



## Executive Summary



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# 1. INTRODUCTION

A Master Plan is one of the most important documents from an airport management and operation perspective, as it guides future growth and development. A Master Plan provides a road map for efficiently meeting aviation demand through the near future while preserving the flexibility necessary to respond to changing industry conditions.

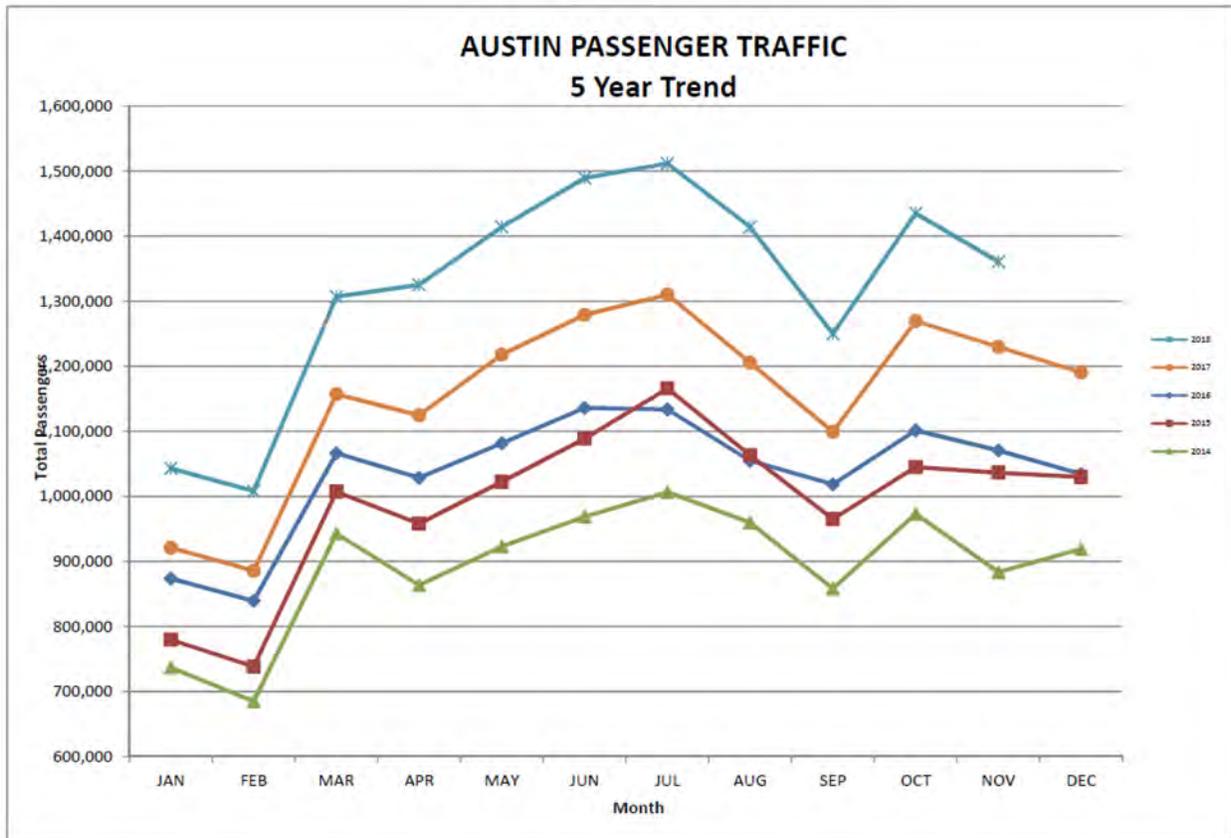
The goal of a Master Plan is to build the overall framework needed to guide future airport development. The plan must also allow the airport to keep pace with aviation growth cost effectively, while also considering potential environmental and socioeconomic impacts. Master Plans also provide the airport with the tools to react to uncertainties by examining key trends in the aviation industry, such as changing airline business models, improvements in technology, and local and regional economics that could affect airport activity.

The Austin-Bergstrom International Airport (ABIA) continues to experience passenger activity levels above the national average growth rate. Since 1999, passenger growth at Austin-Bergstrom International Airport (ABIA) has tripled, with a 4.2% average annual growth rate. Between 2011 and 2017, ABIA has grown at a 7.3% average annual growth rate, and had 13.94 million annual passengers (MAP) in 2017. This growth rate exceeds the national average growth rate of 2.8% for the same time period.<sup>1</sup> For the first eleven months in 2018, ABIA has been setting monthly passenger growth records from the previous year with an average monthly growth rate of 15.06% as shown in **Exhibit 1-1**.

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<sup>1</sup> US DOT Scheduled T100 Passenger Data and Database Products  
December 2018

**Exhibit 1-1: ABIA Historical Passenger Traffic (2014-2018)**



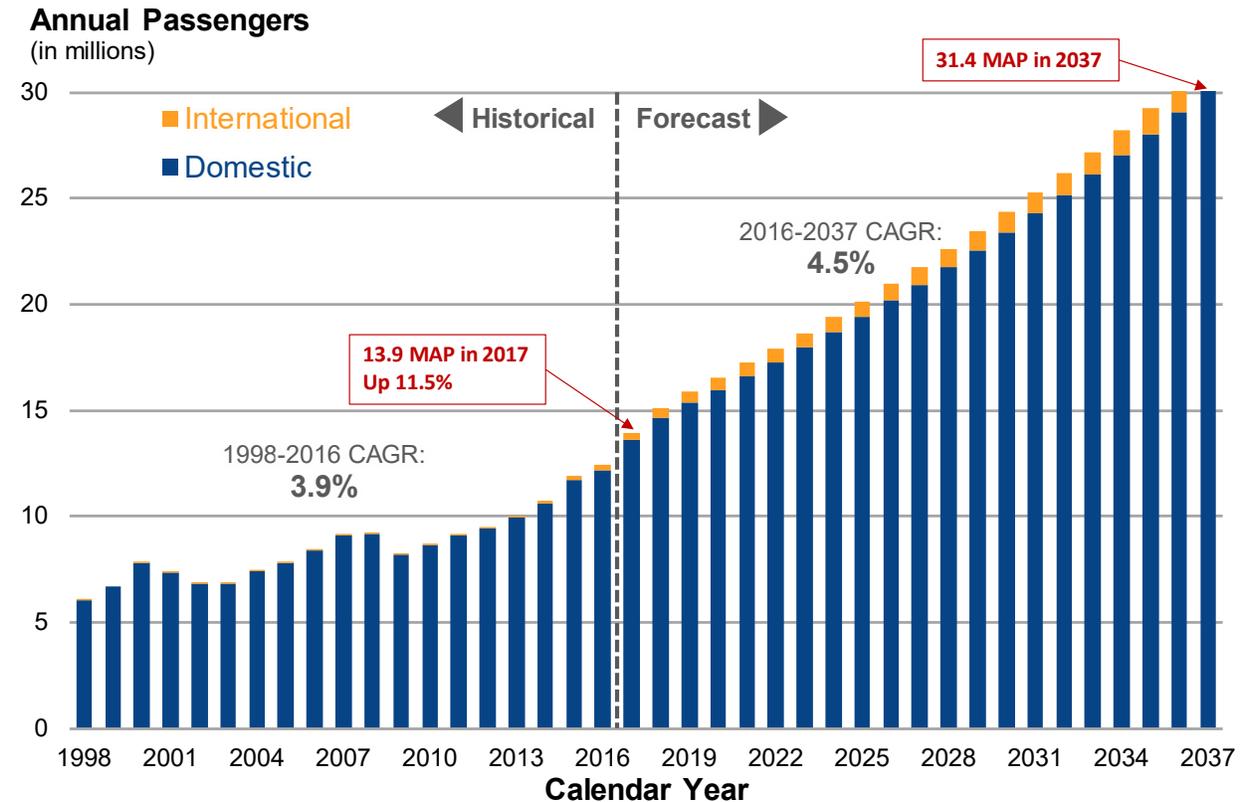
Source: ABIA Historical Data

## 2. AVIATION FORECASTS

### 2.1 Enplaned Passengers

The high-case aviation forecasts as shown in **Exhibit 2-1** were used in this Master Plan, which assumes a higher economic growth for the Austin region. Under the high-case scenario, the Metropolitan Statistical Area’s (MSA’s) Gross Regional Product (GRP) is assumed to increase at an Average Annual Growth Rate (AAGR) of 4.0 percent through 2037. The higher economic growth results in an increase in domestic enplaned passengers of 2.2 million by 2037 compared to the baseline. Under the high case scenario, the international enplaned passengers at ABIA would increase at a rate that is on average 1.5 percentage points higher than the year-over-year national average.

**Exhibit 2-1: ABIA Forecast Enplaned Passengers (High Case Scenario)**

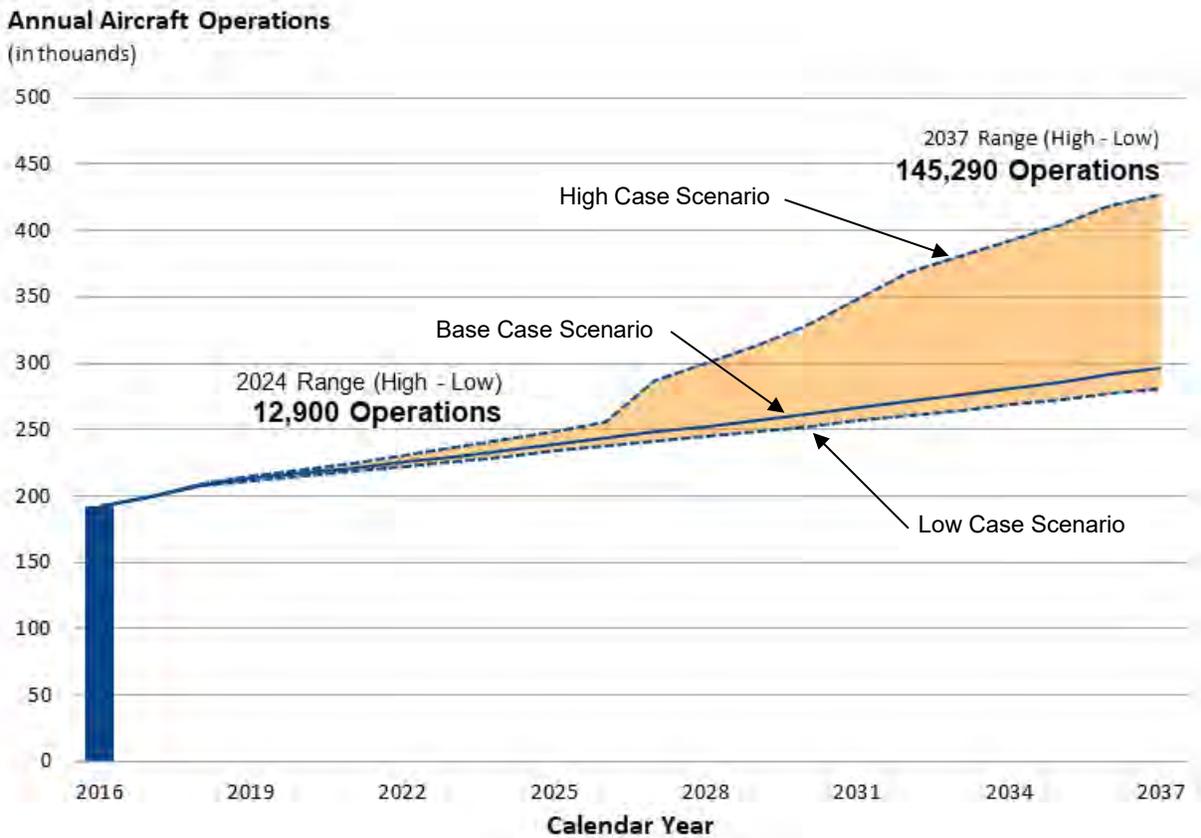


Note: Aviation forecast based on 2017 baseline data time period.  
Source: Landrum & Brown, Inc.

**2.2 Aircraft Operations**

The total aircraft operations forecast is the aggregation of the passenger, all-cargo, air taxi, general aviation (GA), and military aircraft operations forecasts. Total aircraft operations are forecast to increase from 192,032 in 2016 to 296,428 aircraft operations in 2037, representing an average annual growth rate of 2.1 percent. The high-case scenarios for the enplaned passenger and cargo throughput forecasts were used to develop the high-case aircraft operations forecast. This results in an additional 129,844 aircraft operations by 2037 when compared to the baseline as shown in **Exhibit 2-2**.

