

INVENTORY



Chapter One

INVENTORY

INTRODUCTION

The ultimate goal of the Benson Municipal Airport Site Selection and Master Plan Study is an acceptable long-term airport development program that will yield a safe, efficient, cost effective, and environmentally compatible air transportation facility serving the Benson area. The completed master plan provides a phased, step-by-step outline of resources and facility requirements and gives enough advance notice to allow for appropriate scheduling and budgeting. The master plan provides the tools necessary for the orderly development of airport facilities.

Because this master plan is for a new airport facility, an adequate and appropriate site for the airport must be identified. Site selection activities associated with this project include identification and evaluation of potentially feasible airport sites, including an existing, privately-owned airstrip in the Benson area.

In the Master Plan process, the aviation demand and market potential of the Benson area must be integrated with local land use, environmental characteristics, transportation planning, and community development. To ensure overall community compatibility, the Benson Municipal Airport Site Selection and Master Plan will include the following.

- ♦ Inventory and analysis of data pertinent to a potential airport and its environs.
- ♦ Collection and analysis of general economic factors and evaluation of the area's aviation activity.
- ♦ Forecast of aviation activity to the year 2010.
- ♦ Determination of facility requirements for the new airport.
- ♦ Identification and selection of the most suitable site for the facility.

- ◆ Research and analysis of the impacts of the selected site development.
- ◆ Development of an airport layout plan and recommended land use plan for the airport and the surrounding area.
- ◆ Establishment of priorities, schedule for the proposed developments, and estimate of facility development costs.

The initial step in the preparation of the Airport Site Selection and Master Plan for the City of Benson, Arizona is the collection and analysis of various data concerning airport development and the airport environs. This information consists of the following.

- ◆ Background information pertaining to the area.
- ◆ An inventory and description of existing airport facilities.
- ◆ Population, socioeconomic and land use information which provide an indication of future development in the City of Benson and the surrounding area.

The following chapter presents a summary of background conditions identified through the inventory phase of the study.

GENERAL DATA

The City of Benson is located approximately 45 miles southeast of the City of Tucson and approximately 35 miles north of the City of Sierra Vista, in Cochise County, Arizona. Benson is situated in the San Pedro Valley and serves as the western gateway to the scenic and historic attractions of Cochise County. According to the 1989 community profile for Benson, a relatively large percentage of the City's population is retired (23% of residents are 65 and over) and the City is a winter refuge for many visitors.

Located at the intersection of Interstate 10 (I-10), U.S. Route 80, State Route (SR) 90 and the Southern Pacific railroad main line, Benson serves as the northwest corner trade center for Cochise County. Benson's current employment structure indicates more than 50 percent of the community's employment is in the retail and service trades while public administration and manufacturing employment sectors contribute another 25 percent to the City's total employment. The Arizona Electric Power Company and nearby mining and manufacturing facilities are major employers for the community. Many of the residents commute to Tucson and Sierra Vista for employment.

Based on information provided by the Southeast Arizona Governments Organization (SEAGO), the population of Benson is currently estimated at 3,945 for the community of Benson and 103,074 for Cochise County. The incorporated area of the City of Benson is roughly 12 acres.

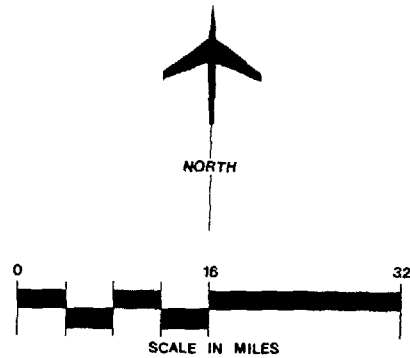
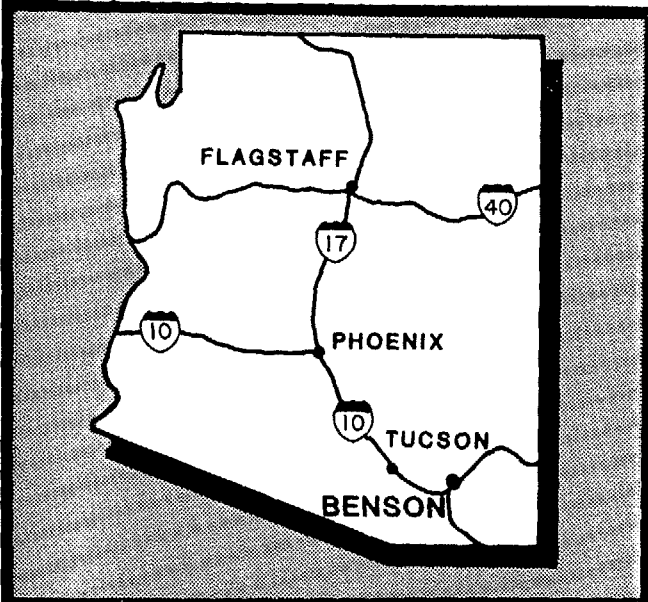
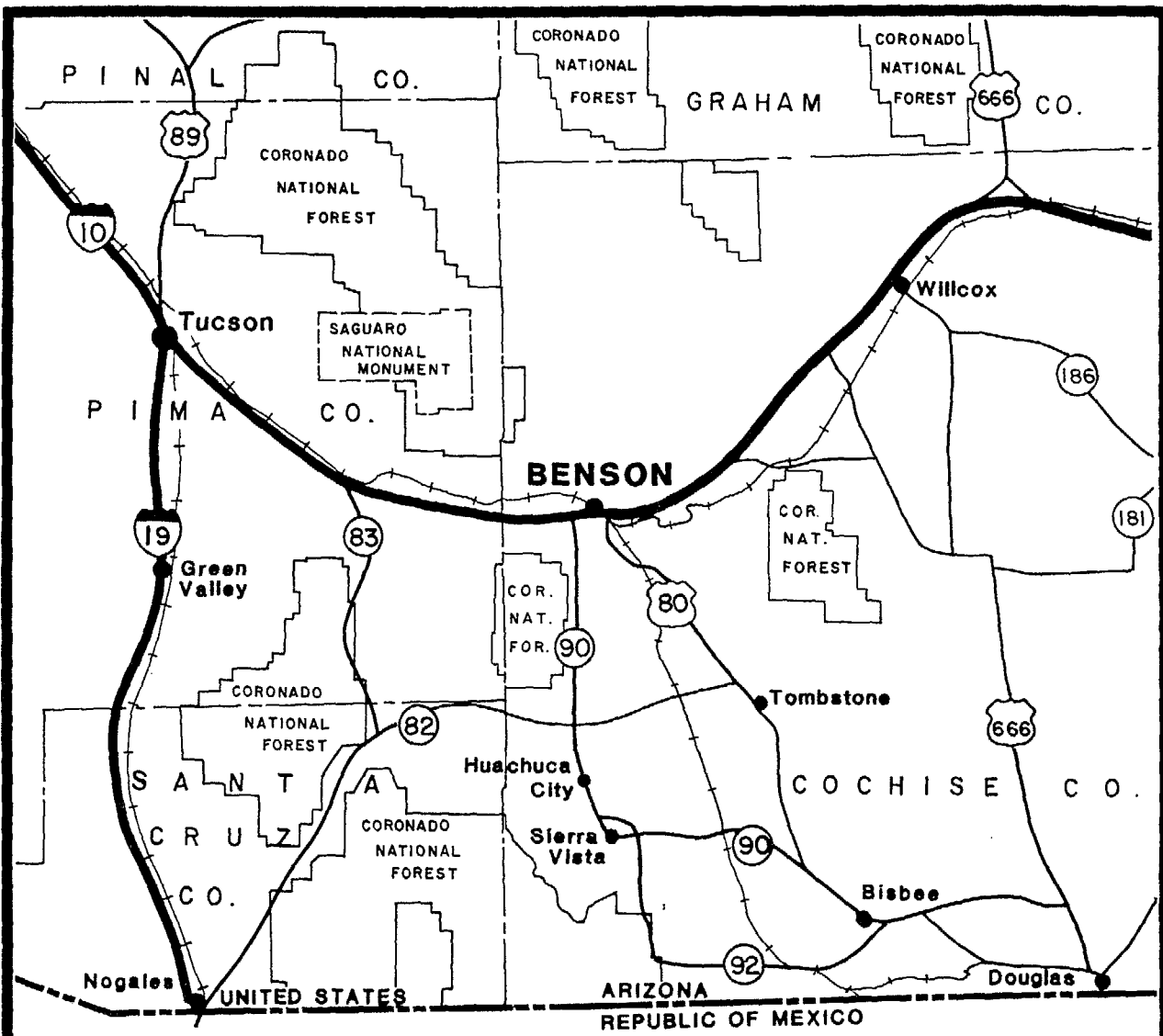
Cochise County, situated in the far southeast corner of the State, is bounded by Pima County to the west, Graham County to the north, Hidalgo County, New Mexico to the east and Sonora, Mexico to the south. **Exhibit 1A** depicts the regional setting and general vicinity of the City of Benson.

