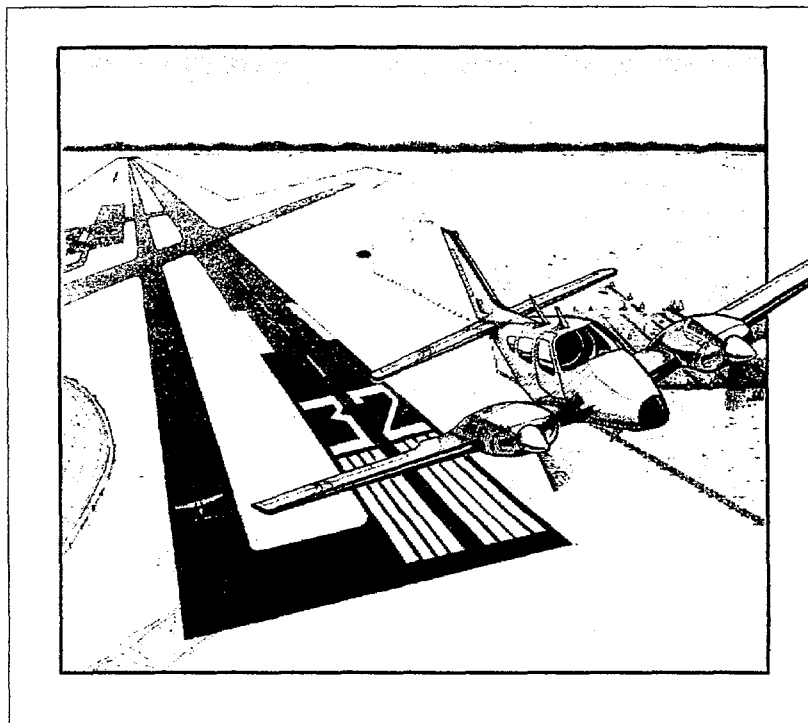


Chapter Two
INVENTORY



Chapter Two

INVENTORY

An Airport Master Plan Study requires the collection, compilation and evaluation of various kinds of data relating to St. Johns Industrial Air Park, the City of St. Johns, and the surrounding area. This broad spectrum of information is intended to provide a complete understanding of the nature and character of the community, as well as the physical and operational characteristics of the airport. Every effort is made to identify and obtain all relevant data pertaining to the airport and the community. Information was collected from a variety of sources and includes the following types of data.

- ◆ Physical inventories and descriptions of facilities available and services provided at the airport.
- ◆ Background information pertaining to the airport, the City of St. Johns and Apache County.

- ◆ Population and other socioeconomic statistics which might provide an indication of future development and economic activity in the area.
- ◆ A comprehensive review of the existing local and regional plans and studies to determine their potential influence on the development of the Airport.

A detailed, accurate and thorough inventory effort is essential to the success of an Airport Master Plan study. The findings, conclusions and recommendations presented in the master plan are heavily dependent on the information obtained during the inventory process and throughout the study. Therefore, the information collected concerning conditions at St. Johns Industrial Air Park, or other external factors that may influence the airport, must be as reliable and up to date as possible.

The information necessary for this study was obtained through on-site inspections of the airport facilities, and interviews with airport management, as well as officials representing the City of St. Johns and Apache County. Information was also obtained from historical records of airport development and operations, and available documents and studies concerning the general welfare of the community.

AIRPORT SETTING

The City of St. Johns is located approximately 175 miles northeast of Phoenix in the White Mountains of northeastern Arizona. It is 18 miles west of the Arizona-New Mexico border and 29 miles north of the Town of Springerville. St. Johns is located on the western banks of the Little Colorado River.

St. Johns was originally named El Vadito (Spanish: little river crossing) by Spanish explorers. It had become a thriving Spanish-American agricultural community by 1873 when Solomon Barth acquired land and cattle and settled nearby. He became a prominent figure in further establishing the settlement and in latter years represented Apache County in the State Legislature.

Mormon pioneers from Utah settled in St. Johns in 1879. The name El Vadito was changed to San Juan (Spanish: St. John) and to St. Johns when the town was established in 1880. The City of St. Johns incorporated in 1946 and today serves as the county seat for Apache County.

The White Mountain Region offers extensive tourism, recreational and

sportsman activities. These recreation activities are most popular during the summer and fall seasons. Many Phoenix and Tucson area residents maintain summer homes near-by, which accounts for a significant portion of the peak summer activity. Winter tourist activity has been increasing steadily with the development and expansion of Apache Sunrise Ski Resort.

St. Johns Industrial Air Park is located on the western edge of the city, approximately one mile from the central business district. The airport is conveniently located for the residents of St. Johns, and also has access from all directions for several nearby communities. This access is provided via U.S. Highway 191 and U.S. Highway 180. The location of St. Johns Industrial Air Park within the area is illustrated on the *Vicinity Map*, Exhibit 2A.

AIRPORT DEVELOPMENT HISTORY

According to long time area residents, the existing airport site was originally used as a landing strip for Barnstormers and military pilots as early as 1917. Development of modern facilities began in 1961 with the construction of Runway 14-32. Runway edge lighting, fencing, rotating beacon and segmented circle were also built at the same time as the runway.

Since 1961, the City of St. Johns has received numerous grants for airport development from both the FAA and the Arizona Department of Transportation - Aeronautics Division. These grants have been used to construct and maintain the majority of airfield facilities that exist