**Exhibit 2-2: Aircraft Operations Forecast Scenarios**

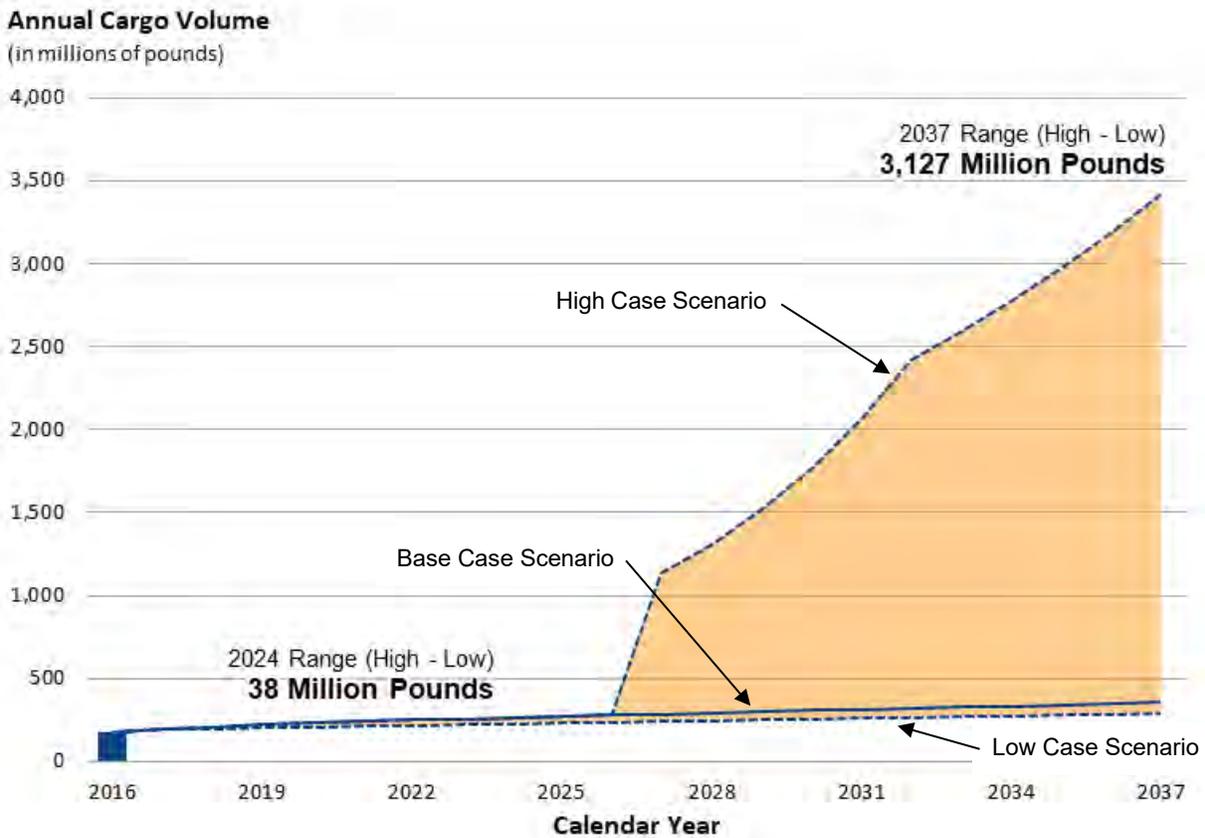


Sources: City of Austin Aviation Department, Austin-Bergstrom International Airport Aviation Activity Reports. City of Austin Aviation Department, Landing Reports; Landrum & Brown, 2017.

**2.3 Cargo Tonnage**

The high-case scenario assumes future development of an e-commerce distribution center at ABIA. It was assumed that the e-commerce distribution center would begin service in 2027 with more than 25,500 annual aircraft operations. The development of the distribution center results in an increase in cargo throughput of 3,060 million pounds by 2037 compared to the baseline as shown on **Exhibit 2-3**.

**Exhibit 2-3: Cargo Throughput Forecast Scenarios**



Sources: City of Austin Aviation Department, Austin-Bergstrom International Airport Aviation Activity Reports; Landrum & Brown, 2017.

**3. DEMAND/CAPACITY AND FACILITY REQUIREMENTS**

Estimated timing of certain threshold events are the basis of planning decisions; this timing should correspond to level of aviation demand, referred to as Planning Activity Levels (PALs). The projected need for facility improvements is based on the PALs rather than specific time periods. This Master Plan addresses four future PALs, corresponding to the planning years 2019, 2022, 2027, and 2037. Future planning levels have been identified for million annual passengers (MAP), annual tons of enplaned cargo, and annual aircraft operations for the High-Growth Forecast as shown in **Table 3-1**.

The facility requirements for the passenger terminal and other airport facilities are Pals in MAP. Facility requirements for cargo facilities are based on annual enplaned tons of cargo, and the requirements for airfield (runways) facilities are based on aircraft operations.

**Table 3-1: Future Planning Levels - High Growth Forecast**

ITEM	ACTUAL (2017)	PAL 1 (2019)	PAL 2 (2022)	PAL 3 (2027)	PAL 4 (2037)	AVG. ANNUAL GROWTH RATE [%]
Annual Passengers, MAP	14.0	16.0	18.0	22.0	31.0	4.5
Annual Enplaned Cargo, tons	88,000	100,700	113,000	513,500	1,549,000	15.2
Annual Aircraft Operations	199,600	214,700	230,600	287,200	426,600	3.9

Source: Aviation Forecast, High Growth scenario

### 3.1 Existing Airfield Capacity Analysis

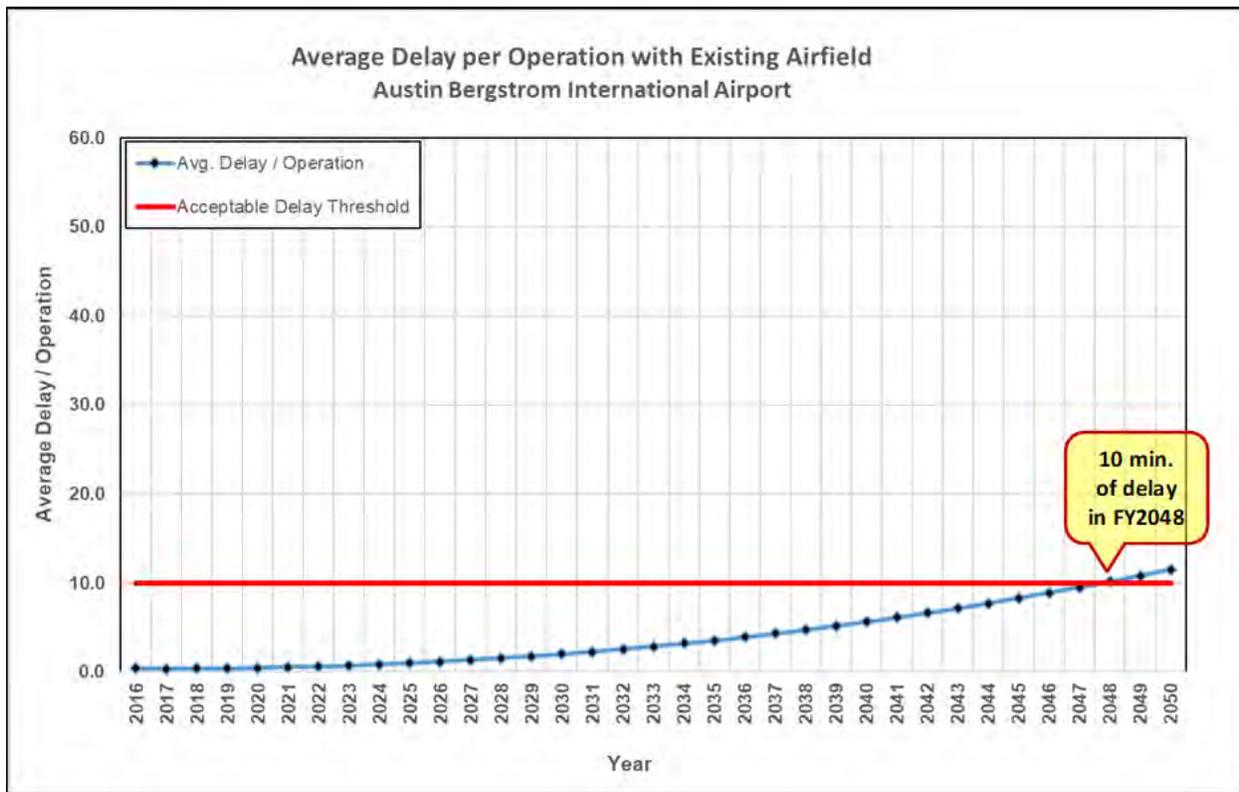
The Existing Airfield Capacity Analysis was conducted using the Landrum & Brown runway queue model to determine a high-level estimate of when the existing airfield will “max-out”, and thus unable to sustain further growth at the airport while keeping the average delay per operation below the acceptable 10-minute threshold. This analysis was used to determine the potential trigger points for development of an additional runway and/or other airfield infrastructure.

Runway capacity was calculated using the Airfield Capacity Estimation Spreadsheet Model and the Airfield Capacity Model (ACM) that was developed in part by L&B and other industry experts in association with the Transportation Research Board (TRB) Airport Cooperative Research Program (ACRP). The ACRP Report 79, Evaluating Airfield Capacity guidelines were used to determine the runway capacity for each of the runway operating configurations.

Based on the Runway Queue Model (RQM) analysis, the existing ABIA airfield provides sufficient capacity to perform operations at the airport efficiently for the next 20-years. **Exhibit 3-1** shows the average delay curve associated with the existing airfield geometry. The average delay per operation is expected to exceed the 10-minute threshold around year 2048. The existing airfield can accommodate approximately 445,000 annual aircraft operations, while the high-case aviation forecast projects that the demand in 2037 will be approximately 426,500 annual aircraft operations (includes commercial, cargo, air taxi, GA, and military).

Runway closures result in reduced capacity and higher delays at an airport. When one of the parallel runways at ABIA is closed for rehabilitation works, all operations require accommodation on the single operable runway. If either existing parallel runway is closed for an extended period, the average delay per aircraft operation will exceed the 10-minute delay threshold set by the FAA. Therefore, a new third parallel runway must be available to minimize aircraft and passenger delays. The new parallel Runway 17C-35C would be located 1,200 feet west of existing Runway 17R-35L, with a length of 10,000 feet.

**Exhibit 3-1: Average Delay Curve – Existing Airfield**



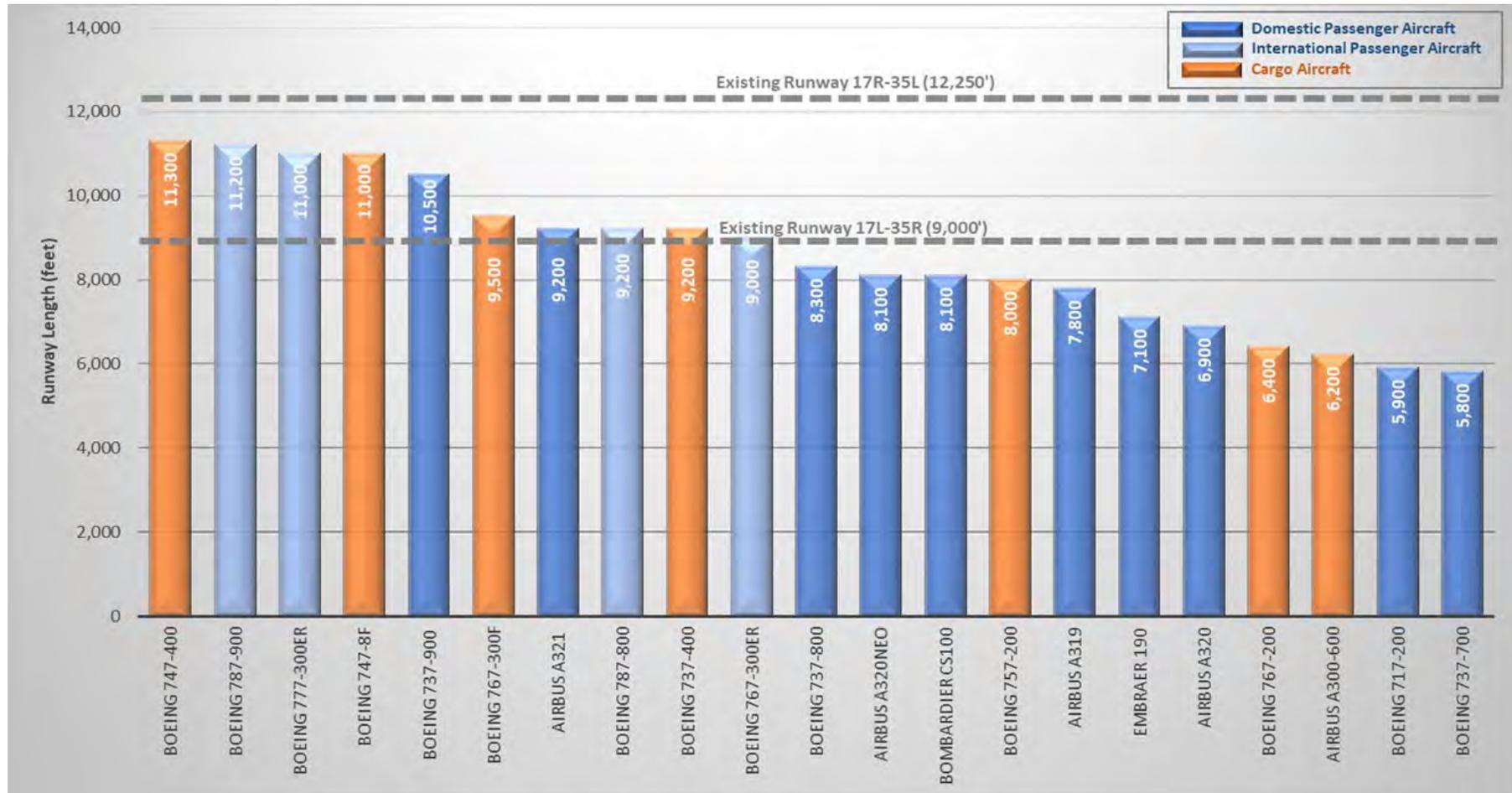
**3.2 Runway Length Requirements**

Runway 17R-35L can accommodate every aircraft in the forecast 2037 fleet mix at Maximum Take-Off Weight (MTOW). The 12,250-foot runway length allows international passenger and cargo aircraft flexibility to fly long distances and/or carry heavy payloads. Landings at maximum landing weight are also possible on Runway 17R-35L.

The 9,000-foot long Runway 17L-35R serves mostly domestic flights, allowing aircraft to carry the maximum payload to most domestic destinations from ABIA. All aircraft in the forecast 2037 fleet can land on Runway 17L-35R with maximum landing weight. The overall takeoff length requirement for the existing runways at ABIA are 11,300 feet for takeoff (Boeing 747-400) and 9,000 feet for landing (Boeing 747-8F) operations as shown in **Exhibits 3-2** and **Exhibit 3-3**, respectively.

Based on the existing 12,250-foot long Runway 17R-35L, **Exhibit 3-4** shows the maximum range for various aircraft type at MTOW. All aircraft in the ABIA future fleet can reach all U.S. cities at MTOW. Long-haul international destinations in Europe (London & Frankfurt) and Asia (Incheon and Narita) can be reached by the majority of the wide-body aircraft.

