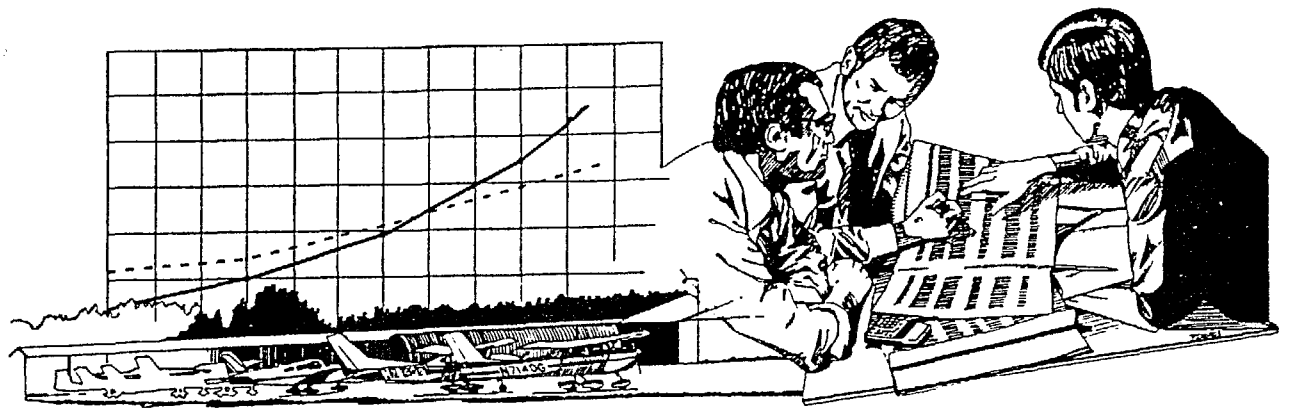
FACILITY REQUIREMENTS



Chapter Three
FACILITY REQUIREMENTS

To properly plan for the future needs of the Benson Municipal Airport, it is necessary to translate forecast aviation demands into specific types and quantities of facilities that will adequately serve these needs. This chapter uses the results of the aviation demand forecasts to determine future airport facility requirements. Established planning criteria were applied to the various demand parameters to determine the specific facility requirements for the airfield, as well as the general aviation terminal areas of the airport.

The **Facility Requirements** Chapter is intended to identify in general terms and outline the new facilities that will be needed to accommodate forecast demands. Once these facility requirements are clearly established, alternatives for providing these facilities can be evaluated in the next chapter to determine the most efficient and cost-effective means of achieving this objective.

AIRSIDE FACILITY REQUIREMENTS

Airside facilities are those that are related to the arrival and departure of aircraft. These facilities are comprised of the following items.

- Runways
- Taxiways
- Navigational Aids
- Marking
- Lighting

The selection of the appropriate FAA design standard for the development of airfield facilities is based primarily upon the characteristics of aircraft which are expected to use the airport. The most critical characteristics are the approach speed and the size of the aircraft anticipated to use the airport both today and in the future. The

planning for future aircraft use is particularly important because design standards are used to determine separation distances between facilities that could be extremely costly to relocate at a later date.

According to FAA Advisory Circular 150/5300-4B, **Utility Airports, Air Access to National Transportation,** aircraft are grouped into five categories based upon their certified approach speed. These categories range from Category A for slower single engine piston aircraft, to Category E for supersonic jet aircraft. The proposed Benson Municipal Airport would likely be used primarily by Category A and B aircraft (approach speeds less than 121 knots) throughout the planning period.

The same advisory circular also indicates six Airplane Design Groups (ADG's) according to the physical size of the aircraft. The airplane's wingspan is the principal characteristic affecting design standards. ADG's range from Group I for small aircraft with wingspans less than 49 feet to Group VI for wingspans of the largest aircraft. The majority of aircraft expected to use the proposed airport would be in ADG I and II (wingspans less than 79 feet).

General aviation airports are divided into two major design classifications -- **Utility** and **Transport.** A Utility Airport is an airport designed, constructed and maintained to serve airplanes in Aircraft Approach Category A and B. Transport Airports are designed, constructed, and maintained to serve airplanes in Aircraft Categories C and D. Each of these classifications are further subdivided by design aircraft size, weight, and speed.

