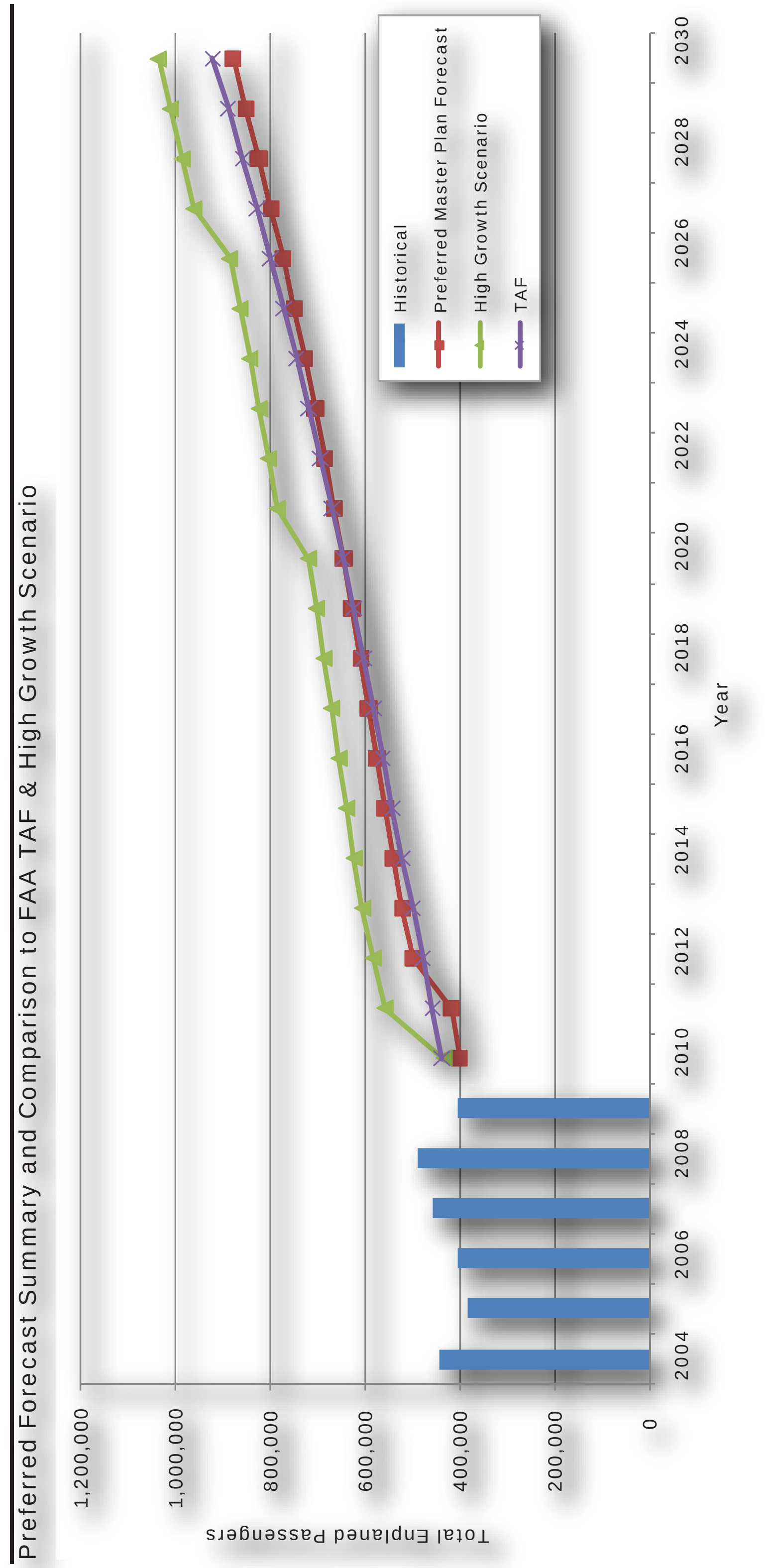


Source: Gulfport-Biloxi International Airport (historical); FAA Terminal Area Forecast, December 2009 (Projected) ; Ricondo & Associates, Inc. (Projected – High Growth & Preferred Master Plan).
Prepared By: Ricondo & Associates, Inc., February 2010.

Gulfport-Biloxi International Airport
www.FlyGPT.com

EXHIBIT 14
PREFERRED FORECAST SUMMARY VS. TAF & HIGH GROWTH SCENARIO

Chapter Three

# DEMAND/CAPACITY ANALYSIS and FACILITY REQUIREMENTS

# Chapter Three
# Demand Capacity/Facility Requirements

## Introduction

This chapter of the Airport Master Plan Update assesses the relationship between demand and facility needs based on the 20 year forecasts presented in Chapter Two, ***Projections of Aviation Demand***. Operational areas will be evaluated to determine existing and future facility requirements. These include:

- Airspace; navigational classifications
- Airfield; weather conditions, Annual Service Volume (ASV), hourly airfield capacity, runway length requirements, taxiways, etc.
- Terminal Facilities; analysis of terminal/administration building, based aircraft apron, hangar requirements, and any other general aviation facilities
- Aviation Support Facilities, including fuel farms, Airport Rescue and Fire Fighting (ARFF) facilities, maintenance facilities, etc.
- Airport Access and Parking; including on-airport roadways and automobile parking

The capacity of existing airport facilities, (runways, taxiways, etc.), will be determined based on criteria set forth in FAA Advisory Circular 150/5060-5, "Airport Capacity and Delay". The forecast aviation demand for each planning horizon will be evaluated against available capacity to determine any additional facilities needed within each planning period. Recommendations for facility improvements will then be developed to alleviate existing or projected deficiencies.

Alternatives will be developed in the subsequent chapter, as appropriate; to accommodate projected facility needs where facility deficiencies are identified. The Airport Layout Plan will then incorporate recommended facilities, as required. Identification of the Critical Aircraft will be necessary in order to determine Facility Requirements.

## Critical Aircraft

The airport's role, the design or "critical" aircraft using the airport, and number of operations are all elements required for the planning and design of an airport. The critical or design aircraft, is defined as the most demanding aircraft operating at an airport on a regular basis. The design or critical aircraft (or type of aircraft) must perform 500 itinerant operations annually to be considered an airport's critical aircraft.

The FAA provides guidance for planning and design of airport facilities in FAA Advisory Circulars (ACs). FAA AC 150/5070-6 "Airport Master Plans" and AC 150/5300-13, "Airport Design," are the principal sources of guidance used in airport planning and design. In particular, AC 150/5300-13, "Airport Design," was used to determine the Airport Reference Code (ARC) of the critical aircraft operating at GPT.

The ARC is a coding system used by the FAA to relate airport design criteria to the operational and physical characteristics of the most demanding aircraft or family of aircraft (Critical Aircraft) operating at an airport.

The ARC has two components associated with the critical aircraft. The first, depicted by a letter, is the aircraft approach category, which is determined by the aircraft approach speed. The second, depicted by a Roman numeral, is the airplane design group, determined by the critical aircraft's wingspan. Generally, aircraft approach speed applies to runways and runway-related facilities, wingspan relates primarily to taxiway and taxilane separation. ***Table 40*** lists the respective Aircraft Approach Categories and Design Groups.

## TABLE 40
## *AIRCRAFT APPROACH CATEGORIES* AND DESIGN GROUPS***

| Approach Category | Approach Speed | Design-Group | Aircraft Wingspan |
|---|---|---|---|
| A | Less than 91 knots | I | Up to but not including 49 feet |
| B | 91 knots or more but less than 121 knots | II | 49 feet up to but not including 79 feet |
| C | 121 knots or more but less than 141 knots | III | 79 feet up to but not including 118 feet |
| D | 141 knots or more but less than 166 knots | IV | 118 feet up to but not including 171 feet |
| E | 166 knots or more | V | 171 feet up to but not including 214 feet |
| | | VI | 214 feet up to but not including 262 feet |

* Aircraft approach categories are groupings of aircraft based on an approach speed of 1.3 times the aircraft stall speed at the maximum certified landing weight.

** Aircraft design groups are categorized by aircraft wingspan. The aircraft design group concept associates airport dimensional standards with aircraft approach categories, aircraft design groups or to runway instrumentation configurations.

The FAA groups aircraft based on their approach speed and maximum certificated landing weight. Approach speed is equal to 1/3 Vso, where Vso is aircraft stall speed. The certificating authority of the aircraft Country of Registry establishes the stall speed and maximum certificated landing weight based on data provided by the aircraft manufacturer.

The FAA establishes Airplane Design Groups based on physical characteristics of aircraft. Design Groups link airport dimensional standards and separation criteria to aircraft wingspans.

A significant number of the aircraft operating at Gulfport-Biloxi International Airport are large, air carrier aircraft weighing more than 60,000 pounds. There are also a significant number of larger, business/corporate aircraft operating at the Airport. The air carrier and cargo jet aircraft typically have approach speeds of greater than or equal to 121 knots but less than 141 knots, which represents Approach Category C.

GPT has experienced a decline in the volume of aviation activity, primarily general aviation activity, since Hurricane Katrina. This decline is a result of a combination of factors. Hurricane Katrina had a significant impact on the number of based aircraft and the Airport's physical facilities. Many of the hangars were damaged as were some of the aircraft stored in those hangars. Many of these damaged aircraft have not been replaced. The terminal building also sustained significant damage and has since undergone reconstruction and expansion.

Operations and facilities are returning to normal conditions, and the number of based aircraft is slowly increasing. Over the next 20 years, GPT is also expected to see growth in the number of large, corporate aircraft.

Table 41 lists actual 2009 operations by aircraft and Airport Reference Code at GPT indicating that there were more than 500 annual itinerant operations performed by all aircraft with an ARC of D-IV.

Continued operation of large commercial air carrier aircraft in Design Group IV and Aircraft Approach Category D is projected throughout the planning period. Currently, the MD 88 represents the critical Aircraft Approach Category. Ultimately, the Boeing 737-800 is expected to replace the MD 88 in that role. The Lockheed C-130 represents the current and future critical Aircraft Design Group. Therefore, the current and future Airport Reference Code (ARC) for Gulfport-Biloxi International Airport is D-IV, for purposes of determining facility development.

## Airfield Capacity

This section of the Demand/Capacity Analysis chapter evaluates the capability of the existing runways and taxiways to support the projected demand throughout the planning period. The factors that contribute to either increasing or decreasing capacity must first be described in order to fully understand demand/capacity analysis. These factors include weather conditions, airfield geometry, runway usage, aircraft fleet mix, percentage of touch-and-go operations, percentage of arrivals versus departures, airspace, etc.

### Weather Conditions

Weather plays a vital role in the capacity of the runway system. A large percentage of aircraft delays are attributable to inclement weather.

Two weather conditions affect airport operations, Visual Meteorological Conditions (VMC) and Instrument Meteorological Conditions (IMC). VMC allows a pilot to operate the aircraft in visual conditions as long as they can maintain established cloud and visibility separation requirements. These requirements vary based on the airspace one is flying in. For GPT, which is Class D, visual operations require at least 3 statute miles of visibility. In addition, aircraft must remain no closer than 500 feet below, 1,000 feet above, and 2,000 feet horizontal distance from clouds. IMC describes weather conditions in which pilots are required to fly the aircraft solely by reference to instruments rather than visually. Airports are considered to be in IMC when the overall visibility is less than 3 statute miles and clouds are below a 1,000-foot ceiling. When an airport is in IMC, arrivals are normally limited to a specific runway that can accommodate instrument only approaches. This can include precision instrument approaches (those providing both horizontal and vertical guidance) and non-precision instrument approaches (those providing only vertical guidance).

Runways 14-32 and 18-36 can each accommodate visual operations during VMC. Runways 14 and 32 also have precision instrument approach capability while Runways 18 and 36 both have non-precision instrument approach capability.

**TABLE 41**

*2009 AIRCRAFT OPERATIONS, AIRPORT REFERENCE CODES, AND AIRCRAFT MIX INDEX CLASSIFICATIONS*

| Aircraft | Departures | Arrivals | Total Operations | Airport Reference Code | Weight Classification |
|---|---|---|---|---|---|
| Dassault Falcon/Mystère 10 | 2 | 2 | 4 | B-I | C |
| North American Rockwell Sabre 40/60 | 12 | 12 | 24 | B-I/C-I | C |
| BAe Jetstream 31 | 3 | 3 | 6 | B-II | C |
| BAe/Raytheon HS 125-1000/Hawker 1000 | 4 | 4 | 8 | B-II | C |
| Beech 1900/C-12J | 20 | 20 | 40 | B-II | C |
| Beech 200 Super King | 267 | 262 | 529 | B-II | C |
| Beech Super King Air 350 | 109 | 107 | 216 | B-II | C |
| Cessna Citation CJ2 | 9 | 9 | 18 | B-II | C |
| Cessna Citation CJ3 | 11 | 11 | 22 | B-II | C |
| Cessna Citation II/Bravo | 185 | 189 | 374 | B-II | C |
| Cessna Citation II/SP | 3 | 3 | 6 | B-II | C |
| Cessna Citation Sovereign | 28 | 27 | 55 | B-II | C |
| Cessna Citation V/Ultra/Encore | 60 | 59 | 119 | B-II | C |
| Cessna Excel/XLS | 84 | 86 | 170 | B-II | C |
| Dassault Falcon 2000 | 18 | 19 | 37 | B-II | C |
| Dassault Falcon 900 | 7 | 7 | 14 | B-II | C |
| Dassault Falcon/Mystère 20 | 22 | 36 | 58 | B-II | C |
| Dassault Falcon/Mystère 50 | 10 | 10 | 20 | B-II | C |
| Mitsubishi MU300/ Diamond I | 3 | 3 | 6 | B-II | C |
| Raytheon Super King Air 300 | 36 | 35 | 71 | B-II | C |
| Raytheon/Beech Beechjet 400/T-1 | 198 | 195 | 393 | B-II | C |
| Saab SF 340 | 20 | 20 | 40 | B-II | C |
| Shorts 330 | 131 | 131 | 262 | B-II | C |
| Shorts 360 | 0 | 1 | 1 | B-II | C |
| Convair CV-540/580/600/640, VC-131H | 1 | 1 | 2 | B-III | C |
| Dassault Falcon F7X | 1 | 1 | 2 | B-III | C |
| Embraer Brasilia EMB 120 | 16 | 17 | 33 | B-III | C |
| Gulfstream V/G500 | 9 | 9 | 18 | B-III | C |
| BAe HS 125-1/2/3/400/600 | 4 | 4 | 8 | C-I | C |
| IAI 1124 Westwind | 19 | 19 | 38 | C-I | C |
| IAI Astra 1125 | 2 | 2 | 4 | C-I | C |
| Learjet 25 | 4 | 5 | 9 | C-I | C |
| Learjet 40; Gates Learjet | 20 | 18 | 38 | C-I | C |
| Learjet 45 | 319 | 322 | 641 | C-I | C |
| Learjet 55 | 10 | 10 | 20 | C-I | C |
| BAe HS 125/700-800/Hawker 800 | 49 | 50 | 99 | C-II | C |
| Bombardier (Canadair) Challenger 300 | 10 | 9 | 19 | C-II | C |
| Bombardier Challenger 600/601/604 | 39 | 39 | 78 | C-II | C |
| Bombardier CRJ All Series | 1 | 3 | 4 | C-II | C |
| Bombardier CRJ-100 | 1 | 0 | 1 | C-II | C |
| Bombardier CRJ-200 | 3,630 | 3,648 | 7,278 | C-II | C |
| Bombardier CRJ-700 | 352 | 353 | 705 | C-II | C |
| Cessna Citation X | 20 | 18 | 38 | C-II | C |

## TABLE 41

*2009 AIRCRAFT OPERATIONS, AIRPORT REFERENCE CODES, AND AIRCRAFT MIX INDEX CLASSIFICATIONS*

| Aircraft | Departures | Arrivals | Total Operations | Airport Reference Code | Weight Classification |
|---|---|---|---|---|---|
| Cessna III/VI/VII | 24 | 24 | 48 | C-II | C |
| Embraer 170 | 16 | 16 | 32 | C-II | C |
| Embraer ERJ 135/140/Legacy | 52 | 51 | 103 | C-II | C |
| Embraer ERJ 145 EX | 131 | 128 | 259 | C-II | C |
| Embraer ERJ-145 | 2,888 | 2,884 | 5,772 | C-II | C |
| Gulfstream III/G300 | 13 | 12 | 25 | C-II | C |
| IAI 1126 Galaxy/Gulfstream G200 | 5 | 5 | 10 | C-II | C |
| Learjet 31/A/B | 50 | 52 | 102 | C-II | C |
| Learjet 35/36 | 163 | 292 | 455 | C-II | C |
| Airbus A319 | 1 | 1 | 2 | C-III | C |
| Airbus A320 All Series | 2 | 2 | 4 | C-III | C |
| Boeing (Douglas) C-9 Nightingale | 7 | 9 | 16 | C-III | C |
| Boeing (Douglas) DC 9-30 | 37 | 35 | 72 | C-III | C |
| Boeing (Douglas) MD 82 | 85 | 85 | 170 | C-III | C |
| Boeing (Douglas) MD 87 | 4 | 3 | 7 | C-III | C |
| Boeing 717-200 | 97 | 97 | 194 | C-III | C |
| Boeing 737-200/VC96 | 7 | 8 | 15 | C-III | C |
| Boeing 737-300 | 44 | 41 | 85 | C-III | C |
| Boeing 737-400 | 306 | 305 | 611 | C-III | C |
| Boeing 737-600 | 4 | 4 | 8 | C-III | C |
| Boeing 737-700 | 37 | 41 | 78 | C-III | C |
| Bombardier CRJ-900 | 16 | 15 | 31 | C-III | C |
| Douglas DC 9-10/30/50 | 8 | 10 | 18 | C-III | C |
| Boeing AV-8 Harrier | 4 | 3 | 7 | D-I | C |
| Boeing F-15 Eagle | 37 | 37 | 74 | D-I | C |
| Boeing FA-18 Hornet | 1 | 4 | 5 | D-I | C |
| Fuji T1 | 150 | 153 | 303 | D-I | C |
| Learjet 60 | 17 | 15 | 32 | D-I | C |
| Gulfstream II/G200 | 2 | 3 | 5 | D-II | C |
| Gulfstream IV/G400 | 32 | 29 | 61 | D-II | C |
| Boeing (Douglas) MD 83 | 68 | 68 | 136 | D-III | C |
| Boeing (Douglas) MD 88 | 444 | 451 | 895 | D-III | C |
| Boeing 737-800 | 103 | 101 | 204 | D-III | C |
| Boeing 737-900 | 1 | 1 | 2 | D-III | C |
| Bombardier BD-700 Global Express | 1 | 1 | 2 | D-III | C |
| Lockheed F-16 Fighting Falcon | 32 | 25 | 57 | E-I | C |
| Northrop F-5 Freedom Fighter | 14 | 12 | 26 | E-I | C |
| Northrop T-38 Talon | 285 | 283 | 568 | E-I | C |
| **TOTAL** | 10,937 | 11,085 | 22,022 | | |

**TABLE 41**

*2009 AIRCRAFT OPERATIONS, AIRPORT REFERENCE CODES, AND AIRCRAFT MIX INDEX CLASSIFICATIONS*

| Aircraft | Departures | Arrivals | Total Operations | Airport Reference Code | Weight Classification |
|---|---|---|---|---|---|
| Airbus A310 All Series | 10 | 10 | 20 | C-IV | C |
| Boeing 757-200 | 23 | 23 | 46 | C-IV | C |
| Boeing 767-300 | 26 | 26 | 52 | C-IV | D |
| Boeing C-17 Globemaster 3 | 81 | 78 | 159 | C-IV | D |
| Boeing KR 35 Stratotanker | 88 | 92 | 180 | C-IV | D |
| Boeing (Douglas) DC 10-10/30/40 | 48 | 47 | 95 | C-IV | D |
| Lockheed C-5 | 23 | 23 | 46 | C-VI | D |
| Lockheed 130 Hercules | 269 | 375 | 644 | C-IV | C |
| Boeing (Douglas) DC 8-60 | 1 | 1 | 2 | D-IV | D |
| Boeing (Douglas) MD 11 | 9 | 10 | 19 | D-IV | D |
| Douglas KC-10 | 0 | 1 | 1 | D-IV | D |
| Boeing 747-200 | 11 | 11 | 22 | D-V | D |
| Boeing 747-400 | 15 | 15 | 30 | D-V | D |
| **TOTAL** | 604 | 712 | 1,316 | | |

Source: URS Corpoartion Analysis, 2011.