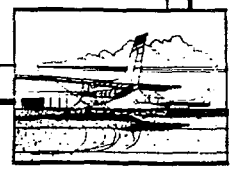
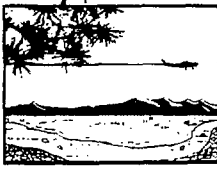
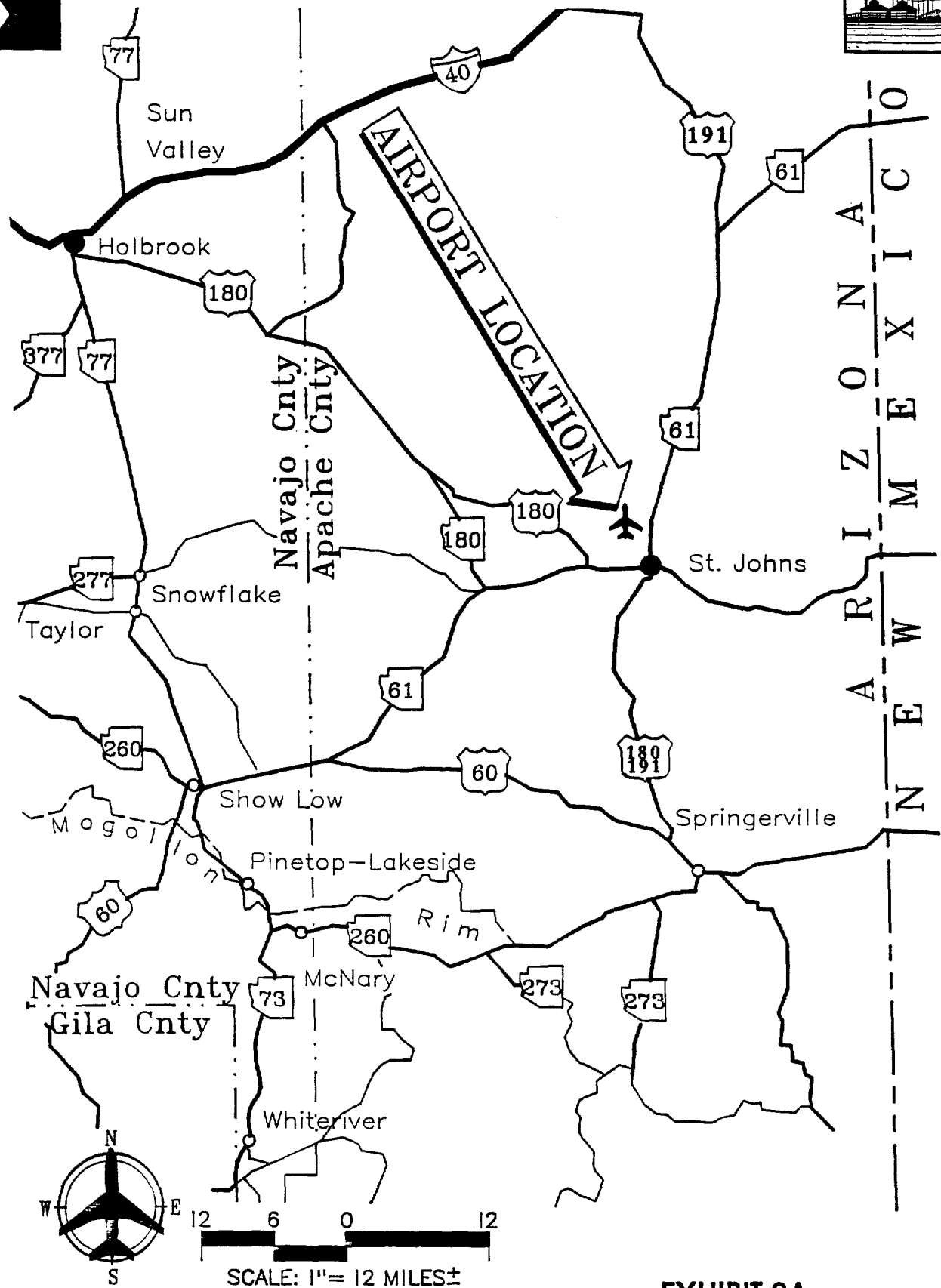
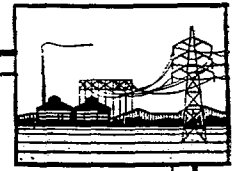


EXHIBIT 2A
VICINITY MAP
St. Johns Industrial Air Park Airport Master Plan

today, such as, constructing aircraft parking aprons and installing various utilities at the airport. Several pavement overlays and preservation projects have also been constructed over the years.

EXISTING AIRPORT FACILITIES

Airport facilities are usually classified as either Airside or Landside facilities for planning purposes. Airside Facilities are those which are directly associated with aircraft operating to and from the airport. Runways, taxiways, navigational aids, and airport lighting are examples of Airside Facilities.

Landside Facilities

Landside Facilities consist primarily of facilities required to accommodate aircraft, or pilots and passengers while they are at the airport. Landside Facilities typically consist of terminal buildings, hangars, aircraft parking aprons, fuel storage facilities and automobile parking. The location and configuration of the existing airport facilities at St. Johns Industrial Air Park are illustrated in the *Existing Facilities*, Exhibit 2B.

RUNWAYS

St. Johns Industrial Air Park has two intersecting paved runways. Runway 14-32 is the primary runway while Runway 3-21 is utilized as a crosswind runway. These runways are designed to accommodate small aircraft weighing less than 12,500 pounds and are constructed of asphaltic concrete.

Airport runways are generally oriented as near as practicable in the direction of the prevailing winds. This orientation is intended to provide maximum wind coverage for normal conditions and minimize hazardous cross-wind conditions.

Runway Orientation

Runway 14-32 is oriented in a southeasterly-northwesterly direction and has a bearing of 148 degrees true. Runway 3-21 is oriented more in a northerly-southerly direction and has a true bearing of 037 degrees.

Runway 14-32

Runway 14-32 was constructed in 1961 and is 5,323 feet long and 75 feet wide. It has a pavement strength of 12,500 pounds rated for single wheel (SW) landing gear aircraft. This runway is currently planned to accommodate general aviation aircraft having approach speeds less than 121 knots (Approach Category B) and wingspans of less than 79 feet (Airplane Design Group II). The effective runway gradient is 0.038 percent sloping downward to the northwest.

The pavement surface is in fair condition having most recently been overlaid with a Porous Friction Course in 1985. Runway 14-32 has a nonprecision (34:1) Approach Surface at each end and is marked with standard nonprecision instrument runway markings. *circling 20:1*
Disp TH??

Runway 3-21

Runway 3-21 is 3,400 feet long by 60 feet wide and was constructed in 1969. This runway has a rated pavement strength of 12,500 pounds (SWL). The runway is currently planned to accommodate general aviation aircraft having approach speeds less than 121 knots (Approach Category B) and wingspans of less than 49 feet (ADG I). The effective runway gradient of