- **Basic Utility** - This type of airport accommodates small, single engine and small twin-engine airplanes, less than 12,500 pounds gross weight, used for personal and business purposes. The length of the runway will determine how many types of these aircraft will be able to operate at the airport. Aircraft that will use this airport will typically have wingspans less than 49 feet and approach speeds of less than 121 knots. Precision instrument approach systems are usually not planned for airports in this category.

- **General Utility** - This type of airport accommodates all small airplanes and some larger aircraft weighing more than 12,500 pounds with wingspans up to 79 feet and approach speeds of less than 121 knots. Precision instrument approach systems may be installed at airports in this category.

- **Transport** - This type of airport is designed for larger aircraft with higher approach airspeeds up to 166 knots. Typical wingspans vary from less than 49 feet up to but not including 262 feet. Precision instrument approach operations are normally planned for most Transport airports.

Based on the projected forecasts described in Chapter 2, the Benson Municipal Airport would serve as a **General Utility - Stage I** airport throughout the planning period. The General Utility -Stage I accommodates all small airplanes and does not usually include precision approach operations.

While the airport is expected to remain in the General Utility category throughout most of the planning period, the history of airport development has revealed that small airports can grow dramatically with the combination of the right factors. Therefore, in the case of the proposed Benson Municipal Airport, site selection and design standards will be in accordance with **Transport** runway criteria. While the runway length would be constructed according to the General Utility standards initially, design and improvements will be consistent with or easily adaptable to those of the Transport category, allowing for future expansion as necessary.

In accordance with the design criteria established in **FAA Advisory Circular 150/5300-13,** the Benson Municipal Airport will be designed to accommodate aircraft in **ADG's I and II** and **Approach Categories A, B and C.** Since the airport's development will be staged over time, facility requirements will be determined and reported for both the Transport and General Utility - Stage I categories.

Airport design criteria are more specifically determined by analyzing the aircraft mix and determining the most demanding airplane(s) to be accommodated. Although one type of aircraft may determine runway length, another may determine runway pavement strength or other appropriate design parameters. The following paragraphs detail the criteria used to establish airfield dimensions and requirements.

RUNWAYS

Runway Length

The ultimate runway length will determine the types of aircraft that will be able to operate at the proposed Benson Municipal Airport. Runway length requirements are based upon three primary factors.

- The mean maximum daily temperature of the hottest month.
- The elevation of the airport.
- The effective runway gradient.

The average daily maximum temperature of the hottest month is 96.4 degrees Fahrenheit. Since the airport elevation and effective runway gradient would be dependent upon the specific site selected, an elevation of 4,000 feet above mean sea level (MSL) and an effective runway gradient of one percent were assumed to be representative of the conditions in the airport search area. Considering these factors and the results of the demand forecasts, a runway length of 5,700 feet would be recommended in the Initial Phase of development. For the second five year period, this runway length should be adequate for the General Utility - Stage I classification. For the ultimate development, or Long Term Phase, a 7,000 foot runway would meet the requirements for a future Transport airport.

Runway Width

According to FAA Advisory Circular 150/5300-13, runway width requirements for the short-term needs and potential long-term needs would be 75 and 100 feet respectively. It is anticipated that the 75-foot width will suffice throughout most of the planning period. Although funding the full 100-foot wide runway pavement may not prove cost effective in the initial construction, grading and locating runway lighting cable to accommodate future widening should be considered as cost-saving construction efforts.

Runway Orientation

In addition to length and width requirements for runways, the FAA recommends that an airport be able to accommodate aircraft for 95 percent of the wind conditions that the airport experiences. Transport category runways require coverage of 15 mile per hour (mph) winds while Utility category runways must obtain 95 percent coverage of the 12 mph winds. Examination of wind rose information reveals that a northeast-southwest runway orientation would provide the best orientation and provide in excess of 95 percent wind coverage of both 12 and 15 mile per hour (mph) winds. Based on the wind data available for the Benson area, no crosswind runway will be required for the Benson Municipal Airport for any runway orientation between 13-31 (Southeast-Northwest) and 05-23 (Northeast-Southwest).

In summary, facility requirement recommendations for the Benson Municipal Airport are to plan for a site that will accommodate or can readily be expanded to accommodate a primary transport runway 7,000 feet in length and 100 feet in width.