## Wind Coverage

Wind affects runway system capacity, since it can particularly have an impact on the operation of small, general aviation aircraft. Large, commercial service aircraft generally are not as susceptible to crosswinds as are the general aviation aircraft. Most general aviation aircraft are not permitted to take off or land if crosswinds exceed the aircraft manufacturer's specifications. Runways should therefore be oriented in the direction of the prevailing winds to provide maximum lift for takeoff. FAA criteria specify that the runway(s) orientation should provide at least 95% wind coverage. Wind roses constructed from historical weather observations and climatology data are used to calculate the percentage of wind coverage offered by individual or groups of runways. The current runway configuration at GPT provides greater than 95 percent wind coverage for all aircraft during all weather and IMC conditions.

## Arrivals and Departures

The percentage of arrivals versus departures can affect an airport's overall capacity since a higher number of departures can typically be accommodated in a given period of time than arrivals.

## Touch and Go Operations

Touch and Go operations are primarily performed for pilot training by small, single- and twin-engine general aviation aircraft. These operations consist of an aircraft performing an approach to a runway, briefly touching down on the runway then immediately applying full throttle to depart the runway. Runways can accommodate a greater number of touch and go operations than any other type of operation. Therefore, the numbers of touch and go operations will impact an airport's overall operational capacity. The greater the numbers of touch and go operations, generally the greater the overall capacity of a particular runway or runway system. Touch and go operations at GPT comprise less than 20 percent of total airport operations and are not expected change significantly during the study period.

### Annual Service Volume (ASV)

The initial step in developing Demand/Capacity Analysis is to conduct a preliminary assessment of the forecast demand levels relative to the airfield capacity. This analysis determines whether demand is approaching the airfield's capacity or Annual Service Volume (ASV) and whether a detailed capacity calculation is warranted. Calculating the ASV incorporates the Runway Use Configuration and Fleet Mix among many other variables.

Chapter 2 of the Airport Capacity and Delay Advisory Circular (AC 150/5060-5) details the procedure for calculating capacity and delay for long range planning. This circular provides a variety of typical runway configurations at airports in the United States. The first step in calculating the ASV is to select the configuration that most closely reflects the airfield configuration at the study airport. As discussed in the Inventory chapter, GPT has two active runways; Runway 14-32 is the primary runway equipped with both precision and non-precision instrument approaches. Runway 18-36 is a crosswind runway with non-precision instrument approach capability. The runway use diagrams in AC 150/5060-5 assume there is at least one runway equipped with a precision instrument approach, which is the case at GPT. The runway use configuration in the capacity and delay advisory circular that best fits GPT's runway layout is number 9 as illustrated on Table 42 below.

**TABLE 42**
*RUNWAY USE DIAGRAM NUMBER 9*

| Runway Configuration | Mix Index | Hourly Capacity Ops / Hour | | Annual Service Volume |
|---|---|---|---|---|
| | % (C + 3D) | VFR | IFR | Ops/Yr |
|  | 0 to 20 | 98 | 59 | 230,000 |
| | 21 to 50 | 77 | 57 | 200,000 |
| | 51 to 80 | 77 | 56 | 215,000 |
| | 81 to 120 | 76 | 59 | 225,000 |
| | 121 to 180 | 72 | 60 | 265,000 |

Source: FAA - AC 150/5060-5, 2010.

The second component needed to calculate the ASV is the fleet mix or mix index. This is the percentage of aircraft operations by multi-engine aircraft in Aircraft Class C (maximum certificated takeoff weights between 12,500 pounds and 300,000 pounds) and Aircraft Class D (maximum certificated takeoff weights greater than 300,000 pounds). The formula for determining aircraft mix is the percentage of Class C aircraft plus three times the percentage of Class D aircraft or % (C+3D). The larger and heavier Class D aircraft have a greater impact on airfield capacity because the wake turbulence they generate can affect trailing aircraft, which requires increased separation during operations; increased separation reduces capacity. Table 43 presents the breakdown of the Aircraft Classifications used in determining the Aircraft Mix Index.

**TABLE 43**
*AIRCRAFT APPROACH CATEGORIES* AND DESIGN GROUPS***

| Aircraft Class | Maximum Certificated Takeoff Weight (lbs.) | Number of Engines | Wake Turbulence Classifications |
|---|---|---|---|
| A | 12,500 or less | Single | Small (S) |
| B | | Multi | |
| C | 2,500 - 300,000 | Multi | Large (L) |
| D | Over 300,000 | Multi | Heavy (H) |

The mix index was developed based on information presented in Table 31, which lists 2009 Large (>12,500 pounds) aircraft operations at GPT by Aircraft Type. Since the Airport Reference Code for GPT is D-IV, the assumption was made that aircraft larger than D-IV do not typically use the airport. The Fleet Mix, based on these data for 2009 operations is 43.1 percent. The projected Fleet Mix index by the year 2030 is expected to be within the same range of 21 to 50 percent.

The existing (2009) and projected (2030) Annual Service Volume, identified using AC 150/5060-5, runway-use configuration number 9 is approximately 200,000 annual operations. In 2009, total airport operations (57,221) represented approximately 28.6 percent of Airport capacity. Projected demand at Gulfport-Biloxi International Airport by 2030 is estimated to be 78,520 annual operations. This represents approximately 39.3 percent of the Airport's estimated capacity of 200,000 annual operations. Exhibit 15 compares forecast demand versus GPT's annual service volume throughout the planning period. Existing airfield capacity will be adequate to accommodate projected demand throughout the planning period as illustrated on this exhibit.

### Hourly Airfield Capacity

The hourly capacity of the airfield is a measure of the maximum number of aircraft operations that can be accommodated during a given hour of the day. This calculation identifies whether the airport can sufficiently accommodate the forecast hourly demand within the planning period.

Estimated VFR and IFR hourly capacities were also determined based on the procedures identified in AC 150/5060-5. For the two mix indices, which are within the 21 to 50 percent Mix Index range, the VFR hourly capacity is approximately 77 operations and IFR capacity totals approximately 57 operations. Peak hour VFR demand is projected to total 30 operations by 2030, which represents 41 percent of the hourly VFR capacity (30/77). Peak hour IFR demand was not specifically quantified in the forecast; however, this value will not exceed peak hour VFR demand. Therefore, the hourly IFR demand would not exceed 53 percent of the IFR capacity (30/57). These calculations show that airfield capacity will be adequate to accommodate projected VFR and IFR demand throughout the planning period.

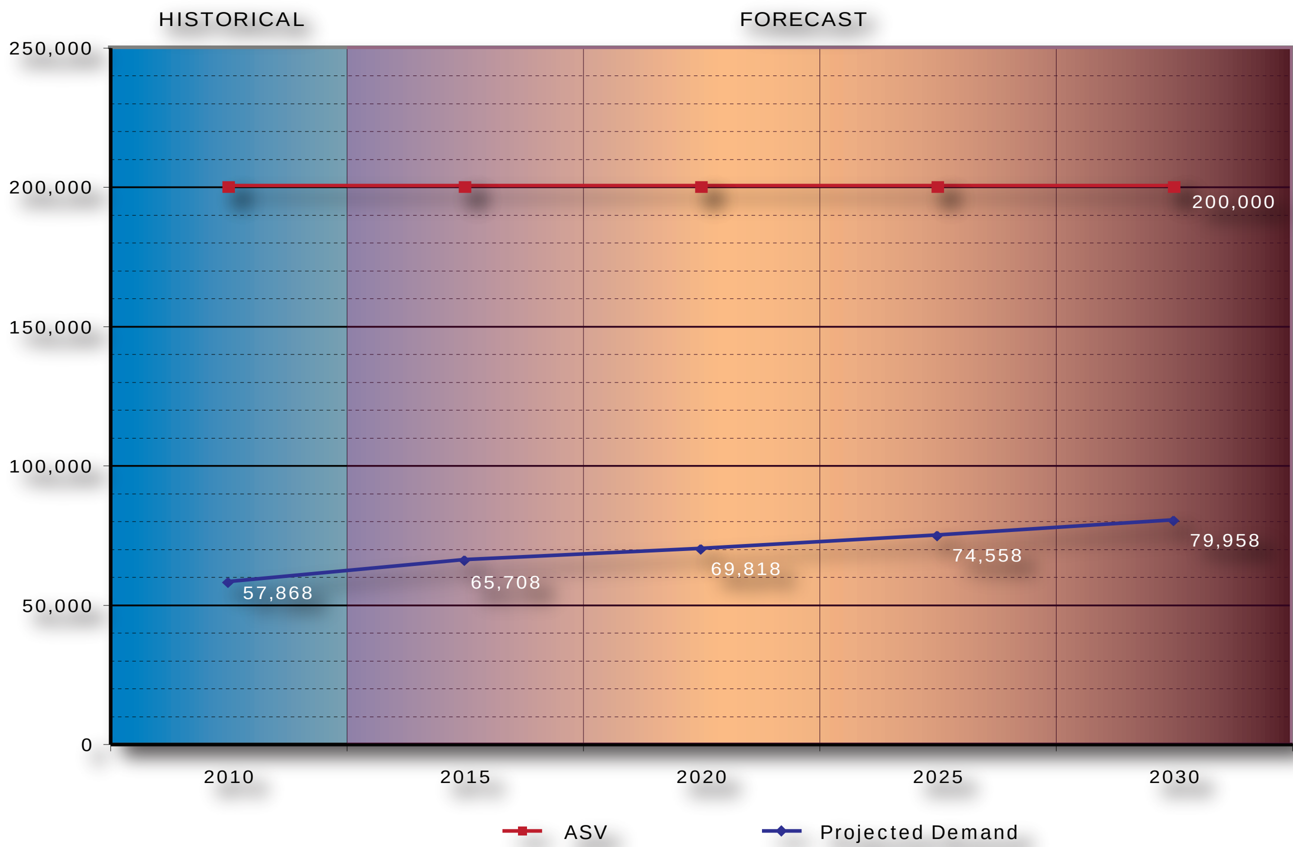


**Exhibit 15**
*FORECAST DEMAND VERSUS ANNUAL SERVICE VOLUME*

FAA guidelines suggest that when annual operations reach 60 percent of Annual Service Volume, planning should be undertaken for facility improvements to increase operational capacity. The calculated estimates of ASV and hourly capacity resulted in the conclusion that the airport will not reach this level within the forecast horizon and therefore, additional runway development for capacity purposes is not anticipated.

## Facility Requirements – Airside

Identification of the "Critical Aircraft" was presented previously in this Chapter of the Master Plan Update with the Boeing 737-800 expected to assume the role of critical aircraft for Aircraft Approach Category and the Lockheed C-130 Hercules expected to remain the critical aircraft for Airplane Design Group.

### Runway Length

The Airport's role and analysis of FAA runway length criteria will determine the required runway length at Gulfport-Biloxi International Airport. Runway length is a function of airport elevation; mean maximum temperature of the hottest month, aircraft take-off weight, aircraft engine performance, runway gradient, runway moisture, etc. All of these variables affect aircraft lift. Runway length is determined using the manufacturers' performance curves or procedures outlined in the FAA Advisory Circulars.

Gulfport-Biloxi International Airport is classified as a Greater than Utility airport, serving Category D aircraft on a regular basis. Category D aircraft have an approach speed of 141 knots or more but less than 166 knots. Aircraft operating at the airport include those in Airplane Design Groups I, II, III, and IV, i.e., aircraft with wingspans up to but not including 179 feet. The airport is not expected to accommodate more than 500 annual itinerant operations by aircraft with approach speeds of 166 knots or greater. Therefore, the Airport Reference Code will remain D-IV throughout the planning period. The current and future Airport role and runway functions of the Gulfport-Biloxi International Airport are:

- Airport Role:........................ Greater than Utility
- Runway 14-32: .................... Greater than Utility Runway –
- ........................................... Aircraft Approach Categories A, B, C, and D
- Airport Reference Code:....... D-IV Current
- Airport Reference Code:....... D-IV Future

D-IV Airport Reference Code airports can accommodate all single engine and light twin-engine aircraft such as the Cessna 150/172, Mooney Ovation, Piper Cherokee/Arrow, Beech Bonanza/Baron, Beech King Air 90F and King Air 100 etc. In addition, these airports can accommodate virtually all business jets including the Cessna Citation I and CitationJet, Citation Excel, the Challenger 600 series aircraft, Falcon 2000, Falcon 900 and the majority of large commercial passenger and cargo aircraft including the Boeing (McDonnell Douglas) MD-11 and DC-8/73.

Table 44 presents the runway length requirements for GPT, which were derived from the FAA Airport Design software program, based on the Airport elevation of 28 feet above mean sea level (AMSL), the mean maximum temperature of 91 degrees Fahrenheit for the hottest month of the year and the effective runway gradient. The runway length requirement is 4,280 feet for all small airplanes (aircraft with maximum takeoff weights of 12,500 pounds or less). The runway length required to accommodate large airplanes with maximum takeoff weights of 60,000 pounds or less would range from approximately 4,690 feet to 8,480 feet.

In addition to the data presented in Table 34, the most recent editions of the Airplane Characteristics for Airport Planning manuals were obtained from both Boeing and Airbus for use in developing the runway length requirement for those airplanes with a Maximum Certificated Takeoff Weight of more than 60,000 pounds (27,200 KG), that are in the existing and projected GPT fleet. These documents provide general information and guidelines for use in determining runway length requirements.

These manuals contain aircraft performance charts for a number of alternative takeoff flap settings for each specific aircraft and engine type. Different flap settings result in different takeoff and landing runway length requirements. The takeoff flap setting that yielded the most conservative takeoff length was selected for each aircraft identified in the GPT fleet. This approach was used for two reasons 1) the takeoff length determined using this characteristic represents the most critical takeoff runway requirement that could be encountered and 2) determination of the specific flap setting to be used cannot be absolutely predicted beforehand since the pilot has ultimate discretion in the choice of flap setting used

**TABLE 44**
*RUNWAY LENGTH REQUIREMENTS*

| Airport and Runway Data | |
|---|---|
| Airport Elevation | 28 Feet |
| Mean Maximum Temperature of the hottest month | 91.0° F |
| Maximum difference in runway centerline elevation | 3 Feet |
| Length of haul for airplanes of more than 60,000 pounds | 1,000 Miles |
| | Dry runways |
| **Runway Lengths Recommended For Airport Design** | |
| Small airplanes with approach speeds of less than 50 knots | 820 Ft. |
| Small airplanes with less than 10 passenger seats: | |
| 75 percent of these small airplanes | 2,520 Ft. |
| 95 percent of these small airplanes | 3,090 Ft. |
| 100 percent of these small airplanes | 3,660 Ft. |
| Small airplanes with 10 or more passengers | 4,280 Ft. |
| Large airplanes of 60,000 pounds or less: | |
| 75 percent of these airplanes at 60 percent useful load | 4,690 Ft. |
| 75 percent of these airplanes at 90 percent useful load | 6,810 Ft. |
| 100 percent of these airplanes at 60 percent useful load | 5,490 Ft. |
| 100 percent of these airplanes at 90 percent useful load | 8,480 Ft. |
| Airplanes of more than 60,000 pounds | 5,960 Ft. |

Source: URS Corporation Analysis, FAA AC 150/5300-13

based on conditions experienced at the time of takeoff, such as wind speed/direction, aircraft weight, available runway length, etc.

Analyses using the Airplane Characteristics for Airport Planning manuals revealed that all of the aircraft currently operating in the commercial passenger and air cargo fleet at GPT could operate from the existing primary Runway 14-32 with no restrictions. However, the Airplane Characteristics for Airport Planning manuals do not provide runway performance curves for all possible operating temperatures that may be encountered. The performance curves typically provided include performance curves for the industry "standard day", which represents an ambient temperature of 59 degrees Fahrenheit. The Standard Day curves are usually supplemented by one or sometimes two additional higher ambient temperature, typically categorized as the "standard day" plus either 25 degrees or 27 degrees Fahrenheit, which equate to 84 degrees and 86 degrees Fahrenheit, respectively. Gulfport, with a mean maximum temperature of 91 degrees Fahrenheit in the hottest month of the year falls outside the parameters provided in these manuals.

