

*Austin-Bergstrom International Airport
Master Plan Update*

**Chapter 7
Implementation Plan and Schedule**

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INTRODUCTION

This chapter details the total development program to satisfy the High Growth forecast through the year 2020 as recommended in this Master Plan Update for ABIA. The design of the airport system as described herein is based on the facility requirements discussed in Chapter 4 and the Preferred Development Concept (evolving from the alternatives process) presented in Chapter 5. The theoretical facility requirements contained in Chapter 4 served as a starting point and this chapter also presents refinements made to the selected alternative concept, which is typical of the final tasks of a master plan. Some refinements were also incorporated as a result of the Peer Review. The airport development program integrates existing facilities and the improvements needed through 2020 within the framework of an implementation schedule.

The passenger terminal was a major focus of study in this Master Plan and therefore is a major emphasis on this chapter. The recommended terminal development strategy, and the recommended improvements for airfield, roads and parking and support facilities are also presented in this chapter. The proposed improvements described are illustrated by accompanying graphics, some of which are reductions of large-scale plans prepared during the course of the Study.

A phased development program is presented herein. Throughout this chapter, the twenty-year planning period will be repeatedly referenced with the planning period broken down into three phases, which include short, intermediate and long term development at the Airport. These development phases correspond to Planning Levels 1, 2, and 3. It is important to note that the development presented herein is based upon facilities recommended to accommodate forecast demand (Planning Levels). It cannot be over-emphasized that it will be *actual*, not forecast, traffic that will dictate the timing of facility improvements. As previously discussed, the facility requirements represent the extent of facilities that should be in place at a planning level, and DOA must begin implementation planning of a project prior to reaching the planning level demand. The “trigger points” discussed in Chapter 4 need to be considered in implementation planning to provide sufficient lead time to ensure that facilities are available when needed.

It is also important to point out that the schedule of improvements proposed in this plan is contingent upon the availability of Federal, State, and local funds, and investment from the private sector. The implementation of projects will then depend on the availability of funds including FAA programming, as well as activity levels.

The estimated costs to implement the master plan recommendations are also included following the presentation of the phased development program. Lastly, this chapter includes a discussion of continuous planning.

ROLE OF THE AIRPORT

Before presenting the recommended development program it is appropriate to briefly discuss the role of the Airport. To begin, the Airport is presently contained in the U.S. National Plan of

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Integrated Airport Systems (NPIAS) and is classified as a **Primary (PR)** airport as defined by FAA. A **Commercial Service (CS)** airport is defined as an airport that is served by a scheduled air carrier and enplanes more than 2,500 annual passengers. Commercial service airports are further subdivided as either CS or Primary. Primary airports are those Commercial Service airports enplaning more than 10,000 passengers annually.

FAA classifies commercial service airports depending on the percentage of total enplanements for the U.S. In this classification system, ABIA is classified as a **Medium hub** airport, which enplanes between 0.25% and 1% of the total U.S. enplanements (about 1.8 million to 7.1 million enplanements based on calendar year 2000 traffic data published by FAA).

The FAA in its current AC 150/5300-13, Airport Design, has developed an Airport Reference Code (ARC) which is a coding system that relates airport design standards to two components: the operational and physical characteristics of aircraft operating at an airport. The coding system is more fully explained in Technical Report 3. Planning standards for an airport reference code of D-V have been used in developing the Airport Layout Plan. This is a continuation of the current ALP and will accommodate aircraft as large as the Boeing B747-400. Also, the flexibility to accommodate operations of New Large Aircraft (NLA) on the airfield or at cargo facilities has been incorporated in the Master Plan. The use of this approach ensures that all commercial aircraft that presently use and those that might use the Airport in the future will be served by facilities of appropriate design. While not critical in this case in terms of airfield geometrics, operations by regional jets may be expected. It is noted that all passenger loading bridges can accommodate regional jets at the passenger terminal.

AIRPORT PLANS

Nine airport layout plan drawings will be updated as part of this Study, which are scaled delineations of the recommended plan and various aspects of the Airport. The airport drawings updated as part of the Master Plan Update are the following: Title Sheet, Airport Layout Plan (ALP), Airport Airspace (FAR Part 77) Plan, Runway Protection Zone Plan, Terminal Area Plan, Airfield Signage and Hold Position Marking Plan, Land Use Plan, Exhibit A Property Map, and Exhibit A Existing Easements Map. Conceptual site and floor plans will also be prepared for the recommended terminal alternative.

This subsection presents a key plan that was updated as part of the Study, the ALP. The ALP is a graphic presentation of existing and ultimate airport facilities and is a key document that serves as a reference of aviation requirements, as well as land use and financial planning. In order to receive federal funding assistance, proposed projects must be consistent with the ALP, and thus the ALP must be revised and periodically updated.

In addition to the Airport Layout Plan, this subsection also presents a conceptual land use plan for the recommended development program. Conceptual floor plans and cross sections of the proposed terminal concept are presented in a subsequent subsection devoted to the passenger terminal and discussed in detail.

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Airport Layout Plan

The Airport Layout Plan, Figure 7-1, delineates the overall development plan for ABIA as recommended in this Master Plan Update. As a graphic overview of the recommended airport development, the ALP is supported by the other plans mentioned above. The Airport Layout Plan conforms to guidelines set forth by FAA for the preparation of this plan, and is the principal plan depicting the recommended improvements and changes to the airport layout and support areas.

Key elements of the development program reflected on the ALP are expansion of existing passenger terminal facilities, development of a new south terminal area with support facilities, development of a new west side cargo area, and airfield improvements to support airport activities. The descriptions of terminal areas and cargo and support facilities are included in subsequent sections of this chapter. The ALP particularly lends itself to the depiction of airfield development, and therefore the following discussion focuses on the recommended airfield improvements. The discussion relates to the overall development proposed in the Master Plan. Phasing will be addressed later in this Chapter.

Runways

Third Parallel Runway

The ALP includes a third parallel runway, designated Runway 17C-35C, that is 9,000 feet long and 150 feet wide. The centerline-to-centerline separation of the runway from the existing west runway (Runway 17R-35L) is 1,000 feet. The runway is located such that the north threshold is even with the north threshold of Runway 17R. The air traffic control tower has indicated that the primary function of the new runway will be for aircraft departures, and in this regard it should be noted that the runway would accommodate those aircraft normally departing on the existing west runway as directed by ATC.

While the need for the third runway is long term with respect to the demand/capacity analysis, initial project planning, environmental and design activities should be considered during the master plan period. A recommendation of the Peer Review of the Master Plan Update was to accelerate development of the third runway. This may need to be also considered. It is important to note that the funding of the runway by FAA will require a Benefit-Cost Analysis in accordance with FAA guidelines. The analysis should include a detailed analysis of runway operations through computer simulation in order to quantify aircraft delays and their associated costs. The need for runway maintenance and rehabilitation should also be factored into the analysis. This should include an indication of costs and identification of periods of runway closure through a formal runway rehabilitation assessment analysis. This may also accelerate the need for the third runway.

