

# CAPITAL IMPROVEMENT PROGRAM

## AUSTIN-BERGSTROM INTERNATIONAL AIRPORT



*Prepared for*  
City of Austin  
Department of Aviation  
Department of Public Works

*Prepared by*  
Jacobs Consultancy

*in association with*  
Gensler  
Sunland Group  
Martinez Wright & Mendez  
CADD Studio

March 2008



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# EXECUTIVE SUMMARY

## Introduction

Since opening in 1999, total annual passenger activity at Austin-Bergstrom International Airport (ABIA or the Airport) has grown from 7.5 million to almost 9 million. While there have been numerous incremental facility improvements, the Airport is in need of a significant expansion program to meet current and projected activity. It is expected that the Airport will need to accommodate 12.4 million total passengers by the year 2016, and existing facilities are insufficient to meet this demand.

Figure ES-1 shows the existing ABIA terminal area. A Capital Improvement Program (CIP) has been prepared to address current deficiencies and growing facility needs at ABIA, including:

- All passenger terminal gates are leased
- Additional terminal apron is needed for overnight aircraft parking
- All ticket counter space is committed
- Baggage claim facilities are at capacity
- Outbound baggage facilities are at capacity
- The parking garage is at capacity
- A centralized maintenance facility is needed



Figure ES-1 Existing ABIA Terminal Area

- New Parking Garage in Lot A
- Cell Phone Waiting Lot
- Airport Maintenance Complex (not shown)

## Terminal Apron Expansion

An expansion of the Terminal Apron is recommended to accommodate current demand for overnight airline aircraft parking and prepare for an extension of the east terminal concourse. This apron expansion, to the east of the existing terminal, has been planned to accommodate Boeing 757-size aircraft, based on established ABIA standards. The City of Austin has initiated the design process for this project, and this will result in a full build-out of the current terminal apron envelope. Figure ES-3 shows the expanded terminal apron.

The CIP establishes a recommended program scope, schedule and probable cost for implementing these improvements. In general, this is a significant program in terms of the scope and cost of improvements. As shown in Figure ES-2, the CIP includes the following program elements:

- Apron Expansion
- Passenger Terminal Expansion

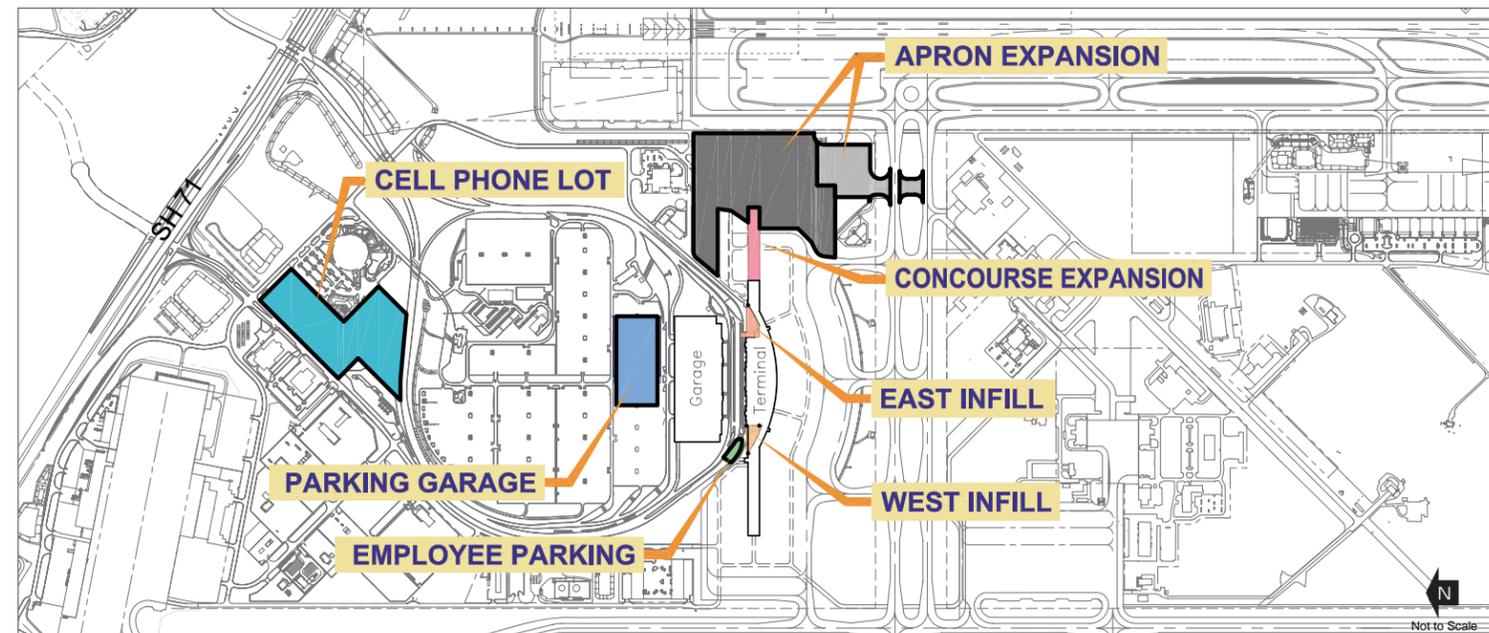


Figure ES-2 Proposed CIP Improvements

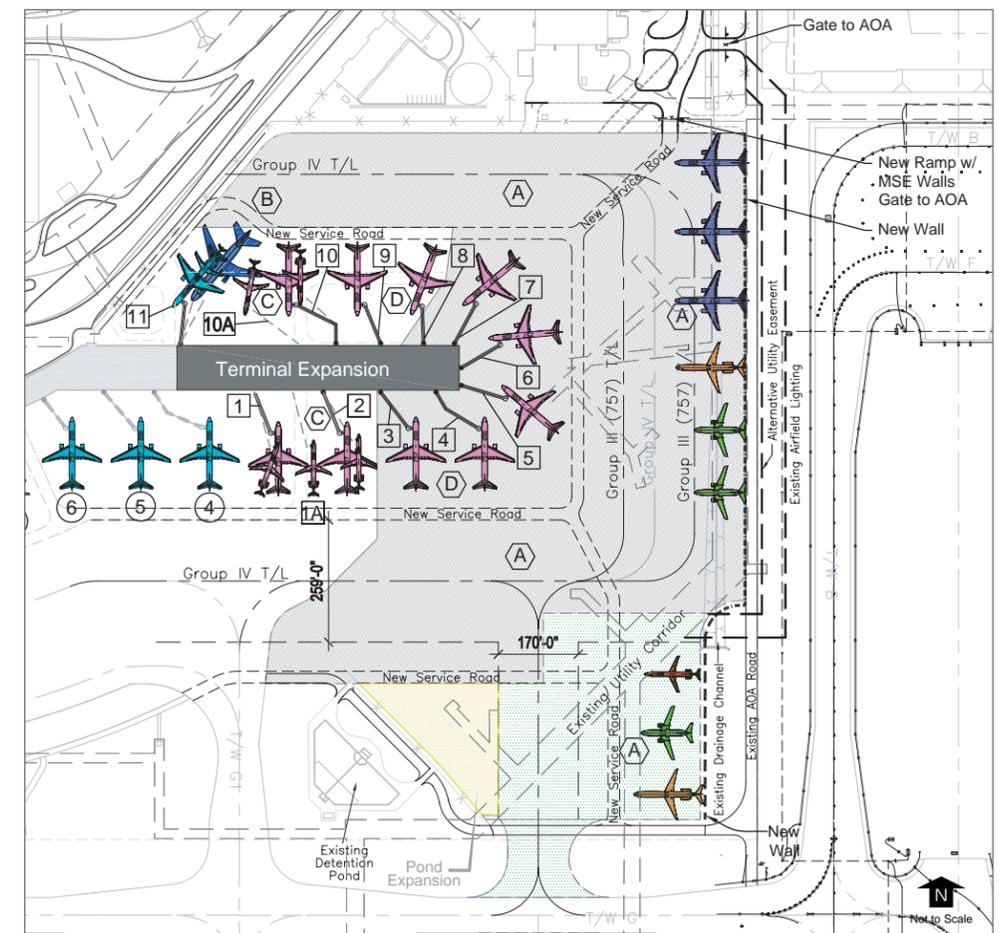


Figure ES-3 Expanded Terminal Apron

## Passenger Terminal Expansion



Growing passenger demand requires expansion of many functional areas of the existing ABIA passenger terminal. The proposed CIP provides for additional airline gates and ticket counters, concessions space, baggage claim facilities, and passenger security screening and outbound (checked) baggage screening areas.

### Concourse Extension

The east concourse will be extended by approximately 600 feet, providing space for 9 new passenger boarding gates, as shown in **Figure ES-4**. The concourse addition represents the maximum practical eastward extension. It is recommended that the interior completion of the concourse be developed in 2 phases with 4 new gates provided in phase 1 followed by 5 more gates in phase 2.