The runway length requirements for a variety of cargo aircraft operated by FedEx and UPS were determined using the Airplane Characteristics for Airport Planning manuals. Table 45 presents a summary of the runway length requirements for the aircraft in the respective cargo fleets. This analysis resulted in takeoff length requirements for these aircraft ranging from 6,500 feet to 7,700 feet. Based on this analysis, the existing 9,002-foot runway length would accommodate all projected future aircraft operations.

**TABLE 45**

*AIRPORT AND RUNWAY DATA*

| Aircraft | Fleet | Engine/Payload | Max Payload | MTOW | Runway Length |
|---|---|---|---|---|---|
| **FedEx Aircraft Fleet** | | | | | |
| Airbus A310-200 | 49 | GE Payload @ 57,000# | 72,296# | 320,000# | 7,200' |
| Airbus A310-300 | 20 | PW – Payload @ 72,500# | 80,685# | 339,291# | 7,200' |
| Boeing 757-200 | 44 | RR – Payload @ 86,000# | 86,000# | 255,000# | 6,500' |
| **UPS Aircraft Fleet** | | | | | |
| Airbus A-300-200* | 53 | GE - Payload @ 82,662# | 82,662# | 347,227# | 7,100' |
| Boeing 757-200 | 75 | RR – Payload @ 86,000# | 86,000# | 255,000# | 6,500' |
| Boeing 767-300 | 39 | GE – Payload @ 121,000# | 121,000# | 412,000# | 7,700' |

* Range limited to @ 2,000 NM @ MTOW

Source: URS Corporation Analysis, FAA AC 150/5300-13

The primary runway, Runway 14-32, at 9,002 feet long by 150 feet wide, will accommodate all of the aircraft projected to operate at GPT. Runway 18-36 at 4,935 feet long by 150 feet wide can accommodate all small aircraft and 75 percent of those large aircraft of 60,000 pounds or less operating at 60 percent of their useful load.

### Secondary Runway

Commercial service airports such as GPT represent a significant economic component within the local economy. As the hub of the tourism travel industry on the Mississippi Gulf Coast, reliable operations are a necessity.

While Runway 14-32 provides the runway length required to accommodate all existing and anticipated aircraft operations throughout the planning period, should Runway 14-32 become unavailable for any reason, such as maintenance or accident, the Airport's operations would experience severe hardship as Runway 18-36 currently does not provide the length needed to accommodate commercial aircraft operations. The closure of Runway 14-32 would also result in significant operational delays, particularly to the commercial air carriers and the military.

Airport management should plan for the development of Runway 18-36 as a secondary, backup runway to Runway 14-32 with an overall length of at least 7,100 feet. At that length, Runway 18-36 could accommodate the vast majority of existing and future aircraft operations in the event Runway 14-32 becomes unusable. Development of Runway 18-36 as a backup would provide for the continued capability of the Airport to support commercial operations in the event of a closure of Runway 14-32 for any reason.

### Summary of Runway Length Requirements

The variety of aircraft operating at GPT encompasses the entire spectrum of the commercial, military, and general aviation fleets. These aircraft have varying requirements relative to takeoff runway length. The fleet operated by the existing commercial passenger carriers, the military, and general aviation are well served by Runway 14-32.

GPT should pursue development of Runway 18-36 as a backup to Runway 14-32 to insure operational capability, providing a takeoff length of 7,100 feet to serve the existing and projected fleet.

### Airfield Pavement - Strength and Condition

Runway 14-32 provides existing pavement strength of 60,000 pounds single wheel, 155,000 pounds dual wheel, and 265,000 pounds dual wheel tandem loading. These pavement bearing capacities will accommodate the majority of the aircraft projected to operate at the airport throughout the planning period.

The runway is comprised of both concrete and asphalt pavement sections. The asphalt pavement, which comprises the middle portion of the runway is in good condition. However, issues have arisen with the concrete pavement sections, which are located on the north (Runway 14) and south (Runway 32) ends of the runway. These two pavement sections have experienced expansion and cracking, which has resulted in excessive horizontal movement along the runway edges and structures; pop-outs and spalling of the pavement; and greater potential for foreign object debris (FOD) on the runway. The Runway 14 ends represents a section approximately 2,000 feet in length by 150 feet wide, while the Runway 32 end is approximately 1,500 feet in length by 150 feet wide.

A comprehensive analysis of these issues was conducted and a plan formulated to address the problem. The initial effort involved cutting relief joints in the pavement to minimize future pavement blow-ups. This effort is being followed-up by a design and construction project that will replace the affected concrete pavement sections on each runway end in 2014.

Runway 18-36 provides existing pavement strength of 20,000 pounds single wheel and 115,000 pounds dual wheel tandem loading with the pavement in good condition. The crosswind Runway 18-36 pavement is not currently capable of supporting daily operations by aircraft in the existing and projected aircraft fleet. This pavement should be strengthened to provide for these operations at the time the runway is extended.

While foreseeable conditions do not indicate the need for additional airfield pavement strength beyond that already discussed, a nominal overlay will likely be required in the latter stages of the planning period to sustain pavement quality, due to the effects of weathering and oxidation. An on-going Pavement Management Plan for all airfield pavements should be maintained to provide more detailed guidance for future airfield pavement requirements.

### Runway Width Requirements

The runway width requirement is based on the Airport Reference Code and the ARC for the specific runway. The FAA Advisory Circular on Airport Design (AC 150/5300-13) specifies a runway width of 150 feet for ARC D-IV. GPT's primary runway is 150 feet wide and currently meets the FAA recommended criteria. The crosswind runway, Runway 18-36, is 150 feet wide and is currently categorized as a C-II ARC that is projected to be upgraded to a C-IV ARC. The FAA guidance recommends that C-II runways have a width of 100 feet and C-IV runways have a width of 150 feet. This runway currently exceeds the federal standards for runway width and will meet the FAA recommended criteria when the ARC is upgraded.

### Taxiway Requirements

Not only do runway improvements increase capacity, taxiway improvements can as well. An efficient taxiway system can increase the airport's ability to handle departing and arriving aircraft by expediting movements onto and off the runway system. Additions or improvements to an airport taxiway system are generally undertaken to increase runway capacity and improve safety. An efficient runway/taxiway system increases an airport's ability to handle arriving and departing aircraft and expedites aircraft ground movements between the runway system and the terminal area.

Taxiway improvements at GPT are recommended to enhance airfield safety and Airport operations. All taxiway improvements are designed to comply with applicable FAA criteria for their respective Airport Reference Codes. FAA criteria recommend a taxiway width of 75 feet to accommodate aircraft in the D-IV ARC and a width of 50 feet to accommodate aircraft in the B-III ARC. All existing parallel taxiways are 75 feet wide and therefore meet existing FAA design criteria.

Taxiway J, located on the southeast side of Runway 14-32, is currently being extended and will ultimately provide a full-length parallel to this runway. Completion of this full-length parallel taxiway will provide more direct access between the runway and the new GA area and air cargo facilities.

Runway 18-36, as mentioned previously, has a parallel, apron edge taxiway on the east side of the Runway along the Air National Guard apron. Development of partial parallel taxiways serving the west side of the airfield and both runway ends has been proposed to increase airfield efficiency and access to/from the west side of the airfield.

Additional angled exit taxiways are proposed off Runway 14-32 that will connect with Taxiway "C".

As currently configured, aircraft taxiing to the Lighthouse hangar and any future hangars constructed southeast of the Million Air facility must taxi on the ramp in front of the Million Air terminal. This has resulted in unanticipated congestion and the requirement for additional safety area setbacks that limit the functionality of the ramp in front of this facility. In order to alleviate this problem the Airport is undertaking a project to construct a new access taxiway (Taxiway "G"), which will provide access to the Lighthouse Hangar and any future new hangars off of Taxiway "J".

FAA has issued an update to AC 150-5300 13 (Change 17), which includes new guidelines for taxiway design. This change incorporates revisions to the configuration of exit taxiways that will affect the layout of some of the proposed taxiways at GPT. Change 17 also includes a requirement that all taxiways "that will accommodate Airplane Design Group III and higher must provide stabilized or paved shoulders to reduce the possibility of blast erosion and engine ingestion problems associated with jet engines that overhang the edge of the taxiway pavement".

FAA airport design guidelines stipulate a 20 foot shoulder for taxiways 50 feet wide accommodating Design Group III aircraft and a 25 foot shoulder for taxiways 75 feet wide accommodating Design Group IV aircraft. In all other cases, the minimum taxiway shoulder width is 10 feet for taxiways that are designed for Group I and II aircraft. All taxiways should continue to be provided with the appropriate shoulders respective of their design aircraft.

### Airfield Instrumentation/NAVAIDS and Lighting

Runway 14-32 is equipped with High Intensity Runway Lights (HIRL) and Runway 18-36 is equipped with Medium Intensity Runway Lights (MIRL). HIRL's are the appropriate lighting recommended by FAA to compliment the Instrument Landing System (ILS) on Runway 14-32. All major taxiways are equipped with Medium Intensity Taxiway Lights (MITL). MITL systems are sufficient throughout the planning period. A lighted windsock is provided for all runways. Runway 14 has a Simplified Short Approach Lighting System with Runway Alignment Indicator Lights (SSALR) and Runway 32 has a Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR).

An upgrade of Runway 18-36 to precision instrument capability is anticipated during the course of the planning period. This upgrade is anticipated at the time the runway is extended. An upgrade of the runway lighting to HIRLs should be undertaken at the time precision instrument approach capability is provided on Runway 18-36.

The Airport has a clear and green rotating beacon that alerts aircraft to the presence of the airfield and that the airfield is lighted. The airport beacon was relocated in 2011 to the former ASR site, which is located just east of the intersection of Virginia Avenue and Harrison Street along the west side of the airfield. While recently refurbished, another rehabilitation of the airport beacon should be programmed late in the planning period.

### FAA Airfield Safety Areas

FAA standards for runways and runway-related elements such as runway protection zones (RPZs), runway safety areas (RSAs), and object free areas (OFAs) are presented in this section. The following narrative discusses the standard width and length for runway-related safety elements.

The dimensions of the respective safety areas are determined by the types of aircraft using the respective runways (i.e., the Approach Category and Design Group of the aircraft) and the type of approach to each runway - visual, non-precision, or precision.

Runway 14-32 has an existing and future Airport Reference Code of D-IV. Runway 18-36 currently has an Airport Reference Code of B-III that is projected to change to D-IV during the planning period. Table 46 summarizes the existing and future safety area criteria for the respective runways based on their Existing and Future Airport Reference Codes.

- Runway protection zones are trapezoidal in shape and are centered on the extended runway centerline (see Exhibit 16). Table 47 lists the RPZ dimensions for the various types of runways with specific approach visibility minima and types of aircraft the runways are expected to serve. The purpose of the RPZ is to enhance the protection of people and property on the ground. The RPZ begins 200 feet beyond the usable end of the runway pavement. Displacing the landing or takeoff threshold does not change the beginning point of the RPZ, except where Declared Distances are implemented. The actual RPZ length and width depend on the size of the aircraft using the runway and type of approach available.

## TABLE 46
## *AIRFIELD SAFETY AREAS*

| Runway | AIRFIELD SAFETY AREAS | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Existing RPZ | | | Future RPZ[a] | | | OFA | | | | RSA | | | | | | | |
| | | | | | | | Existing | | Future | | Existing | | Future | | | | | |
| | L | W[1] | W[2] | L | W[1] | W[2] | Q | R | Q | R | P | C | P | C | | | | |
| 14 | 2,500 | 1,000 | 1,750 | 2,500 | 1,000 | 1,750 | 800 | 1,000 | 800 | 1,000 | 500 | 1,000 | 500 | 1,000 | | | | |
| 32 | 2,500 | 1,000 | 1,750 | 2,500 | 1,000 | 1,750 | 800 | 1,000 | 800 | 1,000 | 500 | 1,000 | 500 | 1,000 | | | | |
| 18 | 1,000 | 500 | 700 | 2,500 | 1,000 | 1,750 | 800 | 600 | 800 | 1,000 | 300 | 600 | 500 | 1,000 | | | | |
| 36 | 1,000 | 500 | 700 | 2,500 | 1,000 | 1,750 | 800 | 600 | 800 | 1,000 | 300 | 600 | 500 | 1,000 | | | | |
| | | | | Ultimate RPZ | | | | | | | | | | | | | | |
| 18R | N.A. | N.A. | N.A. | 2,500 | 1,000 | 1,750 | N.A. | N.A. | 800 | 1,000 | N.A. | N.A. | 500 | 1,000 | | | | |
| 36L | N.A. | N.A. | N.A. | 2,500 | 1,000 | 1,750 | N.A. | N.A. | 800 | 1,000 | N.A. | N.A. | 500 | 1,000 | | | | |

L = Runway Protection Zone - Length
W1 = Runway Protection Zone - Inner Width
W2 = Runway Protection Zone - Outer Width
Q = Object Free Area - Width
R = Object Free Area - Length
P = Runway Safety Area - Width
C = Runway Safety Area - Length

Source: FAA - AC 150/5300-13 with changes - see Figure 19.
[a] - assumes implementation of a precision approach.
URS Corporation Analysis.

Generally, as aircraft size increases and the approach minimums become more precise, the dimensions of the RPZ increase.

## TABLE 47
## *RUNWAY PROTECTION ZONE DIMENSIONS*

| Approach Visibility Minimums | Facilities Expected To Serve | Dimensions: Length Feet (meters) | Dimensions: Inner Width Feet (meters) | Dimensions: Outer Width Feet (meters) | RPZ Acres |
|---|---|---|---|---|---|
| Visual and Not lower than 1-Mile (1 600 m) | Small Aircraft Exclusively | 1,000 (300) | 250 (75) | 450 (135) | 8.035 |
| | Aircraft Approach Categories A & B | 1,000 (300) | 500 (150) | 700 (210) | 13.770 |
| | Aircraft Approach Categories C & D | 1,700 (510) | 500 (150) | 1,010 (303) | 29.465 |
| Not lower than 3/4-Mile (1 200 m) | All Aircraft | 1,700 (510) | 1,000 (300) | 1,510 (453) | 48.978 |
| Lower Than 3/4-Mile (1200 m) | All Aircraft | 2,500 (750) | 1,000 (300) | 1,750 (525) | 78.914 |

Source: FAA - AC 150/5300-13.

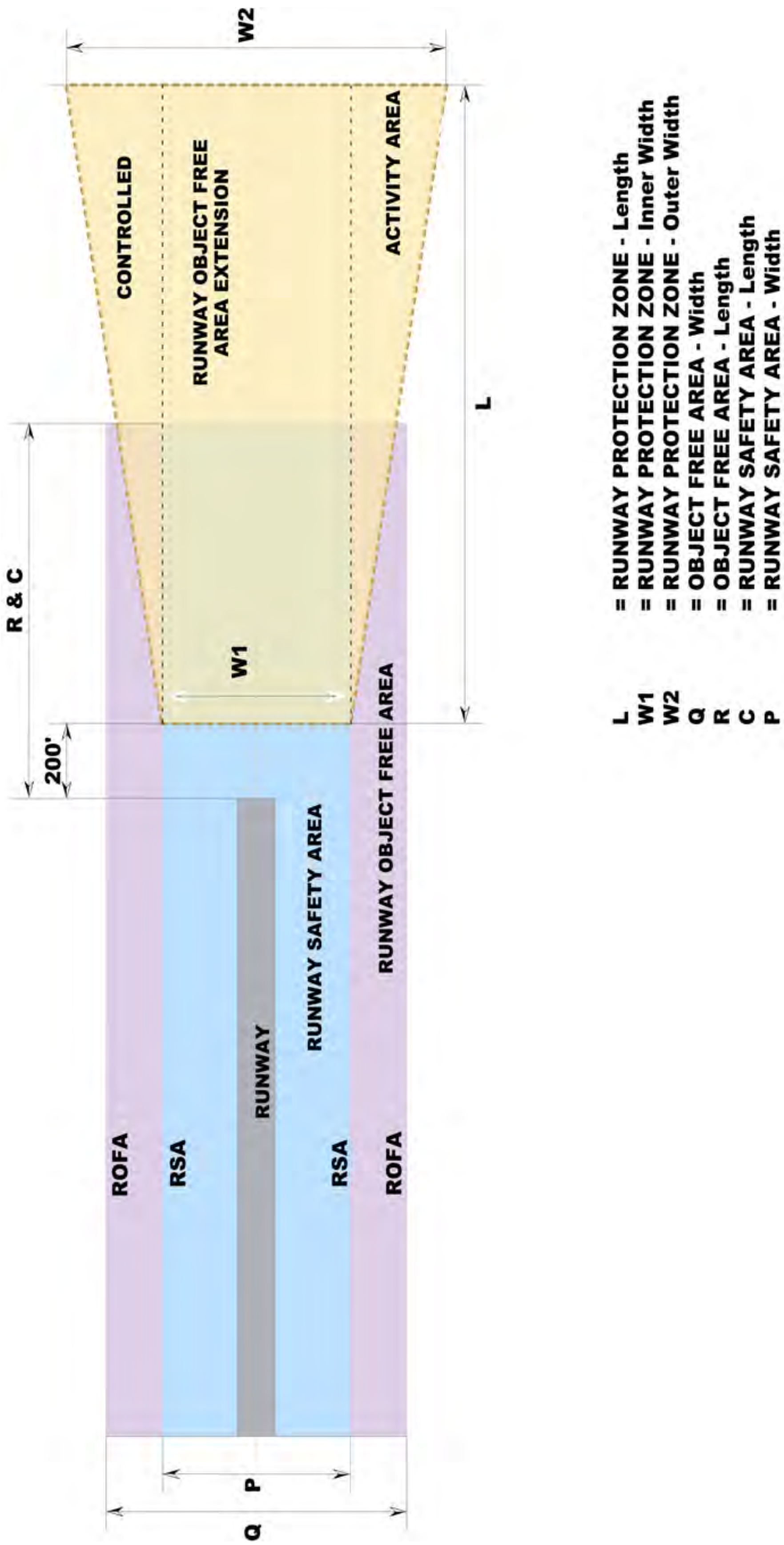


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EXHIBIT 16
AIRFIELD SAFETY AREAS

The RPZ contains two sub-areas, the runway object free area (OFA) and the controlled activity area, discussed in the following sections.