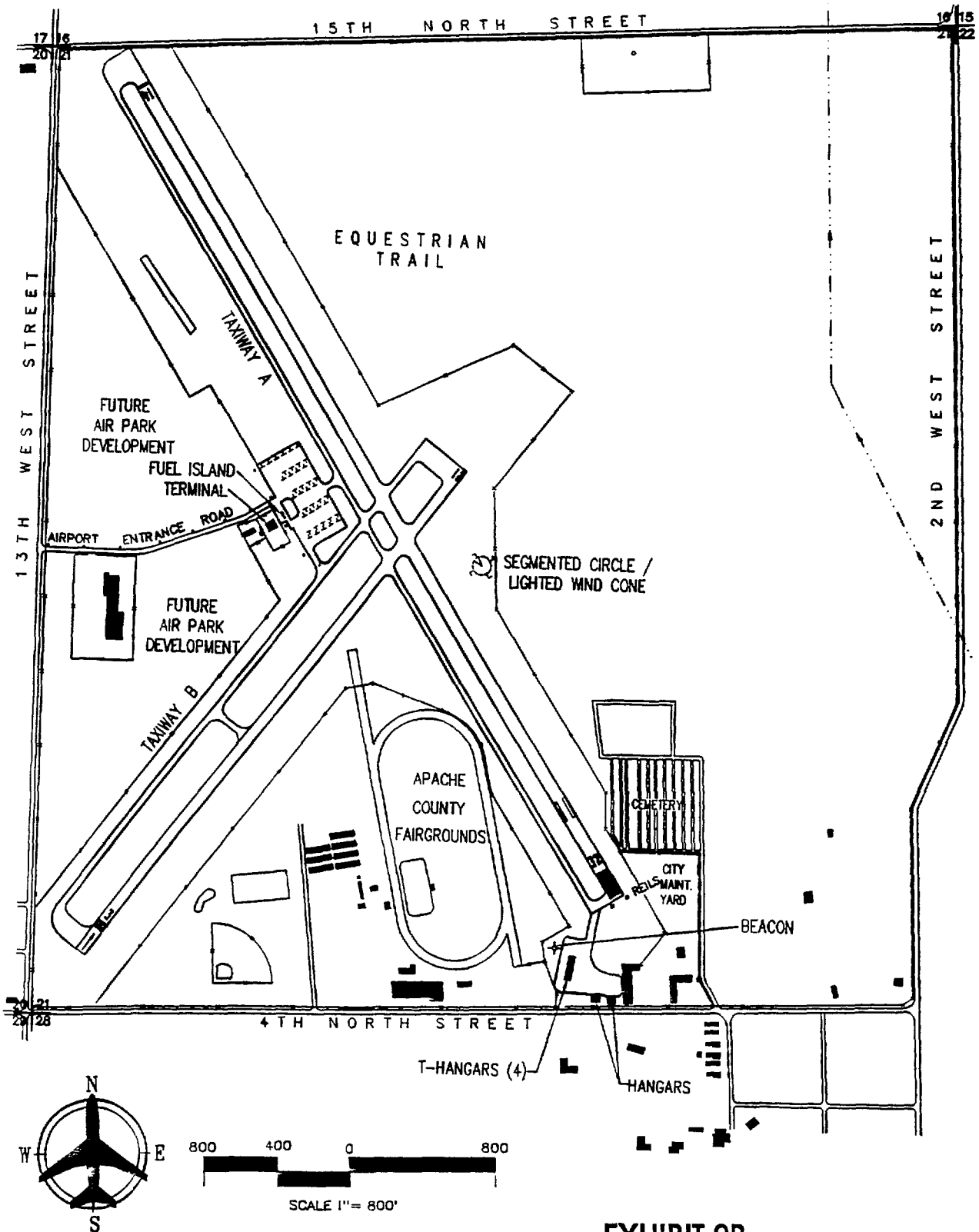
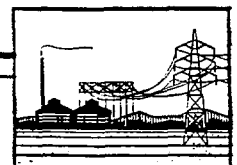
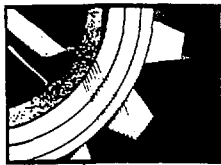
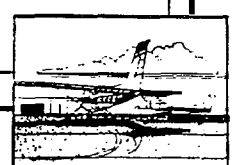


EXHIBIT 2B
EXISTING FACILITIES

St. Johns Industrial Air Park Airport Master Plan



Runway 3-21 is 0.235 percent sloping downward to the southwest. The runway pavement is in good condition having most recently been seal coated in 1991. Runway 3-21 has a Visual Approach Surface at each end and is marked with standard visual runway markings.

A pavement condition survey was conducted in March 1993 to evaluate not only the condition of the airport pavements, but also to estimate their load bearing capacities. Based on the test results of the pavement condition survey, both runways at St. Johns Industrial Air Park may possess a greater load bearing capacity than the minimum for which they are rated. The pavement survey reports the pavement strengths for Runway 14-32 to be approximately 90,000 pounds for single wheel landing gear aircraft. Runway 3-21 is estimated to have a pavement strength of 55,000 pounds, again for aircraft having single wheel landing gear configurations.

TAXIWAYS

Airport taxiways are provided to facilitate the movement of aircraft between the runways, and the apron and terminal area. There are two parallel taxiways at St. Johns Industrial Air Park. Both of these taxiways are constructed of asphaltic concrete, and are designed to accommodate small aircraft weighing 12,500 pounds or less.

Taxiway A

Taxiway A is a full length parallel taxiway that provides access between the parking apron and each end of Runway 14-32. This taxiway is approximately 5,323 feet long and 40 feet wide. Taxiway A also provides one entrance to the aircraft parking apron from the east. This taxiway has an

estimated pavement strength of 12,500 pounds (SWL) and is in fair condition with numerous cracks that need to be repaired. Taxiway A is properly marked with a centerline stripe and taxiway hold lines at runway/taxiway intersections.

Taxiway B

Taxiway B is a full length parallel taxiway that serves Runway 3-21. This taxiway extends from each end of Runway 3-21 and provides access to the southwest corner of the aircraft parking apron. Taxiway B is approximately 3,400 feet long and 35 feet wide. It was constructed in 1991 (south portion) and 1994 (north portion) and is in excellent condition. This taxiway has a rated pavement strength of 12,500 pounds (SWL). The taxiway is properly marked with a centerline stripe and hold lines.

One exit taxiway is located approximately 1,300 feet from the approach end of Runway 3. This taxiway connects between Runway 3-21 and Taxiway B, and can reduce the taxi distance to the parking apron for those aircraft that do not require the full length of the runway for landing. This exit taxiway was included with the construction of the southern portion of Taxiway B.

NAVIGATIONAL AIDS

Navigational Aids (NAVAID's) provide direction, range and position information to pilots. NAVAID's are usually classified as either En Route or Terminal navigational aids. The En Route NAVAID's provide point-to-point navigation between stations, while Terminal NAVAID's provide approach and landing guidance at an

airport. Some NAVAID's can be used in both the en route and terminal roles.

There is only one NAVAID located in the vicinity of St. Johns Industrial Air Park, the St. Johns (VORTAC). The VORTAC is located approximately 15 miles east of the airport and is the primary en route navigation facility in the area.

The St. Johns VORTAC is also used to direct aircraft to the St. Johns Industrial Air Park from all directions within a range of at least 40 nautical miles. The St. Johns VORTAC is the primary means of terminal navigation directly to the airport. This NAVAID is also the facility upon which the sole instrument approach procedure to St. Johns Industrial Air Park is based.

The St. Johns VORTAC is used for terminal navigation in the St. Johns VOR/DME-A instrument approach procedure. This approach provides nonprecision instrument guidance to the airport rather than to a specific runway. The VOR/DME approach uses compass bearings from the VORTAC transmitter for course guidance and distance information for range guidance.

The St. Johns VOR/DME-A approach begins over the VORTAC transmitter with an outbound heading of 103 degrees. This heading is maintained and a descent to 9,000 feet MSL is made. A course reversal (procedure turn) is made within ten nautical miles of the VORTAC to establish the pilot on the proper heading to the airport (283 degrees). Upon passing the VORTAC descent to the airport is begun. Descent continues to 6,200 feet MSL (467 ft. AGL). If the airport is not in sight upon reaching 6,200 feet at 12.6 DME, a missed approach procedure is executed.

LIGHTING

Airport lighting systems are critical to airport operation at night or during periods of poor visibility. A variety of airport lighting aids are available at St. Johns Industrial Air Park to facilitate airport identification, approach, landing, and taxiing operations. The airport lighting systems operate from dusk till dawn and are activated by a photocell that automatically turns the lights on when needed. These systems are categorized by function and are further described below.