Pavement Strength Requirements

The load bearing capacity of a runway should be designed to accommodate the majority of the aircraft operating at the airport and not the occasional large aircraft that would wish to land there. Taxiways should generally be the same strength as the runway, however, a taxiway that only supports small ADG I type aircraft does not have to be designed to accommodate larger aircraft, if large aircraft will not require access to the area the taxiway supports. Apron pavement should be designed to support the type of aircraft that intend to use that area.

Pavement overlays performed as part of a pavement maintenance program can substantially raise the weight bearing capacity of the runway over time without an extensive rebuilding program, as long as a substantial pavement base has been established in the initial construction. By designing the pavement base to meet the long term requirements of the airport, a substantial reduction in pavement costs can be achieved when an increase in the strength requirements of the runway is indicated.

Initially, the runway should be designed to meet a 12,500 pound Single Wheel Load (SWL) strength requirement. The ultimate goal of the airport should be to provide a minimum bearing strength to meet 30,000 pound SWL and 60,000 pound Dual Wheel Loading by the end of the planning period. It should be pointed out that load bearing strengths are determined by the aircraft operating at the airport. Should a larger aircraft operate on a regular basis at the airport than has been forecast in this plan, the City should take appropriate action to increase the pavement strength. Operating heavy aircraft on pavement designed for lighter aircraft will result in rapid pavement deterioration.

TAXIWAYS

Taxiways are constructed primarily to facilitate airplane movements to and from the runway. Some taxiways are necessary on an individual site basis simply for apron to runway access. Other taxiways allow for safe and efficient use of the airfield.

Based upon safety rather than capacity considerations, the runway should have a parallel taxiway and connecting taxiway stubs (short taxiways that connect the parallel taxiway with the runway). This parallel taxiway should be considered for the short-term planning period. One alternative to a parallel taxiway is a turnaround (a looped taxiway that begins at the runway end and circles back to join the runway).

The width of taxiways for the Benson Municipal Airport should be 35 feet according to taxiway width requirements for both the General Utility and Transport airports serving ADG II airplanes. If larger aircraft from ADG III begin operating at the airport in the future, the taxiways supporting these aircraft would need to be increased in width to 50 feet.

NAVIGATIONAL AIDS

Airport and runway navigational aid requirements are based on recommendations as depicted in DOT/FAA Handbook 7031.2B, **Airway Planning Standard Number One,** and FAA Advisory Circular 150/5300-13, **Airport Design.**

Navigational aids provide visual, non-precision, or precision guidance to a runway(s) or the airport itself. The basic difference between a non-precision and precision navigational aid is that the latter provides electronic descent, alignment (course), and position guidance, while the non-precision navigational aid provides only alignment and position location information. The necessity of such equipment is predicated upon safety considerations and operational needs. The type, purpose, and volume of aviation activity expected at the airport are factors in the determination of the airport's eligibility for navigational aids.

A visual approach landing aid is recommended for the airport in the initial stage of development. There are several types of visual approach landing aids available, however, the FAA is currently supporting the installation of Precision Approach Path Indicators (PAPI) for most general aviation airports.

Other landing aids are the Runway End Identification Lights (REIL) which are installed at the runway ends. These strobe lights assist in identifying the runway during low visibility conditions and at night. It is recommended that this equipment be installed on the runway during the short term stage of development.

Although an instrument approach procedure is not mandatory in order to establish an airport, an instrument approach procedure should be requested by the City before the end of the planning period. In order to establish an instrument approach procedure, some form of terminal navigational aid (Non-directional radio beacon, VOR, TACAN, etc.) will be required. There are no navigational aids (navaids) in close proximity to Benson. The closest VORTAC navaid is the Cochise VORTAC located approximately 31 miles east of Benson, at a distance that would make it marginally useful for a non-precision approach procedure.

There are two navaids, a non-directional radio beacon (NDB) or a localizer beacon (LOC), that could enhance the non-precision approach capability of the airport. The localizer, although more expensive, is standard equipment in an Instrument Landing System (ILS) precision instrument approach system. If it should prove feasible at a later date, to construct a precision instrument approach to the Benson Municipal Airport, a localizer would be the recommended navaid from which to establish an interim instrument approach procedure. However, in the event that only a non-precision approach capability can be provided at the airport, the NDB is a suitable alternative.

