# Chapter Two - Inventory of Existing Conditions

## AIRPORT SETTING

Located in Titusville, Florida, the Space Coast Regional Airport (TIX) is a general aviation airport situated in the northern half of Brevard County. The Airport is owned and operated by the Titusville-Cocoa Port Authority, which also owns and manages the Arthur Dunn Airpark and Merritt Island Airport. TIX is part of the East Central Florida Metropolitan Area in the Continuing Florida Aviation System Planning Process (CFASPP), which consists of five counties: Brevard, Lake, Orange, Osceola, Seminole, and Volusia. As such, the facilities that make up the Airport serve as one of the many contributors to general aviation activity including a significant number of corporate/business activity and flight training operations. **Exhibit 2-1**, a general location map of the Airport, depicts the site of TIX in the State of Florida.

The Airport is included within the National Plan of Integrated Airport System (NPIAS), which is published by the U.S. Department of Transportation. In the NPIAS, the Federal Aviation Administration (FAA) establishes the role of those public airports defined as essential to meet the needs of civil aviation. In the NPIAS, the role for each airport identifies one of five basic service levels. These levels describe the type of service that the airport is expected to provide the community at the end of the NPIAS five-year planning period. It also represents the funding categories set up by Congress to assist in airport development. TIX is designated as a General Aviation Reliever airport based on data collected and transmitted to Congress by the Secretary of Transportation for the 1998-2002 planning period.

### Locale

All of the property comprising TIX is located within the municipal district of the City of Titusville. The Airport itself is situated on approximately 1,100 acres, located five miles south of downtown Titusville. The airfield is approximately six miles east of Interstate 95 and one mile west of U.S. Highway 1. The airport is enclosed by State Road 405 (Columbia Boulevard) to the north, Kings Highway to the south, U.S. 1 to the east, and Grissom Parkway to the west. TIX is situated five miles from the Kennedy Space Center complex and only eight miles from Port Canaveral, a major cruise ship port. A portion of Brevard County, which includes the City of Titusville, is shown in **Exhibit 2-2**. Brevard County is bordered by Volusia County to the north; Indian River County to the south; the Atlantic Ocean to the east; and Orange, Osceola, and Seminole Counties to the west. Neighboring cities include Daytona Beach to the north, Cocoa and Melbourne to the south, and Orlando to the west.

There are several public-use airports offering commercial passenger service within a convenient distance to the area served by TIX. The most significant is Orlando International Airport, but also includes: Daytona Beach International Airport, Melbourne International Airport, and Orlando-Sanford International Airport. Also, eight public-use general aviation airports lie within a 40 nautical mile radius of TIX. These include Arthur Dunn Airpark, Deland Municipal Airport, Kissimmee Municipal Airport, Massey Ranch Airpark, Merritt Island Airport, New Smyrna Beach Municipal, Orlando Executive Airport, and Valkaria Airport. **Table 2-1** provides a comparison of the facilities and basic services offered by these public airports.

***Insert Exhibit 2-1 (Location Map)***

***Insert Exhibit 2-2 (Vicinity Map)***

**TABLE 2-1**
**PUBLIC AIRPORTS IN THE REGION**

| Runways | Published Instrument Approach Procedures | General Aircraft Services Offered |
|---|---|---|
| **Arthur Dunn Airpark (X21)** | | |
| 15-33 (3,000' x 70')<br>4-22 (1,790' x 100') turf | GPS Runway 15 & 33 | Fuel – 100LL & Jet A<br>Major Airframe Repair<br>Major Powerplant Repair |
| **Daytona Beach International Airport (DAB)** | | |
| 7L-25R (10,500' x 150')<br>16-34 (6,001' x 150')<br>7R-25L (3,195' x 100') | ILS Runway 7L<br>LOC BC Runway 25R<br>VOR/GPS Runway 16<br>NDB/GPS Runway 7L<br>GPS 34<br>GPS 7R & 25L | Fuel – 100LL & Jet A<br>Major Airframe Repair<br>Major Powerplant Repair<br>ARFF Index C |
| **Deland Municipal Airport (DED)** | | |
| 12-30 (6,000' x 100')<br>5-23 (3,984' x 75') | GPS Runway 12 & 5<br>VOR/GPS Runway 23 | Fuel – 100LL & Jet A<br>Major Airframe Repair<br>Major Powerplant Repair |
| **Kissimmee Municipal Airport (ISM)** | | |
| 15-33 (6,000' x 100')<br>6-24 (5,000' x 150') | GPS Runway 15, 33, & 6<br>NDB Runway 15<br>VOR/DME or GPS-A Circling | Fuel – 100LL & Jet A<br>Major Airframe Repair<br>Major Powerplant Repair |
| **Massey Ranch Airpark (X50)** | | |
| 18-36 (3,845' x 60') | NDB/GPS Runway 18 | Fuel – 100LL & Jet A<br>Major Airframe Repair<br>Major Powerplant Repair |
| **Melbourne International Airport (MLB)** | | |
| 9R-27L (9,483' x 150')<br>9L-27R (6,000' x 150')<br>5-23 (3,001' x 75') | ILS Runway 9R<br>LOC BC Runway 27L<br>VOR/GPS Runway 27L<br>VOR Runway 9R<br>NDB/GPS Runway 9R<br>GPS Runway 9L & 27R | Fuel – 100LL & Jet A<br>Major Airframe Repair<br>Major Powerplant Repair<br>ARFF Index C |
| **Merritt Island Airport (COI)** | | |
| 11-29 (3,601' x 75') | NDB Runway 11<br>RNAV/GPS Runway 11 | Fuel – 100LL & Jet A<br>Major Airframe Repair<br>Major Powerplant Repair |
| **New Smyrna Beach Municipal Airport (EVB)** | | |
| 6-24 (5,000' x 75')<br>11-29 (4,299' x 100')<br>2-20 (4,000' x 100')<br>15-33 (2,300' x 75') | NDB/GPS Runway 29 | Fuel – 100LL & Jet A<br>Major Airframe Repair<br>Major Powerplant Repair |
| **Orlando Executive Airport (ORL)** | | |
| 7-25 (6,003' x 150')<br>13-31 (4,638' x 100') | ILS Runway 7<br>LOC/BC Runway 25<br>VOR/DME Runway 7 & 25 | Fuel – 100LL & Jet A<br>Major Airframe Repair<br>Major Powerplant Repair |

**TABLE 2-1**
**PUBLIC AIRPORTS IN THE REGION**

| Runways | Published Instrument Approach Procedures | General Aircraft Services Offered |
|---|---|---|
| | GPS Runway 7 & 25<br>NDB Runway 7 | |
| **Orlando International Airport (MCO)** | | |
| 18L-36R (12,005' x 200')<br>18R-36L (12,004' x 200')<br>17L-35R (10,000' x 150')<br>17R-35L (9,000' x 150') | ILS Runway 36R (Category 1, 2, & 3)<br>ILS Runway 35L (Category 1, 2, & 3)<br>ILS Runway 18R (Category 1)<br>ILS Runway 17R (Category 1 & 2)<br>ILS Runway 35R (Category 1 & 2)<br>ILS Runway 17L (Category 1 & 2)<br>VOR/DME/GPS Runway 18L & 36R<br>VOR/DME Runway 18R (GPS) & 36L<br>VOR Runway 18L & 18R<br>GPS Runway 36L | Fuel – 100LL & Jet A<br>Minor Airframe Repair<br>Minor Powerplant Repair<br>ARFF Index E |
| **Orlando Sanford International Airport (SFB)** | | |
| 9L-27R (9,600' x 150')<br>18-36 (6,002' x 150')<br>9C-27C (3,578' x 75')<br>9R-27L (3,500' x 75') | ILS Runway 9L & 27R<br>NDB Runway 9L & 27R<br>RNAV/GPS Runway 9L & 27R | Fuel – 100LL & Jet A<br>Major Airframe Repair<br>Major Powerplant Repair<br>ARFF Index D |
| **Space Coast Regional Airport (TIX)** | | |
| 18-36 (7,320' x 150')<br>9-27 (5,000' x 100') | ILS Runway 36<br>NDB/GPS Runway 18<br>GPS Runway 9 | Fuel – 100LL & Jet A<br>Major Airframe Repair<br>Major Powerplant Repair |
| **Valkaria Airport (X59)** | | |
| 14-32 (4,000' x 75')<br>9-27 (4,000' x 75') | Visual Only | Fuel – 100LL |

Source: Southeast U.S. Airport/Facility Directory and Southeast U.S. Terminal Procedures.

**Airport Surroundings**

As described previously, the airport is ideally located in close proximity to several key Florida transportation networks. Both Interstate 95 and Florida Toll Road 528 (the Bee Line) are located just west of the airport, while the East Side of the airport is just off of U.S. 1. TIX is the closest civilian airfield to the Kennedy Space Center. While it is not the closest to Port Canaveral, it is the largest. Merritt Island Airport is closer to the port; however, it only has a 3,601 foot runway with limited instrument approach capability.

TIX is located within Cape Canaveral's Foreign Trade Zone (FTZ) 136, boasting the world's only quadramodal transportation hub. TIX is a part of the area's facilities that offer a complete system of air, sea, rail, and highway modes of transportation to and from Central Florida. Zone 136 is also the only FTZ in the nation to offer space transportation through the launch facilities of Kennedy Space Center and Cape Canaveral Air Station. By being within this zone, many opportunities exist for industrial/business and commercial development, as the purpose of a FTZ is to attract and promote international trade and commerce by providing a special exemption to the normal customs procedures. Zone status allows businesses to use foreign products to create or enhance other products, then ship these products out of the zone to U.S. markets (customs duties are then applied) or back overseas (no duties applied to parts used). The zones create jobs and make products produced in the U.S. more competitive in

the world markets. This aspect alone makes portions of the airport very attractive for corporations conducting international businesses in the Central Florida area.

The City of Titusville and Brevard County have assigned land use and zoning designations to the property within their respective jurisdiction. Existing and future land uses on and off airport property are important considerations with respect to the current and future development of the Airport and community. Compatible land use issues and considerations will be utilized in the development of later chapters in this master plan. Similarly, zoning is another land use control which more clearly defines permitted uses of property within a given land use designation. As with the land use codes, this information will be utilized in later sections of the study.