Identification and Information Lighting:

The location and presence of an airport is universally indicated by means of an airport rotating beacon. At St. Johns the airport beacon is located near the T-Hangars, southwest of the approach end of Runway 32. Airport beacons are designed to project two rotating beams of light, one green and one white. These beams of light appear, to the pilot, to be alternating flashes of green and white light. These flashes can be seen for more than 25 miles and are readily distinguishable, even amongst other background lighting.

A lighted wind cone is combined with a segmented circle near midfield on the east side of the intersection of the runways. The wind tee and segmented circle provide pilots with a positive visual indication of the speed and direction of surface winds, as well as basic information concerning aircraft traffic patterns at the airport.

Runway and Taxiway Lighting:

A Medium Intensity Runway Edge Light (MIRL) system has been installed on Runway 14-32. This system consists of a series of uniformly spaced white lights which outline the runway and illuminate the

runway edge. A series of green threshold lights, which identify the beginning of the landing area at each end of the runway, are also part of the MIRL system. The uniform spacing of the MIRL lights provide pilots with depth perception during approach and a perception of speed during landing rollout.

Delineators have been installed on Runway 3-21 and on Taxiway A. Delineators are colored reflective markers resembling runway and taxiway lights. These reflective markers serve the same purpose as runway and taxiway lights, but are illuminated by the landing lights of the aircraft.

No lights or delineators are currently installed on Taxiway B. Pilots can use this taxiway at night only by means of the on-board landing lights in the aircraft.

Approach Lighting:

Approach light systems provide pilots with visual descent guidance to the runway. A Precision Approach Path Indicator (PAPI-2) system was installed at both ends of Runway 14-32 in 1994. No approach lighting aids are installed on Runway 3-21.

Runway End Identifier Lights (REIL's) are high intensity strobe lights that provide pilots positive identification of the landing threshold. These lights are particularly helpful during periods of low visibility or at night. A REIL system is installed at the approach end of Runway 32.

EXISTING TERMINAL FACILITIES

In addition to the airside facilities just described, general aviation landside facilities are essential to the daily operation

of St. Johns Industrial Air Park. The existing terminal area facilities at St. Johns are located in the western and southern quadrants of the airport. The various landside elements comprising the terminal area facilities are described below.

GENERAL AVIATION TERMINAL

The general aviation terminal building was built in 1982 and has approximately 1,500 square feet of usable space. The terminal building is located in an area near mid-field, west of the runway intersection. The mid-field area serves as the focal point for most airport operations and transient general aviation activity.

Airport management and administrative services are provided by the City of St. Johns. These functions are housed in the general aviation terminal building. In addition to airport management the terminal building also accommodates fuel sales, weather observation and reporting, aircraft traffic advisory services, maintenance and snow removal activities. The terminal building also provides a guest room, pilots lounge and flight planning area, restroom and shower facilities, telephones, vending machines, rest area and storage space.

HANGARS

Hangar facilities provided storage, protection from the elements and security for aircraft. Several types of hangar facilities have been constructed on the airport over the years. These include individual conventional hangars and multiple unit T-hangars. There are two conventional hangars and a four-plex T-hangar located in the southern quadrant of the airport. These hangar facilities are in

fair to poor condition. All of the existing hangar facilities are owned by the city and are leased to private individuals except one conventional hangar which is used to store a city-owned aircraft.

APRONS

There is one aircraft parking apron at St. Johns Industrial Air Park. The parking apron is located just east of the terminal building and fuel island. The apron is constructed of asphaltic concrete and is in fair condition. This section of asphalt is estimated to have a pavement strength of 52,000 pounds. The apron pavement had numerous large cracks which were repaired in 1994.

This parking apron is approximately 582 feet by 262 feet and accommodates both local and transient aircraft parking. This apron currently can accommodate up to 40 single and twin engine aircraft in designated tiedown positions. No special provisions are available for helicopters or larger aircraft that require more than one tiedown position.

FUEL FACILITIES

Fuel storage and dispensing facilities are owned and operated by the City of St. Johns. There is one source of fuel at the airport. A fuel island is located along the west side of the parking apron adjacent to the terminal building. This island has two 10,000 gallon and one 5,000 gallon above ground storage tanks. One 10,000 gallon tank is used to store 100LL octane aviation grade fuel for piston powered aircraft, and the other is used to store Jet A fuel for turbine powered aircraft. The third 5,000

gallon tank is used to store automotive grade fuel for airport vehicles.

A second fuel island was located southwest of the approach end of Runway 32. This island had two underground storage tanks each having a capacity of 5,000 gallons. These two tanks were used to store 100LL and automotive gas for airport vehicles and aircraft that are certified to use auto gas. However, these tanks and fixtures were removed in 1994.

Fuel dispensing is accomplished at the fuel island only. The city does not have any aviation fuel tanker trucks that could be used to provide mobile fuel service and dispense fuel directly into aircraft wherever they may be parked on the apron.

OTHER BUILDINGS AND FACILITIES

Currently, there is only one other building on the airport. This is a residence located adjacent to the terminal building which is used by the Airport Manager. This building is a mobile home type structure that has complete utility service connections. The mobile home is owned by the city and is in very good condition.

The Apache County Fairgrounds are located south of the intersection of the two runways. This facility is located on city property but lies outside of the airport security fence. Although the fairgrounds are on city property immediately adjacent to the airport, these facilities are not considered airport property for purposes of this Master Plan.

The City Maintenance Yard is located at the southeast corner of the airport. This facility provides storage for maintenance

equipment and material stock piles. A portion of the yard lies within the Runway Protection Zone for Runway 32. The maintenance yard property is also not considered part of the airport property.

The City Cemetery is also located adjacent to the airport just north of the maintenance yard. The cemetery is a separate parcel from the airport but lies within 150 feet of Runway 14-32.

An equestrian course is located on the east side of the airport and runs along the perimeter fence. This course is also on city-owned property. The equestrian course is a significant recreation facility for the community and occupies a large area of land.

AIRPORT ACCESS AND AUTOMOBILE PARKING

Access to the airport is available directly from 13th West Street. 13th West Street is a two lane road that connects with U.S. Highway 180 approximately one-half mile south of the airport entrance. The airport entrance road is a paved roadway with relatively little drainage improvements and no pedestrian improvements.

The entrance road leads directly to the terminal building and a gravel auto parking lot. This parking lot has space for approximately 6 to 8 vehicles for short term parking. Additional auto parking is available in another gravel lot north of the entrance road. This lot has space for approximately 12 to 15 vehicles.

UTILITIES

The availability and capacity of utilities serving the airport are important factors in determining the development potential of the airport property. Of primary concern in the inventory investigation is the availability of water, sanitary sewer, natural gas, and electricity.

Water is provided by the City of St. Johns through the municipal water system. The water for the airport is connected to a six-inch water main adjacent to 13th West Street. A six inch service line extends to the terminal area and provides adequate capacity for the existing development.

The airport is served by a sanitary sewer system that is also operated by the city. The terminal facilities are connected to the city sewer system along 13th West Street. The sewer line extends from the southwest corner of the airport eastward and collects additional sewer discharges from the fairgrounds. This sewage continues to the wastewater treatment plant. The capacity of the sewer system is not known, however, it appears to have adequate capacity to service the existing development.