An airport must meet certain operational activity levels to qualify for an FAA-operated tower. The operational forecasts of fleet mix and activity for the proposed Benson Municipal Airport do not indicate that the airport will qualify for a tower under existing criteria.

MARKING AND LIGHTING

The initial runway should be constructed with visual markings, a segmented circle, rotating beacon and lighted wind indicators. In the future, should any instrument approach capability be established at the airport, it will require that the runway be marked accordingly (either non-precision or precision markings). Taxiways should be marked with centerline and side stripes. Signage should be established at the runway ends to indicate the magnetic bearing of the runway, elevation and any airport common frequency available. Signage may be installed along taxiways to indicate desired paths to the terminal area and/or runway ends.

Lighting on runways, taxiways, and aprons is used to provide safety and security for aircraft movements during night operations. It is recommended that the runway be lighted with

Medium Intensity Runway Lighting (MIRL) in the short term planning period to make it more attractive to general aviation pilots. By placing the runway lighting on remote control through radio frequency transmissions, the lights do not have to be operated until required by the pilot. The Taxiways can be marked with delineators (reflectors) initially and later in the planning period, Medium Intensity Taxiway Lights (MITL) can be installed.

Exhibit 3A provides a summary of the Airside requirements illustrated in this section. A discussion of Landside requirements for the airport follows.

LANDSIDE FACILITY REQUIREMENTS

Components of the general aviation landside complex include the following types of facilities.

- Hangars and Hangar Apron
- Local and Itinerant Apron
- Terminal Building
- Vehicle Parking
- Fuel Storage

HANGAR AND HANGAR APRON AREA

The demand for hangar facilities is dependent upon the number and types of aircraft expected to be based at the airport. Actual percentages of based aircraft desiring hangar space will vary across the country as a function of local climatic conditions, airport security and owner preferences. The percentage of based aircraft which are hangared normally ranges from approximately 30 percent in southern states to over 80 percent in northern states and areas subject to extreme weather conditions. In Arizona, at those locations where hangar facilities are available, demand for hangars varies between 60 and 80 percent. For planning purposes it is estimated that approximately 60 percent of all the based aircraft at the proposed airport would desire hangared parking in the future. Similarly, the demand for both conventional hangar space and T-hangars was determined for the airport. Generally, the principal users of conventional hangars are the larger based air craft whose owners desire convenient access to maintenance and related services. T-hangars are predominantly used to store single and light twin-engine aircraft. Since there is no historical data for the City of Benson regarding the percentage of hangared versus non-hangared aircraft, assumptions will be made based on national and regional statistics. The planning factors commonly used to determine conventional hangar storage requirements at other general aviation airports in the vicinity were used to obtain the forecasts for conventional hangar requirements. It was assumed that 10 percent of the single engine, 10 percent of the twin-engine, and 100 percent of the turboprop, turbojet, and rotorcraft aircraft owners would prefer to use conventional hangars for the storage of their aircraft. A conventional hangar is normally sized at 10,000 square feet (SF). A hangar of this size will probably not be constructed initially at the airport because of the capital investment involved. It was assumed that the remainder of the individuals desiring hangar storage want to store their aircraft in T-Hangars or Shade hangars.

The sizing of conventional hangar facilities was based upon 1,500 SF for single engine piston and rotary aircraft, 2,000 SF for twin engine and 2,700 SF for turbine aircraft. Shade and T-hangar dimensions are based upon 1,575 FT per aircraft. The aircraft maintenance portion of the hangar is normally equivalent to approximately 12 percent of the conventional storage hangar area.

FAA guidelines suggest that the size of hangar apron area be equal to the area of conventional hangars plus the area of T-hangars. **Table 3A** illustrates the hangar and hangar apron requirements throughout the