Some of the proposed improvement projects at the Airport will require environmental permitting through a number of different agencies, each with its own criteria and focus. Future development of the Airport and the integration of environmental permitting will be critical to the success of each project as well as to the success of the Airport. Coordination with the appropriate agencies for permitting requirements should be made on an individual basis as each project is funded. Additional details to the possible environmental impacts are included as part of this Master Plan report.

### FAR Part 139 Certification

The FAA provides certification of airports for commercial operations under Federal Aviation Regulation (FAR) Part 139. The FAA recently expanded the coverage and created additional requirements for FAR Part 139. There are four classes of Part 139 Airports; TIX is currently classified as a Class IV facility. A Class IV airport is one that is able to service unscheduled operations for aircraft designed to hold over 31 passengers. Under the new classification, a Class IV airport some of the requirements are to have enhanced recordkeeping, training records, self inspection reporting as well as extend ARFF coverage to scheduled operations of small air carrier aircraft (greater than 9 seats).

## AIRPORT AREA SOCIOECONOMIC DATA

Several socioeconomic factors influence a community's need for airport services. Area population, per capita income, employment/unemployment, construction indicators, and taxable sales all affect the level of activity at an airport. The following sections provide an inventory of the historic and projected data for these socioeconomic factors. Overall growth rates and average annual growth rates, for Brevard County and the State are based on 10 years of historic data from the 2001 Florida Long-term Economic Forecast, prepared by the Bureau of Economic and Business Research, University of Florida. Likewise, the projections of this data are included as they provide an indication of future trends for the airport area. Although the University of Florida's projections stop at 2015, all of the projections have been extrapolated to 2022 to correspond with the study period of this master plan.

## Population

TIX is a publicly owned and operated facility, which provides aviation services to the surrounding community. Therefore, significant increases in the surrounding population would indicate the need for an expansion of the number and type of aviation services provided. According to the Bureau of Economic and Business Research, over the past 10 years, the population in Brevard County has increased every year. Over the past 10 years, the overall population for the State has also steadily increased, but at a rate slightly higher than Brevard County. These numbers are reflected in **Table 2-2**.

**TABLE 2-2**
**HISTORIC POPULATION**

| Year | Brevard County | State of Florida |
|---|---|---|
| 1991 | 410,303 | 13,291,360 |
| 1992 | 418,147 | 13,519,751 |
| 1993 | 426,481 | 13,715,626 |
| 1994 | 434,724 | 14,027,382 |
| 1995 | 441,610 | 14,325,996 |
| 1996 | 446,946 | 14,631,258 |
| 1997 | 453,920 | 14,960,884 |
| 1998 | 461,041 | 15,289,802 |
| 1999 | 469,312 | 15,665,855 |
| 2000 | 478,674 | 16,087,366 |
| Overall Growth (10 years) | 16.7% | 21.0% |
| Average Annual Growth Rate | 1.7% | 2.1% |

Source: 2001 Florida Long-term Economic Forecast.

In comparison to historic levels of population, projections through 2022 indicate that the average annual growth in County population is expected to show a steady increase, albeit at a slightly slower rate than in the past. While State levels are also expected to continue their increase, the average annual growth rate drops from 2.1 percent to 1.5 percent. These figures are reflected in **Table 2-3**.

**TABLE 2-3**
**PROJECTED POPULATION**

| Year | Brevard County | State of Florida |
|---|---|---|
| 2007 | 544,876 | 18,140,102 |
| 2012 | 590,216 | 19,489,893 |
| 2022 | 684,790 | 22,491,242 |
| Projected Annual Growth | 1.6% | 1.5% |

Source: 2001 Florida Long-term Economic Forecast.

### Per Capita Income

Personal income provides a valuable indication of the economic condition for a particular area. The figures in the following table represent the ratio of total personal income, from all sources and before income taxes, to total resident population.

**TABLE 2-4**
**HISTORIC PER CAPITA INCOME**

| Year | Brevard County | State of Florida |
|---|---|---|
| 1991 | $21,360 | $22,512 |
| 1992 | $21,735 | $22,473 |
| 1993 | $21,540 | $23,014 |
| 1994 | $21,509 | $23,166 |
| 1995 | $21,716 | $23,720 |
| 1996 | $21,998 | $24,277 |
| 1997 | $22,863 | $24,760 |
| 1998 | $23,221 | $25,438 |
| 1999 | $23,226 | $25,575 |
| 2000 | $23,862 | $26,146 |
| Overall Growth (10 years) | 11.7% | 16.1% |
| Average Annual Growth | 1.2% | 1.7% |

Source: 2001 Florida Long-term Economic Forecast.

Per capita income for both the County and the State are projected to increase through the year 2022. The average annual growth in per capita income for Brevard County is projected to nearly double over the planning period. Similarly, the rate for the State will also increase, but not as quickly as Brevard County. The projected per capita income levels are included in following table.

**TABLE 2-5**
**PROJECTED PER CAPITA INCOME**

| Year | Brevard County | State of Florida |
|---|---|---|
| 2007 | $27,871 | $31,175 |
| 2012 | $30,402 | $34,999 |
| 2022 | $36,735 | $44,330 |
| Projected Annual Growth | 2.0% | 2.4% |

Source: 2001 Florida Long-term Economic Forecast.

### Employment/Unemployment

The level of employment for a geographic area provides a lot of insight to the economic condition of that area. As with income, employment data can provide an indication of the economic trends that can be expected. Data pertaining to the total number of people employed, as well as the unemployment rate, is provided in the following tables. These figures were used to determine the historic growth or decline in employment. The related rates can then be compared to that of the total population to determine if the area is experiencing a higher or lower employment rate. The data used from the Bureau of Economic and Business Research only reflects employment in nonagricultural industries.

**TABLE 2-6**
**HISTORIC EMPLOYED PERSONS**

| Year | Brevard County | State of Florida |
|---|---|---|
| 1991 | 192,820 | 6,039,124 |
| 1992 | 191,658 | 6,060,693 |
| 1993 | 193,035 | 6,247,525 |
| 1994 | 194,452 | 6,464,032 |
| 1995 | 191,535 | 6,610,013 |
| 1996 | 191,752 | 6,765,387 |
| 1997 | 197,760 | 6,979,418 |
| 1998 | 200,659 | 7,163,815 |
| 1999 | 204,699 | 7,398,710 |
| 2000 | 209,843 | 7,633,359 |
| Overall Growth (10 years) | 8.8% | 26.4% |
| Average Annual Growth | 0.9% | 2.6% |

Source: 2001 Florida Long-term Economic Forecast.

As seen in the above table, for the most part the employment levels for the State have steadily increased over the past 10 years. Although the employment levels for Brevard County have fluctuated over the same period, there was an overall increase in employment in the area. The data in the following table shows that the historic growth rates in overall State employment will continue, but at a lower rate. Conversely, the growth in the number of employed people in Brevard County increases significantly.

**TABLE 2-7**
**PROJECTED EMPLOYED PERSONS**

| Year | Brevard County | State of Florida |
|---|---|---|
| 2007 | 237,608 | 8,619,805 |
| 2012 | 259,337 | 9,336,587 |
| 2022 | 301,652 | 10,807,105 |
| Projected Annual Growth | 1.7% | 1.6% |

Source: 2001 Florida Long-term Economic Forecast.

Just as the number of people employed has basically increased overall, unemployment rates have generally decreased during the same period. Due to the economic recession in the early 90's, unemployment rates rose

briefly, but as the economy recovered, both County and State unemployment rates decreased, as can be seen in **Table 2-8**.

**TABLE 2-8**
**HISTORIC UNEMPLOYMENT RATE**

| Year | Brevard County | State of Florida |
|---|---|---|
| 1991 | 7.01% | 7.41% |
| 1992 | 7.85% | 8.29% |
| 1993 | 7.59% | 7.06% |
| 1994 | 7.36% | 6.58% |
| 1995 | 6.54% | 5.51% |
| 1996 | 5.42% | 5.10% |
| 1997 | 4.55% | 4.79% |
| 1998 | 4.28% | 4.33% |
| 1999 | 3.89% | 3.89% |
| 2000 | 3.38% | 3.62% |
| Overall Change (10 years) | -51.8% | -51.1% |
| Average Annual Change | -7.8% | -7.6% |

Source: 2001 Florida Long-term Economic Forecast.

For both the County and State, the unemployment rate has been projected by the Bureau of Economic and Business Research to increase. It is assumed that this increase in the unemployment rates is due to the economic recession that our nation experienced throughout much of 2001, when these forecasts were prepared by the University of Florida. These increases are reflected in the following table.

**TABLE 2-9**
**PROJECTED UNEMPLOYMENT RATE**

| Year | Brevard County | State of Florida |
|---|---|---|
| 2007 | 4.64% | 4.66% |
| 2012 | 4.43% | 4.40% |
| 2022 | 5.59% | 5.19% |
| Projected Annual Growth | 2.1% | 1.6% |

Source: 2001 Florida Long-term Economic Forecast.

### Construction Indicators

Various construction indicators provide a good gauge of the growth and economic development in an area. Typically, the number of residential building permits that have been issued can be utilized to evaluate the trend in an area. There were no concise lists for the issuance of historic building permits. However, the 2001 Florida Long-term Economic Forecast does provide data on the number of households. These figures, for both Brevard County and the State of Florida, are included in the following table.

**TABLE 2-10**
**HISTORIC NUMBER OF HOUSEHOLDS**

| Year | Brevard County | State of Florida |
|---|---|---|
| 1991 | 166,341 | 5,273,165 |
| 1992 | 170,014 | 5,364,417 |
| 1993 | 173,871 | 5,445,096 |
| 1994 | 177,741 | 5,566,391 |
| 1995 | 181,063 | 5,683,220 |
| 1996 | 183,802 | 5,802,651 |
| 1997 | 187,283 | 5,933,851 |
| 1998 | 190,702 | 6,064,870 |
| 1999 | 194,762 | 6,213,201 |
| 2000 | 199,215 | 6,379,467 |
| Overall Growth (10 years) | 19.8% | 21.0% |
| Average Annual Growth | 2.0% | 2.1% |

Source: 2001 Florida Long-term Economic Forecast.