New Large Aircraft

Until recently, the Boeing 747-400 was the critical aircraft in terms of airport geometrics and design, as it is the largest civil transport used at most major airports worldwide. However, airfield geometrics for an ARC D-V will not be adequate for the next generation "New Large Airplanes" (NLA), larger aircraft with seating capacities from 500 to 800 passengers.

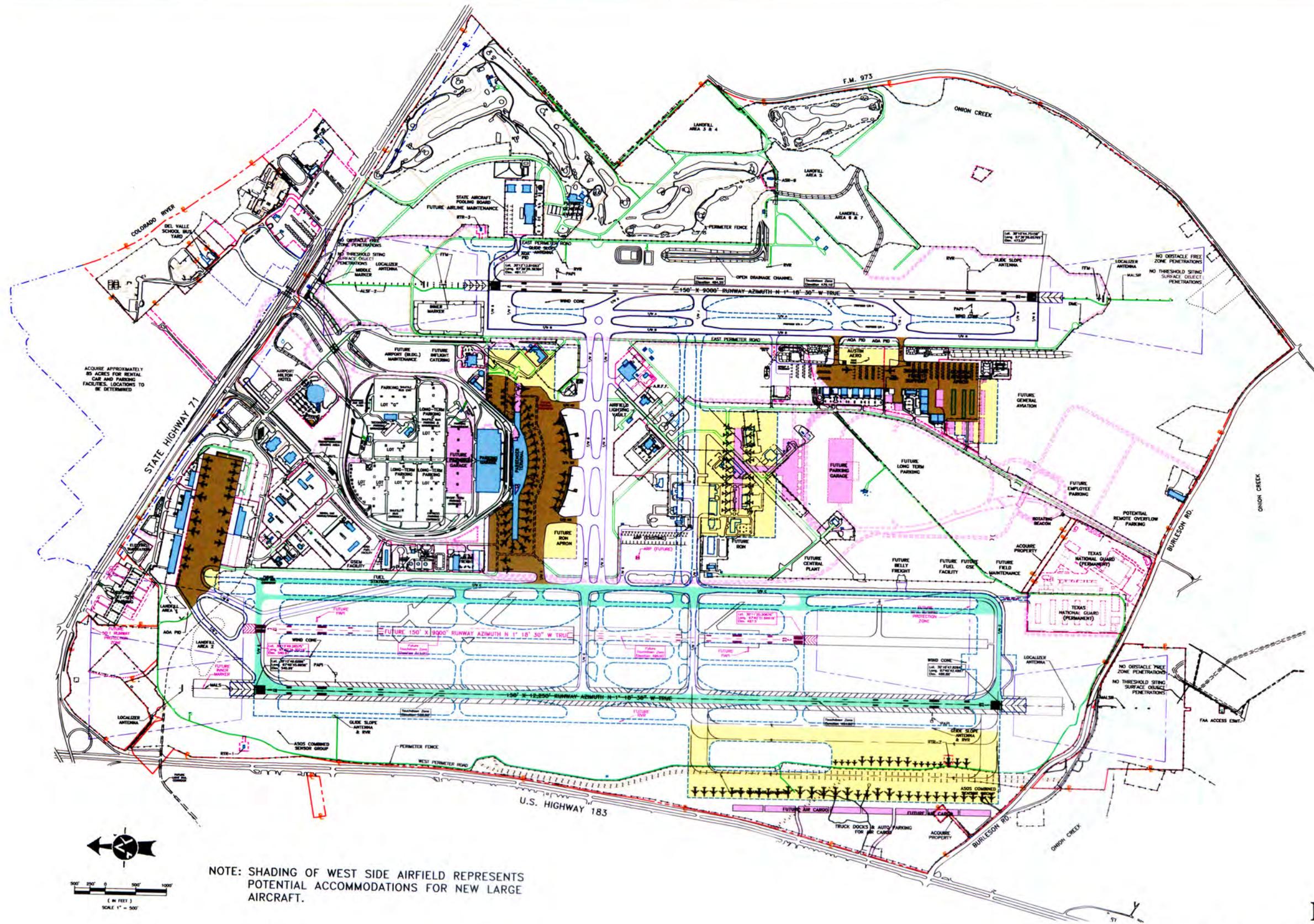


Figure 7-1
Airport Layout Plan

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An important design issue is the compatibility of the size of the new large airplanes and existing airfield and terminal geometrics of major airports around the world. Based on present planning standards, these aircraft would require 200-foot wide runways and runway to taxiway separations of 600 feet, compared to a 150-foot runway width and 400-foot separation requirement for the B747-400. However, reduced separations may be possible.

In the interest of incorporating the flexibility to accommodate NLA operations, DOA requested that a strategy be identified for accommodating next generation large aircraft. The initial specifications for the Airbus 380 involve a 262 foot wingspan, 240 foot length, tail height of 79 feet and a maximum takeoff weight of 1.2 million pounds. In terms of a strategy for accommodating potential Airbus 380 operations the west runway is the preferred runway because an overall pavement width (including shoulders) of 300 feet exists. Therefore, in planning future airfield facilities consideration should be given to NLA operations on the west runway and associated taxiways.

Some principal taxiway system requirements to accommodate the Airbus 380 are as follows: taxiway width – 100 feet; taxiway shoulder width – 40 feet; distance from taxiway centerline to object – 194 feet; and, a taxiway safety area width of 262 feet. Airfield pavements will need to be stressed for aircraft weights of approximately 1.2 million pounds.

Taxiway C presently serves Runway 17R-35L and is 75 feet wide. The existing separation between the west runway and Taxiway C is 1,788 feet and this offers the opportunity to accommodate a future parallel taxiway for NLA operations. The separation from the third parallel runway (Runway 17C-35C) centerline would be 788 feet. Taxiway C could meet separation requirements for an Airbus 380 with some impact on vehicular operations on the airfield service road due to clearance requirements from the taxiway centerline to an object. The ALP indicates a future parallel taxiway (designated Taxiway D) that is separated from Runway 17C-35C by 521 feet. This separation between the third parallel runway and Taxiway D could provide adequate separation for the Airbus 380. Since the separation between the future Taxiway D and Taxiway C would be 267 feet, taxi operations on Taxiway C would be impacted during periods when an Airbus 380 is taxiing on Taxiway D. During these periods aircraft on Taxiway C would be limited to aircraft with wingspans no more than approximately 200 feet in order to meet wingtip clearance requirements for parallel taxiways. Since most aircraft operating at ABIA will have wingspans less than 200 feet this does not appear to present significant operational impacts. Therefore, Taxiways C and D offer opportunities for accommodating NLA operations on the west runway. It should be noted that other taxiway design enhancements would be required involving taxiway width, shoulder width and fillet design. See Figure 7-1 for potential accommodations of NLA on the west runway system.