There is no natural gas service in the area of St. Johns. However, there are two bottled gas companies that service St. Johns and other communities in the White Mountain Region. These companies can provide adequate supplies of LP gas to meet most demands. The nearest natural gas line is located approximately 55 miles north of St. Johns along Interstate 40.

Electricity to the airport is provided by Navapache Electric Cooperative, Inc. Overhead electric power comes onto the

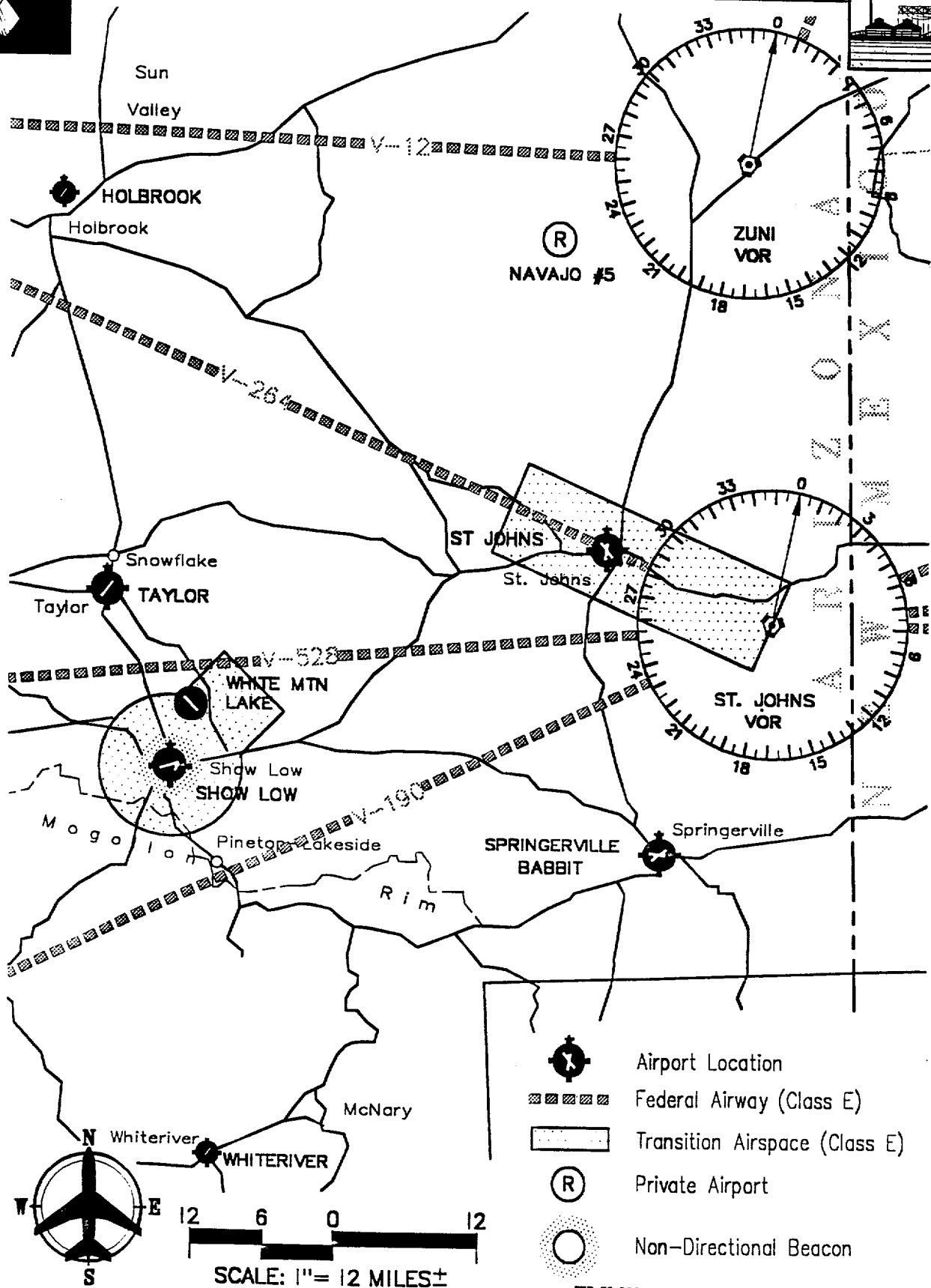
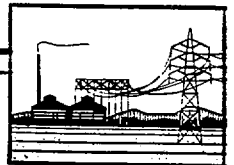
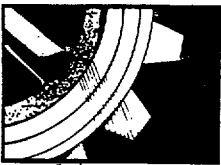
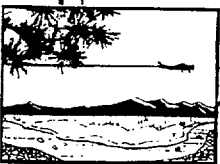


EXHIBIT 2C VICINITY AIRSPACE

St. Johns Industrial Air Park Airport Master Plan



airport approximately 300 feet south of the wood beam manufacturing plant and then is buried underground. Electrical service extends north along 13th West Street then turns east along the south side of the entrance road. The terminal area is supplied with 50 KVA power. Additional ties with the existing power supplies can be made to provide power to future development on the airport.

Telephone service in the St. Johns area is provided by GTE Communications. No specific information on capacity of phone numbers or hook-ups was available but additional phone service appears to be available and reliable.

Other municipal services are provided at the airport. Security and law enforcement services are provided on a routine patrol or as needed basis by the St. Johns Police Department. Fire protection is also available on a continuous basis through the St. Johns Volunteer Fire Department.

Solid waste is collected periodically by a private contractor and disposed of in a county land fill.

AIRPORTS, AIRSPACE AND AIR TRAFFIC CONTROL

An analysis of the airspace structure in the vicinity of St. Johns Industrial Air Park is necessary to determine the operational interaction among the various types of airspace and airspace users. The airspace system in the vicinity of St. Johns Industrial Air Park is relatively simple in comparison to places like Los Angeles or Phoenix. The lack of competing airports, or special use airspace and the absence of any specified

aircraft requirements make St. Johns Industrial Air Park very desirable for general aviation pilots. The airspace structure and the location of other airports in the vicinity of St. Johns is illustrated in *Vicinity Airspace*, Exhibit 2C.

Springerville Babbitt Field

Springerville Babbitt Field is the nearest public use airport in the vicinity of St. Johns Industrial Air Park. Babbitt Field is an uncontrolled, general aviation airport located approximately 25 miles south of St. Johns. It has two intersecting runways that are generally oriented northwest-southeast and northeast-southwest. Runway 3-21 is 8,420 feet long and 75 feet wide. Runway 11-29 is 4,600 feet long by 60 feet wide. Babbitt Field is located far enough from St. Johns that traffic from the Springerville airport will not impact air traffic at St. Johns.

Show Low Municipal Airport

Show Low Municipal Airport is located approximately 40 miles southwest of St. Johns. Arizona Pacific Airlines provides scheduled commuter airline service to Show Low from Phoenix. There are three flights a day into and out of Show Low which reduces the travel time to Phoenix from roughly four hours to one hour. Show Low Municipal Airport is also an uncontrolled airport and has two runways that are aligned on an east-west orientation. Runway 6-24 is 6,000 feet long and 75 feet wide. Runway 3-21 is 3,930 feet long and 60 feet wide. Aircraft operating at Show Low would not conflict with aircraft operating at St. Johns Industrial Air Park.