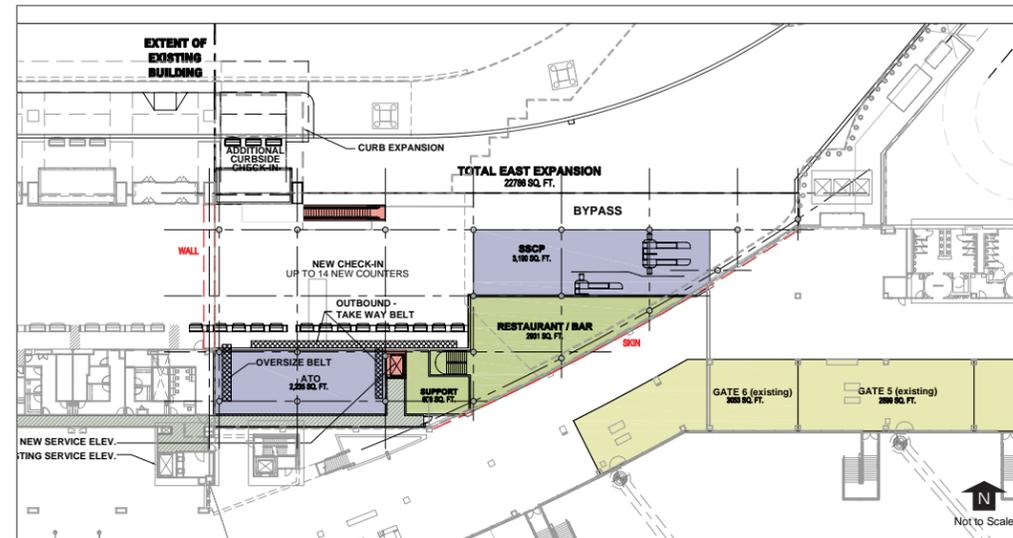


Figure ES-5 East Infill Terminal Expansion

### East Infill Terminal Expansion

The east ticketing lobby will be expanded to provide up to 28 additional airline ticket counter positions. The east lobby expansion also includes infilling the east “triangle area” to provide additional passenger security screening and concessions areas, as shown on **Figure ES-5**. Below the lobby level, there is additional space for checked baggage screening and concessions support, and a relocated terminal loading dock. Above the lobby level, new space would be available for additional concessions and potentially a full-service restaurant.

### West Infill Terminal Expansion

The west ticketing lobby will be expanded to provide up to 18 additional airline ticket counter positions. Similar to the east lobby expansion, the program also includes infilling the west “triangle area” as shown in **Figure ES-6**. The existing bridge to the west concourse would be replaced by this infill development, providing additional passenger security screening area and space for expanded concessions development. The expanded area above the lobby level would be available for additional airline club space, conference rooms and other uses. Below the lobby level there will be additional space for checked baggage screening, outbound baggage carousels, and relocated Department of Aviation offices.