TRANSPORTATION

ROADWAYS

Cochise County is served by four highways: Interstate 10, U.S. Route 80, SR 90 and SR 82. With the exception of SR 82, each of these roadways pass through or originate in the community of Benson. Interstate 10 is generally oriented east to west through the County and provides connections to Arizona communities such as Tucson and Phoenix, as well as numerous communities in the States of California and New Mexico. U.S. Route 80 is oriented in a northwest to southeast

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*City of
Benson*

Exhibit 1A
VICINITY MAP

direction; it originates within the City of Benson, and it connects the City to the communities of St. David, Tombstone, and Bisbee, the county seat.

SR 90 is oriented north to south and connects Benson with the City of Sierra Vista. This road serves as access to many residents of Benson, who commute each day to Sierra Vista for employment at the Fort Huachuca Military Post. **Exhibit 1B** depicts the location of these main transportation corridors.

This highway network also supports motor freight and heavy hauling by a variety of regional trucking firms. In addition, United Parcel Service (UPS) delivers packages to the City of Benson on a daily basis. The closest UPS service centers are in the Cities of Sierra Vista and Tucson.

RAILWAYS

Rail service to the Benson area is provided by Southern Pacific, for freight hauling, and Amtrak, for passenger service. Southern Pacific is the primary user of this rail line, with a low of 40 to a high of 85 trains through the area during a 24 hour period.

Amtrak offers passenger service three times weekly in each direction for a total of six runs per week through the area. An Amtrak passenger station is located in downtown Benson at the corner of 4th and San Pedro Streets.

The main rail line transects the City in a general east to west orientation, connecting this area to the West Coast, the South and the Midwest. A spur line originates on the east side of the City of Benson and connects the main rail to the cities of Bisbee and Douglas, as well as several smaller communities in between (**Exhibit 1B**).

AVIATION FACILITIES

The only airport facility within the vicinity of Benson is the existing Benson Airport, a private facility, which is located just outside the City limits, east of downtown. According to the Phoenix Sectional Aeronautical Chart (June 1, 1989), this airport is listed as non-public use.

Within a 30 nautical mile (nm) radius of the City, there are three airports listed for public use: Cochise County Airport (Willcox, Arizona), Sierra Vista Municipal Airport (Sierra Vista, Arizona) and Tombstone Municipal Airport (Tombstone, Arizona). Whetstone Airport, listed as non-public use, is also located within the 30 nm radius of Benson.