Taxiways

Taxiway improvements reflected on the ALP include development of dual parallel taxiway capability for the existing runways, construction of a west side parallel taxiway serving the new west side cargo area, exit taxiways and midfield cross taxiways. A parallel taxiway between the west runway and future Runway 17C-35C is included on the ALP to indicate the eventual need for this improvement. However, the timing of this taxiway is beyond the master plan period as is the third parallel runway.

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It is proposed to complete the dual parallel taxiway system that partially exists for Runway 17L-35R. This involves extension of Taxiway A to the north and south ends of the runway. Taxiway improvements for Runway 17L-35R also include construction of a high-speed exit taxiway that connects with a new south side midfield cross taxiway system serving the south passenger terminal. This exit will serve Runway 35R and will be located approximately 5,000 feet from the Runway 35R threshold.

Taxiway improvements for Runway 17R-35L also include development of a dual parallel taxiway capability. This involves extension of Taxiway C to the north and construction of Taxiway D and will also serve the existing cargo area. Taxiway D will be 75 feet wide with a centerline-to-centerline separation of 267 feet from Taxiway C. Taxiways C and D will offer opportunities for accommodating NLA operations on Runway 17R-35L. Exit taxiway improvements include high-speed exits for Runways 17R and 35L and right angle exit taxiways. In 2002, the fillets for the existing Taxiways G and T were widened to function as angled exit taxiways. Both sides of Taxiway G were widened and the north side of Taxiway T was also widened. A right-angle exit is included 9,000 feet from the landing threshold of Runway 17R that also corresponds with the south threshold of a third parallel runway. A right-angle exit taxiway is also proposed approximately 9,000 feet from the landing threshold of Runway 35L.

Improvements for the Runway 17R-35L taxiway system also include widening of the entrance taxiway of Runway 35L to provide dual, or bypass, taxi capability and an aircraft deice area.

While the proposed new south passenger terminal does not impact the existing midfield cross taxiways, additional cross taxiways are proposed to serve the new terminal. The southernmost cross taxiway for the new terminal is incorporated as an apron edge taxiway and aligns with the existing Taxiway T. The separation between cross taxiways is 267 feet and the northernmost future cross taxiway is proposed to extend to Runway 17R-35L. The existing Taxiway H is also proposed to be extended to the West Runway. The south fillet of Taxiway H will be widened with geometry similar to the present fillet widening project. Likewise, the north fillet of the future midfield cross taxiway that extends to the runway will also have widened pavement to function as an angled runway exit.

It will be necessary to develop a west side parallel taxiway for Runway 17R-35L to serve the future cargo area. A 75-foot wide taxiway is recommended with a runway centerline to taxiway centerline separation of 400 feet. The west side of the runway will also be served by high-speed and right angle exits, and dual entrance taxiways. An apron edge taxiway on the cargo apron will provide dual taxiway capability in the new cargo area. Taxilanes in the future cargo area should consider operations by NLA and the need for potential requirements described above for the Airbus 380.

Currently planned expansion of the existing cargo apron is also included on the ALP and involves extending the south edge of the existing cargo apron to Taxiway W. In the long term the existing cargo apron will be served by the dual parallel taxiways constructed for the west runway (Taxiways C and D).

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It is also necessary to develop additional access taxiways east of Runway 17L-35R to serve future airline maintenance and general aviation areas. This involves development of a partial parallel taxiway with a runway centerline to taxiway centerline separation of 400 feet. This will involve abandonment and demolition of a portion of the access taxiway presently serving the State Aircraft Pooling Board. The timing of this development will be contingent on development of airline maintenance and general aviation facilities in this area.

Conceptual Land Use Plan

Figure 7-2 presents a generalized land use plan for on-airport property and identifies the location and size of passenger, cargo, parking and support facilities that are needed to accommodate the High Growth demand forecast for the year 2020 (Planning Level 3). It is a refinement of the earlier versions developed during the initial definition of alternatives and evaluation of final alternatives. The planning process is an iterative one and the refinements are a result of the development of the implementation plan and input from the Peer Review. A discussion of land area requirements to balance the ultimate runway capacity will also be presented.

Basis of the Land Use Plan

The primary basis of the land use plan is satisfying the facility requirements to accommodate the High Growth forecast within the preferred passenger terminal alternative. Other important factors considered in the development of the land use plan are as follows:

- Preserving the opportunity to enhance airfield capacity through the development of a third parallel runway as previously described.
- Development of a new south unit passenger terminal together with associated ground access and parking facilities.
- Providing a balance between airside and landside functions and distribution of services between north and south sides of the airport.
- Providing for the ultimate capacity of the Airport beyond Planning Level 3.
- Minimizing impacts on existing support facilities.
- Providing sufficient area and flexibility in accommodating future air cargo activity.
- Development of a consolidated rental car facility.

With respect to facility requirements, Chapter 4 presented land area requirements for cargo and airport support facilities, which are general space requirements to be used in land use planning analyses. The land area estimates represent theoretical projections with the purpose of guiding and facilitating the process of defining alternatives. They were based on planning factors, assessment of