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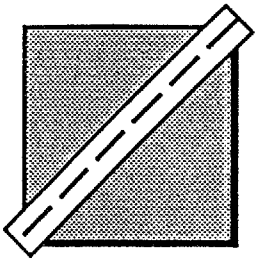
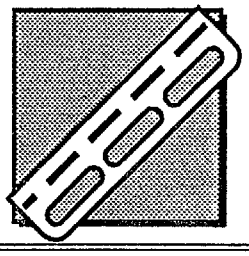
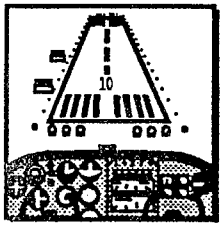
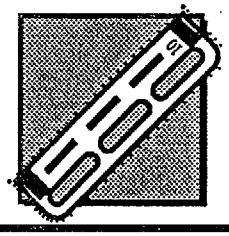
	INITIAL	SHORT TERM	LONG TERM
RUNWAYS 	5,700' x 75' STRENGTH: 12,500 SWL	SAME	7,000' x 100' 30,000 SWL 60,000 DWL
TAXIWAY 	PARALLEL 5,700' x 35' CONNECTING TAXIWAYS 3-400' X 35'	SAME	PARALLEL EXTENTION 7,000' x 35' CONNECTING TAXIWAY 1-400' x 35'
NAVIGATIONAL AIDS 	PAPI SEGMENTED CIRCLE ROTATING BEACON	NDB AWOS	SAME
LIGHTING and MARKING 	LIGHTING RUNWAY-MIRL TAXIWAYS-DELINEATORS LIGHTED WIND CONE MARKING VISUAL	LIGHTING REIL TAXIWAYS-MITL MARKING SAME	LIGHTING RUNWAY EXTENSION-MIRL PARALLEL TAXIWAY EXTENSION-MITL MARKING NON- PRECISION

City of Benson

Exhibit 3A
AIRSIDE FACILITY REQUIREMENTS

planning period. In the tables that follow, sizing or dimensions of facilities will be denoted as square feet (SF) and square yards (SY).

TABLE 3A
Forecast Hangar Apron Requirements
Benson Municipal Airport

	Initial	Short Term	Long Term
Conventional Hangar Positions			
Single Engine Piston	1	1	1
Twin Engine	0	0	0
Turboprop	0	1	1
Turbojet	0	0	1
Rotorcraft	0	0	1
Total	**1**	**2**	**4**
T-Hangar/Shade Positions			
Single Engine Piston	6	7	10
Twin Engine Piston	1	1	1
Total	**7**	**8**	**11**
Conventional Hangar Area			
Aircraft Storage (SF)	1,500	3,500	8,400
Aircraft Maintenance (SF)	200	500	1,000
Total Area (SF)	**1,700**	**4,000**	**9,400**
T-Hangar/Shade Area			
Total Area (SF)	**11,000**	**12,600**	**17,300**
HANGAR APRON AREA (SY)	**1,500**	**1,900**	**3,000**

LOCAL AND TRANSIENT APRON

At a minimum, local apron area should be provided for the number of based aircraft which will not require hangar storage. Sizing of the local apron was based on the results of the aviation demand forecasts and on a value of 2,700 SF per aircraft.

FAA Advisory Circular 150/5300-13 suggests a methodology by which itinerant parking requirements can be determined from knowledge of busy-day operations. At the proposed Benson Municipal Airport, the number of transient spaces required was determined to be approximately 50 percent of the busy-day itinerant operations. The FAA planning criterion of 3,240 SF per aircraft parking space was applied to the number of transient spaces to determine total transient ramp requirements. The results of this analysis are presented in **Table 3B.**

TABLE 3B
Forecast Apron Requirements - Non-Hangared Aircraft
Benson Municipal Airport

	Initial	Short Term	Long Term
Local Apron Positions	5	6	8
Local Apron Area (SY)	1,500	1,800	2,400
Transient Apron Positions	7	11	20
Transient Apron Area (SY)	2,500	4,000	7,200
TOTAL APRON AREA (SY)	**4,000**	**5,800**	**9,600**

TERMINAL BUILDING

General aviation terminal buildings serve several functions. Space is required for administrative and management offices, pilot's lounge and flight planning area, meeting facilities, food services, storage rooms, restrooms, and various other needs. This space is not necessarily limited to a single building and can be provided by the airport sponsor or an FBO. The methodology utilized to examine terminal building capacity generally relates square footage requirements for terminal facilities to the number of design hour general aviation pilots and passengers. Space requirements were determined for the Benson Municipal Airport using 150 square feet per design hour passenger. **Table 3C** outlines the terminal space requirements for general aviation terminal facilities at the proposed airport during the planning period. Terminal facilities and services may be provided in more than one location, and by more than one provider.