Housing projects are derived from a forecast of the housing stock, taking into account not only the increasing number of households in Florida, but also the changing vacancy rates in the stock of various classifications of homes and the replacement of obsolescent housing. Figures for the number of households back to 1990 were incorporated so that an average annual growth rate for a 10-year period could be calculated. As reflected in the table above, the historic number of households for both the County and State have increased at similar rates. According to the projections reflected in **Table 2-11** below, the County's rate of growth will continue to grow as the State's will experience a slight decrease in its overall growth.

**TABLE 2-11**
**PROJECTED NUMBER OF HOUSEHOLDS**

| Year | Brevard County | State of Florida |
|---|---|---|
| 2007 | 230,440 | 7,315,481 |
| 2012 | 256,231 | 8,041,663 |
| 2022 | 311,895 | 9,642,015 |
| Projected Annual Growth | 2.1% | 1.9% |

Source: 2001 Florida Long-term Economic Forecast.

### Retail Sales

Real taxable sales provide a way to analyze the number of dollars spent in an area. This value provides insight not only to local dollars spent, but also includes visitor/tourist sales. **Table 2-12** provides the historic real taxable sales for Brevard County and the State. Historic data reflects a higher growth in the State versus the County. However, due to several factors, caution should be used when using any single measure as a sole indicator of economic condition.

**TABLE 2-12**
**HISTORIC REAL TAXABLE SALES**

| Year | Brevard County | State of Florida |
|---|---|---|
| 1991 | $3,415,507 | $144,143,330 |
| 1992 | $3,398,088 | $146,198,833 |
| 1993 | $3,600,610 | $156,126,978 |
| 1994 | $3,798,896 | $165,300,851 |
| 1995 | $3,889,384 | $173,578,838 |
| 1996 | $4,018,315 | $184,488,467 |
| 1997 | $4,187,752 | $194,906,712 |
| 1998 | $4,508,851 | $209,439,662 |
| 1999 | $4,815,693 | $225,900,928 |
| 2000 | $5,064,652 | $236,513,799 |
| Overall Growth (10 years) | 48.3% | 64.1% |
| Average Annual Growth | 4.5% | 5.7% |

Source: 2001 Florida Long-term Economic Forecast.

The following table demonstrates the projected real taxable sales for the County and State. As mentioned above, care should be used when interpreting these numbers. Taxable sales are derived from Florida Department of Revenue records and sometimes the department uses practices such as refunds, escrow accounts, and vouchers to drive a wedge between economic activity necessary to monitor the accounting of sales. The economical aspect is effective similarly, in that residents tend to spend a substantial proportion of their incomes in metropolitan areas due to better selections and prices. These aspects reduce the effectiveness of a correlation between various series of statistical information. Nonetheless, the figures below support the overall assumption that the airport's service area will continue to grow during the course of this planning period.

**TABLE 2-13**
**PROJECTED REAL TAXABLE SALES**

| Year | Brevard County | State of Florida |
|---|---|---|
| 2007 | $6,333,978 | $311,455,932 |
| 2012 | $7,442,187 | $378,511,559 |
| 2022 | $10,093,835 | $561,465,884 |
| Projected Annual Growth | 3.2% | 4.0% |

Source: 2001 Florida Long-term Economic Forecast.

## METEOROLOGICAL CONDITIONS

Because weather plays such an important role in the operation of aircraft, it must be considered in a number of different airfield design parameters. As such, information about the Titusville area's climate and wind characteristics was obtained. The information collected is presented in the following sections.

### Climate

TIX has an elevation of 34 feet above mean sea level and is separated from the Atlantic Ocean by the Intercoastal Waterway (Indian River). As with most of Florida's east coast, the surrounding land is relatively flat. The maritime location and prevailing easterly sea breeze significantly influence the climate of this region. Although the Airport is located in the warmer southeastern portion of the nation, annual temperatures are considered natively moderate due to the influence of the sea breeze. Temperatures during the summer months rarely reach 100 degrees Fahrenheit, with an average maximum temperature for both the months of July and August of 91 degrees Fahrenheit. During the winter months, the average minimum temperature is around 50 degrees Fahrenheit with record lows near the 20s. On average, this area only experiences freezing temperatures one day a year, which is usually during the month of January.

Rainfall in this area occurs during all seasons, however is more abundant during the summer when daily showers are common. Precipitation amounts in the summer months average above seven inches per month, while the rest of the year averages three inches per month. In total, the coastal region of Florida averages between 50 and 60 inches of rainfall annually, with thunderstorms occurring approximately 70 to 80 days a year. Throughout the year, the relative humidity in the mornings tends to range from 85 to 90 percent. Early afternoon humidity ranges from 55 to 65 percent with the lower values occurring in mid-afternoon when the temperatures reach their highest.

### Wind Coverage

The characteristic of the area's wind is another factor to be evaluated. This element is important since aircraft takeoff and land into the wind. The FAA recommends that sufficient runways be provided to achieve 95 percent wind coverage. This is calculated by using a 10.5-knot (12 mph) crosswind component for the smaller and light aircraft, while the 13-knot (15 mph) and 16-knot (18 mph) crosswind components are utilized for the larger aircraft. FAA Advisory Circular (AC) 150/5300-13, Change 8, "Airport Design" expresses that a period of at least ten consecutive years be examined for determining the wind coverage when carrying out an evaluation of this type. Hourly wind observations, from January 1992 through December 2001, were obtained for TIX. This data was collected by the Titusville Station of the National Climatic Data Center. The National Climatic Data Center, located in Asheville, North Carolina, officially records all aviation meteorological information.

To determine the wind coverage at TIX, Runway 18-36 and Runway 9-27 were evaluated independently and together. It was determined that any combination of these two runways would provide enough coverage to more than satisfy FAA recommendations. **Table 2-14** summarizes the percent of wind coverage for an all weather scenario, using a 10.5-knot, a 13-knot, and a 16-knot crosswind component.

| TABLE 2-14<br>ALL WEATHER WIND COVERAGE | | | |
|---|---|---|---|
| **Airfield Configuration** | **10.5-knots (12 mph)** | **13-knots (15 mph)** | **16-knots (18 mph)** |
| Runway 18-36 | 92.86% | 96.23% | 99.24% |
| Runway 9-27 | 94.04% | 96.78% | 99.35% |
| Combined | 99.57% | 99.92% | 99.97% |

Source: THE LPA GROUP INCORPORATED, 2003.

Because the FAA recommends 95 percent coverage, both runways are needed in order to provide the necessary wind coverage for the smaller and light aircraft (10.5-knot coverage).

## HISTORIC DATA

A number of different sources were utilized to collect historic data on the Airport. This included reviewing the history of the Airport and previous studies conducted for the Airport, as well as records for historic aircraft and activity counts.

### Airport History

The Airport was built in 1943 by the U.S. government during World War II as an auxiliary airfield to Sanford Naval Air Station. Built on property owned by the cities of Titusville and Cocoa, the original airfield consisted of two 5,000 foot by 150 foot runways with a supporting taxiway system. To aid and support the war effort, the Civil Aeronautics Administration created a program called "Development of Landing Areas for National Defense." This program provided airfield facilities like TIX for the essential training and war defense exercises that military bases at the time could not accommodate. The government owned and operated the Titusville-Cocoa Airport throughout the war.

On April 18, 1947, the War Assets Administration handed ownership of the Airport, the property, and the related improvements back to the cities of Titusville and Cocoa under the provisions of the Surplus Property Act of 1944. In 1959, these two cities established an airport authority to jointly own, operate, improve, and maintain the airport and its facilities. In 1961, the cities transferred the property to the newly established authority by quitclaim deed. In the same year, the National Aeronautics and Space Administration (NASA) chose Merritt Island as the site for the nation's missile launch complex. After the initial development of NASA's facilities, TIX was utilized more and more to provide transportation of NASA personnel and equipment.

The "Titusville-Cocoa Airport District Act of 1963" created a district specifically designated for the airport and provided for the Titusville-Cocoa Airport Authority to govern the operations of the facilities. This authority replaced the original airport authority established in 1959 and currently maintains jurisdiction over the Airport District. The Airport District, created under this legislation, incorporates Arthur Dunn Airpark and Merritt Island Airport, as well as TIX. Currently, the authority is made up of seven members, each serving a three year term. Brevard County Commissioners from Districts 1, 2, and 4 appoint two members each and the seventh is an at-large position.

## Previous Planning Documents

It is important to review previous planning documents completed for the Airport to understand and incorporate past efforts. The following planning documents were obtained from the Airport and other agencies during the inventory. These documents were reviewed for historic data and significant insight into past long-range planning processes for TIX.

- 1996 Airport Master Plan Update, Avcon, Inc.
- 1998 Runway Length Analysis, Transportation Solutions Incorporated
- 1998 Space Coast Regional Airport Pavement Evaluation, Eckrose/Green Associates, Inc.
- 1998-2002 National Plan of Integrated Airport Systems, Federal Aviation Administration
- 1999 Terminal Area Development Plan, AEC, Inc. and Edward Just Associates
- 2000 Florida Aviation System Plan (FASP), Florida Department of Transportation
- 2001 Terminal Area Forecast (TAF), Federal Aviation Administration
- 2002 FAA Aerospace Forecasts, U.S. Department of Transportation

## Historic Aircraft and Activity Counts

The historic number of based aircraft and level of aircraft operations at TIX is essential to the development of forecasts for future aviation activity. This information, along with industry trends and select socioeconomic factors, will be evaluated for the planning period of the study. Sources of the best historic information include the 1996 Master Plan Update, FAA Airport Master Records (Form 5010), FAA Terminal Area Forecast (TAF), and the Florida Aviation System Plan (FASP).

### *Based Aircraft*

Historic based aircraft information for TIX is contained in both the FAA 5010 form and the TAF. In both of these records, the counts are separated into the different types of aircraft based at the airport. Typically, the aircraft are divided into the categories of single-engine, multi-engine, jet, and rotorcraft. This information will help determine future airfield requirements for the Airport. The total number and type of historic based aircraft for TIX was obtained. **Table 2-15** presents this information for the past ten years.

