Place: LaQuinta Inn, Highway 100 & Silver Spring

Optional: Name KEN CHRISTIAN

Address 8909 W. LAWN AVE.

- THE EXPANSION LOOKS GREAT. HOPE IT HELPS TO RECOVER THE AMOUNT OF TRAFIC TO THIS AIRPORT.

- MY ONLY CONCERN IS WHERE WILL THE BLIMPS GO IF YOU BUILD HANGERS ON THE EAST SIDE OF AIRPORT

Mail to:
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PUBLIC INFORMATION WORKSHOP MEETING COMMENT FORM

Date: Dec. 4, 2007

Please Print Neatly

Place: LaQuinta Inn, Highway 100 & Silver Spring

Optional: Name Gabriele Schweizer + Wolfgang Schweizer

Address 4950 N 91st St. Milw. 53225

The only problem we have right now with traffic/noise from the airport is coming from the old Fall hangar. This only applies if the owners of the jet decide on Sunday early mornings to fly out and with that noise wake up the neighbors. It would be nice if there could be some restrictions put into place. The overall activity on this airport is o.k. It does not bother us as neighbors.

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LAWRENCE J. TIMMERMAN AIRPORT MASTER PLAN

PUBLIC INFORMATION WORKSHOP MEETING COMMENT FORM

Date: Dec. 4, 2007

Please Print Neatly

Place: LaQuinta Inn, Highway 100 & Silver Spring

Optional: Name CHRIS TROSSEN - CIVIL AIR PATROL

Address 9393 W. APPLETON AVE, MILW, WI 53225

AS A REGULAR USER OF MWC, WE ARE INTERESTED AND EXCITED AT POTENTIAL EXPANSION AND GROWTH AT THE FIELD. WE CURRENTLY DRAW A MEMBERSHIP OF MORE THAN 100 INDIVIDUALS, SOME 40 OF WHICH ARE CADETS (YOUTHS). THIS IS CLEARLY AN IMPORTANT FACILITY FOR US NOT ONLY AT A LOCAL LEVEL, BUT AT A STATE, REGIONAL AND EVEN BEYOND. SEVERAL TIMES PER YEAR, WE DRAW MOST, IF NOT ALL, OF OUR FLEET OF 13 AIRCRAFT IN WISCONSIN TO MWC, AND ADDITIONALLY BRING NUMEROUS ADULTS AND YOUTHS FROM AROUND THE STATE TO OUR HANGAR FOR TRAINING. THE POTENTIAL FOR RENOVATION AND NEW CONSTRUCTION WILL ONLY ALLOW US TO BRING MORE INDIVIDUALS TO OUR PROGRAM AND MORE USERS TO THE AIRFIELD.

THIS IS THE FIRST STEP IN REVITALIZING MWC. THE AIRFIELD USERS CLEARLY WANT THIS. NOW THE NEXT STEP IS TO GET THE REST OF THE COMMUNITY BEHIND THIS PLAN AND TO MAKE IMPROVEMENTS IN THE LOCAL AREA.

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or email your comments to:
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Coffman Associates
Airport Consultants

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(816) 524-3500

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Suite 100
Lee's Summit, MO 64063

PHOENIX
(602) 993-6999

4835 E. Cactus Road
Suite 235
Scottsdale, AZ 85254