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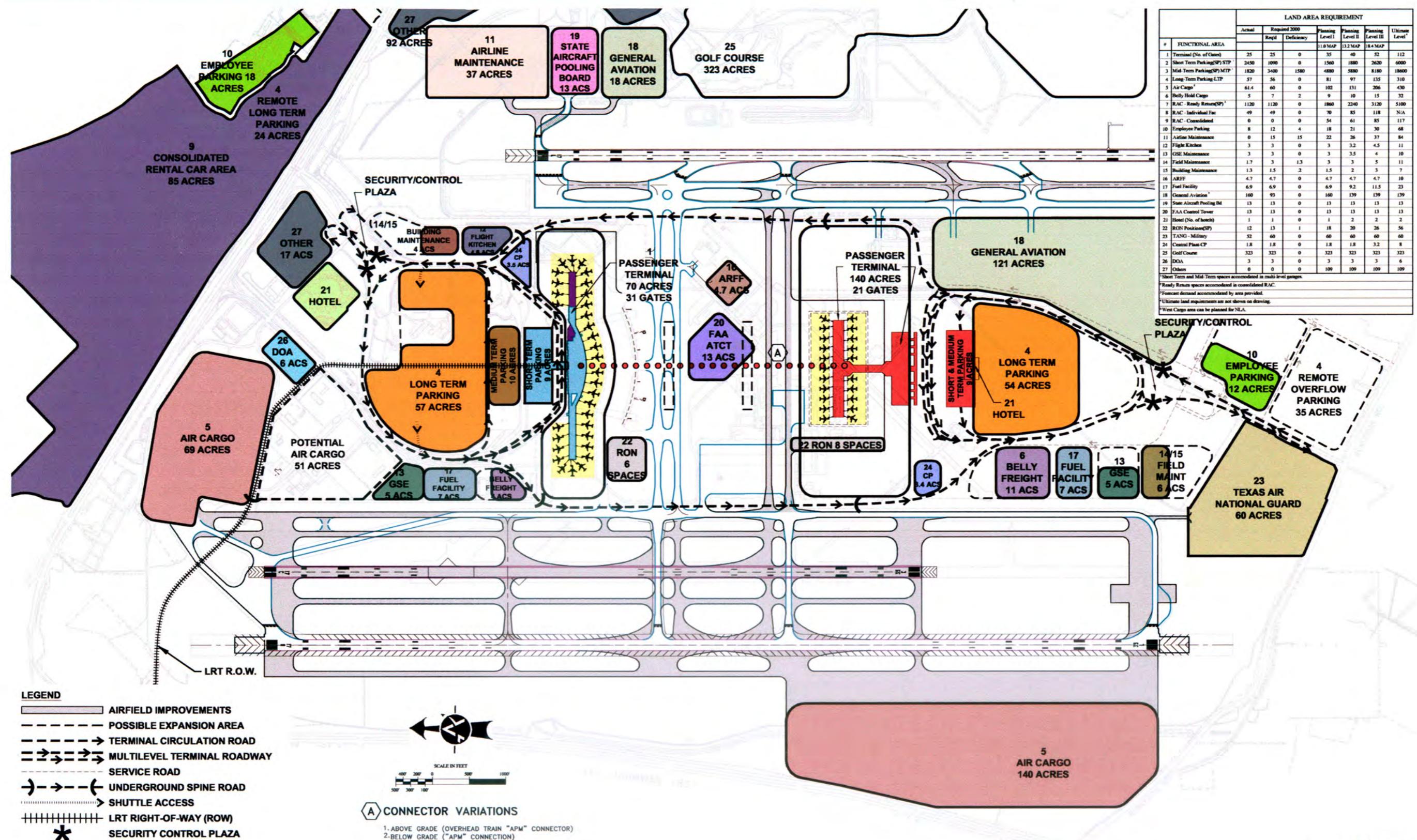


Figure 7-2
Recommended Land Use Plan

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existing facilities and input from various support area personnel. It is important to note that these projections are not specific to a particular concept, and that the actual areas planned may vary depending on the concept. For example, a concept requiring decentralization of a function will generally require more area for that function than the theoretical estimate. The elements of the land use plan are described below and the land areas shown are specific to the preferred development alternative. As stated above, the land areas shown on the plan depict requirements for Planning Level 3.

Passenger Terminal. The existing passenger terminal and apron area occupy approximately 70 acres. The new south unit terminal will encompass approximately 140 acres, which includes area to the east and west for expansion. This also includes RON apron areas.

Structured Parking. The existing parking structure occupies approximately 9 acres and will serve short term parking needs of the north passenger terminal and with the construction of additional floors can serve medium term parking needs. A new three-level parking structure to be located north of the existing garage is an option for serving medium term parking requirements for the north terminal and will occupy roughly 10 acres. A four-level parking structure serving the new south passenger terminal will occupy the same basic footprint as the existing garage (approximately 9 acres) and will serve short-term and medium term parking.

Surface Parking. Surface parking lots will accommodate long-term parking, remote overflow and employee parking. Approximately 57 acres of long-term parking is located within the existing terminal roadway with another 24 acres of remote long-term parking located north of SH 71. These will satisfy requirements of the north passenger terminal building. Approximately 54 acres of long-term parking is located within the new terminal entrance roadway of the new south terminal, with additional area available for expansion. An area for remote overflow parking on the south side of the airport has been designated, east of General Aviation Avenue along Burleson Road, however, this area is not required to meet long-term parking requirements for Planning Level 3.

A new 18-acre north side employee parking lot is located north of SH 71 and will serve employees of the north terminal area. A 12-acre employee parking lot is proposed to be located south of the existing general aviation area, and will serve employees at the new south terminal.

Consolidated Rental Car Facility. A new consolidated rental car facility is proposed and is located north of SH 71. An area of approximately 85 acres has been allocated to accommodate common customer service facilities, ready/return spaces, and service and storage area for rental car companies. This space allocation is a refinement of previous alternative concepts and is based on recent construction of consolidated facilities at other airports. A larger allowance for a consolidated facility has been incorporated in the plan than previous versions of concepts.

Air Cargo. The existing air cargo area located near the north end of the west runway will remain as an air cargo area. In order to accommodate long-term facility requirements for air cargo, a new cargo area is located on the west side of the Airport and will be accessed by U.S. Highway 183. The site is also conveniently located with respect to the airfield, especially the longest runway (17R-35L), which