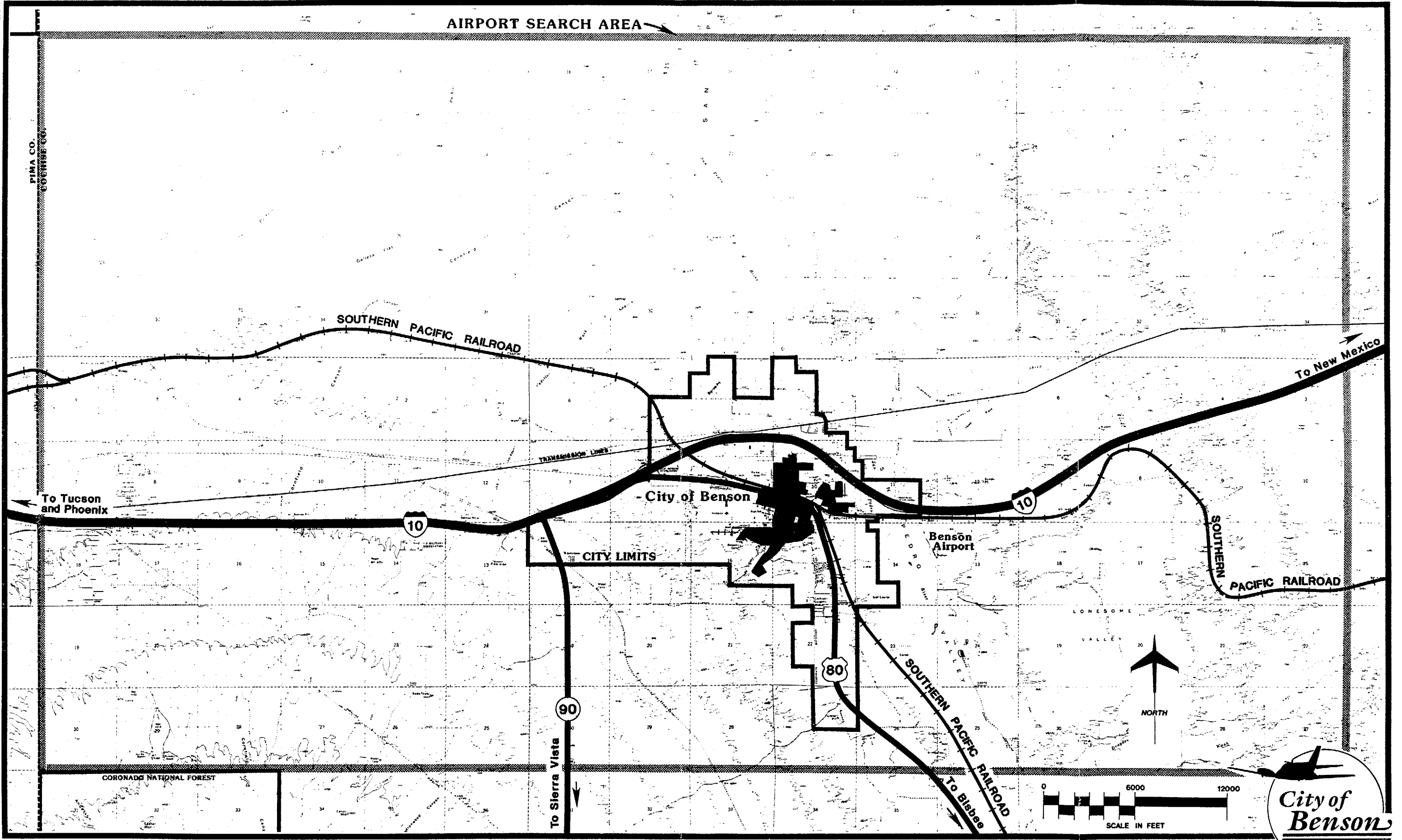
The only airport within the 30 nm radius of Benson offering commercial service is the Sierra Vista Municipal Airport. Tucson International Airport (Tucson, Arizona), located approximately 45 nm to the west provides more extensive commercial service.

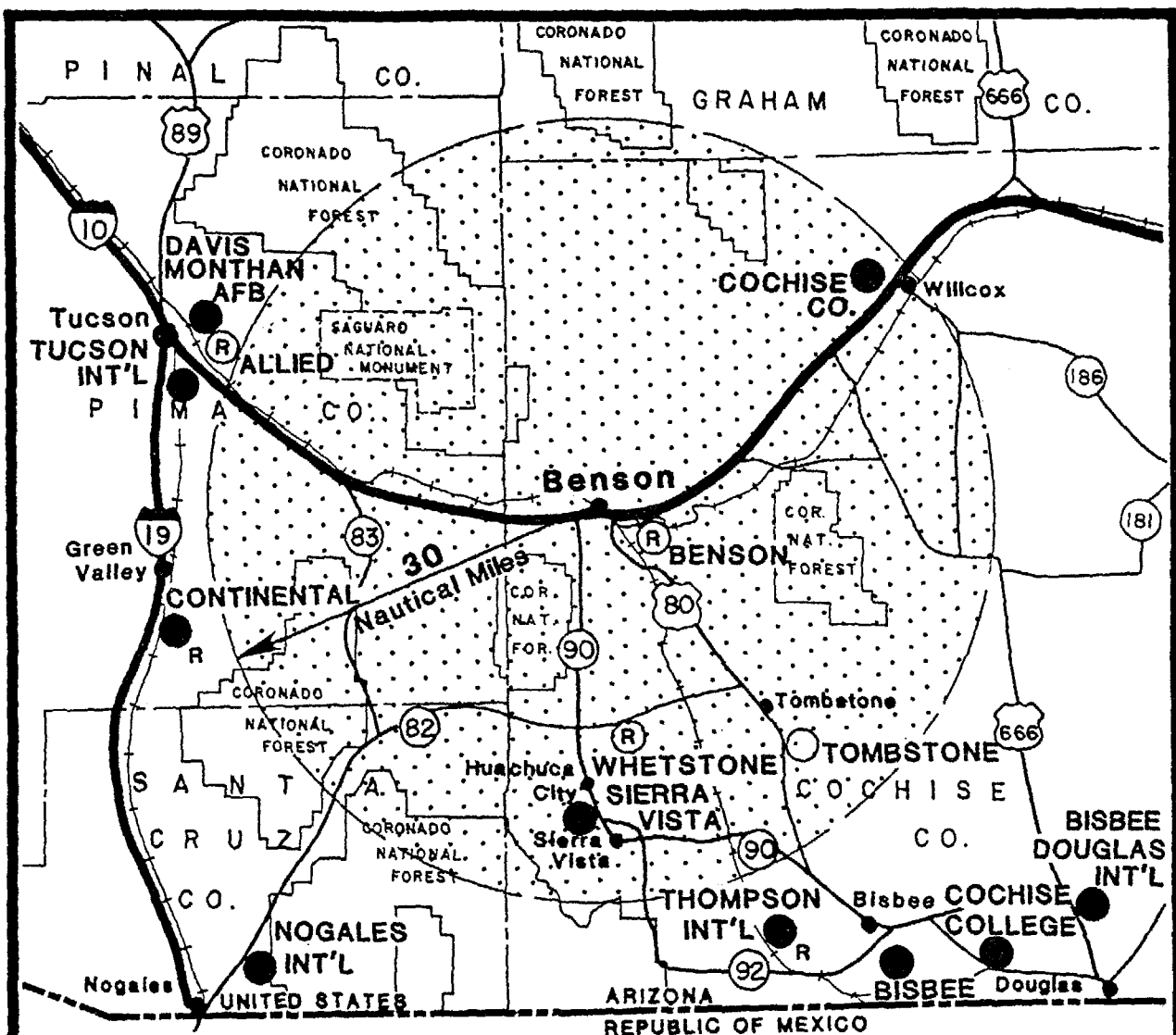
The following is a brief synopsis of the existing airport, public use airports within the 30 nm radius and Tucson International Airport. **Exhibit 1C** depicts these airports, as well as others within the region.