White Mountain Lake Airport

White Mountain Lake Airport is a privately owned airport located six miles north of Show Low. This airport is a private "Sky

Ranch" type development and has very little traffic. The airport has a 4,000 foot paved runway which is oriented in a southeast-northwest direction. Aircraft traffic departing this airport would not conflict with air traffic arriving or departing St. Johns.

Taylor Airport

Taylor Airport is another public use airport in the White Mountain area, however it is located more than 40 miles west of St. Johns. Taylor Airport has a single runway oriented generally in a northeast-southwest direction. Runway 3-21 is 7,200 feet long and 75 feet wide. Taylor Airport is also located far enough from St. Johns Industrial Air Park that traffic from Taylor will not influence air traffic at St. Johns.

Federal Airways

There are several Federal Airways that span the airspace surrounding St. Johns Industrial Air Park. Federal Airways (Class E Airspace) are often referred to as "Victor Airways". Federal Airways provide a means of low altitude "point-to-point" radio navigation that is used by almost all general aviation aircraft. Federal Airways generally begin at 1,200 feet above the ground and extend upward to 18,000 feet MSL. They are eight nautical miles wide and connect between VOR receivers that are located throughout the country.

Victor 190 (V-190) passes approximately ten miles south of St. Johns Industrial Air Park. Victor 190 connects between the St. Johns VORTAC directly to the Phoenix VORTAC. Victor 528 (V-528) passes seven miles south of St. Johns and also connects between the St. Johns and Phoenix VORTAC's. Victor 528 provides an alternate route to Phoenix which is more

westerly to PAYSO Intersection before turning south to the Phoenix VORTAC. Victor 264 (V-264) passes directly over St. Johns and runs northwest from the St. Johns VORTAC directly to the Winslow VORTAC. These Federal Airways have little affect on St. Johns airport traffic except to provide close and convenient access to the en route navigation system.

There is one published instrument approach procedure established for St. Johns Industrial Air Park. A VOR/DME-A approach provides instrument guidance to the airport during periods of poor visibility or Instrument Meteorological Conditions (IMC). This procedure uses the St. Johns VORTAC as the initial approach fix and radials from the station for positive direction guidance to the approach end of Runway 32.

St. Johns Industrial Air Park does not have an air traffic control tower, therefore, no formal terminal traffic control services are available. However, air traffic advisories and weather information services are provided by airport staff on the UNICOM frequency of 122.8 MHz. En route air traffic control services are provided by the FAA through the Albuquerque Air Route Traffic Control Center.

ENVIRONMENTAL EVALUATION

St. John's Industrial Air Park is located in the White Mountains of northeastern Arizona. The town of St. John's is located near the banks of the Little Colorado River. Wilderness areas are surround the area. However, the airport is located in the center of the business district. It is

surrounded by the Apache County Fairgrounds to the South and an equestrian trail to the North with local roadways surrounding on all four sides. Further discussion of specific environmental impacts will follow in Chapter 6, Environmental Evaluation. The chapter will cover noise and land use compatibility, social, air and water quality, cultural resources and other factors specific to the St. John's Industrial Air Park area and operations.

SOCIOECONOMIC CHARACTERISTICS

A variety of historic and forecast socioeconomic information, related to St. Johns and Apache County, was collected for use in various elements of the Master Plan Study. This information is essential in determining aviation service level requirements, as well as forecasting the number of based aircraft and aircraft activity at the airport.

The aviation forecasts are normally directly related to the population base, economic activity in the area, and the ability of the region to sustain a strong economic base. This type of data provides valuable insights into the dynamics and character of the community, and how these characteristics will effect future aviation demands. Aviation demands will in turn have a direct effect on the facilities and services required at the airport.

POPULATION

The St. Johns Industrial Air Park service area extends beyond the municipal

boundary of the City of St. Johns. The service area extends well into the rural areas of the county and across the state. There is also some overlap of service areas with the other airports in the region due to the availability of specific services at the other airports. Therefore, a single population base is not considered a reliable indicator of the people being served by the airport.

In addition to the resident population of St. Johns, there is a rural population that needs to be included within the population served by the airport. It is estimated that a large portion of Apache County residents derive at least some benefit or use from St. Johns Industrial Air Park. Therefore, the overall county population figures will also be used in analyzing potential for aviation demands at the airport. A combination of city and county population figures should provide a good indication of how population in the area will effect aviation demands.

The population growth in this region will have a direct bearing on the need for additional aviation facilities and services. People want and need air transportation; air transportation requires aircraft; and aircraft and passengers require airport facilities and services. Therefore, the need for additional airport facilities will certainly be affected as the population within Apache County continues to grow.

The permanent resident population for St. Johns is expected to increase 38.6 percent between 1995 and 2015. In contrast, the Apache County population is projected to increase by 40.6 percent over the same period. The total growth projected for the City of St. Johns is only 2.0 percent less than that projected for Apache County during this 20 year window. The nearly

identical rate of projected growth between the city and the county indicates that there will be no significant changes in population between the rural areas of the county and the other cities and towns in the county.

In addition to the permanent resident population, there is a significant seasonal population that also must be considered. This seasonal population consists largely of residents from the Phoenix and Tucson areas that have summer homes in the White Mountain area. These seasonal residents not only have an impact on the local economy, they also contribute to the need for aviation facilities and services.

Population growth trends for the City of St. Johns and Apache County are shown in *Table 2.1*. The table indicates both historical data and the most recent population projections. These population projections are currently approved by state and regional planning agencies.

ECONOMY AND EMPLOYMENT

The economy of this region of the state did not benefit as fully in the economic growth that took place in Arizona during the 1980's. During that period the area experienced sporadic growth and contractions in various segments of the local economy. The local economic base is relatively small and as such is quite sensitive to any fluctuations. A slight or even temporary contraction in a single industry can have a ripple effect throughout the economy. Although the local economy

has not expanded as rapidly as other parts of the state, prospects for long term economic growth remain fairly good.

Historically, the St. Johns area economy was dominated by agriculture oriented activities. Forestry, cattle and crops were the mainstays of the regional economy. In recent years however, the construction of electricity generating power plants in the area has changed the local economy considerably. Although agriculture is still a very important component of the local economy, commercial and industrial development has taken on greater importance. The City of St. Johns is making concerted efforts to further broaden its economic base and attract new industry to the area. Tourism and recreation are also significant contributors to the overall economy. These industries are continuing to grow as the population of the state increases and as transportation facilities in the area improve. In the summer months the St. Johns area serves as a mountain retreat for residents from the Phoenix and Tucson metropolitan areas. In the winter months the area provides access to Sunrise Ski Resort and vast areas for cross country skiing as well. The White Mountain Area provides year round recreational opportunities for hiking, fishing, camping and observing nature. The City of St. Johns also serves as the County Seat for Apache County. The County Court House is located in St. Johns along with several other county governmental offices and services. As the county seat, public administration is another significant contributor to the economy of St. Johns.