- The runway OFA is a two-dimensional ground area surrounding the runway from which parked aircraft and objects, except Navaids and objects with locations fixed by function, are prohibited. All existing and future runway OFA's should extend 600 feet beyond each runway end and be 800 feet in width. Existing and future OFA dimensions for all runways are also presented in Table 36.
- The controlled activity area is the portion of the RPZ beyond and to the sides of the runway OFA. The airport should maintain control of this area through fee simple ownership. The controlled activity area should be free of land uses that create glare and smoke and residences. Fuel-handling facilities, churches, schools, and offices are not recommended in the RPZ's controlled activity area. Roads are also typically not recommended within the RPZ.

All of the existing and future Runway 14-32 safety areas (RPZ, RSA, and OFA) meet current FAA design criteria. With the exception of the OFA, Runway 18-36 meets all of the current safety area criteria for it's existing B-III ARC - the existing OFA is 541 feet in length, which is 59 feet short of the FAA criteria of 600 foot length.

The ARC for Runway 18-36 will change to a D-IV classification once this runway is extended, which will result in increased dimensions for all of the safety areas. At that time, the RPZ, RSA, and OFA will fall short of the current FAA safety area criteria as listed in Table 37.

## Airport Design Elements

Table 48 lists all of the specific runway and taxiway width and clearance dimensions for the B-III, C-IV and D-IV Airport Reference Codes applicable at GPT. These dimensions are referenced in this and subsequent sections of this chapter.

The recommended B-III OFA dimensions are 800 feet in width extending 600 feet in length beyond each runway end. C-IV and D-IV OFA dimensions are 800 feet in width extending 1,000 feet in length beyond each runway end. The RSA dimensions for the B-III classification is 300 feet in width by 600 feet in length while the C-IV and D-IV classifications are 500 feet in width by 1,000 feet in length.

The Runway 14-32 OFA's meet the recommended FAA design criteria. The existing Runway 18-36 RSA dimensions meet the current FAA criteria. When this runway is extended, the RSA will only extend 900 feet beyond the Runway 31 end and will need to be upgraded to meet FAA design criteria.

## Runway/Taxiway Separation

The recommended separation distance between the runway centerline and the parallel taxiway centerline for airports designed to accommodate aircraft with maximum gross takeoff weights greater than 12,500 pounds is 300 feet for a B-III ARC while that for a D-IV ARC is 400 feet. The existing separation distance between the centerline of Runway 14-32 (D-IV ARC) and parallel taxiway "C" is 650 feet. The distance between the centerline of Runway

## TABLE 48
### *AIRPORT DESIGN AIRPLANE AND AIRPORT DATA*

| Design Element | CRITERIA | | |
|---|---|---|---|
| Aircraft Approach Category | B | C | D |
| Airplane Design Group | III | IV | IV |
| Airplane wingspan | 61.88 | 124.83 | 156.10 feet |
| Primary end approach visibility minimums | not lower than 1 mile | CAT 1 | CAT 1 |
| Other runway end is | not lower than 1 mile | CAT 1 | CAT 1 |
| Undercarriage width (1.15 x main gear track) | 11.9 feet | 27.6 feet | 35.1 feet |
| Airport elevation | | 28 feet | |
| **Runway and Taxiway Width and Clearance Standard Dimensions** | | | |
| Runway centerline to parallel taxiway/taxilane | 300 feet | 400 feet | 400 feet |
| Runway centerline to edge of aircraft parking | 400 feet | 500 feet | 500 feet |
| Taxiway centerline to parallel taxiway/taxilane | 152 feet | 215 feet | 215 feet |
| Taxiway centerline to fixed or movable object | 93 feet | 129.5 feet | 129.5 feet |
| Taxilane centerline to parallel taxilane centerline | 140 feet | 198 feet | 198 feet |
| Taxilane centerline to fixed or movable object | 81 feet | 112.5 feet | 112.5 feet |
| Runway protection zone at the primary runway end: | | | |
| Length | 1,000 feet | 2,500 feet | 2,500 feet |
| Width 200 feet from runway end | 500 feet | 1,000 feet | 1,000 feet |
| Width 1,200 feet from runway end | 700 feet | 1,750 feet | 1,750 feet |
| Runway protection zone at other runway end: | | | |
| Length | 1,000 feet | 2,500 feet | 2,500 feet |
| Width 200 feet from runway end | 500 feet | 1,000 feet | 1,000 feet |
| Width 1,200 feet from runway end | 700 feet | 1,750 feet | 1,750 feet |
| Runway obstacle free zone width | 400 feet | 400 feet | 400 feet |
| Runway obstacle free zone length | 200 feet | 200 feet | 200 feet |
| Runway width | 100 feet | 150 feet | 150 feet |
| Runway shoulder width | 20 feet | 25 feet | 25 feet |
| Runway safety area width | 300 feet | 500 feet | 500 feet |
| Runway safety area length | 600 feet | 1,000 feet | 1,000 feet |
| Runway object free area width | 800 feet | 800 feet | 800 feet |
| Runway object free area length | 600 feet | 1,000 feet | 1,000 feet |
| Taxiway width | 50 feet | 75 feet | 75 feet |
| Taxiway edge safety margin | 10 feet | 15 feet | 15 feet |
| Taxiway shoulder width | 20 feet | 25 feet | 25 feet |
| Taxiway safety area width | 118 feet | 171 feet | 171 feet |
| Taxiway object free area width | 186 feet | 259 feet | 259 feet |
| Taxilane object free area width | 162 feet | 225 feet | 225 feet |
| Taxiway wingtip clearance | 34 feet | 44 feet | 44 feet |
| Taxilane wingtip clearance | 22 feet | 27 feet | 27 feet |

Reference: AC 150/5300-13, with changes.

14-32 and parallel Taxiway "J" is 504 feet, both of which exceed the FAA recommended distance of 400 feet.

Runway 18-36 (existing B-III ARC, future D-IV ARC) has an existing parallel apron edge taxiway (Taxiway "A") located 537.5 feet east of the runway centerline. The separation distance of this taxiway exceeds FAA criteria for the existing and future ARCs. Future west side partial parallel taxiways on the north and south ends of Runway 18-36 are proposed that will be meet FAA criteria with a 400 foot centerline separation distance. Therefore, all existing and proposed runway-taxiway separations meet FAA recommended standards for the respective existing and future airport reference codes.

### Runway Alignment

FAA criteria recommend a minimum 95 percent wind coverage for airports accommodating small aircraft (less than 12,500 lbs.) in approach categories A and B, for a 12 mph (10.5 knot) crosswind component. Tabulations of wind coverage were presented on Table 6. These tabulations show that the Runway 14-32 alignment provides 97.8 percent coverage for Category A and B aircraft with a 10.5 knot crosswind component for All Weather conditions and 96.1 percent coverage for IFR conditions. The Runway 14-32 alignment provides 99.2 percent coverage for larger aircraft with 13 crosswind component for All Weather conditions and 98.2 percent coverage for larger aircraft under IFR conditions.

The Runway 18-36 alignment provides 95.3 percent coverage for Category A and B aircraft with a 10.5 knot crosswind component for All Weather conditions and 91.3 percent coverage for IFR conditions. Runway 18-36 provides 97.8 percent coverage for larger aircraft with a 13 knot crosswind component for All Weather conditions and 95.5 percent coverage for larger aircraft under IFR conditions with a 13 knot crosswind component.

Therefore the existing runway system provides the FAA recommended minimum 95 percent coverage.

### General Aviation Facilities

A number of changes are being implemented at the Gulfport-Biloxi International Airport relative to general aviation facilities. The GBRAA is investigating the potential of developing the former large Atlantic Aviation FBO hangar as an aviation museum.

Continuing growth of the Air National Guard operations at GPT has resulted in a decision by the Airport Administration to relocate all GA facilities to a new general aviation area. This new location is depicted on **Exhibit 17** and will accommodate growth throughout the 20-year planning period and beyond.

The former Mississippi Power aircraft hangar is located in this area on the east side of the airfield between the north and south ANG aprons east of Runway 18-36. With the departure of Atlantic Aviation, the lease on this hangar has been taken over by Quest Aviation, as noted in the Inventory chapter. This lease will expire in 2017, after which time this area will be turned over to the military, resulting in all GA facilities being located in the new southwest GA area as depicted in Exhibit 17.

Million Air, a new Fixed Base Operator (FBO) at the Airport, has constructed a 52,500 square foot facility incorporating a 20,000 square foot aircraft storage hangar bay that can

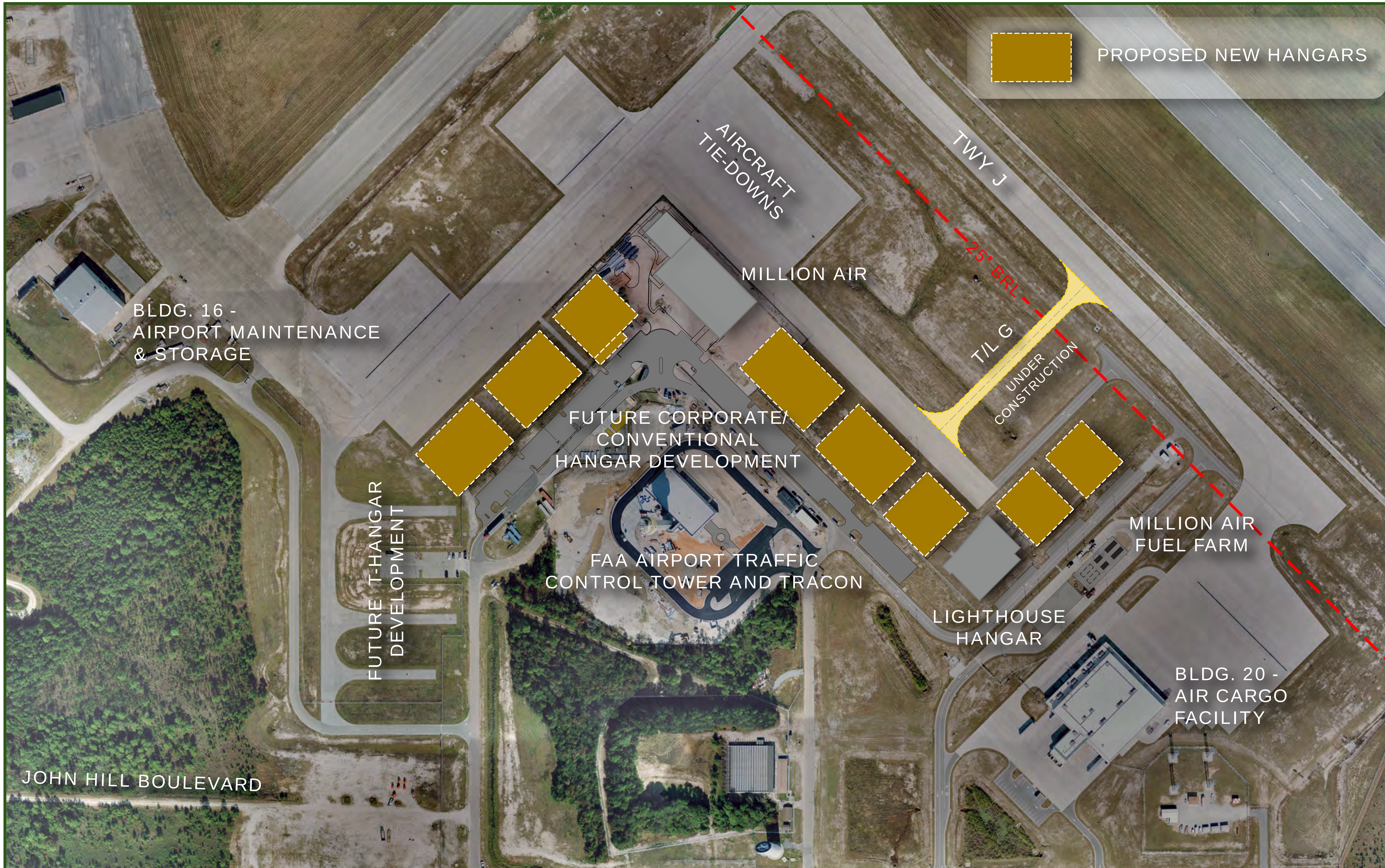


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EXHIBIT 17
NEW GENERAL AVIATION/ AIR CARGO AREA

accommodate up to 20 aircraft, a 12,500 square foot GA terminal, and a 3,600 square foot U.S. Customs facility. The new Million Air facility is located on a 200,000 square foot (22,200 plus square yards) aircraft ramp that can accommodate up to 26 aircraft depending on their size. Million Air has also constructed a new, above ground fuel farm located just northwest of Air Cargo Building 20.

### General Aviation Apron

Thirty aircraft are based at the Airport, comprising 17 single engine piston aircraft, six multi-engine aircraft, and seven jet aircraft. In addition, two helicopters are based at GPT.

#### *Based Aircraft Apron*

The number of aircraft located on the based aircraft apron is expected to be relatively minimal over the course of the planning period. This is due to the high value of aircraft and the fact that many if not most of these aircraft are used for business purposes. They are therefore considered valuable investments that have to be maintained in a controlled environment in order to retain their value and utility.

The existing based aircraft apron is currently located adjacent to the new Million Air facility. Given the value of aircraft and the deteriorating effects of exposure to the elements associated with aircraft based on the apron, it is projected that there would be limited demand for based aircraft apron throughout the planning period. As a result, the based aircraft apron in the new GA area is not expected to require a capacity greater than ten aircraft. This represents an apron area comprising 3,600 square yards. A based aircraft apron area of this size could be expected to accommodate all existing and forecast demand. It would be more economical to construct this entire apron initially rather than developing incremental apron expansion over time.

#### *Transient Aircraft Apron*

A number of assumptions were used in determining apron requirements for transient aircraft; these are listed as follows:

- Transient operations represent approximately 70 percent of the peak day itinerant general aviation operations;
- The number of transient aircraft total 50 percent of peak day transient operations;
- Space should be provided for 80 percent of peak day transient aircraft;
- 40 percent of peak day transient aircraft are single-engine; and
- 60 percent of peak day transient aircraft are multi-engine.

Table 49 presents the projected distribution of transient single engine and multi engine aircraft during the planning period.

There is a distinction between transient aircraft operations and itinerant aircraft operations. Transient aircraft operations are a subset of itinerant aircraft operations. For example, an aircraft based at GPT that is flying to or from Miami would be performing an itinerant operation. In the vast majority of instances, an aircraft based at GPT would return to its hangar once it returned to the Airport. A transient aircraft would be an aircraft that is based at another airport, for instance, Albuquerque, that is flying to The Gulfport-Biloxi International Airport for business or other purposes. The distinction is that the aircraft based

## TABLE 49
### *TRANSIENT AIRCRAFT DISTRIBUTION*

| Component | YEAR | | | |
|---|---|---|---|---|
| | 2010 | 2015 | 2020 | 2030 |
| Peak Day GA Operations | 50 | 61 | 73 | 95 |
| Peak Day Itinerant GA Operations | 38 | 49 | 60 | 81 |
| Peak Day Transient GA Operations | 27 | 34 | 42 | 57 |
| Transient GA Aircraft | 14 | 17 | 21 | 29 |
| Transient GA Spaces | 11 | 14 | 17 | 23 |
| Peak Space Demand | | | | |
| Aircraft < 12,500 pounds | 4 | 6 | 7 | 9 |
| Aircraft > 12,500 pounds | 7 | 8 | 10 | 14 |

Source: URS Analysis.

at Albuquerque would require transient apron space when parked at GPT, while the based aircraft typically would not require ramp space.

Approximately 360 square yards of apron space are adequate to accommodate each single-engine and light twin engine transient aircraft. Transport aircraft and larger multi-engine aircraft require approximately 600 square yards of apron space for each aircraft parking position. The analysis presented in Table 50 shows the need for additional transient aircraft apron space during the course of the planning period. Transient aircraft parking space requirements are projected to increase from 11 spaces in 2010 during the peak day, to 17 spaces by 2030.

#### AIRCRAFT HANGARS

GPT has a variety of aircraft storage hangars, specifically a large, new community hangar and individual corporate style hangars. The corporate hangars are located in the southwest general

## TABLE 45
### *AIRCRAFT APRON SPACE REQUIREMENTS*

| | 2010 | | 2015 | | 2020 | | 2030 | |
|---|---|---|---|---|---|---|---|---|
| | S. Y. | Aircraft | S. Y. | Aircraft | S. Y. | Aircraft | S. Y. | Aircraft |
| **Projected Transient Aircraft Demand** | | | | | | | | |
| Transient single engine[1] | 1,440 | 4 | 2,160 | 6 | 2,520 | 7 | 3,240 | 9 |
| Transient multi engine[2] | 4,200 | 7 | 4,800 | 8 | 6,000 | 10 | 8,400 | 14 |
| Subtotal | 5,640 | 11 | 6,960 | 14 | 8,520 | 17 | 11,640 | 23 |
| Misc. 20% | 1,130 | | 1,390 | | 1,705 | | 2,330 | |
| Subtotal | 6,770 | | 8,350 | | 10,225 | | 13,970 | |
| Existing* | - | - | 6,770 | 11 | 8,350 | 14 | 8,350 | 17 |
| Additional Requirement | 6,770 | 11 | 1,580 | 3 | 1,875 | 3 | 5,620 | 6 |

Source: URS Analysis
Note: [1] 360 S.Y. per single engine aircraft
[2] 600 S.Y. per multi-engine aircraft.

aviation area (as depicted in Exhibit 17). Access to these hangars is provided off Taxiway "F" and parallel Taxiway "J".

All future hangar development is proposed for the southwest G A area depicted in Exhibit 17. The new Million Air FBO facility and fuel farm have already been constructed in this area along with the new Lighthouse hangar. An area for future T-hangar development has also been incorporated within this area.

The distribution of based aircraft in hangars during the course of the planning period will be determined by a combination of the present aircraft distribution by hangar type, availability of hangars, by type, and the development of future hangar facilities.

The following assumptions should be used as a guide in determining future based aircraft hangar requirements:

- All multi-engine turbine and jet aircraft will be located in corporate / community hangar space;
  - Eighty percent of jets will require corporate hangars
  - Twenty percent of jets will require conventional hangars
  - Sixty percent of multi-engine turbine aircraft will require corporate hangars
  - Forty percent of multi-engine turbine aircraft will require conventional hangars
- All multi-engine piston aircraft will be located in T-hangar / community hangar space;
  - Twenty percent will require T-hangars
  - Eighty percent will require conventional hangars
- Approximately 85 percent of single engine piston aircraft and other aircraft will be located in T-hangar or community hangar space;
  - One-third will require T-hangars
  - Two-thirds will require conventional hangars
- All rotorcraft will be located in corporate / community hangars
  - Fifty percent will require corporate hangars
  - Fifty percent will require conventional hangars.