Benson Airport

The existing Benson Airport is located just outside of the City's jurisdiction, about one mile east of the developed urban center of Benson. Privately owned and operated, the existing airport is a general aviation facility. The existing airport property is roughly 130 acres.

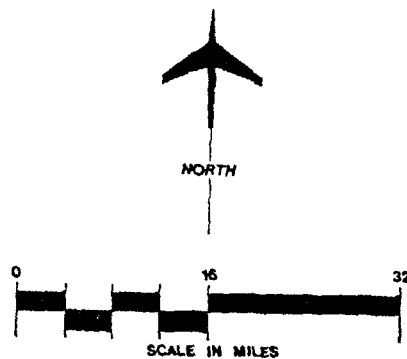
The airport has a single dirt runway, 4,800 feet in length. No additional facilities or





LEGEND:

- Other than hard surfaced runways.
- Hard surfaced runways.
- Ⓡ Private or Non-public use.



services are available at the airport. In 1985, eight single engine aircraft were based at the airport (Benson Airport-Federal Aviation Administration Form 5010, 1985). According to Ben Taylor, the airport owner, approximately five registered aircraft are presently based at the airport. Annual operations have not been estimated.

Cochise County Airport

Cochise County Airport is located 29 nm to the northwest of the City of Benson and is owned and operated by Cochise County. This facility is classified in the National Plan of Integrated Airport Systems (NPIAS) as a general aviation, Basic Utility airport.

Cochise County Airport has a single asphalt paved runway, 6,100 feet in length. Airport facilities include a terminal building, a Fixed Base Operator (FBO), fuel service and a unicom, according to the 1988 Arizona Aviation System Plan (1988 SASP).

In 1987 there were 28 registered aircraft based at the facility. State forecasts anticipate the basing of 29 registered aircraft at the airport in 1989. According to the 1988 SASP, annual operations were reported at 22,000 in 1987 and were forecast at 23,403 for 1989. Based on a general Annual Service Volume of 230,000 operations for single runways, this airport is operating at approximately 10 percent of capacity.

Sierra Vista Municipal Airport

Sierra Vista Municipal Airport is located approximately 22 nm to the south of the City of Benson, on Libby Army Airfield. The airport is a military/civilian joint-use facility, is operated by the City of Sierra Vista, and is classified in the NPIAS as a General Aviation, General Utility airport.

The airport has three asphalt runways, approximately 12,000, 5,400 and 4,300 feet in length. Two of the existing runways satisfy the Federal Aviation Administration (FAA) standards for a Transport category runway. Other airport facilities include an air traffic control tower, a terminal building and fueling facilities. Commercial air service is also provided at this airport.

An inventory count at Sierra Vista Municipal Airport in 1988 indicated a total of 25 based general aviation aircraft. For 1988, total operations for Sierra Vista Municipal Airport were 108,000. Based on an Annual Service Volume of 238,000, estimated in the 1989 master plan for the airport, current operations are roughly 45 percent of capacity.

Tombstone Municipal Airport

Tombstone Municipal Airport is a general aviation facility located approximately 21 nm to the southeast of the City of Benson. It is classified as a secondary airport in the 1988 SASP, but is not included in the NPIAS. The airport is owned and operated by the City of Tombstone.

The Tombstone Airport has a single dirt runway, 4,500 feet in length. According to the FAA Form 5010 dated 1988, there are no registered aircraft based at this facility and annual operations were reported to be 300. Based on a general Annual Service Volume of 230,000 operations for single runways, Tombstone is operating at less than one percent of capacity.

Tucson International Airport

Tucson International Airport, located approximately 36 nm to the west, is classified in the NPIAS as a Primary Commercial Service airport. In addition to serving as an air carrier

airport, Tucson International Airport also serves the general aviation community. The airport is owned by the City of Tucson and operated by the Tucson Airport Authority.

The airport currently has three asphalt runways, approximately 11,000, 9,100 and 7,000 feet in length. According to the FAA Form 5010 dated 1987, there are 405 registered aircraft based at this airport. Located on the airport are several FBO's which provide a full range of services to the general aviation community. According to Tucson Airport Authority planning staff, the 1988 total operation level for Tucson International Airport was 235,548. Based on an Annual Service Volume of 440,000, estimated in the Pima County Regional Aviation System Plan (1985), and annual operations of 235,548, Tucson International Airport is operating at roughly 54 percent of capacity.

Tucson International Airport has two designated relievers, Ryan Airfield and Avra Valley Airport. The 1987 Master Plan for Tucson International Airport assumes that other airports in the Tucson vicinity will accommodate an increasing share of the aircraft basing demand generated in eastern Pima County, thus relieving Tucson International Airport of general aviation demand pressure.

AIRSPACE AND AIR TRAFFIC CONTROL

The analysis of airspace is critical to both the operational interaction between the various surrounding airports and the evaluation of methodologies to mitigate airport noise impacts. Flights into the proposed Benson Municipal Airport will be conducted using both Instrument Flight Rules (IFR) and Visual Flight Rules (VFR). IFR relate to those procedures for conducting instrument flight under all weather conditions. VFR govern the procedures for conducting flight

under visual conditions. Most air carrier, military and general aviation jet operations are conducted under IFR, whether or not weather conditions dictate such procedures. Published procedures for instrument approaches outline the required flight paths and altitude. **Exhibit 1D** shows, in general, the airspace surrounding the Benson area.