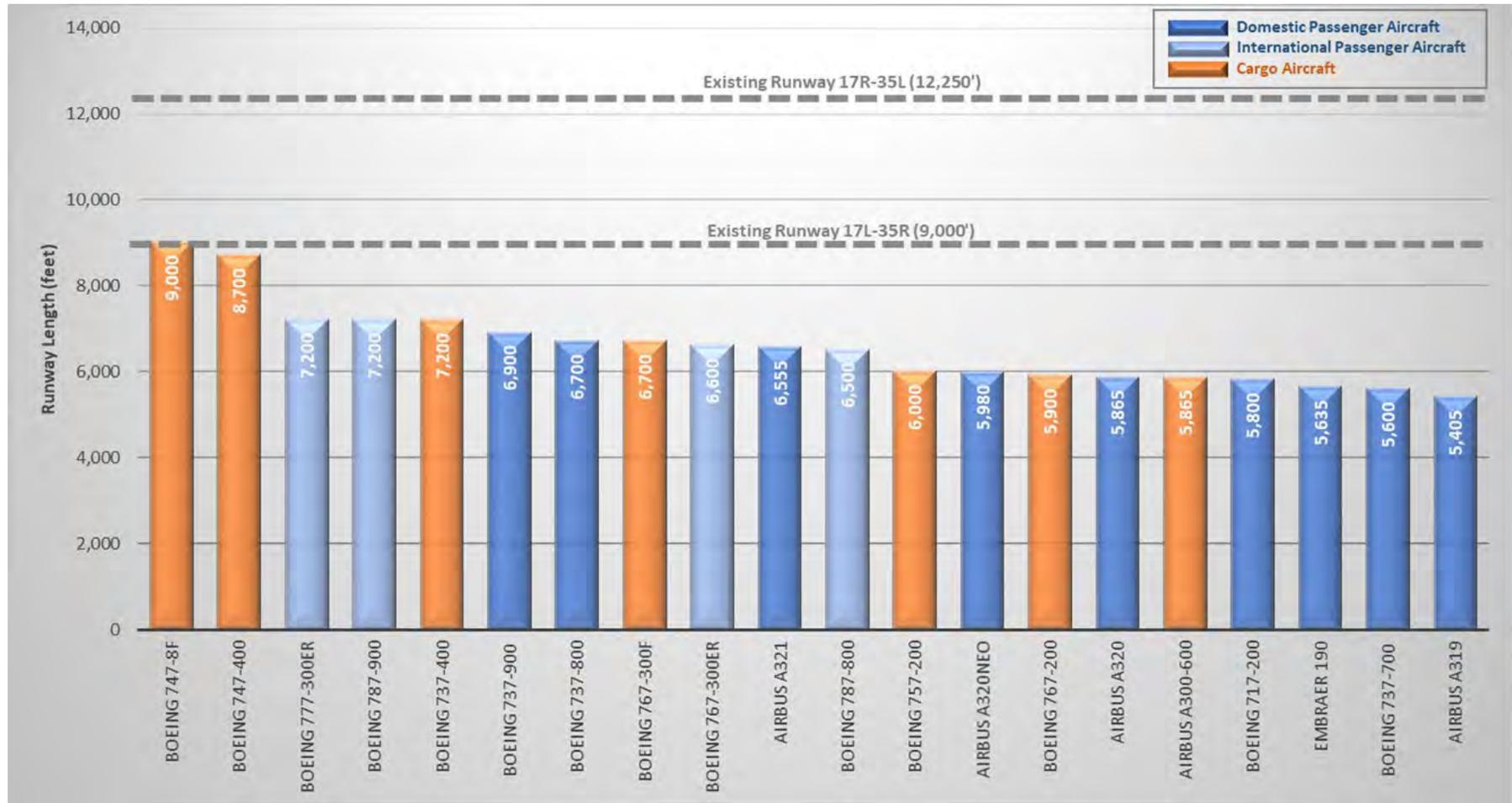
**Exhibit 3-2: Existing Runways: Takeoff Length Analysis at MTOW**



Note: Aircraft manufacturing planning charts were not available to calculate takeoff length analysis for the Boeing 737 Max 8 or Max 9 aircraft.

Source: Landrum & Brown analysis.

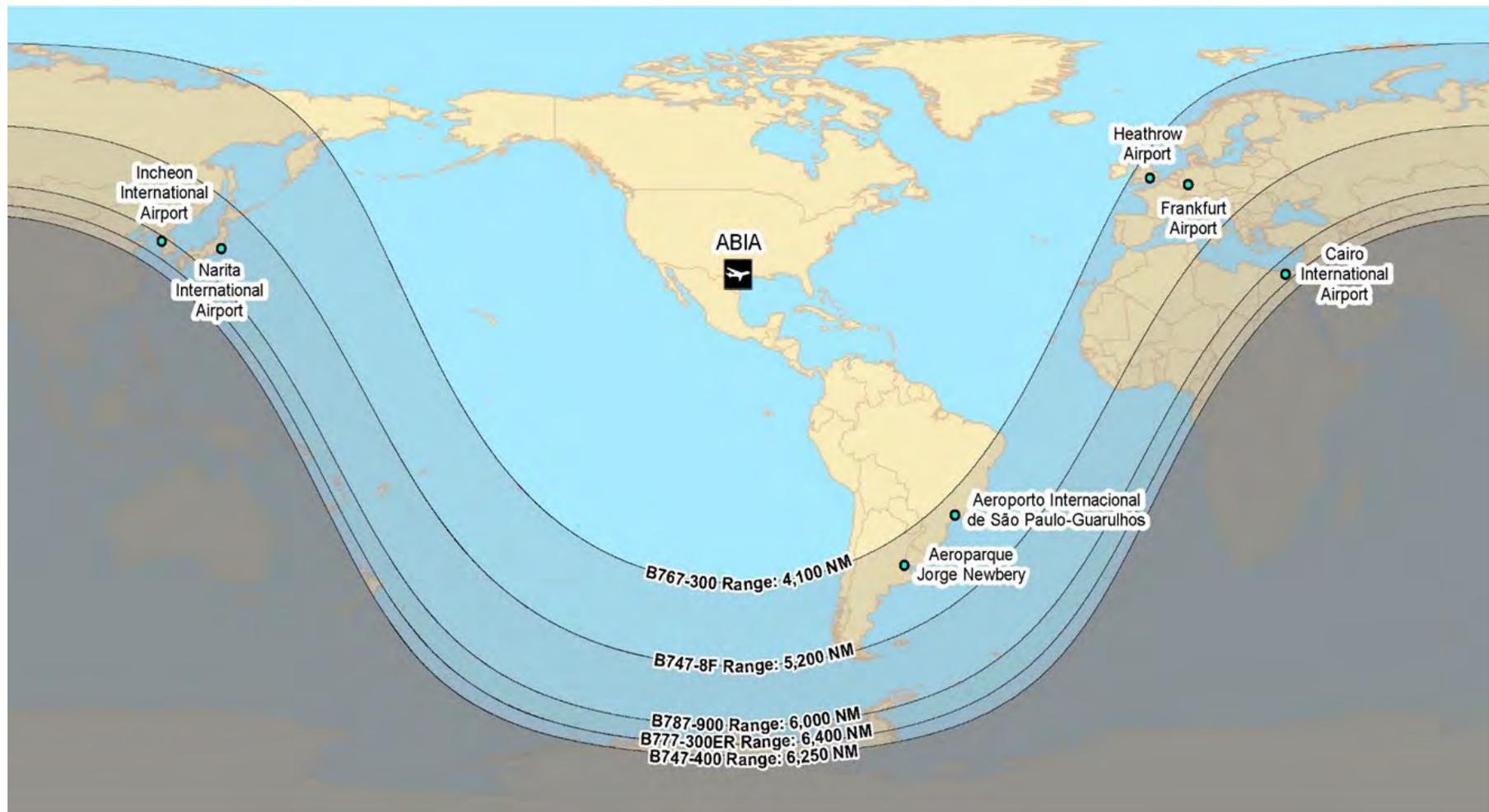
**Exhibit 3-3: Existing Runways: Landing Analysis at MLW**



Note: Aircraft manufacturing planning charts were not available to calculate landing length analysis for the Boeing 737 Max 8 or 9, as well as, the Bombardier CS100.

Source: Landrum & Brown analysis.

**Exhibit 3-4: Aircraft Range Map (12,250' Runway)**



Source: Landrum & Brown analysis.

## 4. TERMINAL DEMAND/CAPACITY ANALYSIS

Spreadsheet models applying industry standard planning parameters were used to assess the ability of the passenger terminal facilities to accommodate the projected demand as established in the Design Day Flight Schedules (DDFS) described in Chapter 3, *Aviation Demand Forecast*. From the DDFS, the peak hour aircraft and passenger volumes were identified and services as the basis the demand/capacity assessment and facility requirements. The planning parameters selected provide an optimum level of service (LOS), as defined by the International Air Transport Association (IATA), during the peak periods.

**Table 4-1** provides a high-level summary of the analysis results. When the East Expansion opens in early 2019, most of the terminal components at ABIA will be operating at or above capacity. By PAL 2 (2022), substantial capacity expansion will be required. **Table 4-2** provides the aircraft gate requirements for each of the planning years.

**Table 4-1: High-Level Terminal Demand / Capacity Analysis Results**

FACILITIES	PAL 1 16.0 MAP	PAL 2 18.0 MAP	PAL 3 22.0 MAP	PAL 4 31.0 MAP
AIRCRAFT GATES				
TICKETING/CHECK-IN				
OUTBOUND BAGGAGE HANDLING				
PASSENGER SECURITY SCREENING				
CONCOURSE/HOLDROOMS				
BAGGAGE CLAIM				
CONCESSIONS				
U.S. CUSTOMS & BORDER PROTECTION				

Notes: **Sufficient** = meets stated requirements

**Deficient** = significantly below one or more of the stated requirements

Source Landrum & Brown

**Table 4-2: Aircraft Gate Requirements**

GATES	EXISTING (2019) *	PAL 1 16.0 MAP	PAL 2 18.0 MAP	PAL 3 22.0 MAP	PAL 4 31.0 MAP
DOMESTIC	32	32	34	42	57
INTERNATIONAL	4	3	5	6	7
<b>SUB-TOTAL GATES</b>	<b>36</b>	<b>35</b>	<b>39</b>	<b>48</b>	<b>64</b>
RONS	42	42	45	58	74
<b>TOTAL POSITIONS</b>	<b>78</b>	<b>77</b>	<b>84</b>	<b>106</b>	<b>138</b>
ADG III GATES	34	33	36	44	59
ADG V GATES	2	3	3	4	5

Note: \* Includes Barbara Jordan Terminal East Expansion and South Terminal

Source: Landrum & Brown

Upon completion of the East Expansion in early 2019, the passenger terminal/concourse facilities at ABIA (Barbara Jordan Terminal and South Terminal) will provide approximately 984,300 square feet of total floor area. Based on the requirements analysis shown in **Table 4-3**, approximately 2 million square feet of terminal/concourse area is required in PAL 4 (2037), which is approximately twice the total area compared to the existing terminal/concourse areas. Demand within the next 5 years PAL 2 is 1.2 million square feet and by PAL 3 (2027), is more than 1.5 million square feet.

**Table 4-3: Summary of Passenger Terminal/Concourse Facility Requirements**

FACILITIES	UNITS	EXISTING (2019)	PAL 1 16.0 MAP	PAL 2 18.0 MAP	PAL 3 22.0 MAP	PAL 4 31.0 MAP
<b>GATES (TOTAL)</b>		<b>36</b>	<b>36</b>	<b>39</b>	<b>50</b>	<b>64</b>
ADG III		34	33	36	46	59
ADG V		2	3	3	4	5
<b>TICKETING / CHECK-IN</b>						
Curbside Check-in	Positions	18	10	13	15	19
Curbside Check-in Area	sq. ft.	2,400	1,955	2,530	2,875	3,680
Full Service Agent Positions	Positions	91	24	27	33	44
Bag Drops	Positions		71	80	98	135
Kiosks	Devices	64	84	95	117	162
Check-in Area	sq. ft.	36,150	61,410	69,230	84,755	115,805
Airline Ticket Offices	sq. ft.	12,450	9,545	10,235	13,225	16,790
<b>OUTBOUND BAGGAGE HANDLING</b>						
Outbound Baggage Screening Machines	Units	6	6	5	6	7
Outbound Baggage Screening Area	sq. ft.	20,000	20,000	17,000	20,000	24,000
Outbound Baggage Make-up Area *	sq. ft.	43,150	43,150	55,000	60,000	75,000
<b>PASSENGER SECURITY SCREENING</b>						
Security Checkpoint	Lanes	17	22	23	28	38
Security Checkpoint Area, incl. queue	sq. ft.	22,750	52,100	54,400	66,300	89,800
<b>PASSENGER HOLDROOMS</b>						
Narrowbody Holdrooms		31	33	36	46	59
Narrowbody Holdroom Area	sq. ft.	106,200	98,670	107,640	137,540	176,410
Wide-body Holdrooms		2	3	3	4	5

FACILITIES	UNITS	EXISTING (2019)	PAL 1 16.0 MAP	PAL 2 18.0 MAP	PAL 3 22.0 MAP	PAL 4 31.0 MAP
Wide-body Holdroom Area	sq. ft.	9,000	16,215	16,215	21,620	27,025
Circulation Corridor	sq. ft.	89,600	125,350	135,125	173,650	221,950
<b>DOMESTIC BAGGAGE CLAIM AND INBOUND BAGGAGE HANDLING</b>						
Baggage Claim	Devices	7	7	7	10	15
Baggage Claim Frontage	LF	1,050	980	980	1,400	2,100
Baggage Claim Hall	sq. ft.	53,500	58,075	60,950	82,800	120,000
Baggage Service Offices	sq. ft.	3,050	4,370	5,060	6,210	8,625
Inbound Baggage Handling Area	sq. ft.	8,100	13,340	13,340	18,975	28,000
<b>CONCESSIONS</b>						
Pre-security Concessions	sq. ft.	3,950	10,695	11,730	13,685	18,055
Post-security Concessions	sq. ft.	67,900	95,680	105,340	122,590	162,150
Concessions Support	sq. ft.	5,500	15,985	17,595	20,470	27,025
<b>U.S. CUSTOMS AND BORDER PROTECTION</b>						
Sterile Corridor	sq. ft.	17,800	29,900	34,900	43,100	51,400
Document Verification Officer	Positions	10	6	8	12	12
Global Entry Kiosks	Devices	8	8	8	8	8
Automated Passport Control Kiosks	Devices	8	13	13	13	13
Primary Processing and Inspection	sq. ft.	8,400	8,600	11,300	16,700	16,700
Secondary Processing and Inspection	sq. ft.	3,000	2,700	2,835	2,835	2,835
Operational Support	sq. ft.	8,000	6,345	9,180	10,395	10,395
Baggage Claim Devices		1	2	3	3	3
Baggage Claim Frontage	LF	198	440	660	660	660
Baggage Claim Hall	sq. ft.	6,500	18,975	30,590	31,280	31,280
<b>OTHER AREAS</b>						
Public Restrooms	sq. ft.	24,300	29,440	30,935	36,225	50,600
Airline Support Space	sq. ft.	81,450	176,180	188,945	243,455	310,615

FACILITIES	UNITS	EXISTING (2019)	PAL 1 16.0 MAP	PAL 2 18.0 MAP	PAL 3 22.0 MAP	PAL 4 31.0 MAP
Airline Clubs / Premium Lounges	sq. ft.	23,000	25,875	34,500	34,500	34,500
Airport Operations	sq. ft.	117,900	100,400	109,800	131,400	171,200
Other – Maintenance, Mechanical, Electrical, Vertical Circulation, Open/Covered	sq. ft.	197,350	186,100	206,100	255,400	322,600
<b>TOTAL BUILDING AREA</b>	sq. ft.	<b>971,400</b>	<b>1,212,836</b>	<b>1,342,514</b>	<b>1,662,538</b>	<b>2,119,848</b>

Note: \*Sixing of Area reflects the number of baggage make-up units required under the current exclusive/shared use model used at AUS today.