Table 2.1
Population Growth
Historical and Projected

<u>Year</u>	<u>City of St. Johns</u>	<u>Apache County</u>	<u>Arizona</u>
1960	1,310	30,438	1,302,161
1970	1,320	32,304	1,775,399
1980	3,368	52,108	2,718,425
1990	3,294	61,591	3,665,228
1995	3,544	66,299	4,134,894
2000	3,805	72,188	4,632,818
2005	4,115	78,497	5,132,727
2010	4,487	85,468	5,652,569
2015	4,913	93,187	6,212,030

Source: U.S. Census Data; Arizona Department of Economic Security, (February 1993)

Numerous small rural settlements and unincorporated communities rely on St. Johns for providing essential goods and services to these outlying areas. St. Johns serves as a commercial center for a large portion of southern Apache County. St. Johns has several retail stores, restaurants, and motels.

The Coronado Generating Station contributes greatly to the Transportation, Communication, Public Utilities sector of the local economy. This sector represents almost eight percent of the Apache County employment. The Services sector contributes slightly more than 35 percent to the total employment in the county. And, the Government sector is the single largest sector of the local economy contributing

more than 37 percent of total employment. *Table 2.2* illustrates the employment structure within the City of St. Johns and Apache County by various types of employment sectors.

Unemployment in St. Johns ran at 5.5 percent in 1994, a relatively low rate in comparison with Apache County as a whole, which had an unemployment rate of 15.3 percent for the same period. This difference in unemployment rates tends to confirm that the majority of unemployment is in the unincorporated areas of the county.

There are several major employers in the St. Johns area. The seven largest firms in terms of employment in the St. Johns area are listed in *Table 2.3*.

Table 2.2
Employment Structure

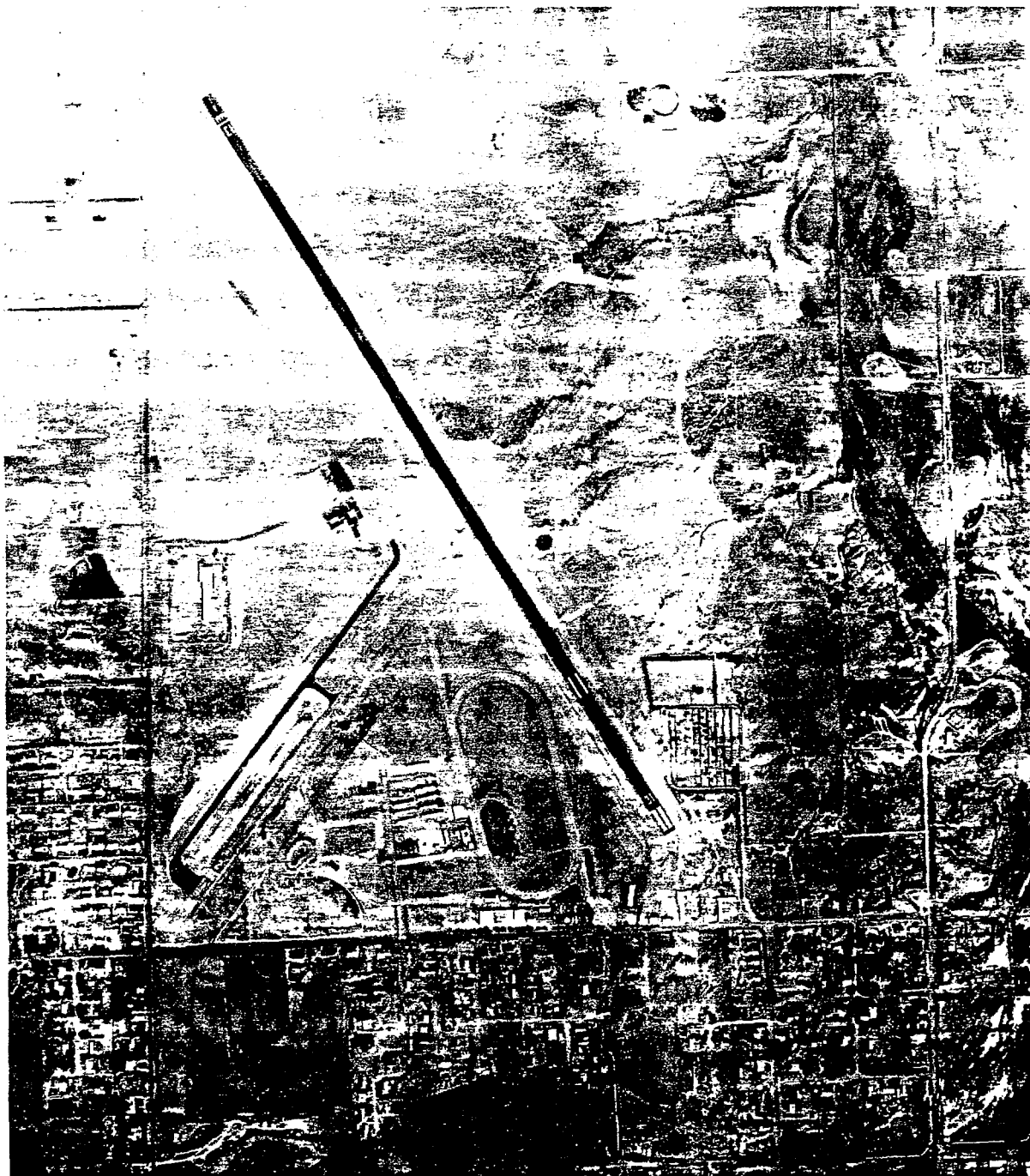
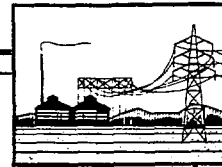
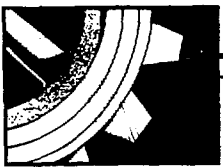
	<u>St. Johns</u> <u>Percent Employed</u>	<u>Apache County</u> <u>Employment</u>
<u>Economic Sector</u>		
Manufacturing	2.9	375
Mining and Quarrying	3.8	25
Construction	20.6	500
Trans., Comm., & Public Utilities	27.1	1,250
Trade (Wholesale, Retail)	10.1	1,700
Finance, Insurance, Real Estate	7.0	525
Services	20.6	5,525
Government	8.1	<u>5,850</u>
Total Wage & Salary Employment	1,008	15,750
Unemployment Rate	5.5%	15.3%

Source: Arizona Department of Commerce.

Table 2.3
Major Employers in St. Johns

<u>Firm</u>	<u>Product</u>	<u>Number of</u> <u>Employees</u>
Salt River Project	Electric Power	500
Apache County	Government	120
Valley National Bank	Finance	13
Navapache Electric Cooperative	Electric Power	5
Southwest Laminates	Building Materials	30
St. Johns School District	Education	165
City of St. Johns	Government	32

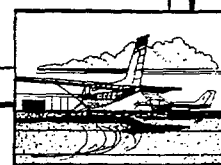
Source: St. Johns, Arizona Economic Development Analysis, (August 1988).