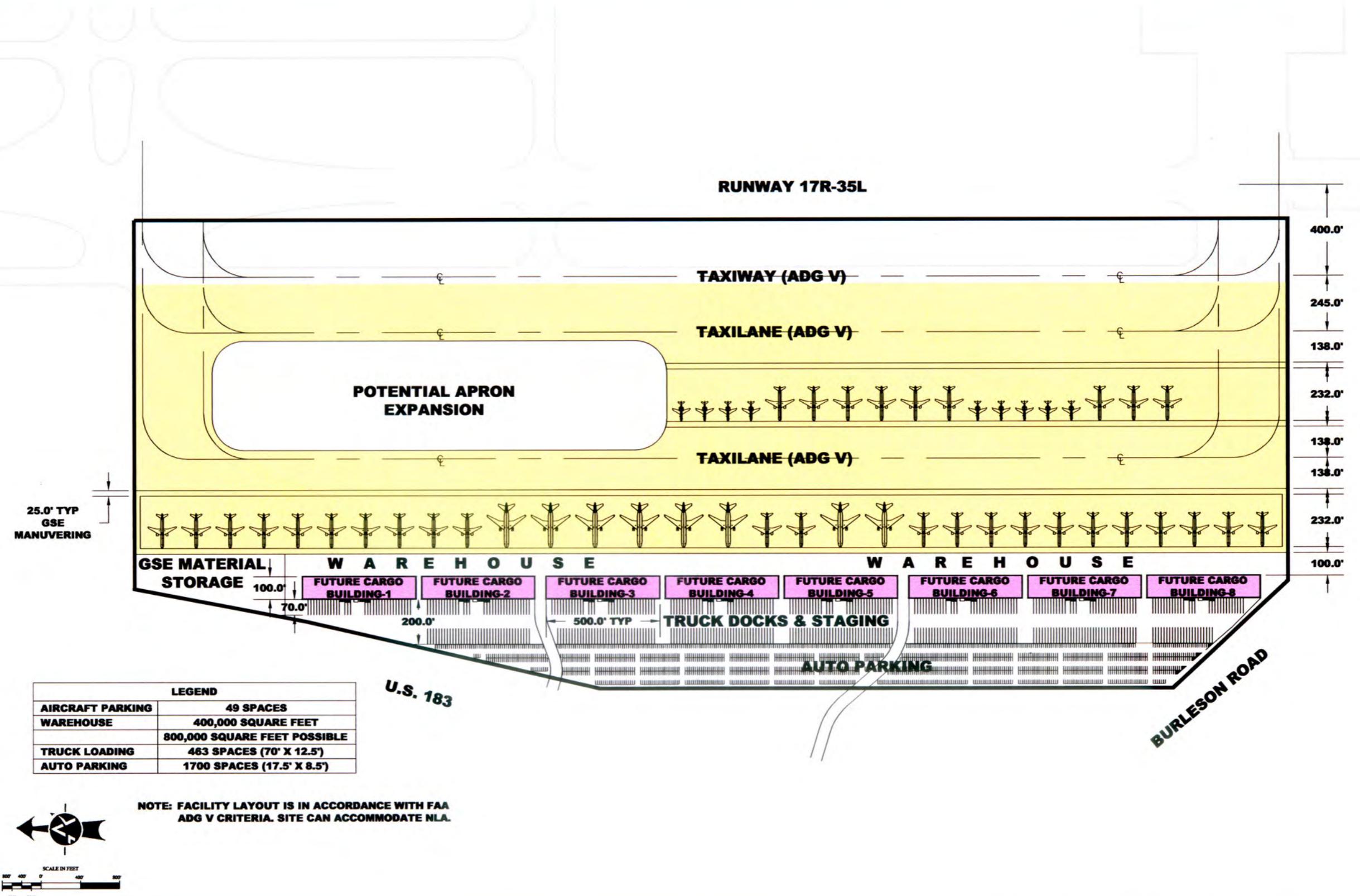


Figure 7-3
Conceptual Layout of West Side Cargo Area

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is 12,250 feet long. Approximately 140 acres is identified for future air cargo development. An area of approximately 51 acres is designated also for potential air cargo development and is located south of the existing cargo area. This area is presently used for rental car operations and storage, and may be reused once a consolidated rental car facility is constructed. Figure 7-3 presents a conceptual site plan for the west side cargo area. The apron, warehouse, truck dock and auto parking requirements for Planning Level 3 are satisfied. As seen on Figure 7-3, expansion of the apron beyond Planning Level 3 requirements is possible. While the layout is based on B747 criteria, the apron could be planned and designed for NLA operations. Future warehouses have been set back more than 100 feet from the apron edge in order to allow development of additional warehouse space without impacting truck dock and auto parking facilities. This allows for the warehouse area to be doubled. The area also provides sufficient area to accommodate separate GSE and fuel areas in support of cargo operations.

Belly Hold Cargo. The development of the west side of the inter-terminal loop road will impact a part of the existing Belly Freight facility, however, it will be possible to retain a portion of this function at the existing area. A new 11-acre area is also provided on the south side of the Airport to meet long-term requirements and is located along Taxiway C near the southern end of Runway 35L. This location is near the proposed south terminal building, and is accessible from the airside and landside.

Airline Maintenance. The master plan provides for the development of airline maintenance facilities. A total of 37 acres is designated for airline maintenance and is located east of Runway 17L-35R and immediately north of the State Aircraft Pooling Board. The area dedicated for airline maintenance will accommodate approximately seven airline aircraft maintenance hangars and apron (for a B757). A B747-400 would require larger hangars and the area would be capable of accommodating six B747 hangars and apron.

Flight Kitchen. The alignment of the proposed east side inter-terminal loop road will impact the existing flight kitchen. The flight kitchen will need to be relocated and an area has been identified immediately north of the existing building. The area will be developed prior to construction of the inter-terminal loop road, and will abut the north side of the loop road. Access to the flight kitchen area is via New Airport Drive. Approximately five acres is preserved for the flight kitchen area.

GSE Maintenance. The existing three-acre GSE Maintenance area will accommodate planned expansion by Aviation Facilities Company including a building of up to 20,000 square feet. There is also additional space north of the existing lease line to accommodate some expansion as well as construction of a planned alternative fuel facility. An area of approximately five acres will be dedicated to this function on the north side of the Airport. This area has also been replicated on the south side of the Airport to provide a GSE area in close proximity to the new terminal.

Airport Maintenance. Two locations are designated for Building and Field Maintenance functions. Building Maintenance will be located in close proximity to the existing passenger terminal, immediately north of the relocated flight kitchen. Four acres is allocated which accommodates requirements for Building Maintenance as well as a satellite location for Field Maintenance.

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Additional area is available for expansion. Field Maintenance will be located in the southern part of the airport, immediately north of the planned TANG area. The area provided (six acres) meets long-term requirements and is large enough to accommodate a satellite Building Maintenance facility to serve the south unit terminal. Space is also available for additional expansion.

ARFF. The existing Aircraft Rescue and Fire Fighting (ARFF) station remains at the present location to the east of the FAA control tower. The ARFF site encompasses almost five acres.

Fuel Farm. The existing fuel farm encompasses approximately seven acres and is retained in the recommended development plan. A second fuel storage area is designated along Taxiway C near the south end of Runway 17R-35L, and is equivalent in size to the existing fuel farm.

General Aviation. While some of the area presently designated for general aviation is used for right-of-way for the inter-terminal loop road, it is still possible to accommodate the forecast number of based aircraft within the remaining area (approximately 121 acres), through tie-downs, T-hangars and conventional hangars. An additional general aviation area has also been designated on the east side of the Airport, immediately south of the State Aircraft Pooling Board that totals 18 acres.

Airport Traffic Control Tower. The existing FAA TRACON/ATCT will remain in its present location and is not impacted by proposed development in the master plan. The FAA leasehold encompasses approximately 13 acres, which will accommodate any anticipated expansion needs such as additional auto parking.

State Aircraft Pooling Board. The SAPB did not indicate the need for additional area and therefore the existing 13 acre site remains in its current use on the land use plan.

Texas Army National Guard. The Texas Army National Guard (TANG) – Austin Army Aviation Support Facility will be permanently located on a 60-acre site at the intersection of Burleson Road and General Aviation Avenue. This will be sufficient for expansion needs for the twenty-year master plan period.

Central Plant. The planned east side inter-terminal loop road that connects the north and south terminal areas should not impact the existing central plant. The existing plant occupies an approximate two-acre site. A second plant will be located on the south part of the Airport to serve the planned south passenger terminal. This facility should be developed as part of the south passenger terminal program. The area is equivalent to the existing central plant.

Department of Aviation (DOA). An airport administration campus totaling approximately six acres is designated on the land use plan and is located at the site of present DOA Engineering and Human Resources and the City of Austin Learning Resource Center. The site is capable of supporting an assumed 80,000 square feet of administrative office space (two stories) and four acres of automobile parking. This will also accommodate administrative functions that are assumed to be relocated from the passenger terminal, although a minor operational presence may be retained at the

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terminal. The locations of Landside Operations and Information Systems offices on Employee Avenue are also retained.

Hotel. The existing hotel occupies ten acres of land. An allowance for a second on-airport hotel is included in the plan. A second hotel is planned as part of the south terminal development, and is envisioned in the master plan to be developed as part of the south parking structure.