Source: Landrum & Brown

## 5. LANDSIDE DEVELOPMENT NEEDS

**Table 5-1** provides a summary of the existing utilization of each parking facility and the future requirements needed to meet the future parking demand. A parking study was performed by PGAL / Ricondo & Associates in January 2013<sup>2</sup>. New data was collected for this analysis in order to account for changes to parking that occurred after the 2013 study.

**Table 5-1: Auto Parking Peak Demand**

PARKING AREA	EXIST. CAPACITY	PAL 1 DEMAND	PAL 2 DEMAND	PAL 3 DEMAND	PAL 4 DEMAND
On-Site Public (Short Term)	3,522	4,303	4,959	5,686	6,519
On-Site Public (Long Term)	8,947	10,930	12,598	14,444	16,560
On-Site Public (Valet)	603	737	849	973	1,116
On-Site Employee	1,785	2,181	2,513	2,882	3,304
Off-Site Public	11,908	14,458	16,767	19,224	22,040
CONRAC	3,498	4,273	4,925	5,647	6,474
<b>TOTAL</b>	<b>30,263</b>	<b>36,882</b>	<b>42,611</b>	<b>48,856</b>	<b>56,013</b>

Source: Garver

<sup>2</sup> ABIA 25 Year Parking Plan, prepared by PGAL in association with Ricondo & Associates, Inc., January 2013.

## 5.1 Regional Traffic and Roadway Development Needs

The regional roadway network accessing ABIA consists mainly of Texas State Highway 71 (SH 71), a multi-lane controlled access road that connects to Interstate 35 (I-35) via direct connector ramps to the west of ABIA and to Texas State Highway 130 (SH 130) to the east of ABIA. Burleson Road is a City of Austin owned street that connects to US 183 and SH 130 on the south side of ABIA. Burleson Road provides access to the South Terminal, Air Traffic Control Tower (ATCT), GA/FBO, and other facilities located in the southern part of the airport.

The Capital Area Metropolitan Planning Organization (CAMPO) maintains a regional travel demand model for all of the region's major roadways. The travel demand model considers future land use and population growth to forecast future traffic demand on the regional roadways. The model uses Volume-to-Capacity (V/C) ratios to express the level at which a roadway facility is operating. V/C ratios serve as a simple representation of roadway segment performance. The Transportation Research Board of the National Academies Highway Capacity Manual defines a roadway's operation Level of Service by its V/C ratio. The Level of Service (LOS) is expressed by the letters A through F, as shown in **Table 5-2**. Roadways with a LOS A through LOS C are considered acceptable, while a LOS D through LOS F are not acceptable and require upgrade to improve their LOS to a LOS C or above.

**Table 5-2: LOS per V/C Ratio**

LOS	V/C RATIO
A	0.35
B	0.55
C	0.77
D	0.92
E	1.0
F	>1.0

Traffic analysis for the 2037 design year was performed using the Verehr in Städten Simulations Model (VISSIM). The model results show unacceptable LOS D, E and F at all intersections, especially unsignalized intersections during the PM peak hour. Furthermore, the majority of roadway segments operate at LOS D or better during the AM peak hour. However, all roadway segments fail operationally during the PM peak hour period mainly due to over-congested terminal curbside conditions and a queue at the terminal curb entry point that propagates to other segments of the entrance roadway.

Analysis of the terminal curbside determined a LOS C for the upper curb and a LOS D for the lower curb for future year 2037 as shown in **Table 5-3**.

**Table 5-3: Terminal Curbside Demand, Capacity and LOS (2037)**

	<b>FUTURE PEAK HOUR VOLUME [VPH]</b>	<b>FUTURE CAPACITY [VPH]</b>	<b>V/C RATIO</b>	<b>LOS</b>
<b>PAL 1 (2019)</b>				
Curbside Upper Level (Total)	710	2790	0.25	B
Curbside Lower Level (Total)	910	2220	0.41	C
<b>PAL 2 (2022)</b>				
Curbside Upper Level (Total)	780	2790	0.28	B
Curbside Lower Level (Total)	1000	2220	0.45	C
<b>PAL 3 (2027)</b>				
Curbside Upper Level (Total)	900	2790	0.32	B
Curbside Lower Level (Total)	1160	2220	0.52	C
<b>(2032)</b>				
Curbside Upper Level (Total)	1040	2790	0.37	B
Curbside Lower Level (Total)	1340	2220	0.60	C
<b>PAL 4 (2037)</b>				
Curbside Upper Level (Total)	1200	2790	0.43	C
Curbside Lower Level (Total)	1540	2220	0.69	D

Note: VPH = Vehicles per Hour

The terminal lower level entry queue and delays primarily result from driver's behavior at the curbside entrance as observed with the current operation. The impacts of these human factors worsen with future conditions as passenger demand increases throughout the roadway system. This behavior consists of the following:

- A large portion of vehicles immediately maneuvering into the two right lanes upon entering the terminal curbside to secure their place and look for their passengers.
- These vehicles slowly driving down the curbside with brief but frequent stops to look for their passengers, as they are not permitted to stop and wait.
- Multiple crosswalks require frequent stops waiting for passengers to cross the lower roadway.

Pedestrians have the right-of-way at each crosswalk with no signalization requiring pedestrians to wait to cross the roadway. These uncontrolled pedestrian crossings cause significant delay to traffic movement at the lower level curbside.

The VISSIM and ACRP Report 40 traffic analysis show unsatisfactory LOS mainly with future no-build conditions, especially to meet the PAL 4 (2037) demand. Inadequate capacity and operations at the entry point to the terminal curbside area will create bottlenecks throughout the roadway system. The calculated utilization factors and corresponding LOS for future years demonstrate deficient capacity by year 2037 that would require geometric improvements at the

terminal curbside. The following mitigation measures are recommended to be analyzed as part of Chapter 5, *Alternatives Analysis*:

- Signalization/optimization of unsignalized intersections throughout the circulation area
- Optimization of signal timings at signalized intersections.
- Geometric improvements at intersections, especially at the two intersections that provide access to the airport circulation area.
- Operational improvements within the curbside area including controlling pedestrian movements, police enforcement to guide drivers through different zones, signage to increase passenger pick-up on upper curbside to relieve some of the congestion at the lower curbside, etc.
- Geometric improvements at the curbside area.
- Removal of some commercial vehicles into a Ground Transportation Center (GTC) located away from the terminal curbside.
- Reallocation of airline space inside the terminal to distribute the vehicle traffic more evenly along the upper and lower curbside.
- Move the terminal entrance and exit doors farther east along the curb. Such changes may require the re-assignment of baggage claim devices or reducing the number of exit points to the curb near the west end.

## 6. SUPPORT FACILITY NEEDS

As ABIA continues to grow, the airport and airline support facilities will also need to expand to support the future airfield, terminal, and landside components. These will include:

- Catering
- Airport Rescue and Firefighting
- Fixed Base Operator and General Aviation
- Aerial Firefighting Facility
- Aircraft Fueling
- Airport Administration Offices
- Airport Maintenance and Police
- Aircraft Maintenance
- Ground Service Equipment Maintenance
- Federal Aviation Administration Facilities
- Air Cargo
- Central Warehouse & Cross Dock

## 6.1 Catering

The existing lease area is sufficient for the anticipated catering expansion requirements. By PAL 3 (2027), the existing catering facility site will require a 13,800 square foot expansion. Approximately 6,000 meals will be served by PAL 4 (2037) and will encompass a site area of approximately 158,300 square feet. A second work shift can be implemented, along with a second level to the catering building to provide additional capacity.

## 6.2 Airport Rescue and Firefighting Station (ARFF)

The existing ARFF station is programmed to be relocated in the PAL 2 (2022) timeframe to a site south of the new cross-field taxiway. This new station will be in compliance with the Federal Aviation Regulation (FAR) Part 139 three-minute response time to the existing and future runways at ABIA. The new ARFF station area will be 20,000 square feet at minimum to comply with Index E equipment and safety requirements.

## 6.3 General Aviation/FBO

The following GA expansion will be required to meet the projected PAL 4 (2037) demand:

- Increase hangar space by approximately 56,000 square feet.
- Provide hangar space for larger corporate/business jet aircraft (G650, Global 7000, BBJs, etc.).
- Increase ramp space by approximately 94,000 square feet.
- Increase auto parking spaces.
- Increase the Ground Support Equipment maintenance area by approximately 1,000 square feet.
- Provide a 4,600 square foot U.S. Customs and Border Protection (CBP) space.

These facilities will be provided within the existing Atlantic Aviation and Signature Flight Support complex. In addition, Million Air is developing a new facility to the south that will include a terminal, aircraft hangars, ramp area, taxiway, and auto parking.

## 6.4 Aerial Firefighting Facility

The Texas A&M Forest Service currently leases a small area adjacent to the north cargo ramp as a base for aerial firefighting operations. This facility is proposed to be relocated on the south side of the existing TxDOT Aviation Services Department facility; the proposed facility may include a 263,000 square foot ramp.

## 6.5 Aircraft Fueling

The PAL 4 (2037) demand will require an additional 2.3 million nominal gallons of Jet-A aircraft fuel storage. The current Airline Consortium proposed existing fuel farm area expansion; alternatively, a new fuel farm may be developed on the west side of the airport. It is recommended that all new aircraft gates and cargo aircraft positions be equipped with a hydrant fueling system. In addition, it is recommended to provide a continuous feed of fuel from the Flint Hills Bastrop Terminal that has 8.2 million gallons of nominal Jet-A storage capacity.

## 6.6 Airport Administration Offices

A new five-level 81,800 square foot Administration Office building is currently under construction along the airport entrance roadway; this building will meet the PAL 4 (2037) demand.

## 6.7 Airport Maintenance and Police Department

ABA proposed a new Consolidated Maintenance Facility (CMF), located on the east side of Golf Course Road, northeast of the Runway 17L end. This facility will be 13.42 acres in area and house the following:

- Maintenance operations
- Motor pool
- Warehouse storage
- Truck wash
- Recycling
- Spoil bins
- Airport police department

In addition, the deicing material storage facility is 0.84 acres in area and will be located immediately north of the existing TxDOT Aviation facility. This new CMF will be able to accommodate the 2037 demand without requiring additional expansion. Construction of this facility is scheduled to begin in early 2019.

## 6.8 Aircraft Maintenance

Currently, no aircraft maintenance facilities are located at ABIA. However, if an airline wishes to perform maintenance on their aircraft fleet, a proposed maintenance facility may be located on the east side of runway 17L-35R. This site will include the following facilities:

- 142,967 square foot narrow-body aircraft hangar building space
- 330,766 square foot wide-body aircraft hangar building space
- 261,400 square foot shop/storage building space
- 80,153 square foot ground service equipment storage space

- 220,736 square foot auto parking space
- 190,000 square foot truck dock space

Two additional expansion areas will be allocated on the north and south sides of the TxDOT Aviation Services facility. A dedicated ADG-V taxiway will be provided for access to these aircraft maintenance facility areas.

## 6.9 Ground Service Equipment Maintenance

The existing Ground Service Equipment Maintenance (GSEM) facility is proposed to be relocated in the PAL 4 (2037) timeframe. The existing facility has limited space at its current location. The new GSEM facility will be located in the area currently occupied by the rental car storage and will include the follow facilities to meet the PAL 4 (2037) demand:

- 27,500 square foot building
- 107,000 square foot auto parking and truck docks
- 6.0 acre total site area

## 6.10 Federal Aviation Administration

This Master Plan does not require relocation of the existing Air Traffic Control Tower (ATCT) and Terminal Radar Approach Control (TRACON) facilities. A line-of-sight study identified any potential siting issues from the ATCT to the existing and future movement areas due to the proposed remote concourse building and other supporting facilities. Based on preliminary renderings of the new terminal/concourse buildings, there does not appear to be any line-of-sight issues from the existing ATCT. For those non-movement areas within the terminal/concourse area, it is recommended that a ramp tower, closed-circuit television (CCTV), and/or a virtual tower be constructed to provide visual contact to these areas.

## 6.11 Air Cargo

The future air cargo requirements were determined based on two air cargo tonnage forecasts (base-case and high-case scenarios). The base-case cargo forecast assumes a continuation of the current cargo market at ABIA with a 3.4-percent average annual growth rate. The high-case cargo forecast assumes development of an e-commerce distribution hub at ABIA. This e-commerce distribution hub will begin service in approximately the PAL 3 (2027) timeframe, with more than 25,500 annual aircraft operations and an average annual growth rate of 15.2 percent.