**TABLE 2-15**
**HISTORIC BASED AIRCRAFT**

| Year | Single-Engine | Multi-Engine | Jet | Rotor | Total |
|---|---|---|---|---|---|
| 1992 | 134 | 15 | 1 | 2 | 152 |
| 1993 | 134 | 15 | 1 | 2 | 152 |
| 1994 | 143 | 17 | 1 | 2 | 163 |
| 1995 | 143 | 17 | 1 | 2 | 163 |
| 1996 | 145 | 25 | 3 | 7 | 180 |
| 1997 | 145 | 25 | 3 | 7 | 180 |
| 1998 | 145 | 25 | 3 | 7 | 180 |
| 1999 | 171 | 46 | 5 | 7 | 229 |
| 2000 | 171 | 46 | 5 | 7 | 229 |
| 2001 | 133 | 28 | 5 | 24 | 190 |

Source: FAA Airport Master Record and Terminal Area Forecast.

### *Aircraft Operations*

An aircraft operation is counted as either one landing or one takeoff. Further, a touch-and-go operation is counted as two operations, since the aircraft technically lands and takes off. Generally, there are two types of recorded aircraft operations: local and itinerant. According to the FAA definition, local operations are those arrivals or departures performed by aircraft that remain in the airport traffic pattern or are within sight of the airport. This covers an area within a 20 nautical mile radius of the airfield. Itinerant operations are arrivals or departures other than local operations performed by either based or transient aircraft that do not remain in the airport traffic pattern or within a 20 nautical mile radius.

**Table 2-16** provides the total number of aircraft operations recorded at TIX over the past ten years. These counts were taken directly from available Air Traffic Control Tower (ATCT) records and supplemented with historic data from the FAA TAF.

**TABLE 2-16**
**SUMMARY OF AIR TRAFFIC ACTIVITY**

| Year | Annual Operations |
|---|---|
| 1992 | 129,532 |
| 1993 | 129,532 |
| 1994 | 108,252 |
| 1995 | 95,312 |
| 1996 | 114,626 |
| 1997 | 116,246 |
| 1998 | 111,545 |
| 1999 | 120,152 |
| 2000 | 132,790 |
| 2001 | 194,736 |

Source: Air Traffic Control Tower records and FAA Terminal Area Forecast.

It should be noted that the totals in **Table 2-16** from 1996 on were taken directly from the historic ATCT activity logs. Currently the ATCT at TIX operates from 7:00 a.m. to 9:00 p.m., seven days a week. In the past few years, a number of operations have been occurring at TIX during the hours that the ATCT is closed. An estimate for the amount of operations conducted when the ATCT is not operational, is included in the following chapter, Forecast of Aviation Activity – Chapter 3.

## AIRFIELD ENVIRONMENT

This section presents a description of the existing airside facilities at the Airport. The description of the following facilities provides the basis for the airfield demand/capacity analysis and determination of facility requirements to be presented in subsequent chapters. The airside facilities generally include those required to support the movement and operation of aircraft. While this most certainly involves the Airport's runways and taxiways, it also includes the instrument approaches; airfield lighting; pavement markings; takeoff and landing aids; and airfield signage. The current physical airside facilities at TIX are depicted in **Exhibit 2-3**.

### Runways

There are two active runways at TIX. As documented in **Table 2-14**, both runways are required in order to meet the FAA recommended 10.5-knot crosswind coverage for the smaller and light aircraft that operate at TIX.

***Runway 18-36***

The primary runway, Runway 18-36, is 7,320 feet in length and 150 feet in width. Runway 18 is presently marked with a displaced threshold of 319 feet. This results in an available length of 7,001 feet for aircraft landing on Runway 18. As part of this displaced threshold, a turnaround is available, since the parallel taxiway does not connect to this end of the runway. The runway is of asphalt construction and has been grooved. Runway pavement grooving provides better traction for operations conducted during wet pavement conditions.

According to the 1998 Pavement Evaluation, the runway condition varies from poor to good. However, since that formal inspection was conducted, the airport extended the runway to its current length in 1999 and conducted an overlay of the older surface in 2002. The original extension was constructed using an eight inch base with two inches of asphalt, which matched the rest of the runway. In 2002, an additional two inches of asphalt was put down to increase the overall strength of the entire runway. Upon visual inspection, all portions of Runway 18-36 are considered to be in excellent condition. Based on the April 18, 2002 Southeast U.S. Airport Facility Directory, Runway 18-36 is currently rated to accommodate aircraft with the following main gear and maximum gross weight configurations:

| | |
|---|---|
| Single Wheel | 80,000 lbs. |
| Dual Wheel | 110,000 lbs. |
| Dual Tandem | 190,000 lbs. |

The pavement strengths above were based on the runway before the overlay was completed. Therefore, it is safe to say that the current pavement should have higher ratings. Nonetheless, **Table 2-17** provides examples of some of the more popular small general aviation, business/corporate, and commercial service aircraft, with their main gear and maximum gross weight configurations. This table is only included to illustrate various types of aircraft flying today. It does not imply that such aircraft will necessarily use the facilities at TIX. The aircraft expected to utilize TIX during the planning period will be address in the Facility Requirements – Chapter 5.

**TABLE 2-17**
**LANDING GEAR CONFIGURATIONS FOR SAMPLE AIRCRAFT**

| Aircraft Type | Gear Configuration | Maximum Allowable Takeoff Weight (pounds) |
|---|---|---|
| ***Small General Aviation*** | | |
| Beech Bonanza | Single | 3,400 |
| Cessna 172 | Single | 2,300 |
| Cessna 310 | Single | 5,100 |
| Piper Cherokee | Single | 2,600 |
| Piper Navajo | Single | 6,200 |
| ***Business/Corporate*** | | |
| Beech King Air 100 | Dual | 10,600 |
| Cessna Citation III | Single | 22,200 |
| Gulfstream IV | Dual | 74,600 |
| Gulfstream V | Dual | 90,500 |
| Lear 55 | Dual | 21,500 |
| Sabreliner 65 | Single | 24,000 |
| ***Commercial*** | | |
| Airbus 320 | Dual | 145,500 |
| Boeing 727-200 | Dual | 172,000 |
| Boeing 737-300 | Dual | 124,500 |
| Boeing 757-200 | Dual Tandem | 220,000 |
| Boeing 767-300 | Dual Tandem | 345,000 |
| Canadair Regional Jet | Dual | 53,000 |
| Douglas MD-11 | Dual Tandem | 602,500 |
| Douglas MD-88 | Dual | 149,500 |
| EMB-120 Brasilia | Dual | 11,500 |
| L-1011-500 | Dual Tandem | 496,000 |
| Saab 340 | Dual | 27,275 |

Source: FAA AC 150/5300-13 Change 8.

Finally, there is a 200 foot long by 150 foot wide blast pad on the approach end of Runway 18 and a 200 foot long by 150 foot wide blast pad on the approach end of Runway 36. Neither of these paved surfaces can be utilized by aircraft for landing or takeoff.

***Runway 9-27***

The secondary or crosswind runway, Runway 9-27, is 5,000 feet long and 100 feet wide. Runway 9-27 also has 25 foot wide paved shoulders. This runway is of asphalt construction and was partially overlaid in 1997. In the 1998 Pavement Evaluation, the western half of the runway was considered to be in excellent condition, while the eastern half was recorded as fair. However, the airport rehabilitated 1,300 feet of the eastern half of Runway 9-27 in 2002. Now the entire runway pavement is considered to be in excellent condition. According to the Airport Facility Directory, Runway 9-27 is currently rated to accommodate the following aircraft configurations:

| | |
|---|---|
| Single Wheel | 50,000 lbs. |
| Dual Wheel | 80,000 lbs. |

As with Runway 18-36, the pavement ratings are based on the information that was available before the eastern half of Runway 9-27 was rehabilitated.

In addition to the physical characteristics of the runway are other safety-related criteria. These surfaces are defined in FAA AC 150/5300-13, Change 8, "Airport Design" and in FAR Part 77, "Objects Affecting Navigable Airspace." While there are various imaginary surfaces associated with each runway, the criteria for each will be discussed in later sections. Details pertaining to the requirements for a Runway Safety Area, Runway Object Free Area, and Runway Protection Zone will be addressed as part of the determination of facility requirements, while the FAR Part 77 surfaces will be included in the text associated with the Airport Layout Plan set.

*****Insert Exhibit 2-3 (Current Airport Configuration)*****

## Taxiways

There are currently six taxiways serving the two runways at TIX. The following sections describe the physical traits for the active portions of each taxiway.

### *Taxiway A*

Taxiway A is a partial full-length parallel taxiway to Runway 18-36. Currently, Taxiway A runs from the approach end of Runway 36 all the way down to the location of the previous Runway 18 threshold, before the runway was extended north. Because of the perpendicular runway configuration, Taxiway A also provides direct access to the approach end of Runway 27. The entire length of Taxiway A has been constructed to a width of 50 feet. This taxiway has a runway centerline to taxiway centerline spacing of 500 feet and is located on the east side of Runway 18-36.

Including the ends, there are six taxiways that serve as connectors to Runway 18-36. The first is off of the previous Runway 18 threshold and has been designated Taxiway A-1. The next connector is between Taxiway A-1 and Runway 9-27 and has been designated Taxiway A-2. Just south of Runway 9-27, Taxiways B and E provide two connections between Runway 18-36 and Taxiway A. While Taxiways B and E meet Taxiway A at the same location, they connect at different angles. Taxiway C creates the next connector taxiway half way between Taxiway E and the approach end of Runway 36, while the final connector is at the approach end of Runway 36.

The portion of Taxiway A between the previous Runway 18 threshold and Runway 9-27 was repaved late in 2001. During this repaving project, all of the connectors, with the exception of Taxiway B, were widened to provide larger fillets between Taxiway A and Runway 18-36. This was done to accommodate the aircraft with wider turning radii that frequent the airport. In 2002, all of Taxiway A was repaved. The repaving project provided an additional two inches of asphalt on top of the previous eight inch base and two inch asphalt structure. In addition, the repaving included all of the connectors between Runway 18-36 and Taxiway A. As a result, the entirety of this pavement is considered to be in excellent condition. Finally, it should be noted that there are no aircraft run-up areas provided for either end of Taxiway A.