Golf Course. The location and size of the golf course has been assumed fixed with present plans for golf course renovation. It encompasses 323 acres on the east side of the airport. Area occupied by nine golf holes that are to be relocated as part of the renovation, may be reused for other, revenue enhancing uses.

Other Uses. Approximately 109 acres of land has been identified as not required for airport/aviation related functions. This area may be considered for non-aviation development in order to increase airport revenue. The main area is located on the east side in an area formerly occupied by the golf course. This area includes frontage on SH 71. A second area at the intersection of SH 71 and Presidential Boulevard encompasses approximately 17 acres.

Ultimate Land Use Requirements

A suggestion by the Peer Review was to determine the maximum runway capacity of the future airfield (including a third runway), and identify general facility requirements for passenger, cargo and parking facilities that match the ultimate runway capacity in order to understand and plan a reasonable balance of facilities. This sub-section is included to provide general approximations of the ultimate extent of facility development that may be anticipated considering the maximum runway capacity.

Maximum runway capacity. In this analysis the annual runway capacity is considered as it can be readily related to parameters needed to approximate ultimate facility requirements. The annual capacity (expressed as Annual Service Volume – ASV) of the existing parallel runways was identified in Chapter 3 of Technical Report 3 as 490,000 aircraft operations. The technical report also indicated that the third parallel runway as planned will increase capacity on average 28 percent during VFR and 10 percent during IFR. Considering that VFR conditions prevail approximately 80 percent of the time suggests an average hourly capacity of 143 operations (compared with 115 for the existing two parallel runways). This translates into an annual capacity (annual service volume) of 615,000 operations.

The next step of the analysis involves allocating the runway capacity utilized by various operators (passenger, cargo, etc.). Technical Report 3 included a review of aircraft operations at the top 29 primary U.S. Airports that concluded that on average general aviation operations comprise nine percent of total aircraft operations at these airports. While it is understood that GA activity at ABIA presently comprises a greater percentage, for the purpose of this analysis, it was assumed that general aviation operations utilize nine percent of available runway capacity and military operations utilize another one percent. This accounts for decreases of these activities that would be expected if the

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airport was to operate at traffic levels associated with a large major hub airport. It is assumed that at activity levels near the ultimate runway capacity that general aviation operations will comprise a significantly lower percentage of operations than historic and forecasts operations in this Master Plan. This leaves 90 percent of the runway capacity (553,500 annual operations) available for use by scheduled passenger and cargo carriers. This also is a more conservative approach for estimating ultimate requirements for passenger and cargo operations and provides a greater footprint for passenger and cargo areas.

Based on the long-range High Growth Forecast of aircraft operations, passenger operations will comprise approximately 77 percent of scheduled (passenger and cargo) operations. Therefore, it is assumed that passenger operations utilize approximately 427,000 operations of the maximum runway capacity. Cargo operations are assumed to utilize the balance of 126,500 operations.

Ultimate Gate Requirements. Based on the ultimate estimate of the maximum potential passenger aircraft annual operations (427,000), it is possible to derive an estimate of the maximum passenger throughput and number of gates. The forecast of aircraft operations described in Chapter 3 applied an average aircraft size of 140 seats and average load factor of 70 percent in the year 2020. Using these values for long-term estimates suggests that the maximum potential passenger operations (427,000) will generate nearly 42 million annual passengers (MAP). Therefore, the maximum number of passengers that is estimated to be supported by the ultimate runway capacity is 42 MAP. Using the annual gate utilization assumed for Planning Level 3 in the determination of gate requirements (376,000 annual passengers per gate) indicates the need for approximately 112 gates to accommodate 42 MAP. This is assumed to be the maximum number of gates to be required, however, as seen from the preceding discussion several variables influence the projection (runway capacity, number of passenger operations, average aircraft size, load factor, and gate utilization). The construction of gates as estimated will require approximately 200 acres of midfield area in addition to the 210 acres identified on the land use plan for passenger terminal facilities.

Auto Parking. Assuming 1,500 spaces of public parking per MAP, it is estimated that 63,000 public parking spaces will be required to accommodate 42 MAP. Although some of the requirement may be met by off-site parking facilities, as previously discussed in Chapter 4, the areas shown in this analysis are based on all requirements being met on-site to provide for the possibility that no off-site facilities are available, as occurred when ABIA first opened. In the projection of facility requirements for Planning Level 3, short-term parking and medium term parking account for approximately nine and 30 percent of the future requirements, respectively. This translates into approximately 6,000 short-term spaces and 18,600 medium term spaces. Approximately 38,400 long-term spaces are estimated which would require approximately 310 acres assuming surface parking. Less area would be needed if off-site parking is considered. It is also estimated that 68 acres would be required for employee parking assuming 400 spaces per million annual enplanements.

Consolidated Rental Car. Rental car transactions were extrapolated from Planning Level 3 estimates to reach 3.4 million at a level of 42 MAP. Based on an assumed 1.5 spaces per 1,000 transactions suggests an ultimate need for approximately 5,100 ready/return spaces, or 1,940 more than Planning Level 3. This translates into an additional 16 acres for ready return. An equal area is

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also assumed for additional rental car storage. Therefore the consolidated rental car area is assumed to require 32 acres more than projected for Planning Level 3. A total of 117 acres is assumed as the ultimate requirement for the consolidated rental car area.

Ultimate Cargo Requirements. As shown above, the ultimate number of annual cargo operations is estimated at 126,500. The cargo forecast presented in Chapter 3 indicates that each cargo departure will enplane approximately 10.7 tons of cargo. Applying this rate to the ultimate number of cargo departures (63,250) translates into an ultimate projection of enplaned cargo of approximately 677,000 tons (622,000 of which may be assumed to be all-cargo based on relationships assumed in Technical Report 3). Using the ratio of enplaned cargo and projected cargo site area included in Technical Report 3 (derived from 296,100 enplaned tons and 206 acres for Planning Level 3), it is estimated that a total of approximately 430 acres of cargo area will be required to accommodate the maximum number of ultimate cargo aircraft operations. Using the same approach, belly freight is estimated to require 32 acres.

Airline Maintenance. Gross estimates of area requirements for airline maintenance were based on a ratio of two acres of maintenance area per million annual passengers. At 42 MAP, an airline maintenance area of 84 acres would be assumed.

Flight Kitchen. The facility requirements analysis suggests a general relationship of 4 MAP per acre of flight kitchen area. Applying this to the projected maximum passenger throughput (42 MAP) suggests the ultimate need for approximately 11 acres for flight kitchen facilities.

GSE Maintenance. The relationship indicated by the results of the facility requirements analysis was also used to extrapolate an ultimate requirement for GSE. Four acres were identified as required for 18.4 MAP in Planning Level 3. This suggests the need for approximately 10 acres for an ultimate passenger throughput of 42 MAP.