The larger multi-engine turbine aircraft and rotorcraft forecast to be based at the Airport are projected to be located in corporate / community type hangars.

Conventional hangar space is based on a standard of 1,200 square feet for a single-engine aircraft and rotorcraft, 1,400 square feet for multi-engine aircraft, and 1,800 square feet for all multi-engine turbine and jet aircraft. All T-hangar units are based on an area of 1,400 square feet. Corporate hangar size is determined by the individual organizations constructing these facilities. Therefore, no specific hangar size was calculated, only the number of spaces required. The area calculations were then applied to the assumptions of based aircraft distribution to determine overall hangar area requirements. (See Table 51 for a breakdown.)

### Air Cargo Facilities

Gulfport-Biloxi International Airport's cargo facilities are located in the vicinity of the new general aviation area, near the new Airport Traffic Control Tower. The air cargo building includes both apron area and support buildings. Exhibit 17 depicts the location of the existing air cargo facilities.

## TABLE 51
### *CONVENTIONAL, CORPORATE, AND T-HANGAR REQUIREMENTS*

| Conventional Hangars | 2015 | | 2020 | | 2030 | |
|---|---|---|---|---|---|---|
| Aircraft Type | No. | Area (sf) | No. | Area (sf) | No. | Area (sf) |
| Single-Engine | 12 | 14,400 | 13 | 15,600 | 15 | 18,000 |
| Multi-Engine Piston | 1 | 1,400 | 1 | 1,400 | 1 | 1,400 |
| Multi-Engine Turbine | 3 | 5,400 | 3 | 5,400 | 3 | 5,400 |
| Jets | 1 | 1,800 | 2 | 3,600 | 2 | 3,600 |
| Rotorcraft/Other | 5 | 6,000 | 5 | 6,000 | 5 | 6,000 |
| **Subtotal** | **22** | **29,000** | **24** | **32,000** | **26** | **34,400** |
| **Corporate Hangars** | **2015** | | **2020** | | **2030** | |
| Aircraft Type | Area (sf) | Spaces | Area (sf) | Spaces | Area (sf) | Spaces |
| Multi-Engine Turbine | - | 5 | - | 5 | - | 5 |
| Jets | - | 5 | - | 6 | - | 10 |
| Rotorcraft/Other | - | 5 | - | 5 | - | 5 |
| **Subtotal** | **-** | **15** | **-** | **16** | **-** | **20** |
| **T-Hangars** | **2015** | | **2020** | | **2030** | |
| Aircraft Type | Area (sf) | Units | Area (sf) | Units | Area (sf) | Units |
| Single-Engine | 8,400 | 6 | 9,800 | 7 | 11,200 | 8 |
| Multi-Engine Piston | 1,400 | 1 | 1,400 | 1 | 1,400 | 1 |
| **Subtotal** | **9,800** | **7** | **11,200** | **8** | **12,600** | **9** |
| **Total Area - All Hangars** | **38,800 sf** | | **43,200 sf** | | **47,000 sf** | |

Source: URS Corporation Analysis, 2011.

Building 20 (pictured on the following page) is a newer air cargo building totaling 53,940 square feet. This building includes 44,990 square feet of warehouse space, 2,440 square feet of support space, and 6,600 square feet of office space. This facility will provides state of the art cargo irradiation capability and can accommodate international air cargo with its location in Foreign Trade Zone 92.

Building utilization rate is the measure typically used to define the capacity of freight facilities. Building utilization rates are expressed as square feet per annual ton of freight. Seventy-five U.S. airports were surveyed by the Airports Council International to establish an average building utilization rate. This survey indicated that the average building utilization rate at U.S. airports is 1.5 square feet per ton. The survey also indicated that the range of adequacy for an airport, on average, is between 1.0 and 2.5 square feet per ton. A building utilization rate of 1.0 square foot per ton typically implies that the facilities are well used and some near-term expansion is required. A utilization rate of 2.5 square feet per ton implies that either the existing tenants have ample space for existing operation with some expansion capability, or there are a number of cargo-related tenants such as freight forwarders, truckers,

Building 20

and handling agents that occupy space at the Airport.

Historically, the Airport has not had air cargo operations. However, construction of the new air cargo building is expected to result in a gradual initiation of air cargo activity. The projected volume of air cargo activity is expected to be adequately handled by the new air cargo facility throughout the planning period. The building utilization rate analysis indicates that the cargo facilities exceed the range encountered at other U.S. airport and additional facilities will not be needed during the planning period.

The national average building utilization rate of 1.5 square feet per ton is significantly lower than the building utilization rate at GPT. Table 52 quantifies the existing and projected air cargo building space, and existing and projected deficiencies. The Airport, as shown, currently has adequate air cargo building space.

Air cargo ramp size can vary considerably based on aircraft size and tenant requirements. Ramp size is also often a function of available land and airport layout. Typical planning criteria for cargo aprons use five square feet of apron space for each square foot of cargo building space. Circulation space can increase the overall apron requirement by as much as 60 percent. The existing cargo apron at GPT is adequate to accommodate the projected demand throughout the planning period.

Building 20

**TABLE 52**
***AIR CARGO FACILITY REQUIREMENTS***

| Year | Air Cargo | | Building | |
|---|---|---|---|---|
| | Pounds | Tons | (SF) | Deficiency |
| 2010 | 0 | 0 | 53,940 | - |
| | Target Utilization Rate | | 2.5 | |
| 2015 | 684,000 | 342 | 53,940 | - |
| 2020 | 1,254,000 | 627 | 53,940 | - |
| 2030 | 2,394,000 | 1,197 | 53,940 | - |

Source: URS analysis.

## Facility Requirements – Landside

Landside facilities are typically associated with areas on the airport other than aircraft operational areas. These areas are associated with the terminal and airfield support services and facilities.

### Commercial Terminal Facilities

Please refer to ***Terminal White Paper Two***, which provides an assessment of the Commercial Terminal Facilities including the commercial passenger terminal building, airport access, vehicular parking (public and employee) and rental car facilities .

### Aviation Support Facilities

#### Fuel Storage

Existing fuel storage is provided in a new Million Air fuel farm. This facility includes four above ground tanks, two of 30,000 gallons each for Jet A fuel storage and two 10,000 gallon tanks . One of the 10,000 gallon tanks is for AvGas, the second 10,000 gallon tank is divided into two 5,000 gallon cells, one for Mo Gas and the second for diesel. Million Air is in the process of expanding their fuel farm due to an increase in airport activity,. This expansion will add two additional 30,000 gallon tanks, which are projected to come online during the latter part of 2012. Both of these tanks will provide storage for Jet A fuel. The Air National Guard has their own separate fuel farm and their fuel storage requirements are beyond the scope of this study.

The average number of gallons of Jet-A fuel usage for commercial and military aircraft departures in 2009 was calculated in order to estimate future Jet-A fuel consumption rates. This calculation yielded an average of 627.8 gallons of fuel consumed per commercial and military aircraft departure. (While Air National Guard military operations are supplied with fuel from the ANG fuel farm, military troop charters are fueled by Million Air and therefore their requirements are included in this tabulation.) Tables 53 and 54 tabulate the Commercial/Military and General Aviation Jet A fuel requirements respectively.

Jet A fuel usage was increased by 2.5 percent during each five-year period to reflect the increased aircraft size projected for the respective operators during the study period. The projected fuel usage per departure was then applied to the forecast of average daily aircraft departures to determine the estimated total average daily fuel usage.

A five-day fuel supply is a typical guide for planning purposes. The combined average daily demand for Jet A was therefore multiplied by five to arrive at the 5-day fuel storage requirement. Projected 5-day Jet A fuel storage requirements for the planning period are provided in Table 55.

### TABLE 53
### COMMERCIAL & MILITARY JET A FUEL USAGE

| Year | Average Daily Departures | | Average Combined Usage/Departure |
|---|---|---|---|
| | Commercial* | Military | |
| 2009 | 25 | 34 | 627.2 |
| 2015 | 29 | 34 | 642.9 |
| 2020 | 31 | 34 | 659.0 |
| 2030 | 40 | 34 | 675.4 |
| **Year** | **Daily Fuel Requirement** | | **5-Day Requirement** |
| 2009 | 36,796 | | 183,979 |
| 2015 | 40,287 | | 201,436 |
| 2020 | 42,612 | | 213,061 |
| 2030 | 51,000 | | 255,001 |

Source: URS analysis, Airport records.
* Numbers may differ due to rounding.

Million Air is contracted to supply Jet A fuel to the airlines and military. Million Air's existing 60,000-gallon Jet-A fuel storage capacity does not provide the recommended 5-day supply of fuel, based on current and projected usage based on the data presented in Table 45. The current doubling of the size of Million Air's Jet A fuel storage capacity will result in a little more that a 3-day Jet A fuel storage capability. Frequent fuel shipments can be problematic since any disruption to these shipments could adversely impact on-going airport operations.

### TABLE 54
### GENERAL AVIATION JET A FUEL USAGE

| Year | Average Daily Departures | Gallons/ Departure | Jet-A Fuel Usage* | 5-Day Total |
|---|---|---|---|---|
| 2009 | 35 | 49.0 | 1,717 | 8,584 |
| 2015 | 36 | 50.3 | 1,810 | 9,050 |
| 2020 | 40 | 51.5 | 2,036 | 10,178 |
| 2030 | 47 | 52.8 | 2,545 | 12,723 |

Source: URS analysis, Airport records.
* Numbers may not total due to rounding.

Additional Jet-A fuel storage capacity should therefore be provided by the end of the Short Range planning period. Based on the preceding analysis and as tabulated in Table 56,, an additional 72,500 gallons of

### TABLE 55
### COMBINED JET A FUEL USAGE

| Year | Daily Usage | | | 5-Day Total* |
|---|---|---|---|---|
| | Commercial/ Military | General Aviation | Jet-A Fuel Usage | |
| 2009 | 36,796 | 1,717 | 38,512 | 192,560 |
| 2015 | 40,287 | 1,810 | 42,097 | 210,485 |
| 2020 | 42,612 | 2,036 | 44,648 | 223,240 |
| 2030 | 51,000 | 2,545 | 53,545 | 267,725 |

Source: URS analysis.
* Numbers may not total due to rounding.

**TABLE 56**
***PROJECTED JET A FUEL STORAGE REQUIREMENTS***

| Year | Daily Usage | | | 5-Day Total* | Existing Storage Capacity** | Additional Capacity Required |
|---|---|---|---|---|---|---|
| | Commercial/ Military | General Aviation | Jet-A Fuel Usage | | | |
| 2009 | 36,796 | 1,717 | 38,512 | 192,560 | 120.000 | 72,560 |
| 2015 | 40,287 | 1,810 | 42,097 | 210,485 | 120,000 | 90,485 |
| 2020 | 42,612 | 2,036 | 44,648 | 223,240 | 120,000 | 103,240 |
| 2030 | 51,000 | 2,545 | 53,545 | 267,725 | 120,000 | 147,725 |

Source: URS analysis.
* Numbers may not total due to rounding.
** Includes expansion currently in process.

storage capacity would be needed to meet the recommended 5-day Jet A fuel storage supply. Additional capacity would also be needed during the Intermediate and Long Range planning periods as tabulated in Table 47, to ensure that adequate capacity is available to support on-going Airport operations.

Similar to Jet A, the average number of gallons of AvGas per general aviation aircraft departure was calculated. In 2009, on average approximately 3.8 gallons of AvGas was dispensed per general aviation aircraft departure. Throughout the planning period, this ratio was increased by 5 percent every five years. Table 57 tabulates the projected AvGas fuel storage requirements. The AvGas fuel storage capacity of Million Air should be more than adequate to accommodate the projected 5-day fuel storage demands throughout the planning period.

**TABLE 57**
***GENERAL AVIATION AvGAS USAGE***

| Year | Average Daily Departures | Gallons/ Departure | Daily AvGAS Usage* | 5-Day Total |
|---|---|---|---|---|
| 2009 | 35 | 3.8 | 132 | 662 |
| 2015 | 36 | 4.0 | 143 | 715 |
| 2020 | 40 | 4.2 | 165 | 824 |
| 2030 | 47 | 4.6 | 216 | 1,081 |

Source: URS analysis, Airport records.
* Numbers may not total due to rounding.

### Airport Rescue and Firefighting Facilities (ARFF)

Airports certified under Federal Aviation Regulation (FAR) Part 139 (Certification of Airports) must comply with specific operational requirements for Airport Rescue and Firefighting Facilities (ARFF). The primary requirements include complying with equipment and agent materials and response time regulations. The FAA and the International Civil Aviation Organization (ICAO) have developed criteria for classifying these regulations into five different indexes. The applicable index is determined by the length of the longest aircraft operated by an air carrier performing *an average of five scheduled departures per day* (calculated on an annual basis). Table 58 lists the ARFF indexes and the requirements for the respective index classifications.

### TABLE 58
### *ARFF INDEX CLASSIFICATIONS*

| Airport Index | Required No. of Vehicles | Aircraft Length | Scheduled Departures* | Agent + Water for Foam |
|---|---|---|---|---|
| A | 1 | <90' | ≥ 1 | 500# DC or HALON 1211 or 450# DC + 100 Gallons $H_2O$. |
| B | 1 or 2 | ≥ 90', < 126'<br>≥ 126', <159' | < 5 | Index A + 1,500 Gallons $H_2O$ |
| C | 2 or 3 | ≥ 126', < 159'<br>≥ 159', < 200' | ≥ 5a< 5 | Index A + 3,000 Gallons $H_2O$ |
| D | 3 | ≥ 159', < 200'<br>> 200' | ≥ 5<br>< 5 | Index A + 4,000 Gallons $H_2O$ |
| E | 3 | ≥ 200' | ≥ 5 | Index A + 6,000 Gallons $H_2O$ |

Source: URS analysis.
* daily departures

GPT is currently certificated under Part 139 of the regulations and is classified as an Index 'B' airport. Index 'B' includes aircraft of at least 90 feet in length but less than 126 feet in length. The representative aircraft discussed in the inventory are all less than 126 feet in length except the MD-87, which is approximately 130 feet in length. However, the forecast of operations for this aircraft is less than the required average of five departures per day.

Index 'B' establishes the following criteria for equipment and agents:

- One vehicle carrying at least 500 pounds of sodium-based dry chemical, halon 1211, or clean agent and 1,500 gallons of water and the commensurate quantity of Aqueous Film Forming Foam (AFFF) for foam production, or
- Two vehicles, one to carry the previously mentioned agents, and one vehicle to carry water and commensurate amount of AFFF so that the total quantity of water for foam production carried by both vehicles is at least 1,500 gallons.

The existing ARFF facilities, as discussed in the Inventory chapter, are manned and operated by the Air National Guard, 24 hours per day and seven days per week. These facilities significantly exceed the Index B requirements and no changes are anticipate beyond those the Air National Guard may have planned for their needs.

Part 139 also includes response time criteria for ARFF equipment. The regulations state that the first responding vehicle must arrive at the midpoint of the farthest air carrier or primary runway within three minutes, beginning at the time of the alarm. Given the location of the ARFF station, to reach the midpoint of the farthest primary runway (Runway 14-32), the route will traverse Taxiway 'A' south to Taxiway 'B' then west and southwest along Taxiway 'B' to the midpoint of the Runway 14-32. It was assumed that 45 seconds would elapse from the time the alarm sounded to the time the first responding vehicle's wheels begin to move. It was also assumed that the average speed of a fully-loaded Class IV first responding vehicle navigating several turns would travel at approximately 35 miles per hour. Given these assumptions, the response time to the midpoint of Runway 14-32, would be well within the three-minute requirement.

The location of the existing ARFF station meets the FAR criteria for vehicle response time.

### Airport Maintenance Equipment and Storage

Maintenance equipment is currently stored in a variety of locations around the Airport. The primary airport maintenance facility is a 4,800 square foot building located immediately west of the commercial terminal building. Areas within the terminal building previously designated for maintenance storage have been minimized due to increased needs of Airport tenants.

Discussions with airport staff have indicated an existing requirement for additional space for maintenance storage and equipment. Building maintenance vehicles (tractors, mowers, trucks, lifts, etc.) need to be stored under a roof to minimize deterioration with a lift provided for vehicle maintenance and repairs. A minimum roof height of 20 feet should be provided for vehicle and equipment storage together with a loading ramp for loading and unloading of supplies and equipment. Parking for approximately 35 vehicles is required for staff and vendors in addition to a secured fleet parking area for up to 20 airport vehicles/light trucks.

Additional covered storage is required for the grounds maintenance equipment and a hazmat building for glycol storage is needed adjacent to the terminal ramp. Development of a new fueling facility outside the existing maintenance compound is also needed for the airlines and other ground support tenants.

### Rental Car Service Center

Future rental car facility requirements were analyzed based on the projected increases in originating and departing passengers and typical industry planning factors.

The number of rental car ready/return spaces needed is based on typical aviation industry planning factors. Rental car ready/return spaces are determined based on the total number of annual originating and departing (O & D) passengers. The number of spaces typically range between 40 and 90 ready/return spaces per million annual O and D passengers.

The existing Rental Car Service Center provides 390 parking spaces and queuing space for an additional 100 cars. The facility has been designed with expansion capability to park an additional 156 cars.

Table 59 tabulates the rental car ready/return space requirements for the recommended passenger activity levels as well as the High Growth Scenario, as presented in Chapter Two of this study. The existing rental car ready/return spaces will be sufficient to accommodate projected demand throughout the planning period for both the recommended forecast levels and the High Growth Scenario based on the data presented in Table 49.

In summary, the existing Rental Car Service Center should be capable of accommodating all projected facility needs throughout the planning period.

## TABLE 59
## *RENTAL CAR READY/RETURN SPACE REQUIREMENTS*

| Year | Recommended Forecast | | | High Growth Scenario | | | Existing Ready/Return Spaces |
|---|---|---|---|---|---|---|---|
| | Enplaned Passengers | Total Passengers* | Ready/Return Spaces | Enplaned Passengers | Total Passengers* | Ready/Return Spaces | |
| 2015 | 558,000 | 1,170,000 | 47-105 | 639,500 | 1,279,000 | 51-115 | 390 |
| 2020 | 645,700 | 1,291,4000 | 52-116 | 719,800 | 1,439,600 | 58-130 | 390 |
| 2025 | 749,300 | 1,498,600 | 60-135 | 863,600 | 1,727,200 | 69-155 | 390 |
| 2030 | 878,600 | 1,757,200 | 70-158 | 1,035,400 | 2,070,800 | 83-186 | 390 |

Sources: Gulfport-Biloxi International Airport Master Plan Tables 37 and 39.
URS Corporation Analysis.
* Assumes arriving passengers equal departing passengers.