Albuquerque Air Route Traffic Control Center (ARTCC) will be generally responsible for enroute control of all aircraft operating on IFR flight plans into the Benson area. This study will focus on those airports and the airspace within 30 nm of the proposed Benson Municipal Airport.

AIR TRAFFIC CONTROL

Most aircraft will enter or exit the Benson area via one of the federal airways in the area depicted on **Exhibit 1D**. Victor Airways, which are corridors eight miles wide between 1,200 and 18,000 feet Mean Sea Level (MSL) and Jet Routes provide aid in cross-country flight planning and navigation. Each airway is a compass heading extending between two very high frequency omnidirectional range (VOR) and/or very high frequency omnidirectional range and tactical air navigation station (VORTAC) navigational aids. Commercial and jet aircraft normally use the Jet Routes, airways between 18,000 and 45,000 feet MSL.

There is no terminal navigational aid in the Benson area, therefore, aircraft will probably use one of the two enroute navigational aids, the Tucson VORTAC to the northwest, or the Cochise VORTAC to the east to enter and depart the area.

The remainder of this section is an evaluation of aircraft operations at the proposed Benson Municipal Airport during the following procedures.

- ♦ Airways and Low Level Routes
- ♦ Visual Flight Rule Procedures

Airways And Low Level Routes

There are three Victor and two Jet airways that will influence air traffic in the Benson area. The three Victor Airways in the vicinity are Victor Airway 66 which proceeds southeast out of the Tucson VORTAC to the Bisbee-Douglas VORTAC, Victor Airway 202 which proceeds southeast from the Tucson VORTAC and then northeast to the Cochise VORTAC and Victor Airway 16 which proceeds east of the Tucson VORTAC direct to the Cochise VORTAC. Two Jet Routes, J-2 which proceeds northwest from the Cochise VORTAC and J-104 that proceeds northeast from the Tucson VORTAC also enter the airspace in the Benson area, however, they do not influence airport operations and are not illustrated on **Exhibit 1D**.

There are no low level Military Training Routes (MTR) in the immediate vicinity of the Benson area, however, MTR's VR-259 and VR-260 traverse the southern part of the Benson area, approximately 10 nm south of the City as indicated on **Exhibit 1D**. The VR designated routes must be flown under VFR conditions. VR-259 and VR-260 are under the control of Davis-Monthan AFB in Tucson. Aircraft may traverse these routes from 100 feet to 6,500 feet above ground level (AGL). VR-263, located to the south and southeast of Benson, is an MTR which is controlled by the Arizona Air National Guard in Tucson. Aircraft may be at altitudes from 100 feet to 7,000 feet AGL along this route structure (**Exhibit 1D**).

Visual Flight Rule Procedures

Because there are no published instrument approach procedures to the existing Benson Airport, aircraft operating into and out of the

proposed Benson Municipal Airport will have to land or takeoff at the airport under Visual Flight Rules (VFR). In these cases, the pilot is responsible for his own collision avoidance and navigation and will operate his aircraft in accordance with VFR procedures.

AIRSPACE

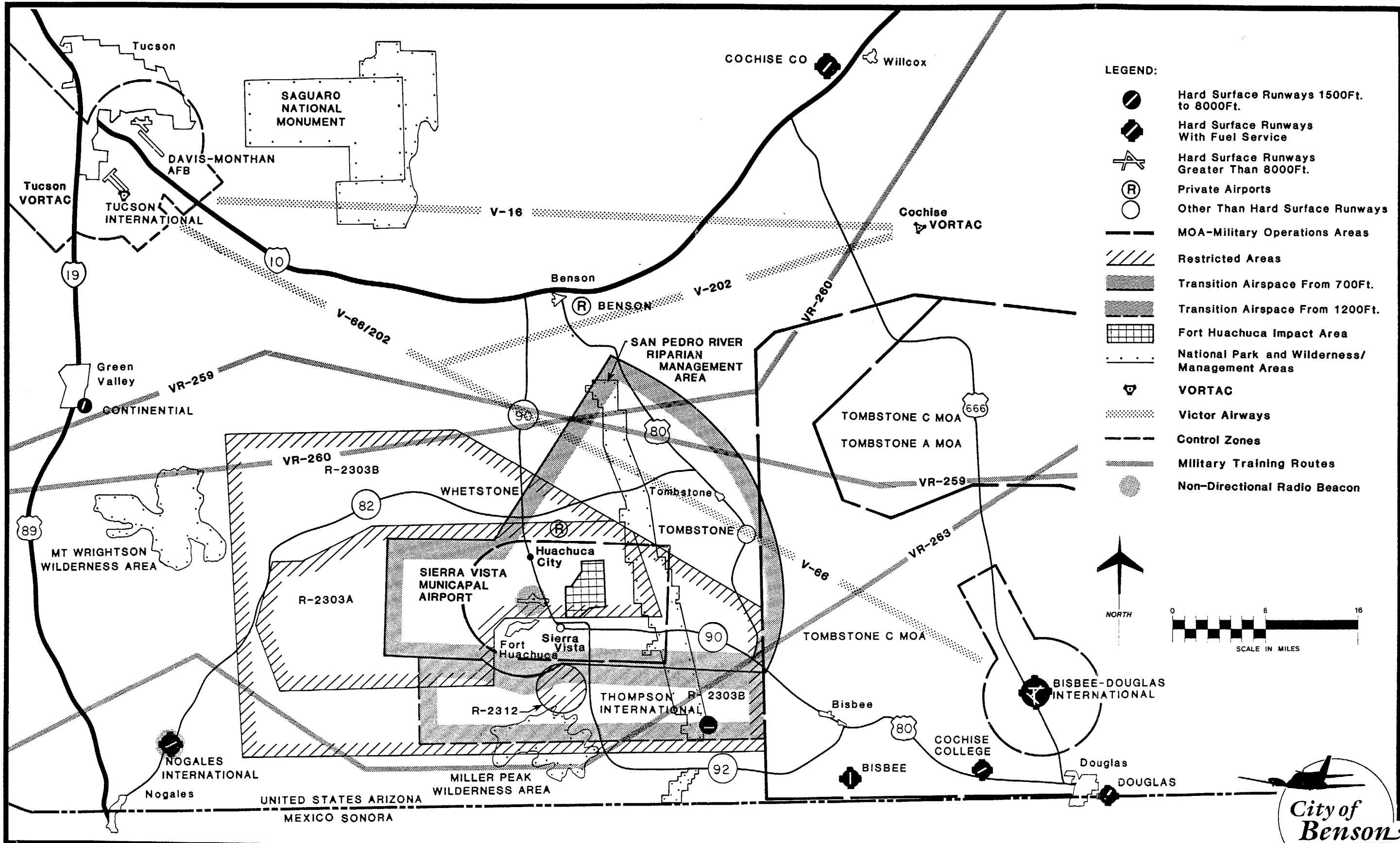
The Airspace, as it affects the proposed Benson Municipal Airport, consists of several elements. The following paragraphs discuss in general the types of airspace in the Benson area and its influence on the proposed Benson Municipal Airport. The airspace is shown on **Exhibit 1D**.