TABLE 3C
General Aviation Terminal Facilities
Benson Municipal Airport

	Initial	Short Term	Long Term
Design Hour Pilots and Passengers	7	11	20
Terminal Space (SF)	1,050	1,650	3,000

AUTOMOBILE PARKING

The requirements for automobile parking at general aviation airports are largely dependent upon the operations levels in addition to the type of general aviation facilities and activities associated with the airport. General aviation terminal area parking facilities are determined under guidelines set forth in FAA

publications while the number of automobile parking spaces for other general aviation facilities is based on other factors.

The terminal public automobile parking area requirements were based upon the number of design hour pilots and passengers. The total number of public parking positions and parking area have been determined based on 1.3 spaces per peak hour pilot and remaining parking requirements (rental car and employee parking) are based upon FAA guidelines in Advisory Circular 150/5360-9. Rental car activity at this airport may be higher than the operational activity levels indicate due to the expected impact of Kartchner Caverns. Employee parking requirements are estimates and may require modification when the actual occupancy of the terminal is known.

In order to provide adequate parking facilities for the conventional hangars, Shade/T-hangar and other aviation related businesses, a method was designed based upon the number of based aircraft at an airport. The amount of parking area required per space is the same as in determining terminal area parking requirements.

Table 3D depicts the entire automobile parking space requirements for the proposed Benson Airport throughout the planning period. Terminal parking requirements were added to the general aviation automobile parking requirements to provide the data depicted in **Table 3D.**

TABLE 3D
General Aviation Automobile Parking Requirements
Benson Municipal Airport

	Initial	Short Term	Long Term
Design Hour Pilots and Passengers	7	11	20
Employee Spaces	2	3	4
Rental Car Ready Spaces	4	8	12
General Aviation Spaces	9	16	31
Terminal Parking Spaces	9	14	26
Total Parking Spaces	24	41	73
TOTAL PARKING AREA (SY)	930	1,600	2,800

FUEL STORAGE

Fuel at airports is normally stored in underground tanks. The practice has undergone a great deal of scrutiny in the past few years because of the potential for fuel leaks and contamination of soil and groundwater. Although the practice of installing fuel tanks underground has not been prohibited, installation, design and monitoring requirements

from both the State and Federal government related to these tanks have increased significantly.

The location of the fuel storage area depends upon the airport's operational activity and management procedures. Remote location of the fuel storage facility will require the use of a servicing vehicle to make the fuel available to the aircraft. Another method, a fuel "island", where the pilot can taxi up to the fuel storage area and fuel the aircraft, may work well when activity levels are low. However, as activity levels increase, this fueling operation normally results in congestion or in the commitment of a relatively large piece of land in order to separate fueling from other aircraft movements. In any case, security, manageability and safety should be the primary objectives considered in determining the fuel storage location. Future fuel storage requirements were determined for the airport following an analysis of fuel utilization characteristics. Based upon data obtained from other general aviation airports in Arizona as well as the United States, average fuel consumed per operation was used to determine the fuel storage requirements throughout the planning period. This ratio can be expected to increase as the size of the fleet mix increases.

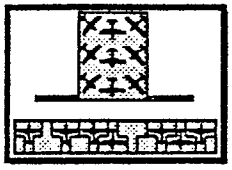
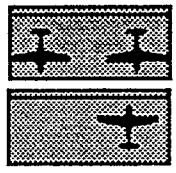
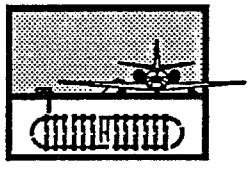
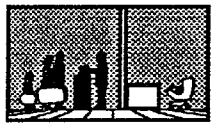
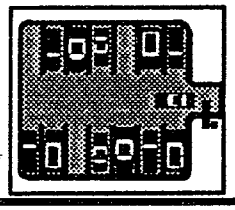
Table 3E shows an estimate of the monthly capacity of fuel storage that will be required at the Benson Municipal Airport. Airport fuel management procedures should include the maintenance of current historical records on all tanks (especially underground storage tanks), a periodic tank inspection and the installation of leak detection/warning equipment with any new storage tanks. The fuel distribution between AVGAS and jet fuel storage will depend upon market demands.