### Land

The Gulfport-Biloxi International Airport comprises a total of 1,616.36 acres in fee simple. Avigation easements are currently in place on an additional 52.12 acres. FAA guidelines recommend ownership of all RPZ's in fee simple title. The Airport does not presently own the entirety of the Runway 18, 36, and 32 RPZ's. Portions of the areas within the RPZ's not currently controlled through fee ownership or easements have been identified for acquisition on the Airport's existing Exhibit "A". Development of precision approaches to all runway ends will require the acquisition of additional land within the respective RPZ's.

The proposed extension of Runway 18-36 to an overall length of 7,100 feet will also require acquisition of additional acreage for protection of the future RPZ.

## Regional Transportation Network and Airport Access

Located in the southern portion of Harrison County in southern Mississippi, the Gulfport-Biloxi International Airport is accessible by way of the local street system (Airport Road) and both the national (Interstate 10) and regional roadway network - U.S. highways 49 and 90. The main entrance to the Airport is located on Airport Road. The Airport exit onto Airport Road received upgrades in 2011. In 2011, John Hill Boulevard was extended on to Airport property in order to provide greater access to the new GA area located in the southwest portion of the airport.

Future community plans propose further revisions to Airport Road that include development of a roundabout at the intersection of Airport Road and Three Rivers Boulevard. In addition, there is a desire to extend Three Rivers Boulevard to the south past Airport Road, thereby providing an alternative to US 49 connecting Gulfport with points to the north.

Finally, future development of facilities on the Airport will necessitate revisions to the existing perimeter road system to facilitate vehicle access to all points on the airport.

## Facility Requirements Summary

A summary of the facility requirements at the Gulfport-Biloxi International Airport through the end of the planning period - year 2030, is provided on Table 60.

## TABLE 60
### *FACILITY REQUIREMENTS SUMMARY*

1. RUNWAYS

| | |
|---|---|
| Primary R/W 14-32 | 9,002' X 150' |
| Reconstruct TDZ (Short Range) | |
| Seal Coat (Long Range) | |
| Crosswind R/W 18-36 | 7,257' X 150' |
| Overlay/Strengthen (Intermediate Range) | 7,100' X 150' |
| Extend R/W (Intermediate Range) | 2,165' X 150' |
| Seal Coat (Long Range) | |

2. TAXIWAYS

| | |
|---|---|
| Construct south parallel taxiway to R/W 14-32 (Short Range) | 5,540' X 75' |
| Construct south partial parallel taxiway west side of R/W 18-36 (Intermediate Range) | 2,285' X 75' |
| Construct partial parallel Taxiway "K" (Short Range) | 1,840' X 75' |
| Construct north partial parallel taxiway east side of R/W 18-36 (Intermediate Range) | 320' X 75' |
| Construct north angled exit taxiway off R/W 14-32 to T/W "C" (Intermediate Range) | 1,020' X 75' |
| Construct south angled exit taxiway off R/W 14-32 to T/W "C" (Long Range) | 1,020' X 75' |
| Construct taxiway fillets T/Ws D1 and D2 (Intermediate Range) | |
| Extend Taxiway "H" (Short Range) | 1,890' X 75" |
| Widen Taxiway "B" (Long Range) | 1,383' X 75' |
| Construct exit taxiway R/W 18-36 to ANG apron (Long Range) | 426' X 75' |

3. TAXILANES

| | |
|---|---|
| Construct Taxilane "G" (Short Range) | 5,540' X 75' |
| Rehabilitate Taxilane "F" (Short Range) | |

4. COMMERCIAL (PASSENGER AND AIR CARGO) AIRCRAFT RAMP

| | |
|---|---|
| Expand Terminal Apron (Long Range) | 17,720 S.Y. |

4. AIRFIELD LIGHTING

| | |
|---|---|
| Install high intensity runway (HIRL) lighting R/W 18-36 (Short Range) | 7,100' |

## TABLE 60
## *FACILITY REQUIREMENTS SUMMARY*

Install MITL south parallel taxiway to R/W 14-32 .......................................... 5,540”
(Short Range)
Install MITL south partial parallel taxiway west side of R/W 18-36 ............... 2,285”
(Short Range)
Install MITL north partial parallel taxiway west side of R/W 18-36 ............... 1,840”
(Long Range)
Install MITL north partial parallel taxiway east side of R/W 18-36 .......... 320’ X 75’
(Intermediate Range)
Install MITL north angled exit taxiway off RW 14-32 to T/W “C” ................ 1,020’
(Intermediate Range)
Install MITL south angled exit taxiway off RW 14-32 to T/W “C” ................ 1,020’
(Long Range)
Rehabilitate MITL taxiway fillets T/Ws D1 and D2 ..................................... 1,243”
(Short Range)
Install MITL widened Taxiway “H” (Short Range) ......................................... 1,890’
Rehabilitate MITL widened Taxiway “B” (Long Range) .................................. 1,383’
Install MITL new exit taxiway R/W 18-36 to ANG apron ................................. 426’
(Long Range)
Rehabilitate rotating beacon and lighted wind cones
(Long Range)
Rehabilitate segmented circle and lighted wind cone
(Long Range)

5. NAVAIDS/VISUAL APPROACH AIDS

Install Medium Intensity Approach Light System with Runway Alignment Indicator Lights (MALSR) - Runway 18-36 (Intermediate Range)
Relocate REILs, Threshold lights, and PAPIs Runway 18 (Short Range)
Relocate REILs, and Threshold lights, Runway 36 (Short Range)
Install Precision Approach Path Indicators (PAPI) Runway 36 approach.

6. LAND ACQUISITION

L.C. Jones Parcel ........................................................................................ 75.0 AC.
Runway 18 RPZ .......................................................................................... 46.69 AC.
Runway 36, RPZ ......................................................................................... 24.09 AC.
Runway 14 RPZ ............................................................................................ 10.6 AC.
Runway 32 RPZ ............................................................................................ 8.82 AC.

7. MISCELLANEOUS

Expand airfield fencing (Short and Long Range)
Expand fuel farm:
Jet-A (Install additional 180,000 gallon capacity - Short Range)
Jet-A (Install additional 15,000 gallon capacity - Intermediate Range)
Jet-A (Install additional 45,000 gallon capacity - Long Range)

**TABLE 60**
***FACILITY REQUIREMENTS SUMMARY***

7. MISCELLANEOUS (Continued)
Pavement marking:
Runway 18-36 (Precision - Intermediate Range) ............................ 7,100' X 150'
Construct perimeter road (Short Range)
Construct perimeter fence (Short Range)
Rehabilitate Airfield Drainage (Short Range)
Acquire Security Vehicle (Short Range)
Install PAPI Runway 32 (Short Range) ...................................................... FAA F&E
Relocate RTR (Short Range) ...................................................................... FAA F&E
Dopplerize VOR (Short Range) ................................................................ FAA F&E

Chapter Four

# ALTERNATIVES AND RECOMMENDED CONCEPT

# Chapter Four
# Alternatives/Recommended Plan

## Introduction

The primary objective of this chapter is to identify an overall development plan for Gulfport-Biloxi International Airport that will meet the Airport's existing and long-term aviation needs. Airside and landside facilities required to satisfy the various elements of aviation demand forecast over the 20-year planning period drive the alternatives analysis. The goal of this analysis is to provide Gulfport-Biloxi International Airport with a plan that ensures flexibility to meet both foreseeable as well as unforeseeable needs.

The intent of this Master Plan Update for the Gulfport-Biloxi International Airport is to identify those specific elements of Airport needs that have changed since completion of the 2002 Airport Master Plan.

The primary functional areas evaluated in this study included the airfield, the terminal area, and the air cargo and general aviation areas. Supporting functional areas including Airport maintenance facilities, and Airport Rescue and Firefighting facilities were also reviewed.

The Airport has expressed their intent to maintain the layout and configuration of the air cargo and general aviation areas as defined in their 2002 Airport Master Plan and the Airport Layout Plan developed in association with that study. In addition, the 2002 Master Plan recommended an extension of Runway 18-36 to serve as a backup to the primary Runway 14-32 and this recommendation has been carried forward to this study. Therefore changes to the airfield, air cargo and general aviation areas are not the focus of this Alternatives analysis. Only minor changes have been made to these areas to reflect recent construction, changes to FAA design criteria, and further requirements identified by Airport staff.

## Development Considerations

The recommended plan resulting from this analysis must be technically, economically, and environmentally sound. The plan must also support the Airport's goals and objectives in order for the plan to be implemented. Facility needs identified in Chapter Three were reviewed and are consistent with the recommendations of the 2002 Airport Master Plan. This chapter focuses on the development options proposed to accommodate:

- Extension of Runway 18-36 to the south to serve as a backup to the primary Runway 14-32 and
- Expansion of the extended Runway 18-36 runway safety areas (RSAs) and object free areas (OFAs) to meet FAA criteria.

## Runway 18-36 RSA and OFA Alternatives

Airfield requirements for Gulfport-Biloxi International Airport are discussed in ***Chapter Three, Demand/Capacity and Facility Requirements***. The primary airfield need is to provide a longer runway length on Runway 18-36. The runway length analysis determined that Runway 18-36 should be extended to provide a backup to Runway 14-32 for commercial aircraft operations by providing an overall runway length of 7,100 feet. This recommendation is consistent with the recommendation of the 2002 Airport Master Plan.

To maintain and increase operational efficiency, partial parallel taxiways should be developed on the extended Runway 18-36 to maximize airfield operational efficiency.

The following alternatives were identified and evaluated to address the runway length requirements, based on the preceding recommendations:

- Alternative 1 - Do Nothing
- Alternative 2 - Extend Runway: 18-36 south to 7,100' and install EMAS
- Alternative 3 - Extend Runway: 18-36 south to 7,100' and relocate Airport Road and perimeter road.
- Alternative 4 - Extend Runway: 18-36 south to 7,100' and implement Declared Distances

These alternatives are described below.

### Alternative 1 - Do Nothing

The "Do-Nothing" alternative considers the option of a "no-build" scenario. This alternative assumes no new development will be planned or undertaken other than regular maintenance. Costs associated with this alternative are minimal. However, the consequences of this type of alternative can be great.

The continued development of Gulfport-Biloxi International Airport is important because of the Airport's current and future role as the commercial hub of the Mississippi Gulf Coast. Currently, the Airport is classified in the National Plan of Integrated Airport Systems (NPIAS), 2011-2015 as a primary commercial service airport. As regional demand continues to grow, increasing numbers of travelers will find it convenient to begin their travel from the Gulfport-Biloxi International Airport. Therefore, pursuing a do-nothing approach would be detrimental to the both Airport's users and role within the commercial transportation system.

The availability of aviation services supports the economic growth of Gulfport and Biloxi as well as the surrounding communities, making the Gulfport and Biloxi area an attractive place for businesses to locate. Failure to develop Gulfport-Biloxi International Airport to its fullest potential could result in a negative impact on the area's economic growth. The local area casinos are particularly dependent on the Airport in supporting their operations. The "No-Build" Option could significantly impact their economic contribution to the local economy. Businesses could opt to locate in other areas that choose to provide enhanced airport facilities. The possible resulting inability of Gulfport and Biloxi to attract potential businesses could result in a loss of jobs and the current favorable economic development environment of the community.

The "Do-Nothing" alternative could impact air service if runway lengthening projects are not implemented. Closure of Runway 14-32 for any length of time would impose severe restrictions on airport operations given the lack of a backup runway alternative. A "Do-Nothing" alternative might provide a savings to the Airport relative to the cost of developing and maintaining additional paved areas, however, the negative implications of such an alternative would be significant for existing and future airport users.

The following sections detail development alternatives that would allow the Airport to provide facilities that can support the Airport's existing and future role within the state and national aviation systems and support the area's economy.

### Alternative 2 - Extend Runway 18-36 South to 7,100′ and Install EMAS

Runway length was one of the primary areas identified for improvement during the facility requirements task of this study. Presently, Runway 14-32 with an overall length of 9,002 feet is the primary arrival and departure runway. This is due to a combination of the overall runway length and the availability of precision instrument approaches.

Runway 18-36, which has an existing overall length of 4,935 feet does not provide the takeoff or landing length, OFA, or safety area needed by the commercial operators. In the event Runway 14-32 needed to be closed for maintenance or an emergency situation, the commercial operators would likely be required to suspend operations at the Airport.

A study was undertaken by the Airport's engineering consultant Neel-Schaffer, in 2011 to evaluate the cost of constructing an Enhanced Materials Arresting System (EMAS), which would meet FAA criteria for the expanded runway safety areas associated with the extended Runway 18-36. Installation of the EMAS would not require relocation of Airport Road and the perimeter road.

Two EMAS options and their costs were evaluated by Neel Schaffer:

- *Option A*: Construction of a standard EMAS bed 260' long by 170' wide placed 340' from the runway end (600' total RSA length). This option would require relocation of the existing perimeter road with a cost of approximately $5.87 million.
- *Option B*: Non-Standard EMAS bed 365' long by 170' wide placed 35' from runway end (400' total RSA length). This option would not impact any existing roads and would have a cost of approximately $7.55 million.

### Alternative 3 - Extend Runway 18-36 South to 7,100′ and Relocate Airport Road and Perimeter Road

Alternative 3 is intended to accomplish the same goals as Alternative 2, but by extending the runway to the south and relocating Airport Road on the north. This alternative provides the same benefits as Alternative 2, an extension of Runway 18-36 to 7,100 feet and provision of precision instrument approach capability to the north and south.

As with Alternative 2, Alternative 3 would result in portions of the expanded RSA and OFA as well as the runway protection zone overlying Airport Road. However, this Alternative proposes relocating Airport Road outside the RSA and OFA. Neel Schaffer also looked at this option in their EMAS study. That study estimated the cost of relocating Airport Road outside the expanded RSA and OFA at approximately $2.13 million.

### Alternative 4 - Extend Runway 18-36 South to 7,100′ and Implement Declared Distances

Alternative 4 incorporates a southern extension to Runway 18-36 that will provide the 7,100 foot backup capability to Runway 14-32. This alternative also incorporates new precision instrument approaches to both the Runway 18 and 36 ends.

Implementation of Declared Distances would address the impacts on the RSA and OFA off the north end of Runway 18-36. This Alternative would implement a 160' displaced threshold on the north runway end. In addition, implementation of declared distances would require publishing the available takeoff run available (TORA) takeoff distance available (TODA), accelerate stop distance available (ASDA) and landing distance available (LDA) for Runway 18-36. These limitations are defined as Declared Distances. Alternative 4 would not impact Airport Road.

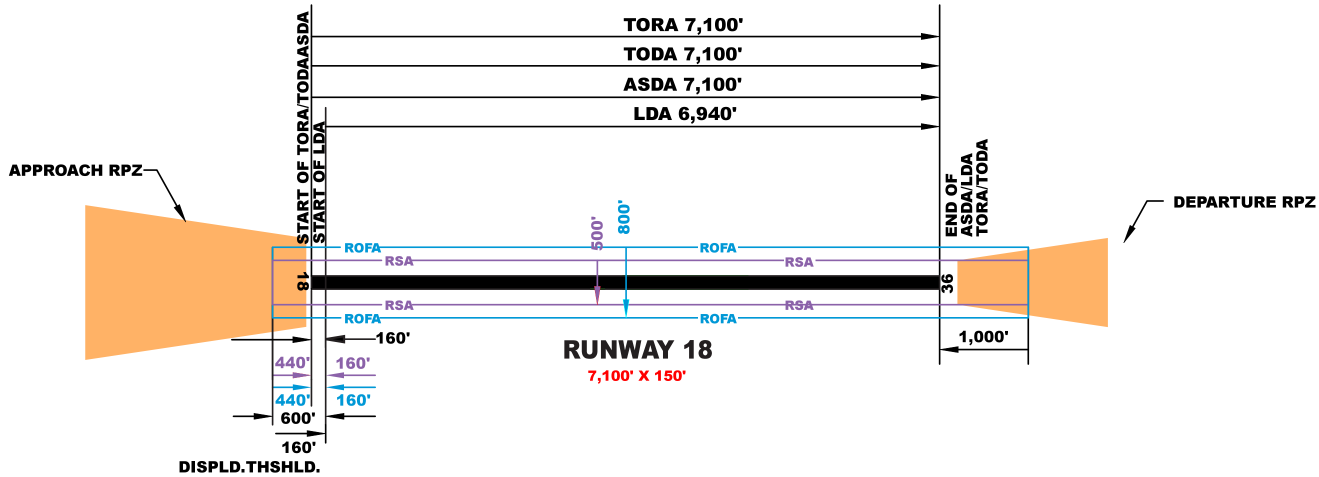
Implementation of declared distances would result in a shorter available landing length for landings to the south. This Alternative would also result in a shorter landing distance for landings to the north and a shorter accelerate-stop distance for takeoffs to the north.

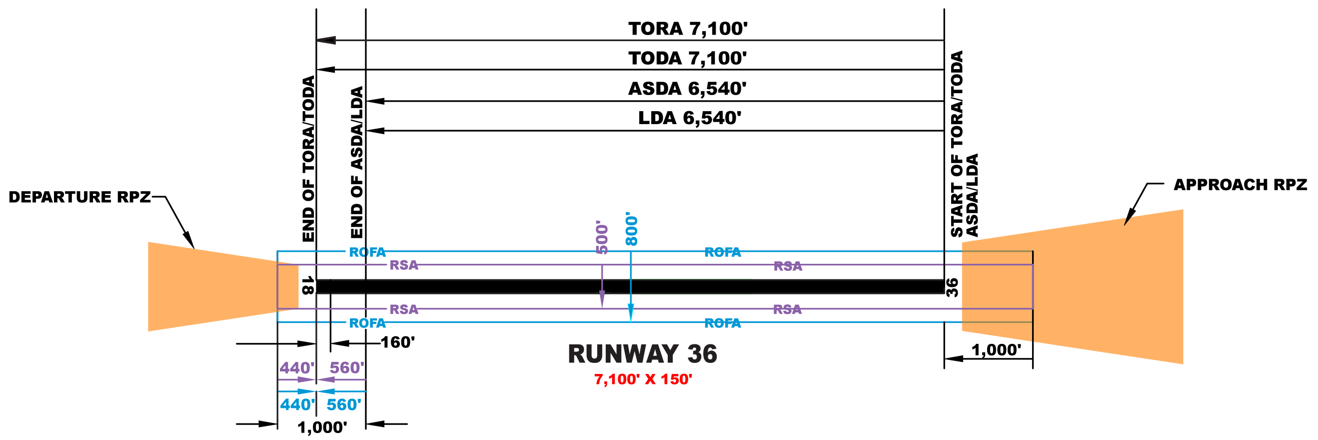
Exhibit 18 depicts the declared distances resulting from Alternative 4.