**Existing North Cargo Area** – The existing north cargo area can accommodate the anticipated PAL 4 (2037) base-case forecast demand. The additional capacity can be accommodated by converting the existing cargo buildings not used for cargo activity (Building #6029 and #6040). These two buildings have a total area of 46,080 square feet. In addition, Building #6040 can be

expanded to the west by approximately 212,000 square feet. The eastern portion of the cargo aircraft ramp can be reclaimed (currently used for overflow auto parking), as cargo demand increases.

**New West Cargo Area** – With the introduction of e-commerce at ABIA, additional cargo space beyond the north cargo area will be required. A large cargo distribution center will require an extensive expansion of the all-cargo facilities at ABIA around the PAL 3 (2027) timeframe, or processing about 540,000 tons of cargo. This cargo distribution center will require approximately 167 acres of land, including buildings, aircraft ramp, truck docks, GSE staging/storage, auto parking, and access roadway.

**Belly Cargo** – The high-case future belly cargo requirements require additional belly cargo facilities around the PAL 3 (2027) timeframe, or processing about 25,500 tons of belly cargo. This will require doubling the size of the existing facility to approximately 8 acres in size. In addition, the existing belly cargo facility may require relocation due to site expansion constraints; it is proposed to be relocated to the north in the current rental car storage area.

## 6.12 Central Warehouse & Cross-Dock

A Central Warehouse & Cross-Dock facility is proposed to be located on the east side of Golf Course Road, along the eastern airport property boundary. The following facility requirements are required in the PAL 1 timeframe:

- Approximately 17,000 square feet for each concessionaire for operations, including storage space and kitchens.
- Approximately 4,000 square feet for the cross-dock operation.
- Approximately 5,000 square feet for additional space, including restrooms and break rooms.
- Approximately 7,000 square feet for a third concessionaire for operational expansion for the existing concessionaire.

The proposed site can accommodate a 50,000 square foot facility, with potential to expand to 75,000 square feet. Direct terminal area access is required for security purposes.

## 7. IMPLEMENTATION OF RECOMMENDED DEVELOPMENT PLAN

The recommended ABIA Development Plan is depicted in **Exhibit 7-1**. A construction implementation schedule was developed to assist the ABIA with future planning and provide input to the Financial Plan (Chapter 10). The recommended Master Plan and 5-year CIP projects were grouped into the following four phases:

- Phase 1: PAL 1 – 16.0 MAP (2019)
- Phase 2: PAL 2 – 18.0 MAP (2022)
- Phase 3: PAL 3 – 22.0 MAP (2027)
- Phase 4: PAL 4 – 31.0 MAP (2037)

The projects were grouped into phases based on overall theoretical demands for infrastructure improvements outlined in Chapter 4, *Demand/Capacity Facility Requirements* and Chapter 5, *Alternatives Analysis*. The phasing was adjusted as needed to reflect realistic funding availability assumptions and overall financial feasibility. The phasing plan presented in this section represents an implementation program which accounts for projected facility needs balanced with anticipated passenger demand and financial capabilities.

In practice, future airport improvement projects will be undertaken only when demand warrants and actual funding is available, rather than in accordance with a specific projected scheduled timeframe. Factors that may trigger the need for an airport development project can range from tenant demands for landside and support facilities to airside and terminal capacity requirements (passenger demand).

### 7.1 Phase 1 Expansion Program (PAL 1 – 16.0 MAP)

Phase 1 development as shown on **Exhibit 7-2** includes projects scheduled to meet the PAL 1 demand. The main focus of the Phase 1 program includes a new terminal building, remote concourse gates, and access roadway improvements. These projects are as follows:

1. New 863,000 square foot North Terminal Building for passenger processing (ticketing, security and baggage)
2. New North Terminal entrance roadway ramps and curbside (2 levels) with a separate passenger level between the new North Terminal and parking garage/CONRAC
3. New 803,000 square foot 20-gate Midfield Concourse, aircraft apron, and hydrant fueling system
4. Elevated passenger bridge connection between the Barbara Jordan Terminal and Midfield Concourse
5. New airport entrance roadway intersection with SH 71 (Braided Left Turn)
6. New ADG-VI Taxiway 'D' parallel to existing Runway 17R-35L
7. New runway 17R-35L rapid exit taxiways
8. Various new ADG-V taxiways and taxilanes (lighting and signage)

9. New Remain Overnight (RON) aircraft apron area
10. GA expansion apron, hangars and auto parking (3<sup>rd</sup> party development)
11. New Aerial Firefighting facility adjacent to TxDOT Aviation (3<sup>rd</sup> party development)
12. New Central Warehouse and Cross Dock facility adjacent to Golf Course Road
13. Relocation of Golf Course Road (Phase 1)
14. Expansion of the existing Catering facility (3<sup>rd</sup> party development)
15. Expansion of the existing north Central Utility Plant
16. New Fuel Farm on the west side of Runway 17R-35L (3<sup>rd</sup> party development)
17. New east and west Airfield Lighting Vaults
18. New Employee Parking north of SH 71
19. Expansion of the North Cargo facilities (3<sup>rd</sup> party development)
20. New south Central Utility Plant
21. Miscellaneous utility upgrades
22. Miscellaneous non-aeronautical development area for commercial development (3<sup>rd</sup> party development)

## 7.2 Phase 2 Expansion Program (PAL 2 – 18.0 MAP)

Phase 2 development as shown on **Exhibit 7-3** includes projects scheduled to meet the PAL 2 demand. These projects are as follows:

1. Existing Barbara Jordan Terminal interior space allocation renovation
2. New ADG-V crossfield taxiway (lighting and signage)
3. Depress Emma Browning Road under the new crossfield taxiway
4. New north and south aircraft hold pads for Runway 17R-35L
5. Expansion of the Remain Overnight (RON) aircraft apron area
6. New South Airport Firefighting Station
7. Expansion of the Belly Freight facility (3<sup>rd</sup> party development)
8. Expansion of the GSEM facility (3<sup>rd</sup> party development)
9. New south Information Technology facility
10. GA facilities expansion (3<sup>rd</sup> party development)
11. Golf Course Road south extension (Phase 2)
12. North Cargo facilities expansion (3<sup>rd</sup> party development)
13. New west side Aircraft Maintenance hangars and apron (3<sup>rd</sup> party development)
14. Miscellaneous aeronautical development areas for support facilities
15. Miscellaneous non-aeronautical development area for commercial development (3<sup>rd</sup> party development)

## 7.3 Phase 3 Expansion Program (PAL 3 – 22.0 MAP)

Phase 3 development as shown on **Exhibit 7-4** includes projects scheduled to meet the PAL 3 demand. These projects are as follows:

1. 458,000 square foot North Terminal Building expansion
2. 232,500 square foot 12-gate Midfield Concourse building and apron expansion

3. Remain Overnight (RON) aircraft apron area expansion
4. Existing Taxiway 'C' relocation to the west with various connector taxiways
5. New east side Aircraft Maintenance hangars and apron area (3<sup>rd</sup> party development)
6. Personal Rapid Transit (PRT) system throughout the public parking areas to the new Terminal Building
7. Land acquisition (126 acres) west of US 183 for west side development flood control
8. North Cargo facilities expansion (3<sup>rd</sup> party development)
9. GSEM facility expansion (3<sup>rd</sup> party development)
10. Belly Freight facility expansion (3<sup>rd</sup> party development)
11. Catering facility expansion (3<sup>rd</sup> party development)
12. GA facilities expansion (3<sup>rd</sup> party development)
13. Miscellaneous aeronautical development areas for support facilities
14. Miscellaneous non-aeronautical development area for commercial development (3<sup>rd</sup> party development)

## 7.4 Phase 4 Expansion Program (PAL 4 – 31.0 MAP)

Phase 4 development as shown on **Exhibit 7-5** includes projects scheduled to meet the PAL 4 demand. These projects are as follows:

1. New Ground Transportation Center (GTC) along SH 71
2. PRT system extension to the new GTC along SH 71
3. New southwest Cargo complex to accommodate the expansion of e-commerce at ABIA (3<sup>rd</sup> party development)
4. East side Aircraft Maintenance facilities expansion (3<sup>rd</sup> party development)
5. GSEM facility relocation and expansion (3<sup>rd</sup> party development)
6. Belly Freight facility relocation and expansion (3<sup>rd</sup> party development)
7. Catering facility expansion (3<sup>rd</sup> party development)
8. GA facilities expansion (3<sup>rd</sup> party development)
9. Miscellaneous aeronautical development areas for support facilities
10. Miscellaneous non-aeronautical development area for commercial development (3<sup>rd</sup> party development)

## 7.5 Post 20-Year Expansion Program

This Master Plan Study evaluated a need for a future runway to meet the future forecast demand. As noted in Chapter 3, *Aviation Demand Forecasts* the need for a new runway is beyond the 20-year (2037) planning horizon and not required until approximately year 2048, or 445,000 annual aircraft operations. However, this Master Plan Study assessed the preferred location and length for this long-term runway to assure the land was preserved for its future development. As shown on **Exhibit 7-6**, a future 10,000-foot long Runway 17C-35C is located 1,200 feet east of existing Runway 17R-35L. The runway will have a various rapid exit taxiways and a full-length parallel taxiway to the east. In addition, an end around taxiway is located off the south threshold to provide

unrestricted taxiing for ADG-III aircraft that are landing on Runway 17R-35L while departures are being conducted on the new Runway 17C.

The runway protection zones (RPZ) for the new Runway 17C-35C will require relocation of various facilities. The US Army Reserve facilities (hangers and apron) are located within the 35C RPZ, and The Parking Spot facility is located within the 17C RPZ. It is proposed to relocate the US Army Reserve facilities northeast of the current complex and it is recommended to purchase the Parking Spot land (22 acres).

An additional long-term airport project is to coordinate with Texas Department of Transportation (TxDOT) and relocate SH 71 to the north between US 183 and Texas 130 roads. This will require ABIA to acquire approximately 165 acres of land and provide a 400-foot right-of-way for the relocated SH 71. All land south of relocated SH 71 will become ABIA property and developed for airport support facilities and commercial development.

The long-term extension of existing Runway 17L-35R is proposed in the long-term so it is comparable in length to existing Runway 17R-35L. This will help to balance the runway usage by long-haul international aircraft and cargo aircraft operations. The most likely runway extension would be on the 17L end, requiring the relocation of SH 71 to the north as noted above.

The Master Plan includes two possible alignment options for high capacity-transit serving ABIA from Riverside Drive. These alignments are being studied through Capital Metro's Project Connect process. Further study is needed to determine the recommended alignment.

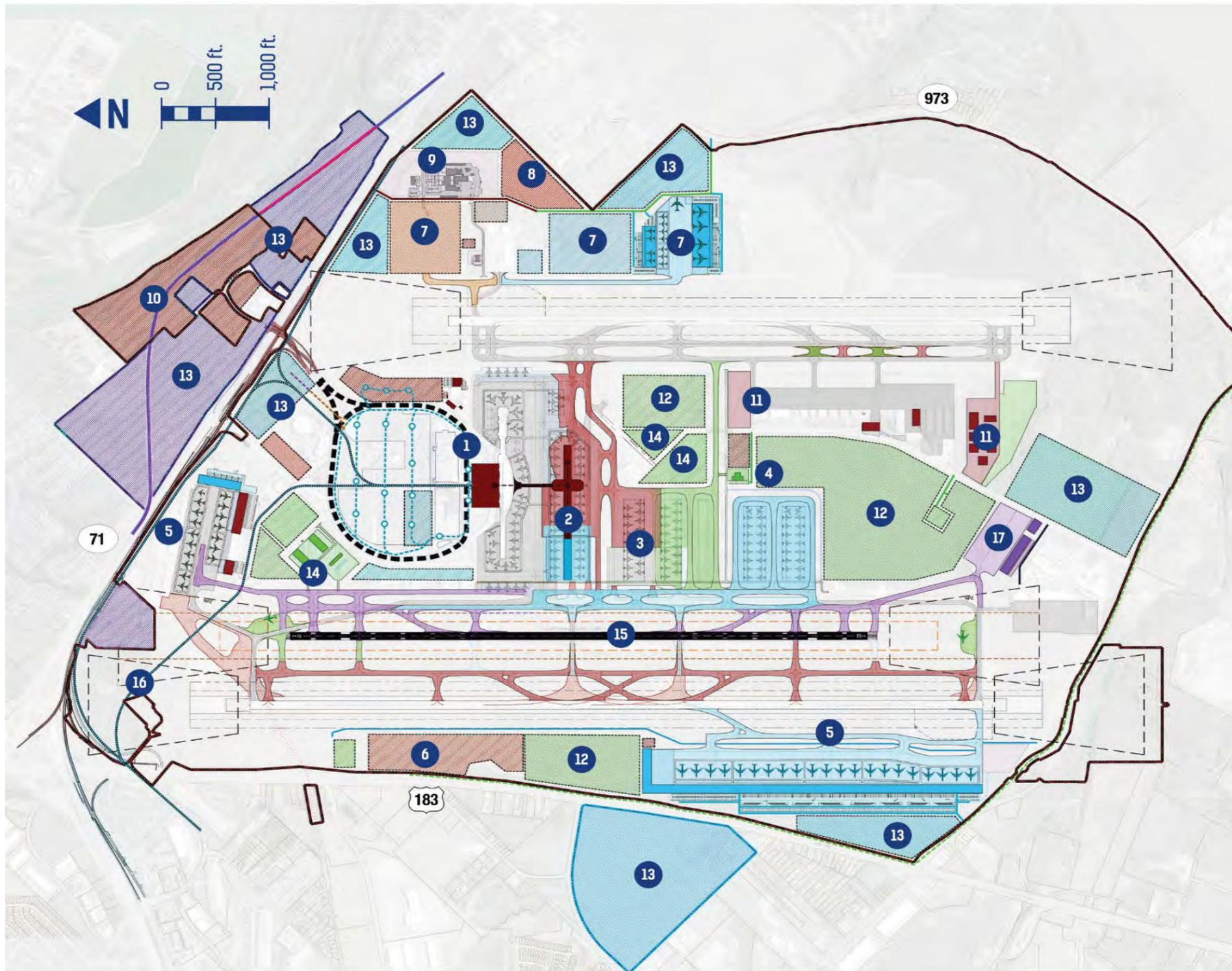
## 7.6 Construction Schedule

A preliminary construction schedule for the ABIA Master Plan and 5-Year CIP projects is presented in **Exhibit 7-7**. Each project has been identified as a "NEW" Master Plan project or a 5-year CIP project with its corresponding reference number. In addition, each project has been divided into two segments: design/engineering/procurement/environmental approvals time, and construction/system testing time. The new North Terminal Building and 20-gate Midfield Concourse are scheduled to be completed and operational by the end of 2025. The implementation plan takes into account projected facility needs based on anticipated passenger demand but may be limited by financial capabilities.