### *Taxiway B*

Taxiway B is a full length parallel taxiway to the crosswind runway, Runway 9-27. This taxiway, which is on the south side of the runway, is 50 feet wide and has a runway centerline to taxiway centerline spacing of 500 feet. Not including Runway 18-36, there are only three connections between Taxiway B and Runway 9-27. On the west end, the taxiway simply ties into Runway 9. Another connector taxiway (actually Taxiway C) is located at the midpoint of Runway 9-27, while the east end of Taxiway B is connected to Runway 27 via Taxiway A. Currently the pavement along the entire length of Taxiway B is considered to range from fair to poor. The last pavement maintenance conducted on this taxiway was a slurry seal that was applied in the mid 1990s. There are no aircraft run-up areas provided for either end of Taxiway B.

### *Taxiway C*

Taxiway C, which has a northwest/southeast alignment, is situated to the southwest of the runway intersection. The northwest end of Taxiway C connects to the midpoint of Runway 9-27 while the southeast end ties into Taxiway A. At 50 feet wide, Taxiway C also intersects with Taxiways B, D, and E. The portion of Taxiway C that lies between Runway 9-27 and Taxiway B is considered to be in fair to

poor condition. It was last treated with the same slurry seal as Taxiway B. Between Taxiway B and Runway 18-36, the pavement of Taxiway C is considered to be in good condition. The final portion of Taxiway C, which lies between Runway 18-36 and Taxiway A, is in excellent condition. This section was included in the repaving of Taxiway A in 2002.

***Taxiway D***

To the southwest of the runway intersection, there remains a significant portion of an old runway pavement, which had a northeast/southwest alignment. Taxiway D begins at the intersection of this old runway pavement and Taxiway C, and continues to the southwest. This taxiway provides access to the hangar facilities and aircraft parking ramps on the northwest side of Challenger Avenue. Currently Taxiway D only extends halfway down Challenger Avenue, when heading towards Perimeter Road. While the old runway pavement is 150 feet wide, Taxiway D is only marked to a width of 50 feet. When this taxiway was rehabilitated in 2001, the centerline was displaced to the northwest half of the old runway pavement. In addition to protecting the required safety areas and setbacks, the shifting of this taxiway provided additional space for the facilities located along the northwest side of Challenger Avenue.

The pavement of Taxiway D is in excellent condition; however, along the flightline northwest of Challenger Avenue there is occasionally a problem with small depressions in the pavement surface. These depressions are the result of this portion of the airfield being constructed over an old citrus grove. As old tree stumps and roots deteriorate, the voids in the ground have caused some small circular areas on the pavement surface to settle. Airport maintenance repairs these depressions as soon as they are detected.

The portion of the old runway pavement between Taxiway C and the runway intersection is currently used for helicopter operations. There are three spots delineated on this pavement surface, which are referred to as Spots #1, #2, and #3.

***Taxiway E***

Taxiway E parallels Taxiway D to the southeast, however, this taxiway runs across Runway 18-36 and ties into Taxiway A. On the southwest end, Taxiway E extends all the way down the southeast side of Challenger Avenue, ending at the last parcel on the corner by Perimeter Road. The portion of Taxiway E from Discovery Aviation's aircraft parking ramp to the southwest is marked to 35 feet wide, but has an additional 15 feet of pavement which may be used to tie into future apron areas. Between Runway 18-36 and Discovery's ramp, the taxiway pavement is 50 feet wide. Both of these portions of the taxiway are in excellent condition due to a recent repaving project. The portion of Taxiway E between Runway 18-36 and Taxiway A, which is also 50 feet wide, is also in excellent condition.

***Taxiway F***

Taxiway F, which is to the southwest of and parallel to Taxiway C, primarily serves the ramp area for Discovery Aviation. As with Taxiway D, this taxiway lies along the alignment off an old runway that had a northwest/southeast orientation. However, the northwest half of Taxiway F has been closed due to significantly weakened pavement. This pavement has been undermined by sinkholes located in the area. The southeast portion of Taxiway F, at a width of 50 feet, connects the ramp area of Discovery Aviation, including the helipad (referred to as Spot F or the Southpad) on the southeast side, to the west side of

Runway 18-36. Taxiway F no longer continues through Runway 18-36 to tie into Taxiway A. The pavement for the active portion of Taxiway F is considered to be very poor.

**Instrument Approaches**

During times of inclement weather, instrument approaches allow pilots to safely land at an airport facility. There are a number of different types of instrument approaches that can be established at an airport, each with their own very specific limitations. As the height of clouds and visibility deteriorate, the necessity for instrument approaches increases. When the cloud ceiling is greater than 1,000 feet above ground level (AGL) and the visibility is greater than three statute miles, the conditions are considered visual and pilots can operate under visual flight rules (VFR). In VFR conditions, no approaches are required for an aircraft to safely land at an airport. However, once the cloud ceiling is less than 1,000 feet AGL and/or the visibility is less than three statute miles, pilots must operate under instrument flight rules (IFR). Instrument operations provide ATCT services to pilots during each phase of flight (departure, en-route, and arrival) to keep aircraft properly separated in less than ideal weather conditions. During the arrival phase, instrument approaches are what allow a pilot to safely navigate to and land on a runway. There are two basic categories for instrument approaches: precision instrument approaches and non-precision instrument approaches.

Both precision and non-precision instrument approaches provide course guidance to the runway centerline it is intended to serve. The precision of this course or horizontal guidance increases with the sophistication of the instrument approach aid, which is reflected through the minimum operating parameters for each approach. The primary difference between a precision and non-precision approach is that the precision approach will also have vertical guidance for a specific runway end, which allows the aircraft to descend safely on a fixed glideslope signal, even when the runway environment is not yet in sight. All instrument approaches have heights published that dictate how far a pilot can descend down towards the runway before having to abandon the approach and try again. For precision approaches, this is called the decision height and for non-precision approaches it is referred to as the minimum descent altitude (MDA). Both heights are published in the number of feet above the intended runway's touchdown zone elevation. In addition, every instrument approach has minimum visibility requirements, measured in feet or miles, at which an instrument approach can be attempted. For either type of approach, if visual contact cannot be made before the decision height/MDA, then the aircraft must execute a missed approach and either try again, or go to an alternate airport.

***Precision Instrument Approaches***

The only precision instrument approach at TIX is an instrument landing system (ILS). An ILS consists of the following four basic components: localizer antenna array, glideslope antenna array, marker beacons, and runway approach lighting system. The purpose of an ILS is to provide a method of precision instrument navigation to a point just beyond the approach end of the runway. Since the system provides both course and glideslope information, much lower weather minimums are possible than the minimums provided by a non-precision instrument approach. Precision instrument approaches are runway specific and therefore, each runway that is to have such an approach must have its own ILS system. Currently TIX only has ILS equipment installed for approaches to Runway 36. This equipment is maintained by the FAA.

The ILS to Runway 36 provides Category I landing minimums with a decision height of 200 feet above runway touchdown zone elevation which calculates to 235 feet above mean sea level and one-half statute mile visibility. Higher minimums are applied if aircraft only use the localizer portion of the ILS equipment or if they conduct a circle to land maneuver. These variations of the ILS approach are actually considered non-precision approaches because they do not utilize the vertical guidance portion of the

approach provided by the glideslope antennae. **Table 2-18** summarizes the minimums associated with the Runway 36 ILS.

**TABLE 2-18**
**RUNWAY 36 ILS APPROACH MINIMUMS**

| Instrument Procedure | Height Above Touchdown Zone Elevation (feet) | Visibility (miles) |
|---|---|---|
| ILS Approach | 200 | ½ (A,B,C,D) |
| Localizer Approach | 365 | ½ (A,B,C) & ¾ (D) |
| Circling Approach | 605 | 1 (A,B) & 1¾ (C) & 2 (D) |

Source: Southeast U.S. Terminal Procedures.
Notes: Minimums based on local altimeter setting. Visibility letters refer to aircraft approach categories.

***Non-precision Instrument Approaches***

Non-precision instrument approaches can be provided at airports through a number of different navigational aids. As documented in the previous section, the localizer portion of the ILS system can be used for course guidance to the runway on which it is installed, hence providing non-precision approach capability to Runway 36. In addition, two other navigational systems offer non-precision approaches at TIX. The first is a non-directional beacon (NDB) facility located approximately 4.8 nautical miles north of the airport. An NDB provides a radio beacon frequency which transmits non-directional signals. With the appropriate equipment, these signals allow the pilot of an aircraft to determine bearings to and from the facility. The NDB north of TIX is identified as Geiger Lake (GGL). In addition, non-precision instrument approaches are available at TIX through the use of Global Positioning Satellites (GPS). GPS is a satellite based navigation system that consists of a network of satellites known as a constellation. This constellation provides a celestial reference for determining the position of any point on or above the Earth's surface. By analyzing the time delays of signals received from some of these satellites, air based receivers are able to determine latitude, longitude, and altitude.

A NDB/GPS non-precision approach is available to Runway 18 at TIX. This approach has published minimums with a MDA of 447 feet above the touchdown zone elevation, which calculates to 480 feet above mean sea level. One statute mile visibility is required for Approach Category A and B aircraft, while one and a quarter mile visibility is required for Approach Category C aircraft, and one and a half mile visibility is required for Approach Category D aircraft. Higher minimums apply to aircraft performing a circle to land maneuver. A GPS only non-precision approach is also available for Runway 9 at TIX. The GPS approach to Runway 9 has a published MDA of 367 feet above touchdown zone elevation, which calculates to 400 feet above mean sea level. One statute mile visibility is required for Approach Category A, B, and C aircraft, while one and a quarter mile visibility is required for Category D aircraft. As with the NDB/GPS approach, higher minimums apply to aircraft performing a circle to land maneuver. **Table 2-19** summarizes the minimums associated with the non-precision instrument approaches at TIX.

| TABLE 2-19<br>NON-PRECISION INSTRUMENT APPROACH MINIMUMS | | |
|---|---|---|
| **Instrument Procedure** | **Height Above Touchdown Zone Elevation (feet)** | **Visibility (miles)** |
| Runway 18 NDB/GPS Approach | 447 | 1 (A,B) & 1¼ (C) & 1½ (D) |
| NDB/GPS Circling Approach | 605 | 1 (A,B) & 1¾ (C) & 2 (D) |
| Runway 9 GPS Approach | 367 | 1 (A,B,C) & 1¼ (D) |
| GPS Circling Approach | 605 | 1 (A,B) & 1¾ (C) & 2 (D) |

Source: Southeast U.S. Terminal Procedures.
Notes: Minimums based on local altimeter setting. Visibility letters refer to aircraft approach categories.