Special Use Airspace

Special Use Airspace is defined as airspace areas within defined dimensions identified by an area on the surface of the earth wherein activities, by their nature, must be confined and/or where limitations may be imposed on aircraft operations that are not a part of those activities. In the case of restricted airspace, flight in these areas is subject to strict controls. There is only one special use airspace that will influence the proposed Benson Municipal Airport: Restricted Airspace Area R-2303 (**Exhibit 1D**).

R-2303 is divided into two areas defined as R-2303A and R-2303B. R-2303A is an area from the surface to 15,000 feet MSL where all air operations are subject to military approval whenever the restricted area(s) is activated with Albuquerque Air Route Traffic Control Center.

R-2303B is a larger airspace area that lies between 15,000 to 45,000 feet, with similar restrictions to air operations. The controlling agency for this restricted area is also Albuquerque Air Route Traffic Control Center (ARTCC). Both of these areas are restricted due to the various operations that



could be conducted in the airspace from Remotely Piloted Vehicle and/or Drone operations to live firing exercises conducted by Fort Huachuca units. R-2303B is also used to conduct air refueling operations.

To the east, is the Tombstone Military Operating Area (MOA). A MOA is not restricted airspace and civilian operations may be conducted in the area, however, the pilot is advised that military aircraft may be using the area. This MOA is divided into two sections, similar to the R-2303 airspace.

Tombstone MOA-A is effective from 6:00 am to 9:00 pm, Monday to Friday, from 500 feet to 14,500 MSL in altitude. Tombstone MOA-C is effective at the same time and includes the airspace from 14,500 up to but not including 18,000 feet. Albuquerque ARTCC controls activities within this area.

There are two Wilderness Areas in the vicinity of Benson: Saguaro National Monument, approximately 20 miles northwest; and Rincon Mountain Wilderness Area, approximately 15 miles northwest. Flight over a Wilderness Area is permitted, however, aircraft are requested to remain a minimum of 2,000 feet above the surface of the area.

Terminal Airspace

There are no terminal airspace areas in the Benson area, however, several are illustrated in **Exhibit 1D** for airports that will influence Benson airspace. Terminal airspace areas contain Control Zones and Transition Areas. Control Zones are airspace areas centered on airports, from the surface to the base of the continental control area, within which some or all of the aircraft are subject to air traffic control. The control zone is effective as long as an air traffic control tower (ATCT) is controlling the area. Transition Areas are designated airspace areas designed to contain IFR operations. The Transition airspace begins at either 700 or 1,200 feet above the

surface when designated for an airport with an instrument approach procedure or airway route system, respectively.

Transition airspace exists around Libby Army Airfield/Sierra Vista Municipal Airport to the south of Benson, as indicated on **Exhibit 1D**. This area allows aircraft on IFR flight plans adequate airspace to conduct an instrument approach/departure to or from the airport.

Traffic Patterns are based upon aircraft type and operational considerations. Left traffic patterns are the norm at most airports, however, circumstances could preclude the establishment of a left traffic pattern. Airspace allowed for traffic patterns at an airport depends upon the type of aircraft (operational capabilities such as stall speed, approach speed, etc.) operating at that airport. Traffic pattern altitudes vary depending upon aircraft type but normally will be established based upon the type of aircraft operations.

LAND USE

HISTORICAL OVERVIEW

Benson, originated as a transportation center, is located at the junction of the east-west railroad and the north-south overland trails in the San Pedro Valley. The first railroad, the Southern Pacific, was constructed to transport ore from mines in Tombstone, Fairbank, Contention and Bisbee to California. As more rail lines were built, including El Paso and Southwestern, Benson became a transportation hub.

In the 1890's, agricultural activities and ranching expanded in response to the availability of water for irrigation purposes from the construction of artesian water wells. This growth began the area's transition from a railroad town to a trade center for a prosperous agricultural region. The completion of a highway underpass in late

1941, greatly increased traffic through Benson, initiating Benson's transition to a highway city. Increased highway traffic and the proximity of Fort Huachuca, a major employer of the region, have stimulated the growth of Benson.

DEVELOPMENT PATTERNS

Today, most of the development in the airport search area is within the jurisdictional boundary of the City of Benson. Benson's original streets were platted in a grid pattern which was bisected by the Southern Pacific Railroad right-of-way. Commercial uses concentrate along the highway through Benson. Public and quasi-public uses are located south of the highway-railroad routes. Industry has located on the perimeter of the town or at greater distances, as in the case of the Apache Powder Company. Residential units within the City are located both north and south of the railroad.

Outside of the City limits, agricultural areas and low density residences are scattered throughout the lower elevations of the San Pedro River Valley. Two sites of development activity, primarily residential in nature, also characterize the area. These areas include the J-Six/Mescal and Empirita Ranch area, located near the intersection of I-10 and the Pima/Cochise County line, and Pomerene, located just north of the City limits. In addition, scattered residential development is occurring in close proximity to I-10 between Benson and Mescal, and along Ocotillo Road north of Benson.