Airport Maintenance. Similar to the approach taken for flight kitchens and GSE, extrapolation of projected requirements to accommodate 42 MAP suggest the need for approximately 18 acres for airport maintenance functions (11 acres for Field Maintenance and 7 acres for Building Maintenance).

ARFF. While an increase in airport operations and passengers will not necessarily add to the requirement for land area, it is assumed that in the ultimate development of the Airport a second ARFF facility is provided, equivalent to the existing area. Therefore, approximately 10 acres are assumed as the ultimate requirement.

Fuel Farm. Using the approach and the projected long term relationship of Jet A fuel per commercial air carrier operation included in Technical Report 3, it is estimated that a total storage capacity of approximately 5.8 million gallons would be required to support the estimated number of commercial aircraft operations (427,000) associated with 42 MAP. The total land area required to accommodate this storage capacity is estimated to be 23 acres.

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General Aviation. It is assumed that at the activity levels reflected in this analysis (that are representative of the largest of large hub airports), that the number of and nature of general aviation operations will be significantly different than present operations. As previously indicated, GA operations are assumed to comprise a much smaller percentage of the mix of operations if the Airport were to support 42 MAP. It could also be expected that under such a scenario that the majority of GA operations would be conducted by business aircraft as opposed to the smaller single-engine personal use aircraft presently based at the Airport. For the purpose of this analysis it is assumed that the ultimate land area requirement for general aviation is the same as is provided for in the recommended plan (139 acres). The ultimate decision on GA accommodations will require consideration of commercial service and general aviation demand, as well general aviation airports in the Austin area. It is not unreasonable to assume that considering the distant horizon implied in this analysis, that other general aviation airports would be developed in the area and relieve ABIA of significant GA activity.

Airport Traffic Control Tower. The existing land area (13 acres) dedicated to the FAA ATCT/TRACON is assumed adequate for ultimate requirements. However, the ultimate relocation and redevelopment of air traffic control facilities would be required by the ultimate build-out of midfield passenger terminal facilities.

State Aircraft Pooling Board/Texas Army National Guard. These tenants are assumed in this analysis to remain operating within their present leasehold areas, 13 acres and 60 acres, respectively.

Central Plant. Approximately 8 acres for central plant facilities is assumed necessary to accommodate 42 MAP.

Department of Aviation (DOA). The airport administration campus provided in the recommended plan encompassing six acres is assumed adequate to accommodate the ultimate requirements.

Summary of Ultimate Land Use Requirements

Table 7-1 summarizes the projection of ultimate land areas required to accommodate facilities estimated as needed to serve the ultimate runway capacity. This would include 42 MAP, nearly 680,000 tons of air cargo, and approximately 60,000 annual general aviation aircraft operations. The corresponding requirements for Planning Level 3 and existing facilities are also shown for comparison.

It is important to note that the estimated ultimate requirements should be interpreted as very general approximations, based on the rationale described in the preceding discussion. However, they do offer a glimpse of order of magnitude requirements. All of the ultimate requirements may not be accommodated within the airport property, and decisions and policy by DOA will be required as traffic begins to exceed that which is forecast for Planning Level 3 in anticipation of ultimate long-term requirements. Nonetheless, certain observations can be drawn from this analysis.

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Table 7-1
ESTIMATED REQUIREMENTS
FOR ULTIMATE AIRPORT DEVELOPMENT
(in acres unless noted)

Functional Area	Existing	Planning Level 3	Ultimate Runway Capacity
Terminal (No. of Gates)	25	52	112
Short-Term Parking (spaces)	2,450	2,620	6,000
Mid-Term Parking (spaces)	1,820	8,180	18,600
Long-Term Parking	57	135	310
Air Cargo	61	206	430
Belly Freight	5	15	32
Rental Car R/R (spaces)	1,120	3,120	5,100
Consolidated Rental Car Area	49	85	117
Employee Parking	8	30	68
Airline Maintenance	0	37	84
Flight Kitchen	3	4.5	11
GSE Maintenance	3	4	10
Field Maintenance	1.7	5	11
Building Maintenance	1.3	3	7
ARFF	5	5	10
Fuel Farm	7	11.5	23
General Aviation	160	139	139
State Aircraft Pooling Board	13	13	13
FAA Control Tower	13	13	13
Texas Army National Guard	52	60	60
Central Plant	1.8	3.2	8
Airport Administration	3	3	6

Source: P&D Aviation.

Passenger terminal and gate requirements can be met through the development of midfield satellite concourses connected by a below grade automated people mover system. The configuration of ultimate gate requirements will need to consider the location of midfield cross taxiways.

The ultimate number of short and mid-term vehicle parking spaces is more than twice the number projected for Planning Level 3, thus there will be a need for expanded structured parking in proximity of the passenger terminals. Likewise over 300 acres is estimated as the ultimate long-term parking requirement, which is 175 more acres than the Planning Level 3 requirement. Accommodating such an area on the airport will be a challenge and suggests several options such as: use of undeveloped airport property, acquisition of additional property, structured parking, or reliance on off-site parking facilities. At some point in the future, beyond the planning period, use of golf course land for aviation functions may be required. Likewise, the excavation and filling of landfills may also be considered.

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The ultimate requirement for air cargo also represents a need to identify a major land area which is over 200 acres more than the requirement for Planning Level 3. This also suggests the potential need to redevelop portions of airport property or acquisition of additional property.

The accommodation of certain functions such as airline maintenance and general aviation may prompt discretionary action or development of policy strategy by DOA. Reduction of general aviation activity could occur without proactive action by DOA, as commercial operations at ABIA continue to increase and GA operators experience increasing delays. To be proactive, DOA could encourage the development of additional GA airports and facilities in the vicinity of the airport, and encourage FAA to designate additional GA airports in the area as reliever airports, which would allow them to receive additional FAA funding for capacity enhancements. Other support functions such as flight kitchens, airport maintenance, GSE, fuel storage and ARFF do not appear to present problems in accommodating as these require relatively small areas and may be accommodated as extensions of areas presently depicted on the land use plan.

TERMINAL EXPANSION PLAN

This section presents the recommended terminal expansion plan of the Master Plan Update. It includes a detailed description of the passenger terminal building and airport ground access system. The description of the plan is in the context of facilities proposed at the end of the twenty-year master plan period. This corresponds with Planning Level 3 activity, specifically 18.4 MAP. A subsequent section of this chapter will address phasing of the recommended plan.

Recommended Passenger Terminal Plan

At Planning Level 3, the existing terminal on the north side of the airport property is assumed to have been maximized and fully developed. All the existing gates including the fully expanded and developed East concourse extension, is assumed to be leased, occupied and fully operational. Ramp frontage has been optimized and gate reallocation accomplished as some airlines shift their operation to the new south terminal. The internal workings of the existing terminal is assumed to have been fully reconfigured, retrofitted, and refurbished to accommodate tenant operations and adhere to the most up-to-date security requirements mandated by the Federal Government. Figure 7-4 presents the planned north side terminal building.