## Evaluation Criteria and Methodology

The criteria used to evaluate each alternative vary with the particular functional area. However, in general, similar criteria were used to measure the effectiveness and feasibility of the various options available for future development. The criteria used in the alternatives review and evaluation process can be grouped into four general categories defined below:

- Operational - Any selected development alternative should be capable of meeting the Airport's facility needs for the 20-year planning period. In addition, a preferred option should ideally resolve any existing or future deficiencies related to FAA design and safety criteria.
  Protection of the airspace needed to accommodate runway extensions or instrument approach procedures is of paramount importance, as are local land use regulations. All Part 77 Imaginary Surfaces and safety areas defined in AC 150/5300-13 should be kept clear to the extent possible. However, only the runway object free zones (OFZ) must be kept clear to meet FAA guidelines. Objects in other FAA safety areas or surfaces may require an airspace analysis to determine whether or not an instrument approach can be accommodated. For example, the fact that there is an object in the primary surface, other than one required by function, does not automatically preclude the establishment of an instrument approach.
- Environmental - Airport growth and expansion has the potential to impact the Airport environs. The selected plan should minimize to the extent possible impacts on areas beyond Airport property. Alternatives should also provide a reasonable balance between expansion needs and off-site acquisition and relocation impacts. Recommended development plans should also recognize sensitive environmental features that may be impacted by certain growth scenarios.




## DECLARED DISTANCE STANDARDS

| FUTURE DECLARED DISTANCES | RUNWAY 18 | RUNWAY 36 |
|---|---|---|
| TAKE-OFF RUN AVAILABLE (TORA) | 7,100' | 7,100' |
| TAKE-OFF DISTANCE AVAILABLE (TODA) | 7,100' | 7,100' |
| ACCELERATE STOP DISTANCE AVAILABLE (ASDA) | 7,100' | 6,540' |
| LANDING DISTANCE AVAILABLE (LDA) | 6,940' | 6,540' |

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EXHIBIT 18
PROPOSED RUNWAY 18-36
DECLARED DISTANCES

- Cost - Some alternatives may result in excessive costs based on construction, acquisition, or other development requirements. Alternatives could also impact operational costs. The recommended alternative should satisfy development needs within reasonable costs.
- Feasibility - The selected alternative should be capable of being implemented. Therefore, the alternative must be accepted by Airport management and be responsive to the community's needs. The recommended alternative should also support the Airport's development goals and provide facilities that support the area's long-term economic objectives.

Operationally, how well does each alternative meet the Airport's 20-year facility needs? Environmentally, to what extent does each alternative impact the Airport environs? With regard to Cost, the alternatives should not result in excessive capital costs nor dramatically elevate Airport operating costs. The Feasibility of each alternative will impact implementation of that Alternative.

Table 61, Alternative Evaluation Matrix, lists each of the alternatives and quantifies the evaluation of the facilities provided within each evaluation criterion.

**TABLE 61**
***ALTERNATIVE EVALUATION MATRIX***

| Alternative | Evaluation Criteria | | | | Total |
|---|---|---|---|---|---|
| | Operational | Environmental | Cost | Feasibility | |
| Do-Nothing | 2 | 8 | 8 | 6 | 24 |
| Extend Runway 18-36 and install EMAS | 7 | 6 | 1 | 8 | 22 |
| Extend Runway 18-36 and relocate Airport Road | 9 | 5 | 3 | 5 | 22 |
| Extend Runway 18-36 and implement Declared Distances | 8 | 6 | 5 | 9 | 28 |

Source: URS analysis.

### Selection of the Recommended Airfield Development Alternative

Each of the six alternatives have various advantages and disadvantages. The Do-Nothing Alternative results in lesser overall direct environmental impacts and direct costs. However, this alternative results in significant future operational deficiencies and could constrain future economic development within the surrounding community. The alternative to Extend Runway 18-36 south to 7,100' and install EMAS results in greater environmental impacts and costs while it improves Airport operations and is more feasible. The alternative to Extend Runway 18-36 south to 7,100' and relocate Airport Road results greater operational efficiency, which is offset by additional environmental impacts, costs, and problematic feasibility. The alternative to Extend Runway 18-36 south to 7,100' and implement declared distances results in greater operational efficiency and enhanced feasibility, which is offset by additional environmental impacts, and project costs.

Ultimately, Extending Runway 18-36 south to 7,100' and implementing declared distances was identified as the recommended alternative. This recommendation is based on this alternative's ability to maximize operational flexibility, limit overall environmental impacts, balance development costs with savings achieved through increased operational flexibility, and incorporate a feasible approach to meeting the Airport and the local community's needs and development goals.

In order to accommodate existing and future Airport maintenance requirements, the old air cargo building (Building 20) has been designated for conversion to equipment maintenance, repair, and storage. In order to accommodate the grounds maintenance equipment, a new storage facility has been designated for development in the area of the rental car service facility.

At the time the existing Airport Traffic Control Tower is decommissioned and the new ATCT currently under construction is commissioned, the old facility will be demolished. After demolition of the old ATCT, a new hazmat storage facility is recommended for development in the area of the old ATCT with provision for fueling facilities that will not impact the existing maintenance facility

Chapter Five

# IMPLEMENTATION PLAN AND COST ESTIMATES

# Chapter Five
# Implementation Plan and Cost Estimates

## Introduction

This chapter outlines the Implementation Plan and Cost Estimates for the proposed airport development identified on the Airport Layout Plan. The Implementation Plan comprises a project Phasing Plan with the associated Capital Improvement Plan (CIP). The CIP incorporates the improvements identified in previous chapters of this master plan, including the facility requirements analysis and recommended alternative. These improvements provide the facilities needed to accommodate the demand identified in the Aviation Demand Forecast Chapter. The recommended Phasing Plan incorporates the recommended 20-year planning horizon facility improvements.

Implementation of the proposed facilities should be demand driven. Therefore, any project to enhance airport capacity should be initiated as demand dictates rather than by an arbitrary time period. The implementation schedule balances the needs identified in the analyses against competing and conflicting financial priorities.

While facility development is demand driven, it is necessary to provide a timeline for project implementation. Therefore a timeline for project development is provided in order to establish project sequencing should aviation activity occur as forecast. However, it is recommended that the project implementation schedule should be closely monitored in the event future activity varies from the timeline established by the forecasts.

Airfield development projects should be initiated in a timely manner to accommodate increased demand levels while simultaneously avoiding development that results in inefficient and under-utilized facilities. In addition, airfield development that enhances safety receives a higher priority than capacity enhancing development.

For example, recent history has seen a decline in general aviation activity at GPT. However, development of the new Million Air FBO facility could significantly stimulate general aviation activity in the future. A significant increase in general aviation activity could necessitate acceleration of airfield facility development. Similarly, initiation of international operations could ultimately result in growth faster than forecast, which could require changes to the timeline of airfield facility development.

The implementation period encompasses three development phases spanning a 20-year time frame including:

- Phase I: Phase I covers the period through 2015. Projects assigned to Phase I are scheduled on a year-by-year basis, consistent with the FAA's Capital Improvement Program (CIP) format.

- Phase II: Phase II encompasses the 5-year period extending through 2020. Projects are not assigned specific years for implementation during this period.
- Phase III: Phase III spans the 10-year period from 2021 through 2030. Similar to Phase II, projects are not allocated to specific years during Phase III.

Preliminary estimated costs of development were prepared using techniques appropriate to the planning level of information currently available for the recommended projects. Although individual project costs could vary from the totals shown in the following tables, the total cost of each phase is not expected to change significantly. However, detailed cost estimates should be prepared as projects become more defined.

In the preliminary cost estimates presented in the following exhibits, projects meeting FAA funding eligibility requirements are noted, along with the anticipated percentage of FAA participation. It should be noted that eligibility for FAA funding does not constitute a commitment that FAA funds will be obtainable, or available in the time frame of the implementation plans. Ongoing coordination with FAA will be needed to determine the extent and timing of federal funding of each of the proposed projects.

The Implementation Plan represents the Airport's intentions for accomplishing the recommended projects and improvements. While a reasonable degree of certainty in project scheduling is needed to provide a coherent approach to development, various factors may cause schedule changes in the plan over time, including:

Financial Feasibility: The financial feasibility of implementing a project may change due to increased project costs or decreased available funding. Activity Levels: Since activity levels trigger the need for all demand-driven improvements they are not tied to pre-determined time frames. Thus, depending on how a particular segment of activity meets the forecast of aviation demand, certain improvements may be accelerated or delayed. Unanticipated Needs: The Master Plan cannot identify all demands the Airport may experience throughout the 20-year planning period. Requests from existing or prospective tenants, new business opportunities for the airport or unforeseen circumstances can and do arise at any time and create needs at the airport that may not be identified in the current plan. Changing Priorities: Over time, changes in the Airport's business and strategic plans are likely to occur in response to the dynamic nature of the aviation industry. Such changes are likely to trigger revisions to or adjustments of the existing CIP.

## Implementation Plan

The recommended Airfield Implementation Plan for the Airport's Capital Improvements is presented by phase in the following exhibits. The Phase I period has been developed in sufficient detail to be used for federal funding purposes. The exhibits provide the project name, estimated cost of construction, the level of FAA funding eligibility, and the year the construction is anticipated. The graphic exhibits depict the location of each project. The Airport Layout Plan incorporates all of these projects through the end of the 20-year planning period.

Phase I – through 2015

Phase I projects are presented by year in this plan and are listed in Table 62. Those projects proposed for 2012, 2013, 2014, and 2015 are tabulated on Table 47. All Phase I projects are depicted in Exhibit 19. The total cost of implementing Phase 1 is approximately $42.3 million.

Project expenditures during Phase I include acquisition of land within the existing runway protection zones, airfield security enhancements, developing new general aviation facilities, implementing upgrades to NAVAIDS and improving airfield drainage. Specific projects include:

- Rehabilitation of Taxilane "F", construction of Taxilane "G", and construction of connector to JHB;
- Acquire new security vehicle;
- Construction of airfield perimeter roadways;
- Construction of airfield perimeter fencing;
- NAVAID improvements – relocation of the RTR, dopplerizing the VOR, and installation of PAPIs on Runway 32;
- Reconstruction of Runway 14-32 touchdown zones;
- Completion of parallel Taxiway "J";
- Acquisition of land within the Runway 36 approach runway protection zone;
- Rehabilitation of the airport's drainage;
- Airfield pavement study.

Phase II – 2016 to 2020

Projects recommended during Phase II total approximately $45.3 million. The single greatest expenditure is assocaited with the extension of Runway 18/36, which is expected to cost approximately $25.8 million including installation of the associated navaids. The timing of some projects may need to be accelerated if demand arises earlier than anticipated. Conversely, some projects may be deferred in the event the need doesn't materialize during the planning period. Table 63 lists Phase II projects and Exhibit 20 identifies their relative location on-airport.

Phase III – 2021 to 2030

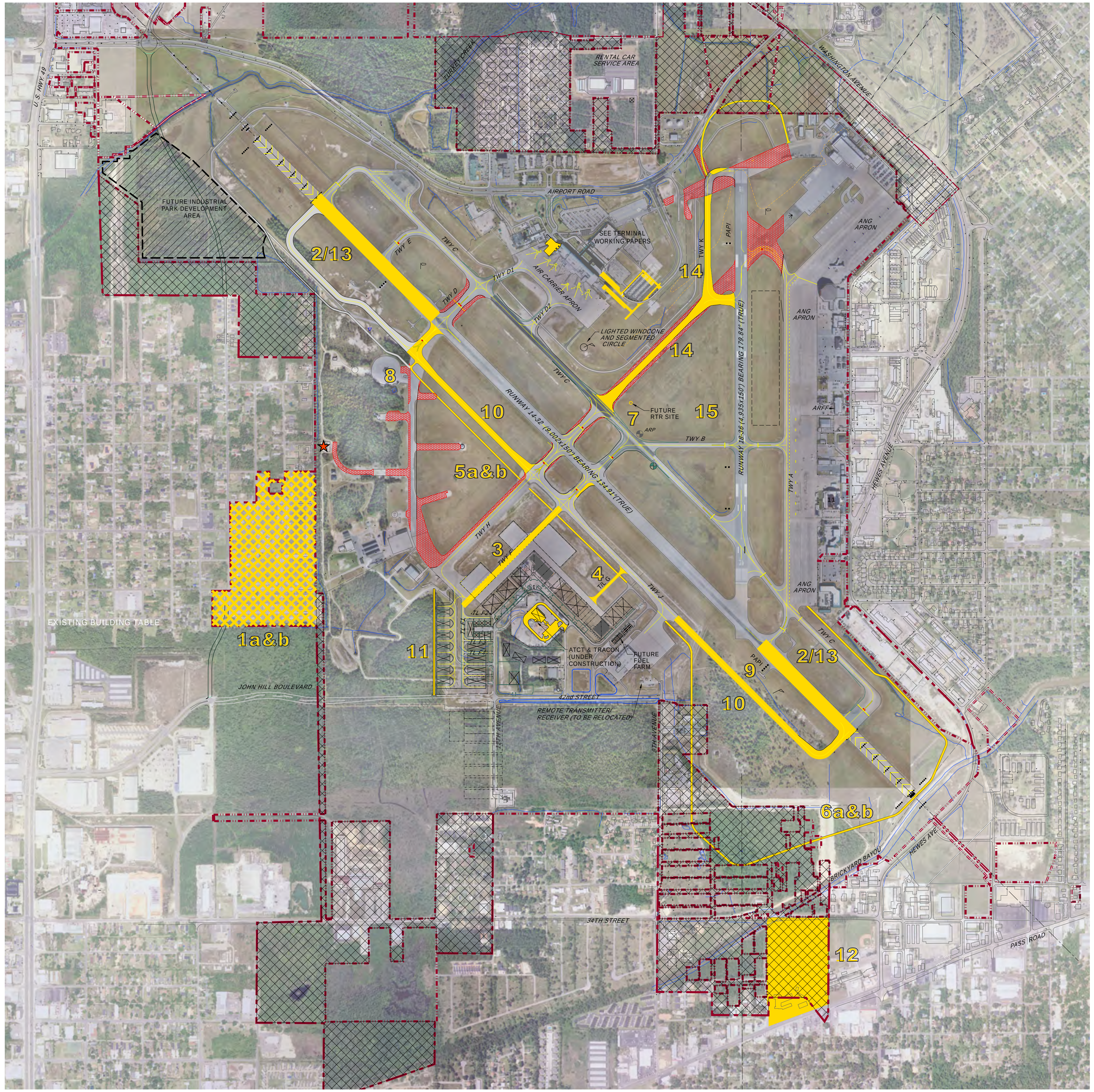
Phase III projects are estimated to cost approximately $22.7 million. As noted earlier in this chapter, changing conditions and circumstances may impact the timing and/or nature of projects and this is particularly true of projects proposed during Phase III. As with projects proposed during Phase II, some Phase III projects may need to be accelerated if demand arises earlier than anticipated. In the same vein, some projects may need to be deferred in the event the need falls outside the planning period. The Airport should periodically review and evaluate the projects on this list against existing and projected demand and make adjustments as needed to ensure facilities aren't over- or under-built.

Table 64 lists the Phase III Implementation Plan projects and Exhibit 21 depicts their location.

## TABLE 62
### *PHASE I CAPITAL IMPROVEMENT PROGRAM*

| Project | Total Cost | FAA Participation |
|---|---|---|
| **2012** | | |
| Acquire LC Jones, Part I | $1,500,000 | 90% |
| PCI / PCN Study | $197,105 | 90% |
| Runway 14-32 Study and Rehabiltation | $216,534 | 90% |
| Rehabilitate Taxilane "F" at GA | $142,574 | 90% |
| Construct Taxilane "G" | $607,941 | 90% |
| Perimeter Road Phase III (C) | $2,368,421 | 90% |
| **Sub-Total** | **$5,032,575** | 90% |
| **2013** | | |
| Acquire LC Jones, Part II | $1,500,000 | 90% |
| Acquire Security Vehicle | $40,000 | 90% |
| Perimeter Fence | $1,036,935 | 90% |
| Perimeter Road Phase III (D) | $2,368,421 | 90% |
| Relocate RTR | $1,000,000 | 100% |
| Dopplerize VOR | $2,500,000 | 100% |
| Install PAPI Runway 32 | $300,000 | 90% |
| South Parallel Taxiway "J" and Lighting | $14,012,730 | 90% |
| **Sub-Total** | **$22,432,518** | |
| **2014** | | |
| GA Connector to JHB | $358,750 | 90% |
| Perimeter Fence | $773,244 | 90% |
| Acquire Runway 36 Approach RPZ Land | $720,000 | 90% |
| Reconstruct Runway 14-32 Touchdown Zones | $7,900,000 | 90% |
| **Sub-Total** | $10,345,894 | |
| **2015** | | |
| Construct Taxiway "H" & "K"; Phase I | $2,221,600 | 90% |
| Perimeter Fence | $818,195 | 90% |
| Rehab Airfield Drainage | $1,134,400 | 90% |
| **Sub-Total** | $4,174,195 | |
| **PHASE I TOTAL** | $42,310,850 | |

Source: Gulfport-Biloxi Regional Airport Authority
URS analysis.