Runway 27 does not presently have any type of published instrument approach procedure. Only visual approaches can be made to Runway 27.

## Airfield Lighting

Proper airfield lighting is required at all airports that are utilized for nighttime operations. TIX is capable of accommodating aircraft operations at night because of the existing lighting fixtures found on the airfield.

### *Identification Lighting*

An airport-rotating beacon universally indicates the location and presence of an airport at night or in adverse weather conditions. The airport rotating beacon tower for TIX stands on the southeast side of the airfield, east of Runway 18-36 and just south of the Titusville-Cocoa Airport Authority offices. This beacon, approximately 60 feet above ground level and is equipped with an optical rotating beacon system that projects two beams of light, one green and one white, 180 degrees apart. The beacon, which is in poor condition, is continuously operated during nighttime hours and when the airfield is under instrument conditions.

### *Runway Lighting*

Runway lights allow pilots to identify the edges of the runway and assist them in determining the runway length remaining during periods of darkness and restricted visibility. These lighting systems are classified according to their intensity, or brightness. Runway 18-36 is equipped with High Intensity Runway Lights. On each end of Runway 18-36, the fixtures within the last 2,000 feet of lights have a two color (white/amber) lens. With the amber side visible while on the last 2,000 feet, pilots have an obvious indicator when they are near the end of the runway. Runway 9-27 is equipped with Medium Intensity Runway Lights. These lighting systems are operated through the Common Traffic Advisory Frequency (CTAF), 118.9 MHz, when the ATCT is closed. Having the pilot controlled lighting on the CTAF eliminates the need for pilots to change frequencies in order to turn the airfield lights on, thus allowing a continuous listen/watch form of communication on a single frequency. The pilot simply keys the aircraft's microphone to control the entire airfield lighting system.

As part of the runway lighting system, the identification of the runway end, or threshold, is of major importance to a pilot during landing and takeoff. Therefore, runway ends and thresholds are equipped with special lighting to aid in the approach to or identification of the runway end during takeoff. All four runway ends at TIX are identified with four standard inboard threshold lights on each side of the runway. These threshold lights have a two color (red/green) lens, placed across the end of the runway pavement.

When landing, the green half of the lens faces the approaching aircraft, indicating the beginning of the usable runway. The red half of the lens faces the aircraft on takeoff, indicating the end of the usable runway. Additional threshold lights have been installed on the approach end of Runway 18. These fixtures, which have an all red lens cover, indicate the beginning and end of the displaced threshold. Therefore, at night when pilots are approaching Runway 18, the first set of threshold lights are red, indicating an unsafe area to land, then 319 feet down, the green lights appear on the threshold, indicating the beginning of the area usable for landing. All of the runway lighting systems have been constructed with light cans and conduit, and are considered to be in excellent condition.

***Taxiway, Taxilane, and Apron Lighting***

All of the major taxiways at TIX are equipped with Medium Intensity Taxiway Lights. As with the runway lights, the taxiway lighting systems have all been constructed with light cans and conduit, and are considered to be in excellent condition. In fact, new edge lights were installed on Taxiways C and E in 2003. The taxiway lighting systems are also pilot controlled when the ATCT closes. The only true taxilanes at TIX include those around the t-hangars and a private taxilane off of Taxiway F. While none of these taxilanes have edge lighting systems, these areas have overhead lighting fixtures that assist in nighttime operations. With the exception of Discovery Aviation, all of the aircraft parking aprons at TIX have floodlighting for nighttime ramp operations. Discovery Aviation only has limited floodlighting, most of which are located on the sides of buildings.

**Pavement Markings**

Pavement markings provide the standards for delineating operations on paved areas (runways, taxiways, and aprons) of the airfield. The runways at TIX have the full runway pavement markings required for the various approaches available. Both runways at TIX have designation numbers, centerline striping, threshold markings, aiming point markers, and side stripes. Only Runway 36 has touchdown zone markings. The designation markings identify the runways by their magnetic azimuth, while the threshold markings are located at the beginning of each runway to identify the beginning of the available landing area. As mentioned previously, the approach end of Runway 18 is displaced. As such, it has the appropriate markings. Both of the blast pads associated with Runway 18-36 are also properly marked with yellow chevrons.

All of the taxiways at TIX have visible taxiway centerline stripes with hold short lines located at all of the required locations. These markings ensure that aircraft taxi along designated passageways for proper wingtip clearance and to warn of the areas protected for runway operations. Where appropriate, such as for Taxiway D and Taxiway F, taxiway edge markings are used to delineate the width of the taxiways. Taxiway edge markings show where the taxiway edge does not correspond with the edge of the pavement.

There are seven primary locations on the airfield from which helicopter operations are conducted. These locations are not fully certified helipads, rather helicopter landing spots that have been designated by the Airport Authority and ATCT to accommodate the high frequency of helicopter training that is conducted at TIX. Four of the seven helipads have no markings, rather are just areas utilized for rotorcraft operations. These include the south helipad, which is located off Taxiway F, halfway between the facilities of Discovery Aviation and Runway 18-36. The north helipad is an area around the midpoint of Runway 18-36, which is used by helicopters when Runway 9-27 is active. Similarly, Spot #4 and Spot #5 are designated as an area around the midpoint of Runway 9-27 and are used for helicopter training when Runway 18-36 is active. Spots #1, #2, and #3 are the only helicopter training spots that are actually marked on the pavement. These three spots consist of painted circles with the appropriate numeral in the middle. Spots #1, #2, and #3 are located on the old runway pavement

between Taxiway C and the runway intersection. Spot #1 is the closest to the runway intersection, while Spot #3 is the closest to Taxiway C.

**Takeoff and Landing Aids**

There are a number of different takeoff and landing aids at TIX. The following paragraphs describe those that are physically part of the airport facilities. As with the runway and taxiway lighting, any of the takeoff or landing aids that use light are pilot controlled after the ATCT closes. Perhaps the most basic takeoff and landing aid at TIX are the wind socks. Currently there are four of these located on the airfield and all of them are internally illuminated. Three of the wind socks directly serve specific runway ends. There is one located at the approach end to Runway 18, on the left side of the runway; one at the approach end of Runway 36, on the right side; and one located at the approach end of Runway 9, on the right side. The fourth wind sock is located in the triangle created by Runway 18-36, Taxiway C, and Taxiway E. There is no segmented circle at the airport.

The identification of the runway end, or threshold, is of major importance to a pilot during instrument landing operations. This is especially true for precision instrument approaches; therefore, runways with an ILS are equipped with special lighting to aid in the approach to or identification of the runway end. At TIX, the approach to Runway 36 is identified with a Medium Intensity Approach Lighting System (MALS) as part of the ILS equipment. The actual system installed for Runway 36 is a Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR).

A MALSR is a MALS approved for ILS Category I precision approaches with decision heights as low as 200 feet. The MALS portion of the MALSR is 1,400 feet long. The Runway Alignment Indicator Light (RAIL) portion of the system extends outward an additional 1,000 feet when the glide slope angle is 2.75 degrees or higher, which is the case at TIX since the precision instrument approach has a 3.0 degree glide slope. The purpose of the MALSR is to aid the pilot in identifying the runway environment and to facilitate a safe transition from the instrument flight phase to the visual phase of the landing. This system provides pilots with early runway lineup, lead-in guidance, and runway end identification during landings. Such lighting is extremely helpful during some periods of restricted visibility. As with the ILS, the Runway 36 MALSR is maintained by the FAA.

Runway End Identification Lights (REIL) provide pilots with a rapid and positive visual identification of the approach end of the runway during night, instrument, and marginal weather conditions. REILs also aid in identification of the runway end in areas having featureless terrain. The systems consist of a pair of synchronized white flashing lights facing the approaching aircraft, which are situated on each side and abeam of the runway end/threshold lights. The beam axis is orientated 15 degrees outward from a line parallel to the runway edge and inclined at an angle of 10 degrees upward. The REILs emit a white strobe light simultaneously at a rate of one per second. All four ends of Runway 18-36 and Runway 9-27 have REILs.

A Precision Approach Path Indicator (PAPI) system provides the pilot of an aircraft with visual descent guidance information during the approach to a runway. These lights are typically visible from five miles during the day and up to 20 miles or more at night. PAPIs use a light bar unit that is installed in a single row perpendicular to the runway edge. The lights in the light bar project a beam of white light in the upper segment and red light in the lower segment. Depending on the aircraft's angle in relation to these lights, the pilot will receive a combination that indicates his position relative to the desired glide slope. Both ends of Runway 18-36 and both ends of Runway 9-27 have a four light PAPI system located on the left side. All of the PAPI systems at TIX are maintained by the FAA.

### Airfield Signage

As part of the airfield lighting system, the airport has a number of illuminated airfield signs. These signs are strategically placed to provide instruction and guidance information to the users of the airport. There are mandatory instruction signs such as holding positions or no entry into an area; there are location signs to indicate which runway or taxiway the user is on or crossing; there are direction signs; and there are destination signs. Also, both runways are equipped with distance remaining signs. These signs, which are located on the west side of the runway, provide single digit numbers, indicating how many thousands of feet are remaining on the runway ahead.

## AIRSPACE AND AIR TRAFFIC CONTROL

As mentioned previously, TIX does have an air traffic control tower (ATCT). The tower, which is located to the east of Runway 18-36, between TICO Executive Aviation and Helicopter Adventures, normally operates between the hours of 7:00 a.m. to 9:00 p.m. local standard time. During the period of time that the ATCT is in operation, the Airport is located within Class D controlled airspace. **Exhibit 2-4** illustrates a portion of the Jacksonville Sectional Aeronautical Chart, which depicts the airspace structure in the vicinity of TIX. The Class D airspace is represented by a blue colored dashed circular area having a radius of four nautical miles around the Airport. The Class D airspace extends upward from the surface to an elevation of 2,500 feet above mean sea level (MSL). Basic VFR weather minimums (cloud ceiling greater than 1,000 feet AGL and visibility greater than three statute miles) are applicable to this airspace. All aircraft must establish two-way radio communications with the ATCT before entering Class D airspace. During the hours when the ATCT is closed, the Class D airspace reverts to a Class G (uncontrolled) airspace.