LAND OWNERSHIP

Much of the land within the airport search area, particularly to the northwest and the east of the City, is owned by the State of Arizona. A smaller, yet still significant percentage of land is under the jurisdiction of the United States, Bureau of Land

Management (BLM). The majority of the BLM property is located to the northeast of the City primarily in areas of rough terrain. Other federal land includes the Coronado National Forest, located just outside the search area to the south (**Exhibit 1E**).

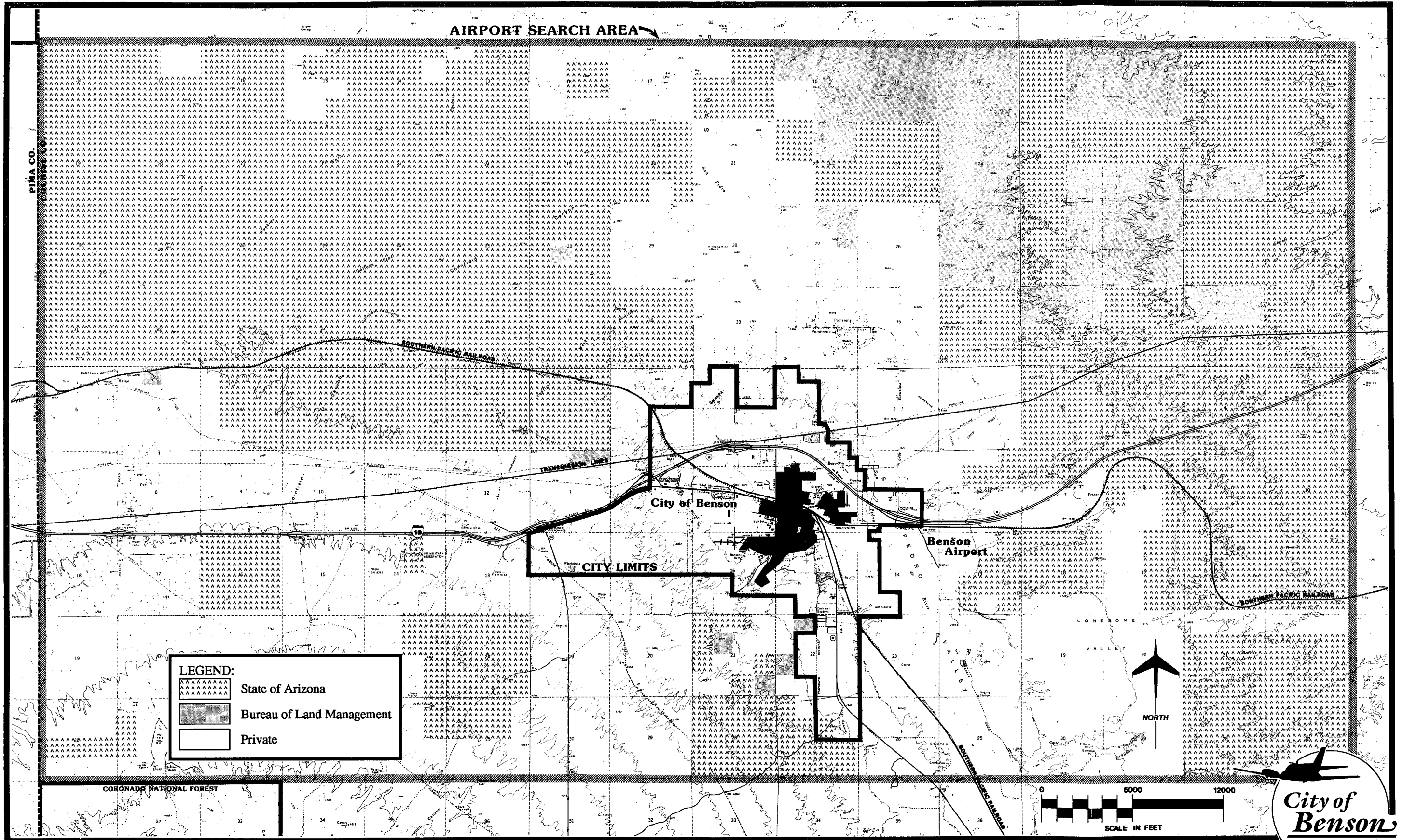
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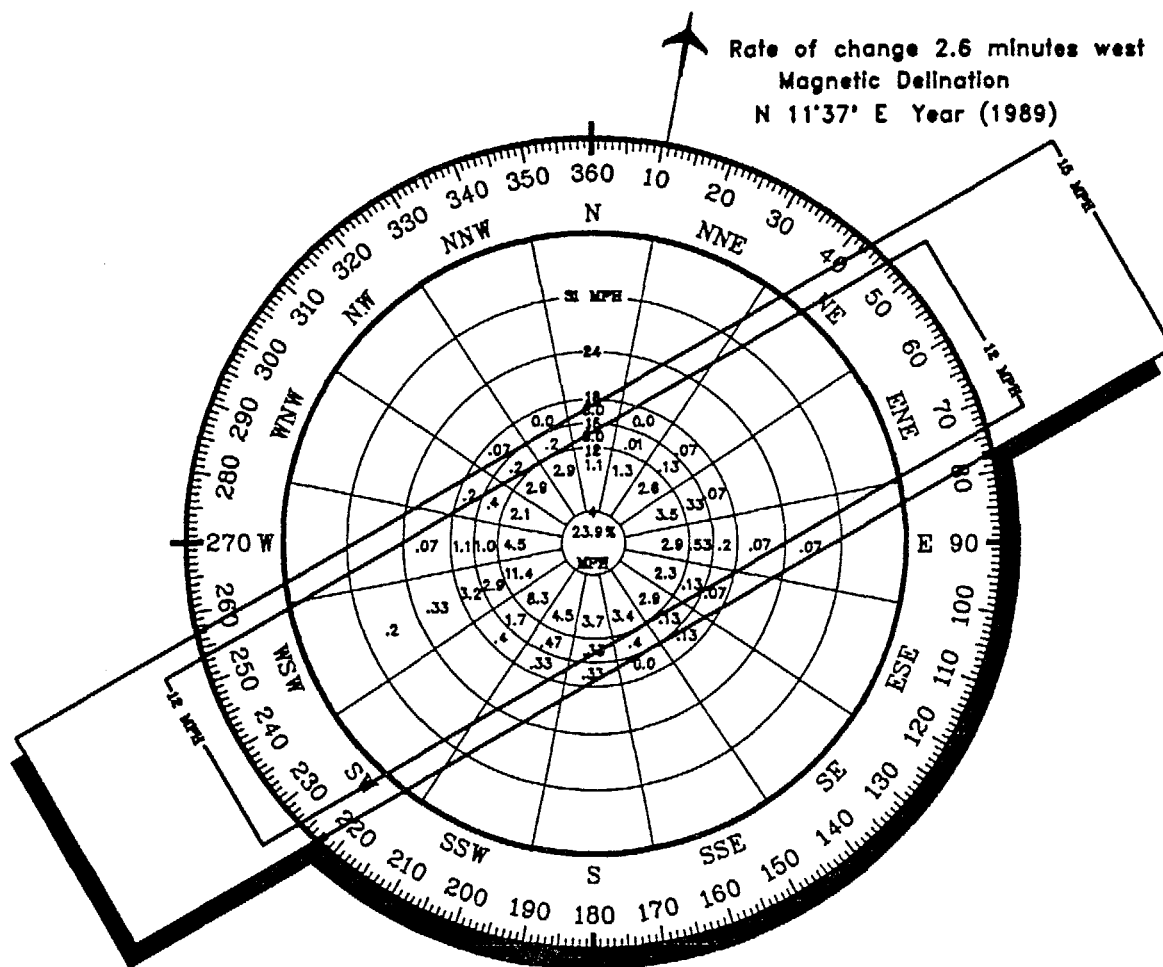
Weather conditions play an important role in the planning and development of an airport. Temperature is a vital factor in determining runway length, while wind speed and direction determine optimum runway orientation. The percent of time visibility is impaired due to cloud coverage is also a major factor in determining the need for navigational aids and lighting.