SHORT TERM -
PHASE I AIRFIELD PROJECTS

| DATE | | PROJECT |
|---|---|---|
| FY 2012 | | |
| | 1a | Acquire LC Jones, Part I |
| | 2 | Runway 14-32 Study and Rehabilitation |
| | 3 | Rehabilitate Taxilane "F" at GA |
| | 4 | Construct Taxilane "G" |
| | 5a | Perimeter Road Phase III (C) |
| FY 2013 | | |
| | 1b | Acquire LC Jones, Part II |
| | 6a | Perimeter Fence |
| | 5b | Perimeter Road Phase III (D) |
| | 7 | Relocate RTR |
| | 8 | Dopplerize VOR |
| | 9 | Install PAPI Runway 32 |
| | 10 | South Parallel Taxiway "J" |
| FY 2014 | | |
| | 11 | GA Connector to John Hill Boulevard |
| | 6b | Perimeter Fernce |
| | 12 | Acquire Runway 36 Approach RPZ Land |
| | 13 | Reconstruct Runway 14-32 Touchdown Zones |
| FY 2015 | | |
| | 14 | Construct Taxiway "H" & "K", Phase I |
| | 7c | Perimeter Fence |
| | 15 | Rehabilitate Airfield Drainage |


## LAYOUT PLAN LEGEND

| | EXISTING |
|---|---|
| AIRPORT PROPERTY LINE | |
| AIRPORT AVIGATION EASEMENTS | |
| AIRPORT FENCE | |
| PAVEMENT TO BE REMOVED | |
| AIRPORT BUILDINGS | |
| BUILDINGS (OFF-AIRPORT) | |
| 25'± BUILDING RESTRICTION LINE (BRL) | 25' BRL |
| RUNWAY SAFETY AREA (RSA) | RSA |
| RUNWAY OBJECT FREE AREA (ROFA) | ROFA |
| PRECISION OBSTACLE FREE ZONE (POFZ) | POFZ POFZ |
| INNER TRANSITIONAL OBSTACLE FREE ZONE (IT-OFZ) | IT-OFZ |
| INNER APPROACH OBSTACLE FREE ZONE (IA-OFZ) | IA-OFZ |
| OBSTACLE FREE ZONE (OFZ) | OFZ |
| TREES / SHRUBS | |
| DRAINAGE DITCHES/ BODIES OF WATER | |
| AIRPORT BEACON | ★ |
| AIRPORT REFERENCE POINT | ARP |
| VISUAL APPROACH SLOPE INDICATOR (VASI) | |
| PRECISION APPROACH PATH INDICATOR (PAPI) | |
| GLIDE SLOPE, LOCALIZER, ASR & VOR CRITICAL AREAS | |
| RUNWAY PROTECTION ZONE | |
| 2' CONTOURS | 20 |

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# EXHIBIT 19
# PHASE I PROJECTS

## TABLE 63

### *PHASE II CAPITAL IMPROVEMENT PROGRAM*

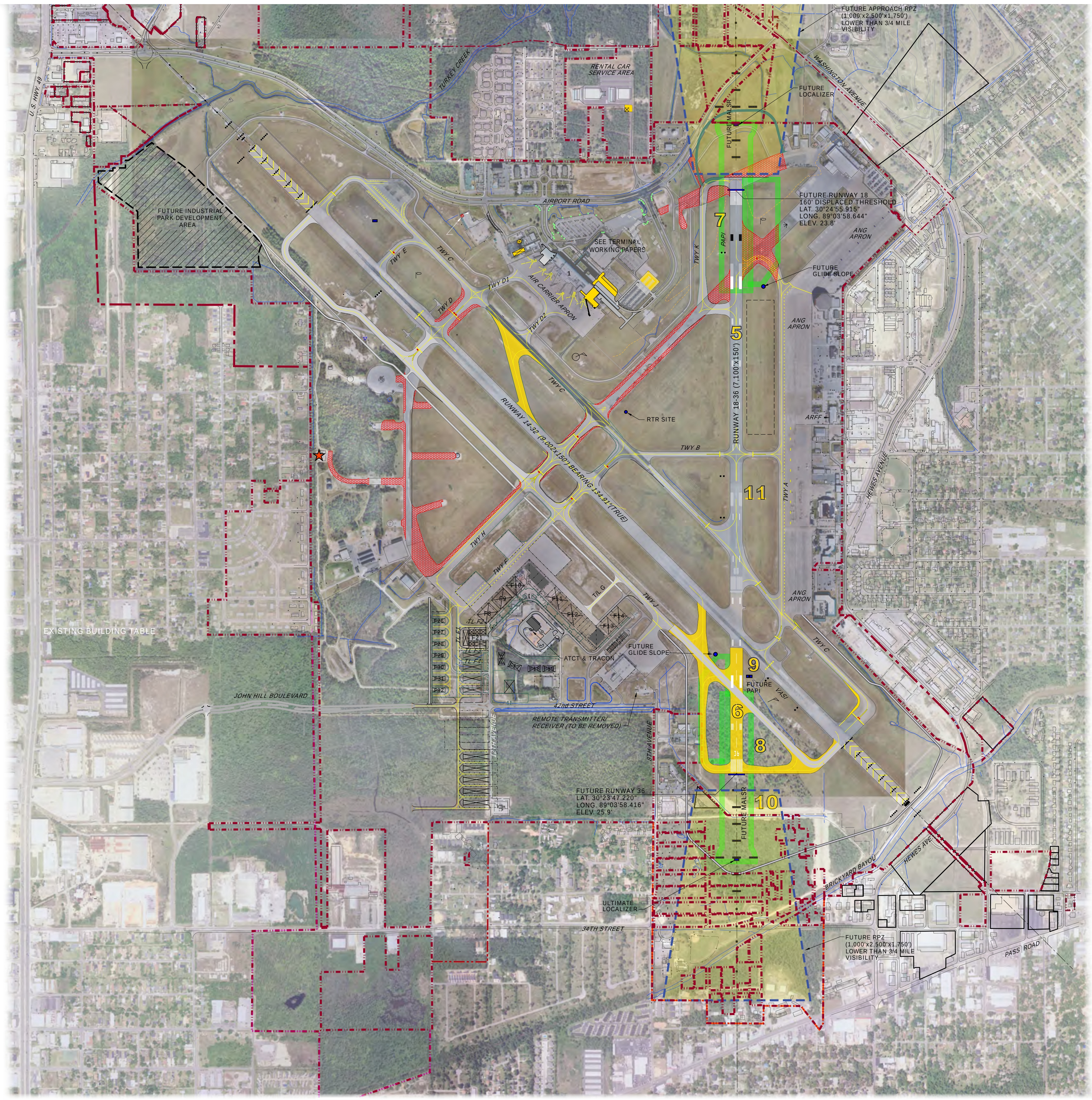
| Project | Total Cost | FAA Participation |
|---|---|---|
| **PHASE II** | | |
| Construct Taxiway “K” Phase II | $3,546,600 | 90% |
| Rehabilitate Airfield Drainage | $1,888,530 | 90% |
| Acquire Runway 36 Approach RPZ Land | $2,000,000 | 90% |
| Erect Perimeter Fence | $1,039,795 | 90% |
| Runway 18-36 Overlay/Strengthen | $6,307,329 | 90% |
| Runway 18-36 Extension | $16,564,995 | 90% |
| Relocate REILS, Threshold Lights, and PAPIs Runway 18 | $510,744 | 90% |
| Relocate REILS, and Threshold Lights Runway 36 | $527,505 | 90% |
| Install Precision Approach Path Indicators (PAPI) Runway 36 | $54,648 | 90% |
| Install Medium Intensity Approach Light System with Runway Alignment Indicator Lights (MALSR) Runway 18-36 | $1,405,415 | 90% |
| High Intensity Runway Lighting Runway 18-36 | $438,513 | 100% |
| South Partial Parallel Taxiway West Side of Runway 18/36 | $6,357,873 | 100% |
| MITL - South Partial Parallel Taxiway West to Runway 18-36 | $191,587 | 90% |
| North Angled Exit Taxiway off Runway 14/32 to Taxiway C | $4,352,915 | 50% |
| MITL - North Angled Taxiway off Runway 14-32 to Taxiway C | $87,747 | 90% |
| **PHASE II TOTAL** | $45,274,196 | |

Source: Gulfport-Biloxi Regional Airport Authority
URS analysis.

## TABLE 64
### *PHASE III CAPITAL IMPROVEMENT PROGRAM*

| Project | Total Cost | FAA Participation |
|---|---|---|
| **PHASE III** | | |
| Runway 14-32 Seal Coat | $1,021,059 | 90% |
| Runway 18-36 Seal Coat | $1,043,840 | 90% |
| South Parallel Taxiway "J" | $13,687,162 | 90% |
| North Partial Parallel Taxiway East Side of Runway 18/36 | $6,855,332 | 90% |
| MITL - North Partial Parallel Taxiway East to Runway 18-36 | $150,725 | 90% |
| South Angled Exit Taxiway off Runway 14/32 to Taxiway C | $4,352,915 | 90% |
| MITL - South Angled Taxiway off Runway 14-32 to Taxiway C | $87,747 | 90% |
| Taxiway Fillets D1 & D2 | $1,509,054 | 90% |
| MITL - Taxiway Fillets D1 and D2 | $91,270 | 90% |
| Widen Taxiway B | $3,225,794 | 100% |
| MITL - Taxiway B | $135,191 | 100% |
| Exit Taxiway from Runway 18/36 to ANG Apron | $2,871,857 | 90% |
| MITL - Exit Taxiway Runway 18-36 to ANG Apron | $50,714 | 50% |
| Extend Terminal Apron | $1,267,059 | 90% |
| Rehabilitate Rotating Beacon and Lighted Wind Cone | $59,455 | 90% |
| Rehabilitate Segmented Circle and Lighted Wind Cone | $15,180 | 90% |
| **PHASE III TOTAL** | $22,737,192 | |

Source: Gulfport-Biloxi Regional Airport Authority
URS analysis.





## INTERMEDIATE TERM - PHASE II AIRFIELD PROJECTS

| DATE | | PROJECT |
|---|---|---|
| FY 2016 - 2021 | | |
| | 1 | Construct Taxiway “K”, Phase II |
| | 2 | Rehabilitate Airfield Drainage |
| | 3 | Acquire Runway 36 Approach RPZ |
| | 4 | Erect Perimeter Fence |
| | 5 | Runway 18-36 Overlay/Strengthen |
| | 6 | Runway 18-36 Extension |
| | 7 | Relocate REILs, Threshold Lights, & PAPI Runway 18 |
| | 8 | Relocate REILs and Threshold Lights Runway 36 |
| | 9 | Install PAPIs Runway 36 |
| | 10 | Install MALSR Runway 18-36 |
| | 11 | Install HIRL Runway 18-36 |
| | 12 | Construct South Partial Parallel Taxiway Runway 18-36 |
| | 13 | MITL - South Partial Parallel Taxiway West to Runway 18-36 |
| | 14 | North Angled Exit Taxiway off Runway 14/32 to Taxiway C |
| | 15 | MITL - North Angled Taxiway off Runway 14-32 to Taxiway C |

## LAYOUT PLAN LEGEND

| | EXISTING |
|---|---|
| AIRPORT PROPERTY LINE | |
| AIRPORT AVIGATION EASEMENTS | |
| AIRPORT FENCE | |
| PAVEMENT TO BE REMOVED | |
| AIRPORT BUILDINGS | |
| BUILDINGS (OFF-AIRPORT) | |
| 25'± BUILDING RESTRICTION LINE (BRL) | 25' BRL |
| RUNWAY SAFETY AREA (RSA) | RSA |
| RUNWAY OBJECT FREE AREA (ROFA) | ROFA |
| PRECISION OBSTACLE FREE ZONE (POFZ) | POFZ POFZ |
| INNER TRANSITIONAL OBSTACLE FREE ZONE (IT-OFZ) | IT-OFZ |
| INNER APPROACH OBSTACLE FREE ZONE (IA-OFZ) | IA-OFZ |
| OBSTACLE FREE ZONE (OFZ) | OFZ |
| TREES / SHRUBS | |
| DRAINAGE DITCHES/ BODIES OF WATER | |
| AIRPORT BEACON | ★ |
| AIRPORT REFERENCE POINT | ARP |
| VISUAL APPROACH SLOPE INDICATOR (VASI) | |
| PRECISION APPROACH PATH INDICATOR (PAPI) | |
| GLIDE SLOPE, LOCALIZER, ASR & VOR CRITICAL AREAS | |
| RUNWAY PROTECTION ZONE | |
| 2' CONTOURS | 20 |

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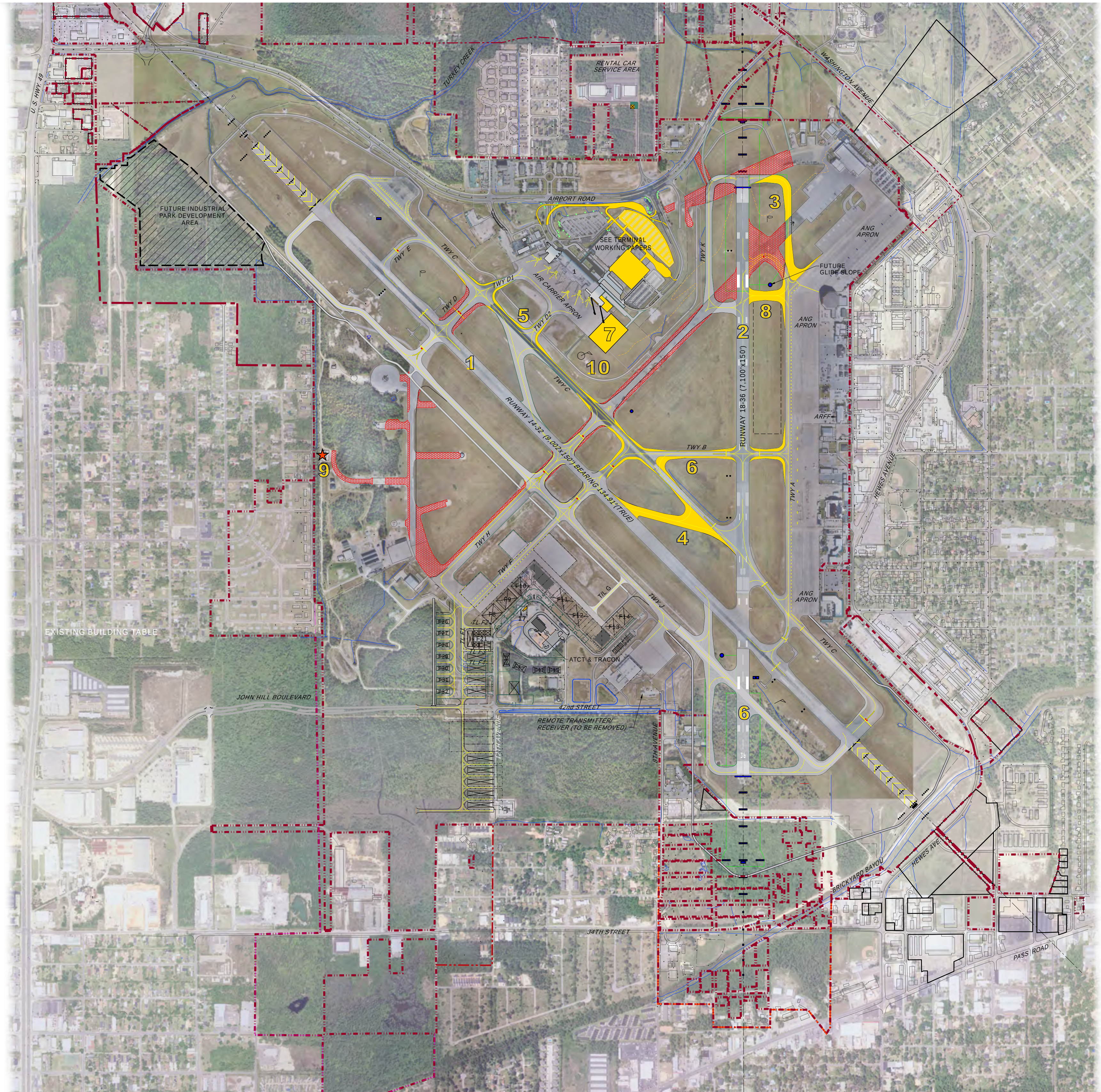
# EXHIBIT 20
# PHASE II PROJECTS





## LONG TERM - PHASE III AIRFIELD PROJECTS

| DATE | PROJECT |
|---|---|
| FY 2021 - 2030 | |
| 1 | Runway 14-32 Seal Coat |
| 2 | Runway 18-36 Seal Coat |
| 3 | Partial Parallel Taxiway & Lighting East Side Runway 18-36 |
| 4 | South Angled Exit Taxiway & Lighting Off Runway 14-32 |
| 5 | Taxiway Fillets & Lighting D1 & D2 |
| 6 | Widen & Lighting Taxiway “B” |
| 7 | Exit Taxiway & Lighting from Runway 18-36 to ANG Apron |
| 8 | Extend Terminal Apron |
| 9 | Rehabilitate Rotating Beacon |
| 10 | Rehabilitate Segmented Circle & Lighted Wind Cone |

## LAYOUT PLAN LEGEND

| | EXISTING |
|---|---|
| AIRPORT PROPERTY LINE | |
| AIRPORT AVIGATION EASEMENTS | |
| AIRPORT FENCE | |
| PAVEMENT TO BE REMOVED | |
| AIRPORT BUILDINGS | |
| BUILDINGS (OFF-AIRPORT) | |
| 25'± BUILDING RESTRICTION LINE (BRL) | 25' BRL |
| RUNWAY SAFETY AREA (RSA) | RSA |
| RUNWAY OBJECT FREE AREA (ROFA) | ROFA |
| PRECISION OBSTACLE FREE ZONE (POFZ) | POFZ POFZ |
| INNER TRANSITIONAL OBSTACLE FREE ZONE (IT-OFZ) | IT-OFZ |
| INNER APPROACH OBSTACLE FREE ZONE (IA-OFZ) | IA-OFZ |
| OBSTACLE FREE ZONE (OFZ) | OFZ |
| TREES / SHRUBS | |
| DRAINAGE DITCHES/ BODIES OF WATER | |
| AIRPORT BEACON | ★ |
| AIRPORT REFERENCE POINT | ARP |
| VISUAL APPROACH SLOPE INDICATOR (VASI) | |
| PRECISION APPROACH PATH INDICATOR (PAPI) | |
| GLIDE SLOPE, LOCALIZER, ASR & VOR CRITICAL AREAS | |
| RUNWAY PROTECTION ZONE | |
| 2' CONTOURS | 20 |

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EXHIBIT 21
PHASE III PROJECTS