The landside facility requirements that should be developed within the planning period are illustrated in **Exhibit 3B.**

TABLE 3E
Fuel Storage Requirements
Benson Municipal Airport

	Initial	Short Term	Long Term
Annual Operations	11,000	16,000	26,000
Average Monthly Operations	917	1,333	2,167
Average Fuel Ratio (gal./ops.*)	3.00	4.50	5.50
Monthly Fuel Storage Requirements (gal.)	2,800	6,000	11,900

* Ops = Operations

		INITIAL	SHORT TERM	LONG TERM
HANGARS 	Conventional Hangar (Postions)	1	2	4
	T-Hangar (Positions)	7	8	11
	Total Hangar Area (S.F.)	1,700	4,000	9,400
	Total Hangar Apron Area (S.Y.)	1,500	1,900	3,000
APRON TIE-DOWNS 	Local Ramp Positions	5	6	8
	Transient Ramp Positions	7	11	20
	Total Apron Area (S.Y.)	4,000	5,800	9,600
FUEL STORAGE 	Monthly Storage Requirements (Gallons)	2,800	6,000	11,900
GENERAL AVIATION TERMINAL 	Total Terminal Area (S.F.)	1,050	1,650	3,000
AUTO PARKING 	Terminal Spaces	9	14	26
	General Aviation Spaces	9	16	31
	Employee Spaces	2	3	4
	Rental Car Spaces	4	8	12
	Total Parking Area (S.Y.)	930	1,600	2,800

City of Benson

Exhibit 3B
LANDSIDE FACILITY REQUIREMENTS

SUPPORT FACILITIES

Aviation support facilities include Airport Maintenance and Administration, Airport Rescue and Fire Fighting, Utilities and Services.

AIRPORT ADMINISTRATION AND MAINTENANCE

The current and future needs of airport administration are highly dependent upon the specific management system employed by the City of Benson. Initially, the administrative responsibilities for the airport can be assigned to existing City staff, however, ultimately an airport manager should be selected to manage the facility.

Maintenance is another area of responsibility that can be assumed by the City initially and depending upon the situation, continued throughout the planning period or until assumed by an airport management staff or FBO.

The airport maintenance section, however, may need a building or facility to store vehicles or maintain a minor repair shop. This facility should be planned for mid-point in the planning period.

AIRPORT RESCUE AND FIRE FIGHTING

Airport Rescue and Fire Fighting (ARFF) requirements are outlined by FAA regulations. The Benson Municipal Airport will not be required to comply with the standards established in the Code of Federal Regulations 14, Part 139, that governs ARFF operations. These regulations are only applicable to airports that conduct certificated air carrier operations.

However, as a minimum, procedures should be established with the airport to utilize City fire fighting resources to respond to aircraft incidents/accidents. It should also be the responsibility of the City to insure that fire fighting personnel be specifically trained in aircraft accident procedures. As air taxi operations increase in frequency toward the end of the planning period, an increase in ARFF capability might be warranted.

UTILITIES

The proposed airport will require basic utilities to support its operation. In planning for the development of utilities for the initial stage, consideration should be given to the possibility of sizing the utilities to meet future demands and projected on-airport development.

SERVICES

It is recommended that the airport consider installation of an Automated Weather Observing System (AWOS) during the initial planning stage. The AWOS-I system was recently made available to general aviation airports. This system, when transmitted over the tower frequency, either by pilot command or automatically, provides basic weather information to pilots over a radio frequency.

LAND REQUIREMENTS

Land requirements are one of the most important considerations in airport site selection. The minimum amount of land required for the ultimate development of the Benson Municipal Airport can be determined by translating the Transport facility requirements into a typical airport layout plan as depicted in **Exhibit 3C**. The Transport category is used for this typical layout in order to determine if a potential site could accommodate the ultimate requirements of the airport. Please note that because the