At the new south terminal, the structure is configured differently from the existing north terminal in the sense that the terminal processing area is completely segregated from the concourse gate departure and arrival function. Such a separation is intended to further reinforce the idea of distancing parked aircraft from terminal processing activities thus providing an additional measure of safety and security. Moreover, the separation enables full development of a double loaded concourse that, on average compared to a single-loaded concourse, reduces the walking distance between the terminal and the concourse gates.

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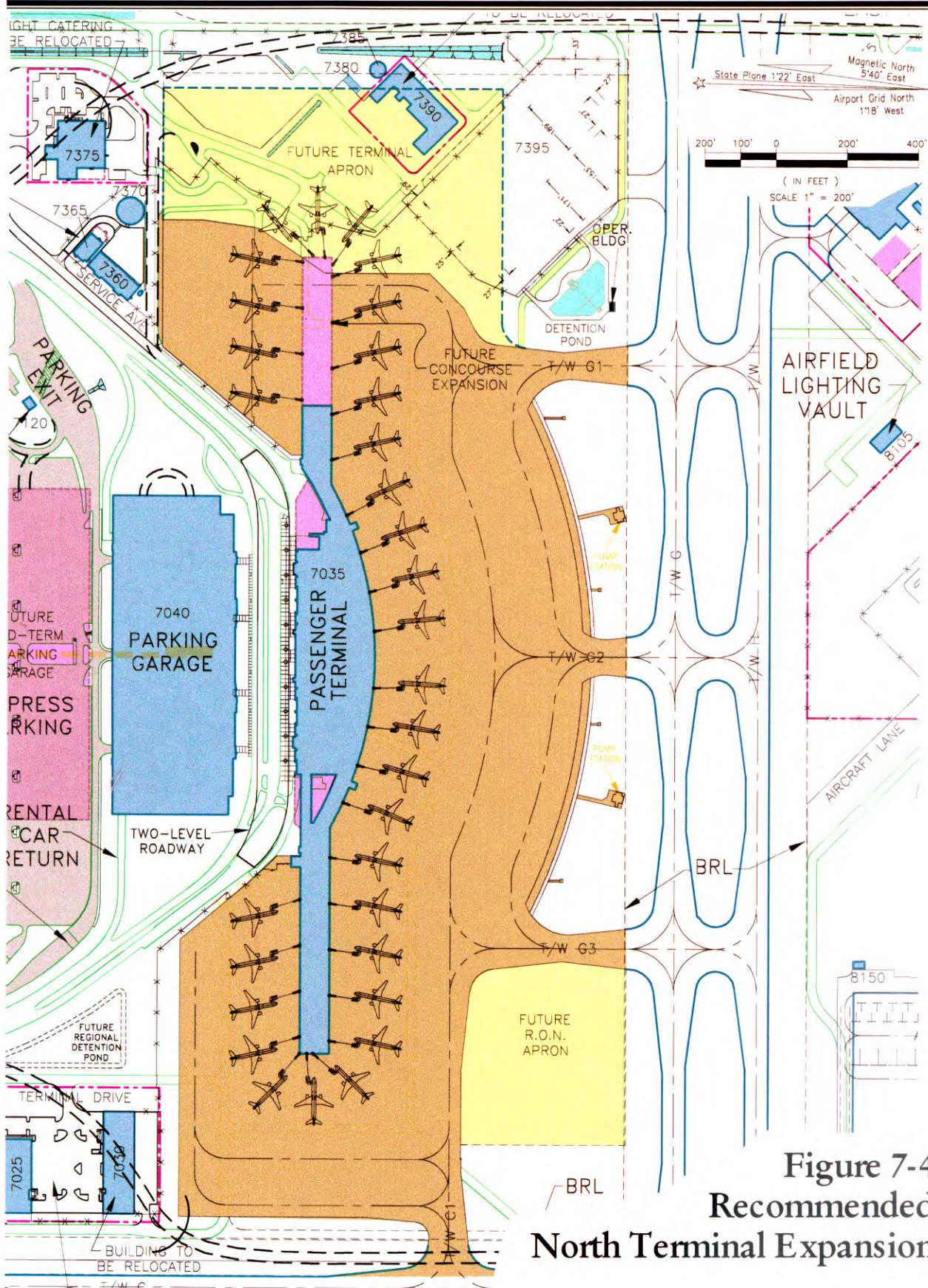


Figure 7-4
Recommended
North Terminal Expansion

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The new south terminal is different from the existing north terminal in its rectilinear form versus the crescent shaped linear configuration of the north terminal. The objective is to create a modular building system that will provide maximum flexibility for future building addition, expansion, contraction or modification to meet changing aviation needs and demands, including additional security measures that may be adopted at the time when implementation of the program to meet Planning Level 3 requirements occurs.

With flexibility in mind, along with security and budget considerations, the new terminal is planned as an airline and passenger friendly facility with three-level structures on both the passenger and baggage processing portion of the new facility as well as in the middle section of the concourse holdroom and gate areas. The top level of the terminal is intended to be the ticketing/check-in level whereas the lower two levels are primarily intended to accommodate arrival activities such as baggage claim on the mid-level, car rental and ground transportation services at the lowermost level.

The recommended south terminal building is graphically presented in Figures 7-5 through 7-8. Figure 7-5 presents a plan view of the departure level, Figure 7-6 presents the arrivals level, and Figure 7-7 presents the lower, ground transportation level. Figure 7-8 presents a conceptual cross section of the south terminal building.

The top floor level of the terminal is essentially aligned with the concourse passenger level, whereas the mid-level area of the terminal which supports the baggage claim facility on the unsecured side of the building and the outbound baggage screening and processing center on the secured backside of the building, is approximately aligned with airline ramp services facilities located on the apron (ramp) level below the concourse spaces immediately above them.

In the terminal however, a ground transportation service center is also provided one level below the baggage claim level to accommodate all ground transportation services and related transactions. This creates an opportunity and additional relief for additional curbside and roadway pick-up and drop-off zones, both for private and public vehicles. The three-level roadway can also be viewed as part of a design strategy to accommodate curbside and road demands resulting from future gate and terminal expansion beyond Planning Level 3 projections.

The terminal facility is conceived to be approximately 250 feet in depth and 1,000 feet in length. Along its East-West and North-South axis, the structure should be designed on a modular grid basis. The modular system may be modified in the upper level of the main terminal where large clear span would be desirable and is preferable to minimize both physical and visual obstructions to the ticketing/check-in areas. The depth is projected to accommodate all the ticketing/check-in functions including the placement of Explosive Detection System (EDS) equipment for the screening of checked baggage up-front. It should be noted that the actual placement of the EDS equipment should be revisited, modified and repositioned in accordance with security measures and requirements prior to, or during the actual design and construction of the south terminal. It should also be noted that the dimensions stated here should serve as guidelines for future development. The length of the main terminal building in this instance will require adjustment based on more detailed analysis and current regulations and requirements at the time of design.