## 7.7 Construction Costs

A summary of the order-of-magnitude construction cost estimate for each phase of development is provided in **Table 7-1**. The costs have been divided into two categories: ABIA costs and 3<sup>rd</sup> Party costs. All costs are in 2018 dollars and have not been inflated to reflect timing of the anticipated construction year. Regardless of the identified need for improvement, the ability to fund the capital program will ultimately determine when the projects can be implemented.

Exhibit 7-1: ABIA Ultimate Airport Layout Plan

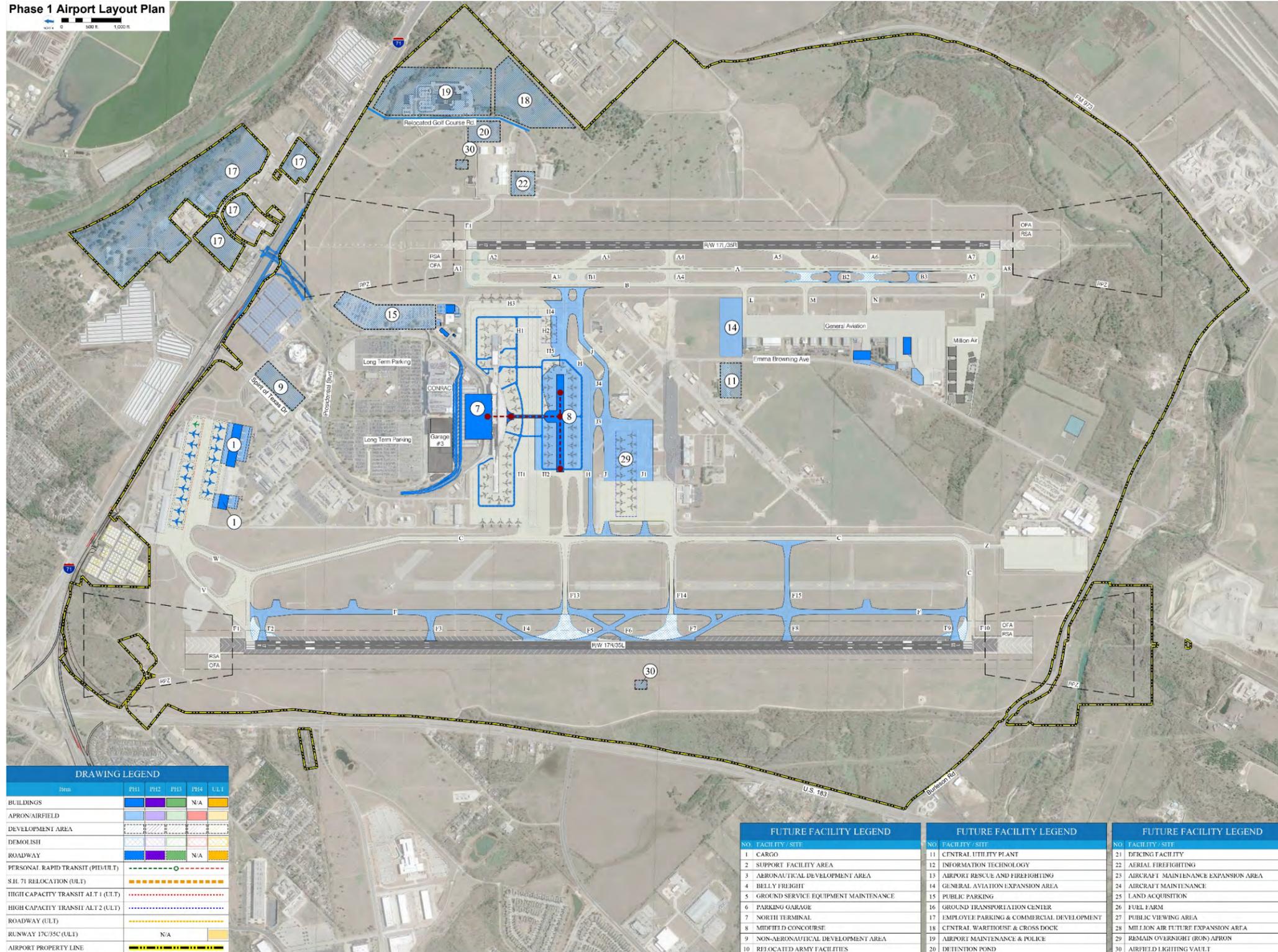


# ULTIMATE AIRPORT LAYOUT

- 1 North Terminal & Central Bag System
- 2 32-Gate Midfield Concourse
- 3 Remain Overnight Parking Positions
- 4 Airport Firefighting Station
- 5 Cargo Development
- 6 Fuel Farm
- 7 Aircraft Maintenance
- 8 Central Warehouse
- 9 Airport Maintenance
- 10 Relocated SH 71
- 11 General Aviation
- 12 Aeronautical Development Areas
- 13 Non-Aeronautical Development Areas
- 14 Support Facility Areas
- 15 New Runway 17C-35C
- 16 High Capacity Transit
- 17 U.S. Army Reserve

Exhibit 7-2: ABIA Phase 1 Airport Layout Plan

Phase 1 Airport Layout Plan



Item	PH1	PH2	PH3	PH4	UL1
BUILDINGS	Blue	Green	Yellow	Red	N/A
APRON/AIRFIELD	Blue	Green	Yellow	Red	N/A
DEVELOPMENT AREA	Blue	Green	Yellow	Red	N/A
DEMOLISH	Blue	Green	Yellow	Red	N/A
ROADWAY	Blue	Green	Yellow	Red	N/A
PERSONAL RAPID TRANSIT (PH1/RT)	Blue	Green	Yellow	Red	N/A
SH. 71 RELOCATION (UL1)	Blue	Green	Yellow	Red	N/A
HIGH CAPACITY TRANSIT ALT 1 (UL1)	Blue	Green	Yellow	Red	N/A
HIGH CAPACITY TRANSIT ALT 2 (UL1)	Blue	Green	Yellow	Red	N/A
ROADWAY (UL1)	Blue	Green	Yellow	Red	N/A
RUNWAY 17C/35C (UL1)	Blue	Green	Yellow	Red	N/A
AIRPORT PROPERTY LINE	Blue	Green	Yellow	Red	N/A

NO.	FACILITY / SITE
1	CARGO
2	SUPPORT FACILITY AREA
3	AERONAUTICAL DEVELOPMENT AREA
4	BELLY FREIGHT
5	GROUND SERVICE EQUIPMENT MAINTENANCE
6	PARKING GARAGE
7	NORTH TERMINAL
8	MIDFIELD CONCOURSE
9	NON-AERONAUTICAL DEVELOPMENT AREA
10	RELOCATED ARMY FACILITIES

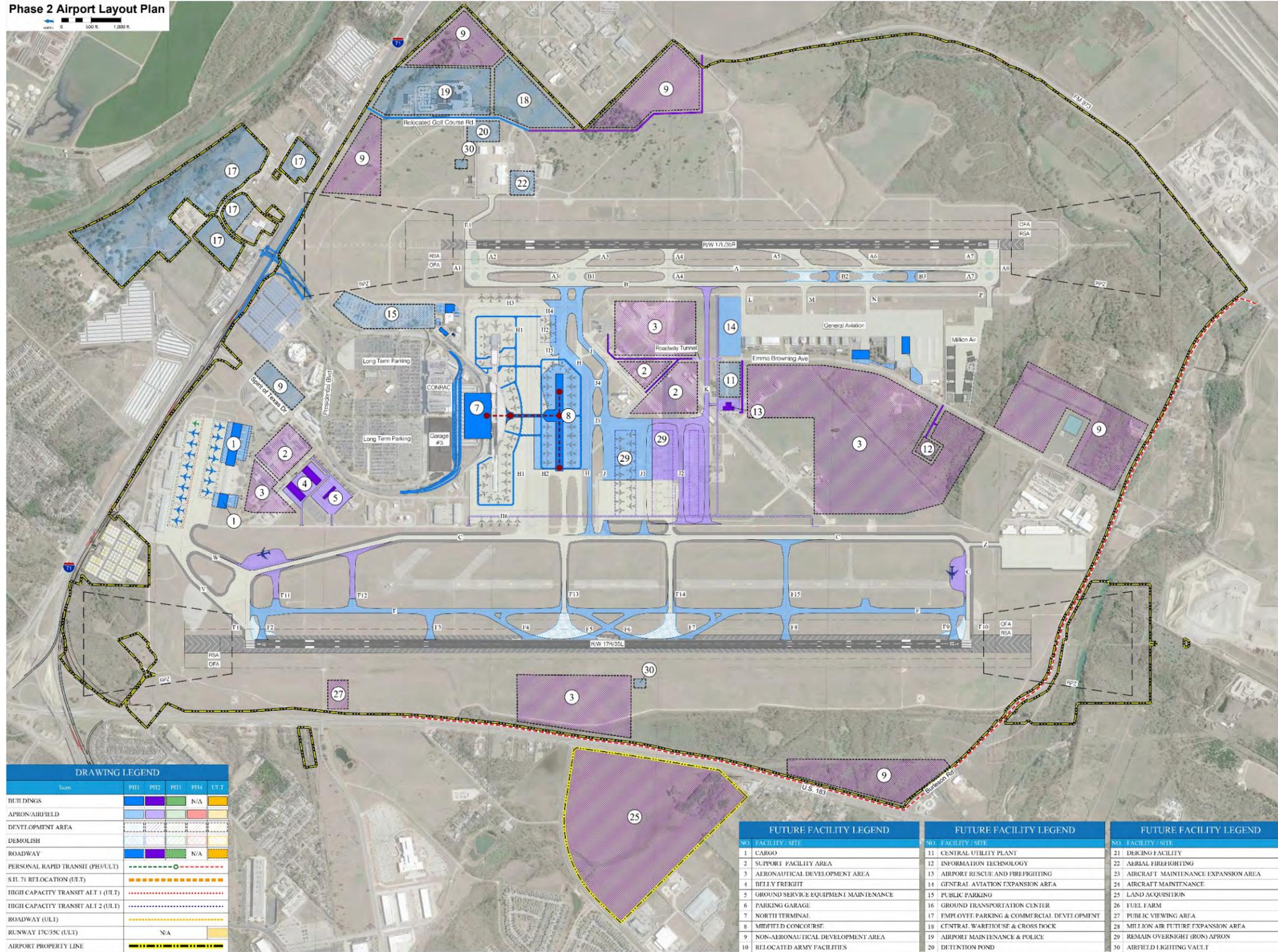
NO.	FACILITY / SITE
11	CENTRAL UTILITY PLANT
12	INFORMATION TECHNOLOGY
13	AIRPORT RESCUE AND FIRE FIGHTING
14	GENERAL AVIATION EXPANSION AREA
15	PUBLIC PARKING
16	GROUND TRANSPORTATION CENTER
17	EMPLOYEE PARKING & COMMERCIAL DEVELOPMENT
18	CENTRAL WAREHOUSE & CROSS DOCK
19	AIRPORT MAINTENANCE & POLICE
20	DETENTION POND

NO.	FACILITY / SITE
21	DECKING FACILITY
22	AERIAL FIRE FIGHTING
23	AIRCRAFT MAINTENANCE EXPANSION AREA
24	AIRCRAFT MAINTENANCE
25	LAND ACQUISITION
26	FUEL FARM
27	PUBLIC VIEWING AREA
28	MILION AIR FUTURE EXPANSION AREA
29	REMAIN OVERNIGHT (RON) APRON
30	AIRFIELD LIGHTING VAULT

Source: Landrum & Brown

Exhibit 7-3: ABIA Phase 2 Airport Layout Plan

Phase 2 Airport Layout Plan



Item	PH1	PH2	PH3	PH4	UL1
BUILDINGS	Blue	Green	Red	Orange	Yellow
APRON/AIRFIELD	Blue	Green	N/A	Red	Orange
DEVELOPMENT AREA	Blue	Green	Red	Orange	Yellow
DEMOLISH	Blue	Green	Red	Orange	Yellow
ROADWAY	Blue	Green	N/A	Red	Orange
PERSONAL RAPID TRANSIT (PHS/ULT)	Blue	Green	Red	Orange	Yellow
SIL 71 RELOCATION (ULT)	Blue	Green	Red	Orange	Yellow
HIGH CAPACITY TRANSIT ALT 1 (H1T)	Blue	Green	Red	Orange	Yellow
HIGH CAPACITY TRANSIT ALT 2 (H2T)	Blue	Green	Red	Orange	Yellow
ROADWAY (UL1)	Blue	Green	Red	Orange	Yellow
RUNWAY 17C/35C (ULT)	N/A	N/A	N/A	N/A	N/A
AIRPORT PROPERTY LINE	Blue	Green	Red	Orange	Yellow

NO.	FACILITY / SITE
1	CARGO
2	SUPPORT FACILITY AREA
3	AERONAUTICAL DEVELOPMENT AREA
4	BILLY FREIGHT
5	GROUND SERVICE EQUIPMENT MAINTENANCE
6	PARKING GARAGE
7	NORTH TERMINAL
8	MIDFIELD CONCOURSE
9	NON-AERONAUTICAL DEVELOPMENT AREA
10	RELOCATED ARMY FACILITIES