The City of Benson does not have a national weather reporting station, therefore, weather data had to be analyzed from different sources. Both Tucson and Sierra Vista, Arizona are weather reporting stations and could be used to obtain climatology and wind data for the Benson area.

Wind data for the area was available from the Arizona Electric Power Cooperative, Inc. (AEPCO). In 1987, AEPCO collected one year of wind data at their power generating plant located approximately 22 miles east of the City of Benson. By comparing the results of wind studies for Sierra Vista with a tabulation of windrose information from the AEPCO, a windrose for a proposed Benson Municipal Airport was prepared. This windrose is illustrated in **Exhibit 1F**.

The climate of Benson is typical of the high country in the southern part of the state. Precipitation averages approximately 11 inches annually, with most of this falling during July and August. Approximately 70 percent of the thunderstorms that occur annually occur in these two months. Snowfall occurs occasionally between November and February.





WIND DATA		
CROSSWINDS	12 MPH	15 MPH
	98.12%	99.66%

SOURCE:
 Arizona Electric Power Cooperative, Inc.
 March 1987
 1498 Observations
 between March 1-30, 1987



The average annual snowfall in Benson is approximately 1.3 inches based upon a 30 year average.

Normally July is the hottest month with an average daily maximum temperature of 96.4 degrees fahrenheit. The average annual high temperature is 79.8 degrees while the average annual low is 45 degrees. The average relative humidity is 40 percent with the driest month in June and wettest month in August.

Ceiling and visibilities in the area are generally excellent all year round. Ceilings equal to or greater than 1500 feet and visibilities equal to or greater than 3 miles, the definition of visual flight rule conditions, exist 98.5 percent of the year. Clear or scattered conditions (0-30 percent cloud cover) are present 75 percent of the year while broken to overcast conditions are encountered only 25 percent of the year. Ceilings and visibilities lower than 200 feet or one half mile occur less than one tenth of one percent.

Winds are normally light with approximately 80 percent of the wind averaging 5 miles per hour or less. The predominant wind direction is from the southwest with occasional gusts exceeding 30 miles per hour. Although wind speeds are relatively low on average, occasional wind gusts can register as high as 50 miles per hour and may occur in any month, particularly during thunderstorm passage.

The FAA requires construction of a crosswind runway whenever a single runway cannot

achieve 95 percent coverage of the predominant winds for the specific category of runway. According to the FAA, for transport category runways, the runway orientation must achieve 95 percent coverage of winds of 15 miles per hour and less. Winds greater than 15 miles per hour are not considered in the requirement. For utility category runways, the runway orientation must achieve 95 percent coverage of winds of 12 miles per hour and less. In this case, winds greater than 12 miles per hour are not considered in the requirement.

The wind analysis completed for the proposed Benson Municipal Airport was based on 1,498 wind observations taken at the AEPC power station, 22 miles east of the existing Benson Airport. The wind rose provided in this report, **Exhibit 1F**, reflects this information and indicates miles per hour and associated percentage of occurrence for winds by the use of concentric circles. For example, winds of four miles per hour or less, considered to be calm winds, total 23.9 percent of the total winds in this area. The next largest circle encloses winds of 12 miles per hour and less. Total percentage wind coverage of the runway is determined from this chart. Generally speaking, the runway orientation that accommodates the greatest percentage of winds is considered preferable for the airport. In this case, a northeast southwest runway orientation will provide the necessary 95 percent wind coverage of both 12 and 15 mile per hour crosswinds. The wind coverage totals calculated for particular runway orientations follows in **Table 1A**.

TABLE 1A
Runway Orientation - Wind Coverage
Benson Municipal Airport

<u>Runway Orientation (True)</u>	<u>Percentage of Crosswind Coverage</u>	
	<u>12 MPH</u>	<u>15 MPH</u>
18-36	90.1	97.8
16-34	88.6	95.0
14-32	89.6	96.3
12-30	93.1	98.5
10-28	97.3	99.2
08-26	98.1	99.6
06-24	98.1	99.7
04-22	97.1	99.3
02-20	93.8	98.1

MPH = Miles Per Hour

Source: Tucson Electric Power Cooperative, 32°04'12"N 109°54'23"W
March 1987, based upon 1,498 Observations