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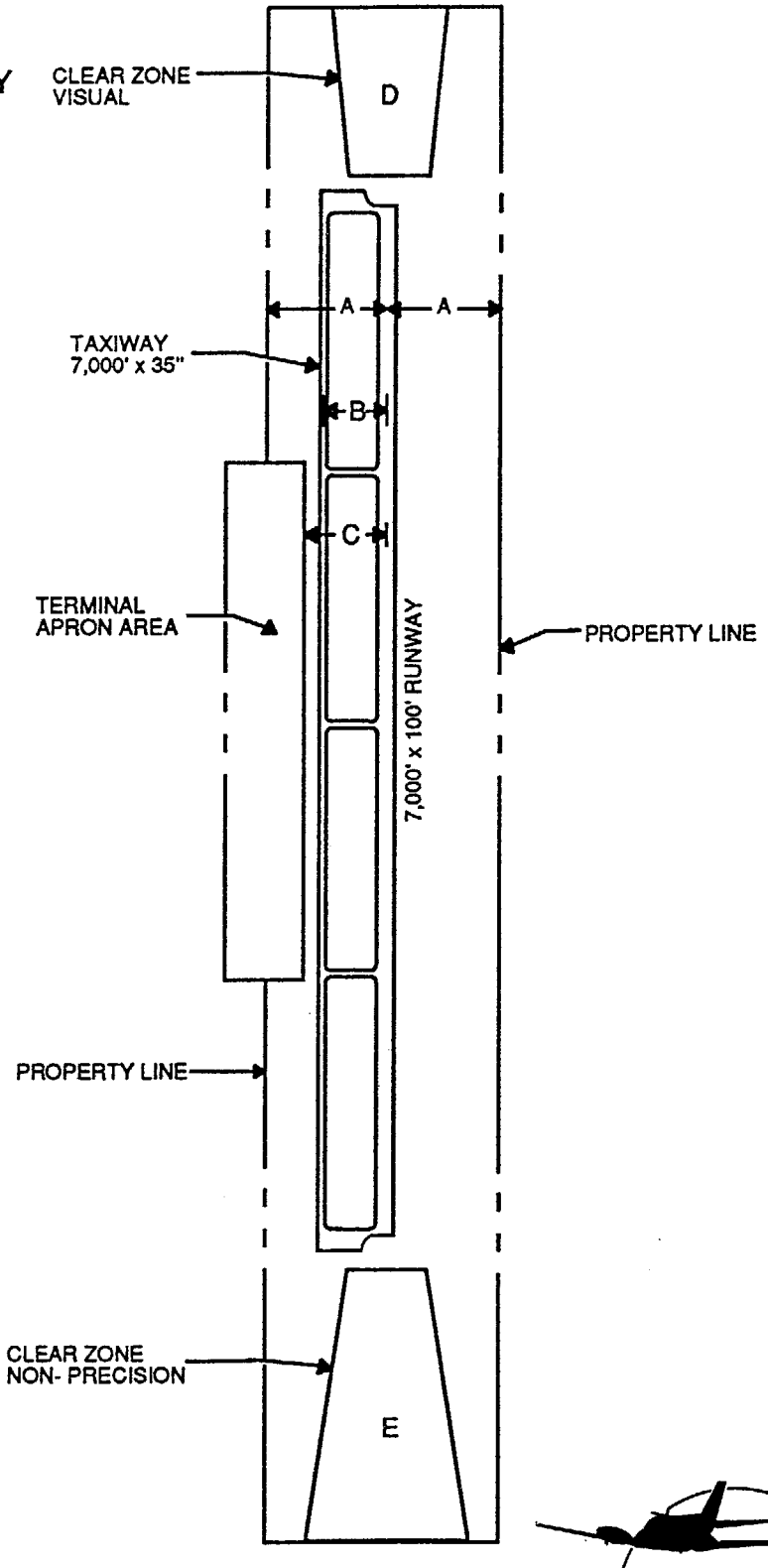
TRANSPORT RUNWAY
7,000' x 100'

ACRES =400

LEGEND:
A= 750'
B= 400'
C= 500'
D= 500' x 1,000' x 700'
E= 500' x 1,700' x 1,010'



City of Benson

Exhibit 3C
TYPICAL AIRPORT LAYOUT

airport would initially be constructed as a General Utility - Stage I category airport, it would probably not be necessary to purchase this entire acreage at project initiation.

The typical airport layout for the Transport category airport requires a minimum land acquisition of 327 acres. Clear zones on each runway approach would have to be controlled by either acquiring fee simple title or by navigation easements, etc. This amounts to an additional 43 acres.

Based on the recommended runway length for initial development of the airport, minimum land acquisition for the initial and short term planning stages would be roughly 269 acres, and an additional 16 acres will be needed for clear zone protection.

Actual land requirements will be dependent on the specific site selected for the airport, and land purchases will probably be somewhat greater than the minimums listed due to the unlikelihood of acquiring fragmented parcels from landowners.