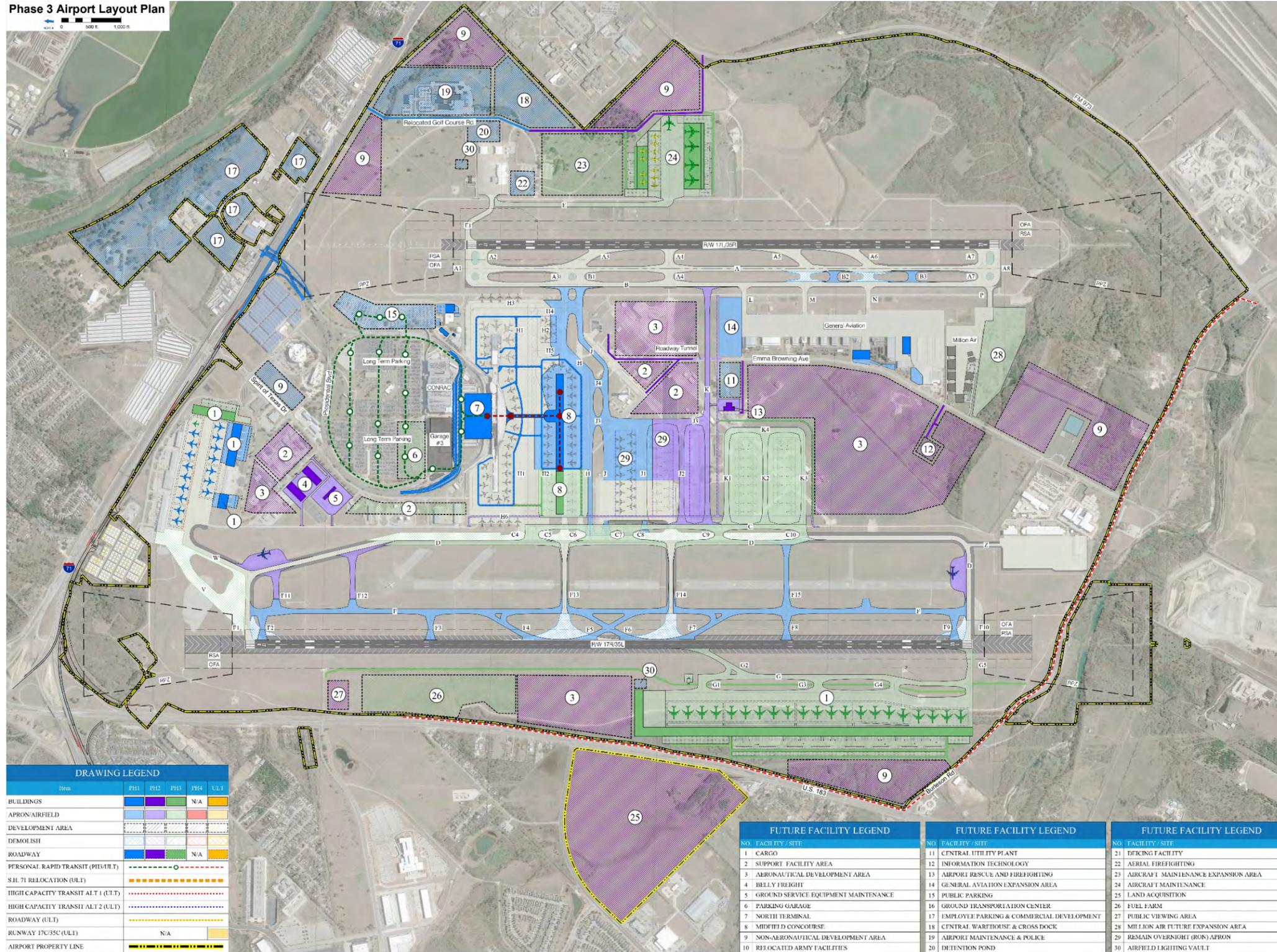
NO.	FACILITY / SITE
11	CENTRAL UTILITY PLANT
12	INFORMATION TECHNOLOGY
13	AIRPORT RESCUE AND FIREFIGHTING
14	GENERAL AVIATION EXPANSION AREA
15	PUBLIC PARKING
16	GROUND TRANSPORTATION CENTER
17	EMPLOYEE PARKING & COMMERCIAL DEVELOPMENT
18	CENTRAL WAREHOUSE & CROSS DOCK
19	AIRPORT MAINTENANCE & POLICE
20	DETENTION POND

NO.	FACILITY / SITE
21	DECORATING FACILITY
22	AERIAL FIREFIGHTING
23	AIRCRAFT MAINTENANCE EXPANSION AREA
24	AIRCRAFT MAINTENANCE
25	LAND ACQUISITION
26	FUEL FARM
27	PUBLIC VIEWING AREA
28	MILKON AIR FUTURE EXPANSION AREA
29	REMAIN OVERNIGHT (RON) APRON
30	AIRFIELD LIGHTING VAULT

Source: Landrum & Brown

Exhibit 7-4: ABIA Phase 3 Airport Layout Plan

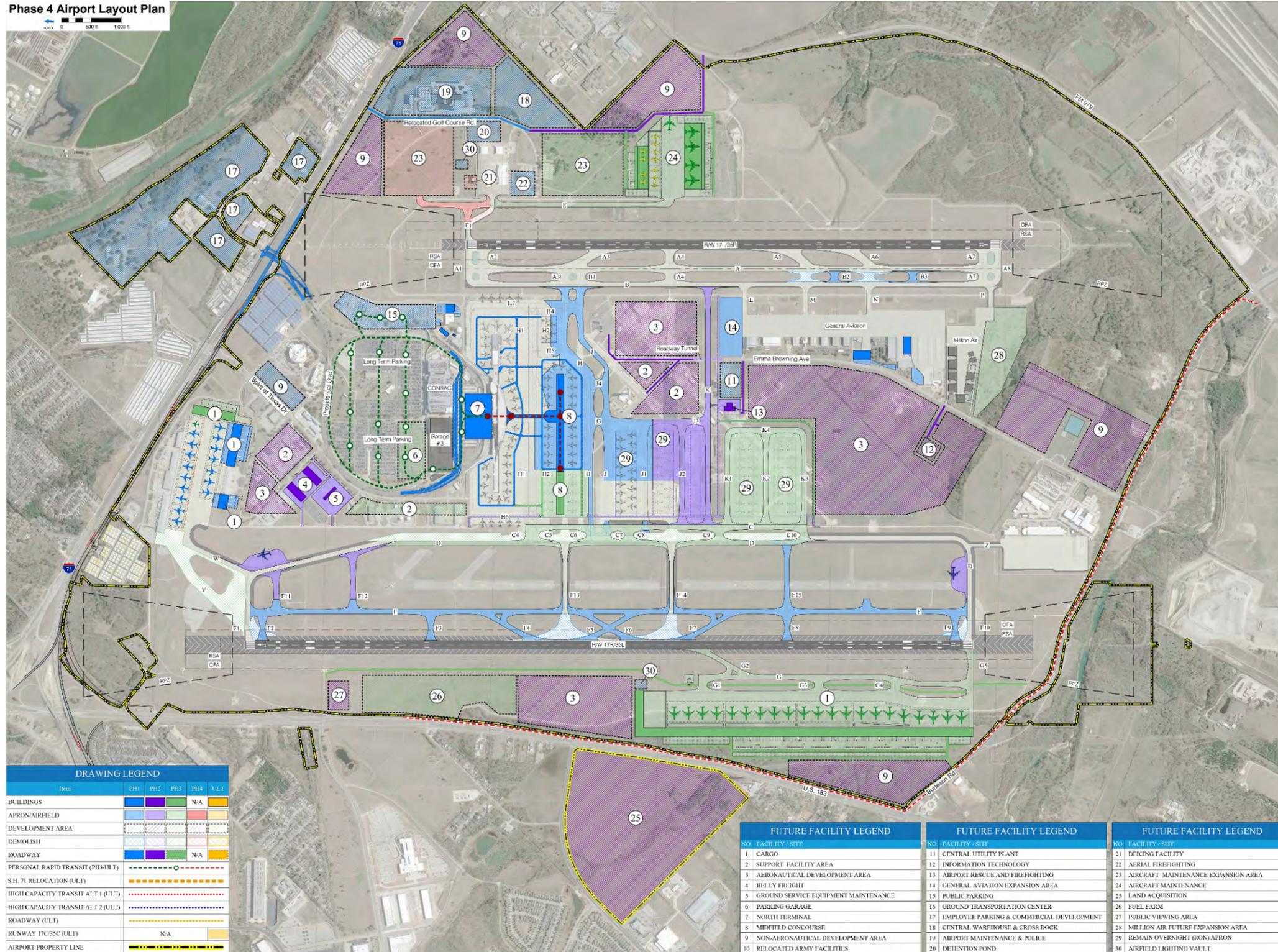
Phase 3 Airport Layout Plan



Source: Landrum & Brown

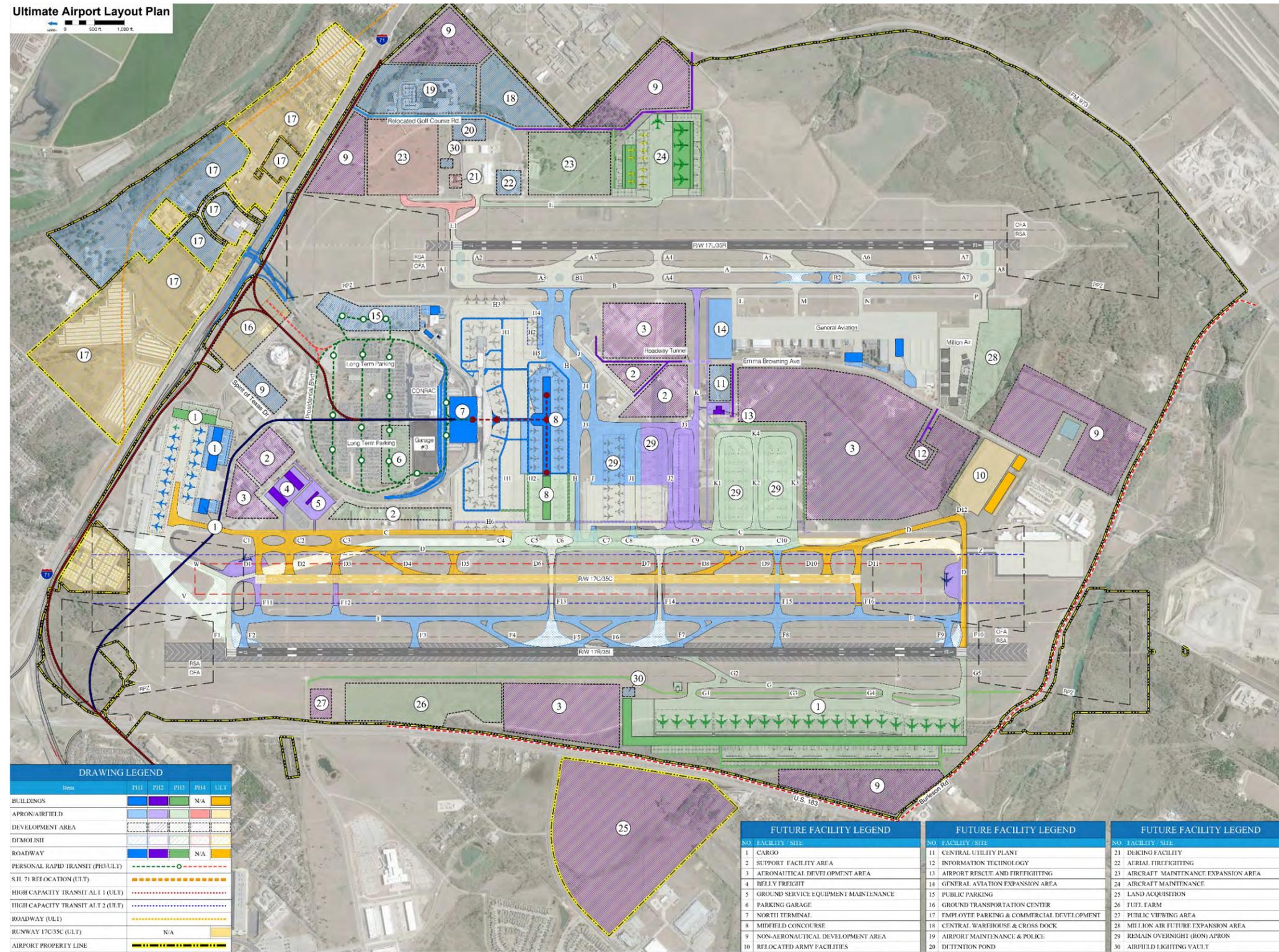
Exhibit 7-5: ABIA Phase 4 Airport Layout Plan

Phase 4 Airport Layout Plan



Source: Landrum & Brown

Exhibit 7-6: ABIA Post 20-Year Airport Layout Plan



**Exhibit 7-7: ABIA Master Plan Construction Schedule (1 of 3)**

Project Description			2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
<b>Airfield Projects</b>																								
A-1	1246.001	Rwy. 17R-35L Rapid Exit Taxiways (incl. shoulders)																						
A-2	New	New Twy. Delta & Connectors (incl. shoulders)																						
A-3	New	New Taxiway Pavement (incl. shoulders)																						
A-4	New	South Crossfield Taxiway Bridge																						
A-5	New	Airside Access Road Pavement																						
A-6	7861.067	Security Fencing																						
A-7	New	Taxiway Lighting (edge, centerline, signage)																						
A-8	New	Navigational Aids																						
A-9	New	Airfield Pavement Demolition																						
A-10	7860.059	Existing Runway Keel Replacements																						
A-11	6000.120	Airfield Electrical and Pavement Improvements																						
A-12	7860.056	Aircraft Rescue and Firefighting 3 replacement w/Comm. Package																						
A-13	7860.040	Runway and Taxiway Restoration - Charlie																						
A-14	7860.060	Terminal Apron Trench Drain Repairs																						
<b>Terminal Projects</b>																								
T-1		Existing BJT Renovations																						
T-1.1	7719.072	West Infill-Temp Ground Load																						
T-1.2	7719.072	Interior Demo																						
T-1.3	New	Renovate Existing Terminal for Passenger Bridge																						
T-2	12460.006	New North Terminal Building																						
T-3	12460.005	New Midfield Concourse (Ph. 1 & 2)																						
T-4	12460.005	New Passenger Bridge to Concourse																						
T-5	12460.004	New Apron Area (Ph. 1 & 2)																						
T-6	3rd Party	New Apron Hydrant Fuel System (Ph. 1 & 2)																						
T-7	12460.005	New Midfield Concourse Loading Bridges (Ph. 1 & 2)																						
T-8	7860.054	New RON Apron Area (Ph. 1 & 2)																						
T-9	New	New Ramp Tower (Ph. 1)																						
T-10	12460.002	New Centralized Baggage Handling System (BHS)																						
T-11	New	Personal Rapid Transit System (Terminal/Concourse) (Ph. 1 & 2)																						
T-12	7719.068	Renovate Existing BJT Loading Bridges																						
T-13	3rd Party	BJT Hydrant Fuel System																						
T-14	7719.066	Chilled Water Valve Loop Replacement																						
T-15	7719.077	Elevator Refurbishments Rebid																						
T-16	5415.098	Restroom Completion																						
T-17	7719.075	Customs Escalator Refurbishment																						
T-18	7719.074	IT Hardware Upgrades																						