The magenta colored circular area surrounding the Airport designates Class E controlled airspace that begins at an elevation of 700 feet above the surface. Class E airspace also extends outward beyond the magenta circular area, where it begins at an elevation of 1,200 feet above the surface. Basic VFR weather minimums for aircraft operating in this airspace in the vicinity of the Airport requires a distance from cloud requirement of 500 feet below, 1,000 feet above, and 2,000 feet horizontally, as well as the flight visibility of three statute miles. A number of restricted (airspace) areas exist in the Airport vicinity. Restricted Area R-2935 is located above the Airport, and when active, begins at an altitude of 11,000 feet MSL. Restricted Areas R-2932 and R-2933 are located east of the Airport. R-2932 encompasses an area from the surface to but not including 5,000 feet MSL. It is active on a continuous basis. R-2933 begins at an altitude of 5,000 feet, and is active on an intermittent basis. In addition, R-2934 exists northeast of the Airport, is active on an intermittent basis, and extends upward from the surface. All of the above Restricted Areas are associated with Cape Canaveral. Also illustrated by a light blue shaded area on **Exhibit 2-4**, airspace as defined in FAR 91.143 entitled, "Flight Limitation In The Proximity Of Space Flight Operations", exists east of the Airport. This airspace is associated with the Kennedy Space Center and when active, extends upward from the surface. The Space Flight Operations Area encompasses Restricted Areas R-2932, R-2933, and R2934, and extends to the east over the Atlantic Ocean. The Space Flight Operations Area does not extend over TIX.

While not specifically shown on the aeronautical chart, Temporary Flight Restrictions (TFR) have been implemented before Space Shuttle launches occur. These TFRs began to be implemented after the September 11$^{th}$ attacks, and are used to secure airspace usage within a thirty nautical mile radius of the Kennedy Space Center Launch Pad before launches occur. The restrictions are quickly lifted after the launch. Only civil aircraft operating under FAR Part 121 (air carrier operators) or FAR Part 135 (air taxi operators) are permitted when the temporary flight restrictions are in effect. While these restrictions do affect FAR Part 91 (general aviation) aircraft operations at the airport, the length of time (hours) that the temporary restrictions are in effect continues to

be reduced. It is anticipated that this time period will be further reduced to a nominal level, with a removal of the temporary restrictions altogether in the near future as aviation activities continue to be normalized throughout the United States.

The Orlando International Airport (MCO) is located approximately 27 nautical miles to the west of the Airport. Class B controlled airspace associated with MCO exists approximately five nautical miles west of the Airport. Class B airspace in this segment begins at an altitude of 6,000 feet MSL, and extends upward to 10,000 feet MSL. While this Class B airspace does not extend over TIX, the Mode C "Veil" associated with this airspace does. The Mode C Veil area is shown in **Exhibit 2-4** by the magenta colored 30 nautical mile circular area, centered on MCO. As required by FAR 91.215, unless otherwise authorized, aircraft must be equipped with an operable coded radar beacon transponder with automatic pressure altitude reporting capability when operating in the Mode C Veil area. In the case of TIX, certain aircraft operations not meeting the requirements of FAR 91.215 are authorized, as defined in Special Federal Aviation Regulation (SFAR) No.62 to Part 91. This SFAR provides for limited non FAR 91.215 equipped aircraft operations in the vicinity of TIX at or below an altitude of 1,400 feet AGL.

IFR airspace from the surface up to 1,999 feet MSL is controlled by the ATCT at TIX, while the Daytona Beach Terminal Radar Approach Control (TRACON) facility, which facilitates approach/departure operations to/from TIX, controls traffic from 2,000 feet MSL to 5,999 feet MSL. Radar information is provided to the TRACON from an Air Force GPN-20 radar installation located at Patrick Air Force Base. Good radar coverage is provided in the vicinity of the Airport, with coverage extending down to approximately 400 feet AGL. Supplemental radar coverage is provided by the Melbourne (MLB) Enroute Long-Range Radar. Presently, the Orlando TRACON controls the IFR airspace in the vicinity of the Airport from 6,000 feet to 14,000 feet MSL. Substantial improvements and equipment upgrades are planned to occur at the Orlando radar facility over the next five to six years. Once these improvements are in place, it is planned that the Orlando TRACON will also control the low altitude IFR airspace in the vicinity of the Airport, in place of the Daytona Beach TRACON.

*****Insert Exhibit 2-4 (Jacksonville Sectional Aeronautical Chart)*****

## AIRPORT FACILITIES

Due to the geometric layout of the active runways, the TIX airfield is divided into three general areas. For the purpose of this study and throughout the remainder of this Master Plan, these areas will include:

- East Side – the area located east Runway 18-36
- Southwest Side - the area located south of Runway 9-27 and west of Runway 18-36
- Northwest Side – the area of located north of Runway 9-27 and west of Runway 18-36

These three general areas of the airport described above are depicted on **Exhibit 2-3**. A description of the facilities located within each area is included in the following sections.

### East Side

This portion of the airfield is highly active and offers a wide array of facilities. TICO Road spans the east side of the airfield and provides access to several of the current airport tenants. The northern most tenant in this area is the Valiant Air Command aircraft museum. Currently there are 13 based aircraft, the majority of which are ex-military and restored World War II aircraft that are housed in a large hangar. These aircraft are typically utilized for training and performing in the annual air show. The buildings of the museum appeared in good condition, as did the 62 space automobile parking lot, four of which are for handicapped parking.

TICO Road continues south until it meets Golden Knights Boulevard. On the other side, TICO Road becomes Perimeter Road. A number of airport facilities are located off of Golden Knights Boulevard as it swings into and along the eastern flightline of the airport. On the northern most end of Golden Knights Boulevard is TICO Executive Aviation, a full service fixed base operator (FBO) situated just southeast of the intersection of Runways 18-36 and 9-27. TICO Executive provides services such as: fuel, aircraft parking, a passenger/pilot lounge, catering, pilot supplies, car rentals, courtesy transportation, crew cars, public telephone, pilot snooze room, flight planning room, and restrooms. The FBO is housed in the old Eastern Airlines terminal building. This structure provides 1,286 square feet of space and considered to be in fair to good condition. There are currently 42 automobile parking spaces to the east of the facility and the aircraft parking ramp on the west side of the facility which only allows a limited number of aircraft to be parked at the same time. Taxiway A provides access to the airfield from the ramp. All of the fuel dispensed by TICO Executive is stored on the southwest side of the field at its sister company Discovery Aviation. TICO Executive primarily serves business/corporate and the occasional ad hoc charter jet aircraft. Therefore, a 3,000 gallon Jet A truck delivers most of the fuel from the southwest side of the airport.

To the south of TICO Executive, the next facility is TIX Air Traffic Control Tower and the airport's electrical vault. To the south of these facilities is a single port-a-port hangar and a single clearspan hangar occupied by Cape Kennedy Communications. The port-a-port, which is in fair condition, is owned by the Authority and leased by Cape Kennedy Communications. The clearspan hangar provides 3,000 square feet of space and is used to conduct avionics work. This facility, which is also leased from the Airport Authority, is in good condition.

The next facilities to the south include the combined hangars, terminal, and ramp space for Helicopter Adventures and Gateway Aviation, which are both under the same owner. Helicopter Adventures is currently the largest civilian helicopter training school in the world while Gateway Aviation is a full service FBO. Their facilities include a large clearspan hangar, passenger/pilot terminal area, office space, and a trailer building. The aircraft apron area begins adjacent to Cape Kennedy Communication's and extends around the large clearspan hangar to the east, just north of the t-hangar complex. The clearspan hangar is used for the storage of aircraft as well as maintenance operations, primarily on the large helicopter fleet based here. Currently there are 21 helicopters

operated by Helicopter Adventures, consisting of 14 Schweitzer 300Cs, six Robinson R-22s, and one Bell 206 Ranger. Terminal and office space supports the intense helicopter training operations as well as the amenities for the flying public. As with any full service FBO, Gateway Aviation offers fuel, aircraft parking, a passenger/pilot lounge, pilot supplies, aircraft rentals, aerial tours/sightseeing, a flight planning room, and restrooms. The trailer building provides six bedrooms and three bathrooms, which are used for short-term student housing. A number of helipads and aircraft tiedown positions are marked on the aircraft apron. Not including the trailer, the clearspan hangar, terminal area, and offices provide 22,560 square feet and are in good condition. At the time of the inventory, the pavement on the ramp was documented to be in poor condition with very significant and visible cracks.

Just east of the clearspan hangar for Helicopter Adventures and Gateway Aviation, is another trailer building which is housed by DeBenair Aviation Services. DeBenair provides flight training and aircraft rental services through a fleet of 14 aircraft. DeBenair rents its ramp and land space from Helicopter Adventures and Gateway Aviation, as well as some space in the large clearspan hangar, which is used primarily for maintenance on their aircraft fleet. In the trailer building, DeBenair operates its office building for the shared purposes of administration and classroom training. As with the main flightline ramp, the apron space leased by DeBenair is in relatively poor condition.

Just to the east of DeBenair's office/classroom building are two above ground fuel tanks, owned and operated by Gateway Aviation. This fuel farm consists of two 30,000 gallon tanks, one containing Jet A and the other 100LL Avgas. This fuel is dispensed by three fuel trucks: one 5,000 gallon Jet A, one 2,000 gallon Avgas, and one 1,500 gallon Avgas. To the north of DeBenair's building is the office building for the Titusville-Cocoa Airport Authority. The Authority office building provides 1,500 square feet of space and is considered to be in fair to good condition. As indicated previously, the airport's rotating beacon is located between the office buildings of the Authority and DeBenair. There is a total of 71 automobile parking spaces in this area that serves Helicopter Adventures, Gateway Aviation, DeBenair, and the Airport Authority.