SCALE: 1" = 12 MILES ±

EXHIBIT 2D **1995 AERIAL PHOTOGRAPH**

St. Johns Industrial Air Park Airport Master Plan



EXISTING LAND USE

The City of St. Johns prepared and adopted a Comprehensive Plan for the city in November 1971. The Comprehensive Plan is the basis for all land use regulation in the city. The plan contains a detailed Land Use Plan which profiles existing land use and presents a Land Use Plan to guide future development.

The city also adopted a detailed local Zoning Ordinance in May 1983 that regulates land uses within the city boundaries. The Zoning Ordinance provides for six Zoning Districts which establish permitted uses and development standards within the community. The formal Zoning Districts within the ordinance consist of Agricultural, Commercial, Industrial, and three different types of Residential that vary in density and dwelling types.

The Commercial development in St. Johns is strip development concentrated along Cleveland Street (U.S. Highway 180) and Commercial Street. The commercial core has a wide variety of retail, office and government uses. There is also a limited amount of residential development along this commercial corridor.

The Land Use Plan for the city has set aside 80 acres of land for industrial development on and around the airport. Currently there is significant undeveloped industrial space in the Industrial Air Park located along the western side of the airport. This area is unsubdivided and has good access from either 13th West Street or connecting to the airport entrance road. Other smaller areas within the city have also been identified for future industrial development.

Agricultural land use occurs on both the east and west sides of town and on all sides surrounding the community. The largest agricultural area in the city is the area west of the airport. This large area of agricultural land use within the city consists of more than two sections of land that are divided into small family farms. The other agricultural area lies between South Water Street and the Little Colorado River.

The majority of single family residential development within the city limits has occurred south of Cleveland Street. Other residential development occurring elsewhere in the city is very low density and primarily associated with agricultural operations. This residential development consists mostly of farmhouses, garages, barns and ancillary buildings.

Currently, the City of St. Johns has residential areas that are mixed with a variety of housing types. Multi-family dwellings are interspersed throughout the city. Mobile homes are not only located in mobile home subdivisions but throughout the other residential sections of the city. The age, value and sizing of housing is widely varied throughout all areas of the city.

The 1995 Aerial Photograph, Exhibit 2D shows the existing generalized land use in the vicinity of St. Johns Industrial Air Park.

CLIMATE

Weather conditions play an important role in the planning and development of airport facilities. Temperature is an important factor in determining runway length and aircraft performance. Wind speed and direction are used in determining optimum

runway orientation and may influence runway width. The percentage of time that visibility is impaired due to cloud coverage or other atmospheric conditions is a major factor in determining the need for navigational aids and airport lighting systems.

The climate of the St. Johns Area is very good for general aviation flying. St. Johns has a great number of days of sunshine each year. Annual precipitation is slightly

more than 10.6 inches with most of this falling in relatively short periods in the summer months during the thunderstorm season. During this season there are periods of low visibility due to heavy rain and high winds during thunderstorm passage. Occasional ground fog may also occur during the morning hours in the fall and spring months. *Table 2.4* shows average daily temperatures, average total precipitation and average number of days of sunshine by month.

Table 2.4
St. Johns Weather Summary

<u>Month</u>	<u>Avg. Daily Temperature (°F)</u>		<u>Avg. Total Precipitation (inches)</u>	<u>Avg. No. of Days of Sunshine</u>
	<u>Max.</u>	<u>Min.</u>		
January	48.5	17.0	0.59	20
February	54.6	20.6	0.54	20
March	60.6	25.4	0.80	22
April	70.9	33.0	0.44	23
May	79.4	40.4	0.36	26
June	88.2	48.3	0.43	26
July	90.9	57.0	2.06	23
August	88.4	55.1	2.07	25
September	84.1	47.4	1.22	26
October	73.9	35.6	1.01	25
November	60.6	23.6	0.40	22
December	50.0	17.0	0.71	20
YEAR	70.8	35.0	10.63	278

Average Annual Snow, Sleet and Hail: 19.7 inches.
Source: U.S. Weather Bureau.

The wind pattern at St. Johns Industrial Air Park has generally been calm winds from sunset to sunrise and generally light to moderate south and southwesterly winds during daylight hours. These winds begin with light breezes in the morning and increase in intensity into the afternoon returning to calm in the evening hours.

Thunderstorms and frontal passage will upset this flow occasionally and it is fairly common to see winds rise above 25 miles per hour for short periods whenever these

conditions occur. *Table 2.5* shows the wind speed and direction of the prevailing winds. Local winds are typically out of the west and southwest. Source: The wind data was observed and recorded over a one year period at St. Johns Industrial Air Park. The data was tabulated by the Bechtel Corporation in conjunction with the Coronado Generating Station north of St. Johns.

Table 2.5
St. Johns Wind Data

Direction (True)/ Speed (MPH)	<u>Calm</u>	<u>1-5</u>	<u>5-10</u>	<u>10-12</u>	<u>12-17</u>	<u>17-22</u>	<u>Total</u>
N	0.0	1.0	0.5	0.1	3.0	0.1	4.7
NNE	0.0	1.5	1.0	0.2	0.2	0.1	3.0
NE	0.0	1.5	2.0	0.3	0.7	0.5	5.0
ENE	0.0	1.5	5.5	0.1	2.0	1.0	10.1
E	0.0	2.5	6.5	0.2	0.8	1.0	11.0
ESE	0.0	1.0	0.5	0.2	0.5	0.3	2.5
SE	0.0	1.0	0.5	0.2	0.5	0.3	2.5
SSE	0.0	1.0	1.0	0.3	0.7	0.5	3.5
S	0.0	1.5	3.0	2.0	5.0	2.5	14.0
SSW	0.0	1.0	3.5	1.5	3.5	1.5	11.0
SW	0.0	1.0	2.0	1.0	2.0	2.0	8.0
WSW	0.0	1.5	3.0	1.5	2.0	1.8	9.8
W	0.0	2.0	3.0	0.5	1.5	1.0	8.0
WNW	0.0	1.0	1.0	0.1	0.2	0.2	2.5
NW	0.0	1.0	0.5	0.1	0.2	0.2	2.0
NNW	0.0	0.5	0.5	0.1	0.2	0.2	1.5
CALM	<u>0.9</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.9</u>
TOTAL	0.9	20.5	34.0	8.4	23.0	13.2	100.0

SUMMARY

This chapter has examined those conditions, factors and issues that will have the greatest effect on the future of St. Johns Industrial Air Park which include: airport setting; airport development history; existing airport facilities (both airside and landside); airspace and air traffic; socioeconomic characteristics; existing land use and climate. The research and data collection process completed and presented in this chapter has produced the data base necessary to perform various analyses, make professional judgments and develop the proper perspective from which to prepare a realistic Master Plan that will not only meet the needs of the City of St. Johns, but the entire White Mountain Region. The balance of this plan presents the results of these efforts in the forthcoming chapters.

The next chapter will examine the current aviation demands being experienced by the airport and how these demands can be expected to change in the future. Projections of aviation activity through the year 2015 will be prepared in order to provide the necessary guidelines, so important for long range planning.