Source: Landrum & Brown

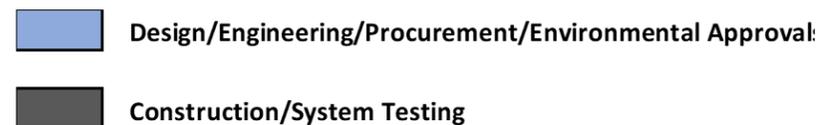
 Design/Engineering/Procurement/Environmental Approval

 Construction/System Testing

**Exhibit 7-8: ABIA Master Plan Construction Schedule (2 of 3)**

Project Description			2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
<b>Landside Projects</b>																								
L-1	12460.006	Demo Existing Parking Garage #1																						
L-2	12460.006	Demo Exist. Upper Terminal Roadway																						
L-3	New	Depressed Emma Browning Road																						
L-4	7861.089	New Employee Parking Lot (north of SH 71)																						
L-5	7861.076	Golf Course Road Realignment																						
L-6	7861.046	New Airport Entrance Roadway (Braided Left Turn)																						
L-7	7861.079 7861.046 7861.091	Upgrade Existing Access Roadway Network																						
L-8	New	New North Terminal Curbside Roadway w/ Vertical Circulation																						
L-9	New	PRT System in Parking Lots (track, station & pods)																						
L-10	7861.088	Ground Transportation Center (South of SR 71)																						
L-11	New	PRT System to New GTC (track, station & pods)																						
L-12	New	New Parking Garage #2																						
L-13	7861.085	Autonomous Shuttle																						
L-14	7861.064	Airport Landscaping & Irrigation Improvements																						
L-15	7861.090	Lot J Covered Parking																						
<b>Support Facility Projects</b>																								
S-1	3rd Party	Existing New North Cargo Buildings/Apron Expansion																						
S-2	3rd Party	New Southwest Cargo Complex																						
S-3	7861.092	New West Fuel Farm																						
S-4	3rd Party	Fuel Pipeline from Flint Hills Bastrop Terminal																						
S-5	3rd Party	Relocated Ground Service Equipment Maintenance																						
S-6	3rd Party	LSG Sky Chefs Expansion																						
S-7	New	New South ARFF Station																						
S-8	3rd Party	Relocated Belly Freight Facility																						
S-9	3rd Party	New Aircraft Maintenance Facility																						
S-10	3rd Party	Atlantic Aviation & Signature Flight Services Expansion																						
S-11	3rd Party	Million Air Facility																						
S-12	3rd Party	New Aerial Firefighting Facility																						
S-13	6001.117	Consolidated Maintenance Facility																						
S-14	6001.114	Renovate Learning Resource Center for Aviation Office Space																						
S-15	6001.128	Planning and Engineering HVAC and Office Space																						
S-16	7861.077	Maintenance Facility Storage Bldg. w/ Airside Access																						

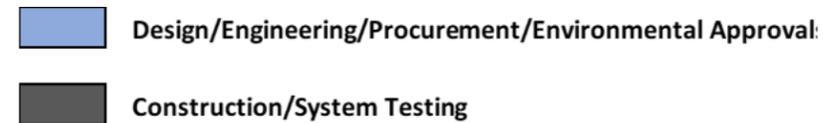
Source: Landrum & Brown



**Exhibit 7-9: ABIA Master Plan Construction Schedule (3 of 3)**

Project Description			2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
<b>Miscellaneous Projects</b>																								
M-1	New	Relocate Public Viewing Area																						
M-2	7861.083 7861.047	Demo South Buildings																						
M-3	New	Land Acquisition (west of US 183)																						
<b>Utility Projects</b>																								
U-1	7861.082	South Campus Storm Water Improvements																						
U-2	12460.003	Upgrade Utility Infrastructure																						
U-3	12460.003	Water & Electric Power																						
U-4	12460.003	New South Central Utility Plant (CUP)																						
U-5	7861.093	Upgrade Existing Central Utility Plant (CUP)																						
U-6	6001.104	New South IT Building/Lines																						
U-7	12460.003	New South Sub-Station																						
U-8	12460.003	Relocated Airfield Lighting Vault (East)																						
U-9	12460.003	Relocated Airfield Lighting Vault (West)																						
U-10	12460.003	Utility Tunnel (between remote concourse & BJT)																						
U-11	7861.078	Stormwater Improvements and Modeling																						
U-12	7861.084	Hotel Pond Repairs																						
U-13	7861.062	Environmental and Sustainability Management																						
U-14	7861.080	Stormwater Improvements FY2021																						

Source: Landrum & Brown



**Table 7-1: ABIA Summary Construction Costs**

ITEM DESCRIPTION	PHASE 1		PHASE 2		PHASE 3		PHASE 4		TOTAL COSTS	
	ABIA	3RD PARTY	ABIA	3RD PARTY	ABIA	3RD PARTY	ABIA	3RD PARTY	ABIA	3RD PARTY
<b>Airfield Projects</b>	\$ 365,980,816	\$ -	\$ 34,978,488	\$ -	\$ 39,841,748	\$ -	\$ 7,500,000	\$ -	\$ 448,301,052	\$ -
<b>Terminal Projects</b>	\$ 1,810,160,889	\$ 35,000,000	\$ 55,764,000	\$ -	\$ 772,004,556	\$ 21,000,000	\$ -	\$ -	\$ 2,637,929,444	\$ 56,000,000
<b>Landside Projects</b>	\$ 55,880,041	\$ -	\$ 46,097,727	\$ -	\$ 150,000,000	\$ -	\$ 43,881,818	\$ -	\$ 295,859,587	\$ -
<b>Support Facility Projects</b>	\$ 84,158,795	\$ 73,499,789	\$ 10,182,242	\$ 147,172,075	\$ -	\$ 223,617,855	\$ -	\$ 467,758,395	\$ 94,341,037	\$ 912,048,114
<b>Miscellaneous Facility Projects</b>	\$ 3,240,000	\$ -	\$ -	\$ -	\$ 3,351,200	\$ -	\$ -	\$ -	\$ 6,591,200	\$ -
<b>Utility Projects</b>	\$ 199,120,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 199,120,000	\$ -
<b>Hard Costs</b>	\$ 2,518,540,541	\$ 108,499,789	\$ 147,022,458	\$ 147,172,075	\$ 965,197,504	\$ 244,617,855	\$ 51,381,818	\$ 467,758,395	\$ 3,682,142,321	\$ 968,048,114
<b>Soft Costs</b>	\$ 1,139,954,376	\$ 19,204,463	\$ 26,022,975	\$ 26,049,457	\$ 491,847,008	\$ 43,297,360	\$ 9,094,582	\$ 82,793,236	\$ 1,666,918,941	\$ 171,344,516
<b>TOTAL PROJECT COSTS</b>	<b>\$ 3,658,494,917</b>	<b>\$ 127,704,252</b>	<b>\$ 173,045,433</b>	<b>\$ 173,221,532</b>	<b>\$ 1,457,044,512</b>	<b>\$ 287,915,215</b>	<b>\$ 60,476,400</b>	<b>\$ 550,551,631</b>	<b>\$ 5,349,061,262</b>	<b>\$ 1,139,392,630</b>

Notes: Costs are in 2018 dollars  
 Source: Landrum & Brown

## 8. FINANCIAL PLAN

Implementing and funding the Master Plan Study CIP for ABIA will largely be a function of potential funding sources, including the Federal Aviation Administration's (FAA's) Airport Improvement Program (AIP), Passenger Facility Charges (PFCs), rental car Customer Facility Charges (CFCs), and ABIA funds including both available cash and future airport revenue bond debt. Due to the conceptual nature of a master plan, implementation of most capital projects should occur only after further refinement of costs and timing has been undertaken.

Based on the Implementation Plan identified, a proposed funding plan was developed for ABIA's Master Plan Study Phases 1 and 2 projects. In developing the funding plan, the overriding objective was to maximize the use of external resources and minimize the amount of funding from local sources. The Master Plan CIP is to be funded from a combination of these sources:

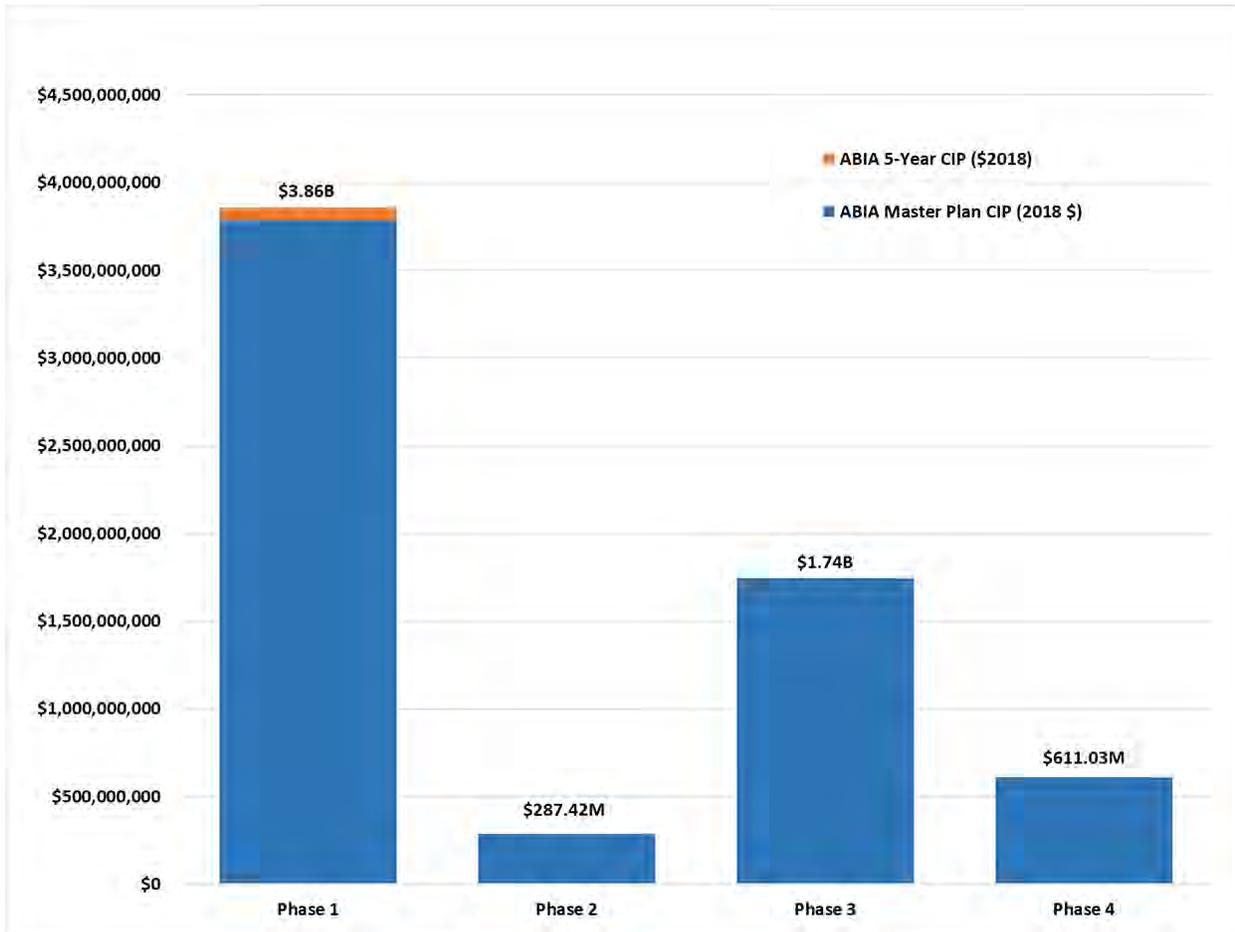
- FAA AIP Grants
- Local ABIA Funds (including PFCs, CFCs, ABIA cash, and airport revenue bonds)
- 3<sup>rd</sup>-Party Funds

Master Plan Study costs for Phases 1 through 4 are estimated to cost approximately \$6.5 billion in 2018 dollars. With inflation, the total cost of the Master Plan Study capital plan is estimated to be approximately \$8.4 billion. **Exhibit 8-1** presents a summary of the estimated construction costs by phase based on inflated dollars. As shown, after including the Airport's on-going 5-year CIP projects and inflation impacts<sup>3</sup>, total capital costs over the next 20 years is estimated to be approximately \$8.36 billion. Of this total, the Master Plan Study account for approximately \$8.29 billion including inflation and the Airport's 5-year CIP accounts for \$70.9 million.

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<sup>3</sup> Inflation impacts of 3 percent annually were assumed for the purposes of this analysis.

**Exhibit 8-1: ABIA Master Plan Construction Costs by Phase (Future Dollars)**



Notes: Costs are in 2018 dollars and include both ABIA cost and 3<sup>rd</sup> party costs. Does not include inflation.

Source: Landrum & Brown