At the southern end of the East Side, there are 70 t-hangar units owned and leased out by the Airport Authority. These hangars house mostly single-engine aircraft, but do contain some small multi-engine aircraft as well. There are a total of seven individual buildings which are considered to be in good condition. The pavement around the four northernmost t-hangar buildings is of asphalt construction, while the pavement around the three buildings to the south are of concrete construction. While the concrete is in good condition, the asphalt is in fair to poor condition. Also, the southern most portion of the Gateway Aviation ramp, extends down between the north t-hangar buildings and Taxiway A. This portion of the ramp has been closed to aircraft as it is in a very deteriorated condition. The cracking of the pavement surface has become so bad that pieces of asphalt were constantly being broken up by taxing aircraft tires, creating a very hazardous condition with foreign object debris. The last buildings on the East Side are those that make up the Airport Authority's maintenance facilities. These buildings and storage areas are just south of the t-hangar complex, across Perimeter Road. A visual inspection from the exterior indicated that the structures making up the maintenance facilities were in fair shape.

**Southwest Side**

A majority of the development on this side of the airfield is related to Discovery Aviation, which is located at the end of Challenger Avenue. Discovery Aviation is a full service fixed based operator whose facilities span along the flightlines of Taxiway D and Taxiway F, as well as down a portion of Taxiway E. Currently there are a number of buildings, ramp areas, and subtenants that occupy this area. The main clearspan hangar for Discovery Aviation is in the center of the rest of the facilities, just to the east of the intersection between Taxiway E and Taxiway F. This building provides 8,400 square feet of space and is in good condition. In addition to hangar space, the main clearspan hangar building for Discovery also provides office space and passenger/pilot services.

Services offered at this facility, through a number of operators, includes: fuel, aircraft parking, a passenger/pilot lounge, flight training, aircraft rental, aerial tours/sightseeing, charters, maintenance, catering, pilot supplies, car rentals, courtesy transportation, crew cars, public telephone, pilot snooze room, restrooms, and showers. A single automobile parking lot provides 21 spaces, two of which are for handicap parking. There is also an unpaved area adjacent to the parking lot and main hangar that is also used for parking. This space appears to double the space available in the paved lot.

To the southwest of Discovery Aviation's main hangar and across Taxiway E, is another clearspan hangar (5,000 square feet) subleased to CADIZ Airport Maintenance & Restoration. Approximately halfway down Taxiway E, to the southwest, is Discovery Aviation's fuel farm. There are two above ground 12,000 gallon tanks: one holding Jet A fuel and the other 100LL Avgas. Immediately to the northwest and at the very end of Challenger Avenue is the Outer Marker Café. This 2,000 square foot building, which is also leased from Discovery Aviation, is the only restaurant on airport property. To the northwest of the Outer Marker Café is another smaller clearspan hangar (1,120 square feet) operated by Discovery Aviation. All of these facilities are considered to be in good shape with the exception of the hangar that CADIZ occupies. This building is a little bit older and at best considered to be in fair condition.

Immediately next to the CADIZ hangar, towards Runway 18-36, there are four port-a-ports owned and leased by the Airport Authority. These port-a-ports are considered to be in fair condition. There are seven other clearspan hangars on the Southwest Side of the airport. Four of these are off of Challenger Avenue, the first of which is located on the corner by Perimeter Road. Although this hangar has airside access to Taxiway E, the facility primarily serves as office and storage/manufacturing space for Aero Industries. The next two clearspan hangars are up Challenger Avenue on the Taxiway D side of the road. These two private hangars are referred to as Hangars 40 and 41. Currently Hangar 40 provides 5,600 square feet of space, while Hangar 41 provides 7,250 square feet of space (4,900 square feet of hangar and 2,350 square feet of office space). Across from these is a 5,200 square foot clearspan hangar occupied by Airscan. This hangar has access to Taxiway E and is adjacent to the fuel farm for Discovery Aviation. All four of these clearspan hangars are considered to be in good condition. Two of the three remaining clearspan hangars on this side of the airport are located directly off of Taxiway E and are occupied by the Brevard County Mosquito Control. It should be noted that these hangars are not part of the existing airport property boundary, as the entire mosquito control facility lies on property owned by Brevard County, just off Perimeter Road. The final hangar is located on a private taxilane off of Taxiway E. This is the second hangar occupied by Airscan, but is accessed off of Center Lane. This 11,200 square foot facility is in good condition as is the taxilane and ramp area serving it.

### Northwest Side

Currently there are no aviation or non-aviation related facilities constructed on this portion of the airport. This area, pending future land acquisition, has historically been designated for future aviation-related development as well as for future non-aviation related development.

## AIRPORT INFRASTRUCTURE

Most of the facility requirements developed in this study will be dependent upon the ability of serving that development with the essential water, sewer, and electrical utilities. This section also briefly describes the telephone and stormwater systems on the airfield. Local providers were contacted to determine the size and location of the current utilities available at the airport.

### Water

Potable water is provided to all of the airport tenants by the City of Titusville's Water Resource department. There are currently three main lines that provide water service to the airport property. The first is a 10-inch supply that comes off of State Road 405 (Columbia Boulevard). This water line follows TICO Road from the intersection with S.R. 405, all the way down to the intersection with Golden Knights Boulevard. At this point, the line meets up with the second 10-inch water line that comes off of U.S. 1. From this connection, the 10-inch line continues straight into the airfield, going due west, at which point it crosses straight under the airfield to tie into another 10-inch water line running up Challenger Avenue. The 10-inch lines from Golden Knights Boulevard and Challenger Avenue connect in the vicinity of Discovery Aviation and the Outer Marker Café. Back on the East Side, all of the facilities off of Golden Knight Boulevard either tap directly into the 10-inch line, or have 8-inch feeder lines. One of the 8-inch pipes turns north along Golden Knights Boulevard to serve TICO Executive, the ATCT, and Cape Kennedy Communications. At the intersection of TICO Road and Golden Knights Boulevard, another 8-inch line runs south along Perimeter Road and then turns due west to provide water to the Authority's t-hangar complex. This line truncates between the northern and southern rows of t-hangar buildings.

On the Southwest Side of the airport, a 10-inch water line comes into the airport off of Grissom Parkway. This line essentially follows the alignment of Perimeter Road until it comes to a point where it cuts straight across to Challenger Avenue, approximately perpendicular to the hangar occupied by Aero Industries. The 10-inch line then continues up Challenger where it ties into the 10-inch line described earlier, which comes across the airfield. Recent improvements to water service in this area extended an 8-inch line from the 10-inch line along Perimeter Road. This new extension carries water all the way to the intersection of Perimeter Road and Center Lane, and then up Center Lane to the Airscan hangar. At this point, the newer 8-inch line ties into an older 10-inch line that spurs straight off of the 10-inch line serving Challenger Avenue. Back on Perimeter Road, another 8-inch line runs the short distance up Challenger Avenue to tie into the older 10-inch line. Again, this connection is made approximately right in front of Aero Industries' hangar.

### Sanitary Sewer

Sanitary sewer is only currently available on the Southwest Side of the airport and as with the water, this utility is provided by the City of Titusville. All of the facilities located on the East Side of the airport currently use septic tank systems for their wastewater needs. The closest sanitary sewer lines to this side of the airport include 12-inch force mains that run along S.R. 405 and U.S. 1.

The sewer lines on the Southwest Side of the Airport run nearly identical to the water lines on this side of the airfield. All of the sewer lines on the airport are 8-inch gravity lines. The original service terminated at the end of Challenger Avenue by Discovery Aviation's main hangar building. This line provides sewer to all of the parcels off of Challenger. In front of the hangar occupied by Aero Industries, the sewer line runs straight out to Perimeter Road along side the water line. At this point, it follows Perimeter Road for a short distance to a lift station just off the southwest side of the road. From here, a line runs into the force main along Grissom Parkway. Recently, the sewer service on the Southwest Side was expanded with the water line. A new 8-inch line now picks up the older line where it comes across Challenger Avenue in front of Aero Industries' hangar. The new line continues along Perimeter Road all the way around to Center Lane. It then turns up Center Lane and provides service all the way up to the Airscan hangar. A spur of the 8-inch line also runs due south off Perimeter Road at a point half way between Center Lane and the Brevard County Mosquito Control facilities.

### Electrical Power

Florida Power and Light is the electric utility provider for the Airport. All of the power lines serving the airport run above ground and follow the various access roads into the airfield. From the roadside poles, the lines then go underground to tie into the different buildings. On the East Side, 3-phase power lines come off of U.S. 1 and run the entire length of Golden Knights Boulevard. A split off of Golden Knights Boulevard provides service to all of the facilities off TICO Road, but ends at the facilities of the Valiant Air Command. South of the intersection of Golden Knights Boulevard and TICO Road this service is downgraded to single phase. The single phase line runs south from the road intersection, paralleling Perimeter Road. The above ground portion of this line stops at a point located east of the gap between the northern and southern row of t-hangars. From this location the line goes underground and provides service to the t-hangar buildings, overhead lighting, and airport maintenance facility.

On the Southwest Side, the main 3-phase line comes onto the airport property from the south. This line runs due north into the intersection of Perimeter Road and Center Lane. One portion of this line follows Perimeter Road a short distance to the east where it ends at a pole before the road turns south. At this point, it goes underground to provide electricity to the glideslope antennae of the Runway 36 ILS. To the west, the power line follows Perimeter Road back towards Grissom Parkway, but ends at the lift station described in the previous section. A number of spurs off this line run up to serve the buildings located along Challenger Avenue and Center Lane.

### Telephone

Telephone service for the airport is provided by Bell South. While it was not necessary to determine all of the runs for telephone lines, most co-exist on the poles for the overhead power lines. Nonetheless, telephone service is available to all of the facilities at the airport.

### Stormwater

A survey of the stormwater system was not included as part of this study. However, it is worth mentioning that a significant amount of the old original military drainage pipes exist on the airfield. Many of these pipes have been collapsing and causing some very significant depressions across the airfield. The most significant deterioration of these pipes can be found along a line that bisects the airport. This old pipe runs parallel to Taxiway C and Taxiway F, approximately equidistant between the two. While some sections have been removed, a significant amount of this old pipe still exists along this line between Runway 18-36 and Runway 9-27.

## CONCLUSION

While concise, the above descriptions do not provide an exhaustive account for every specific detail and facet of TIX. The purpose of the inventory is to provide general facility data on which subsequent and more detailed analyses will be conducted. For example, the following section will utilize various methodologies, including current trends at the airfield, to project the historic aircraft and activity data presented in this chapter.