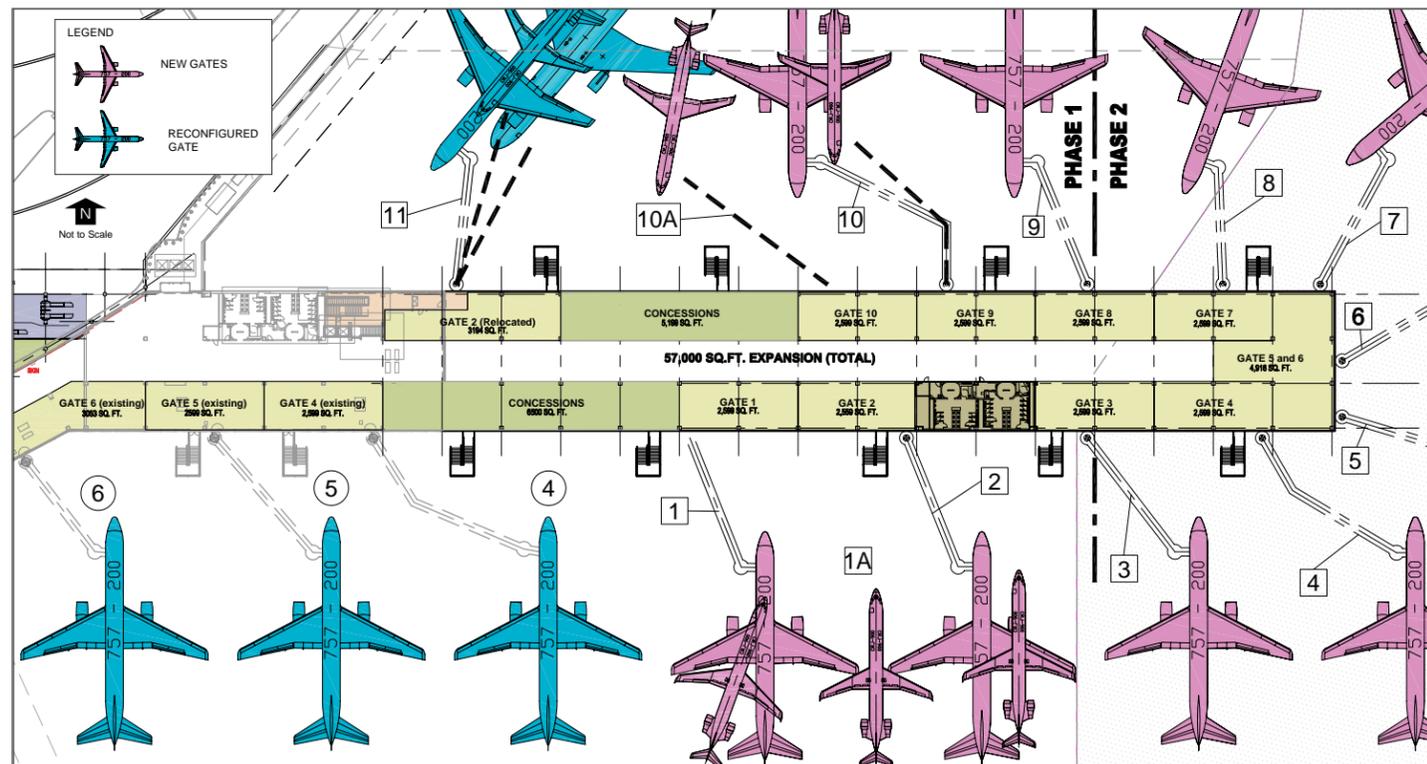


Figure ES-4 Passenger Terminal Concourse Extension

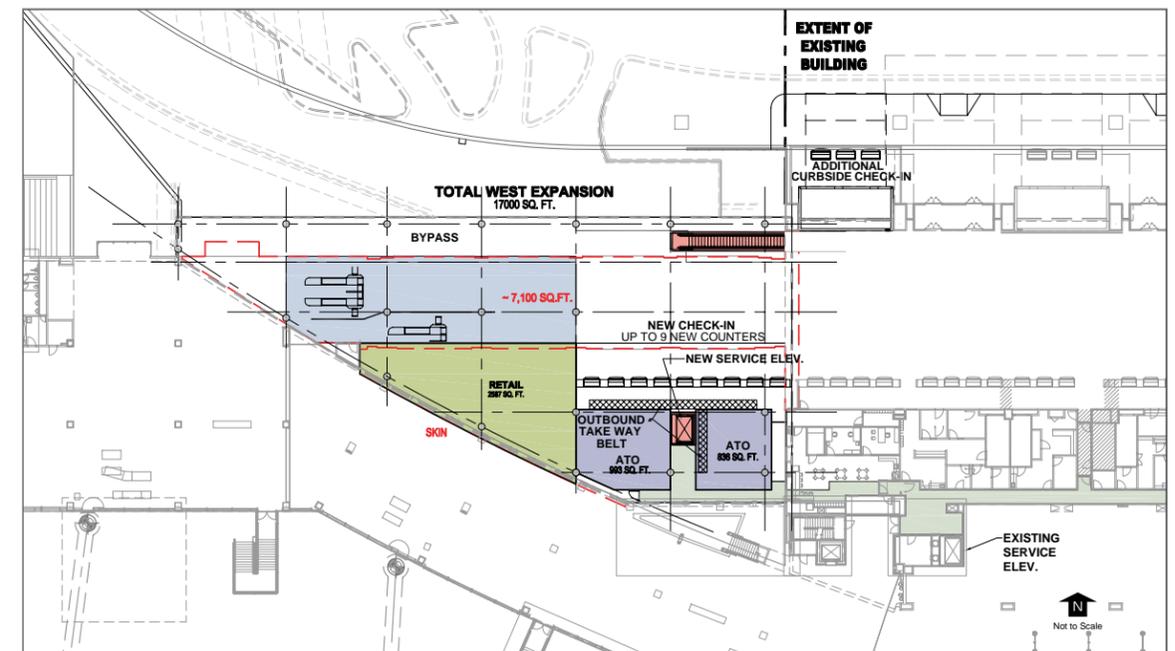


Figure ES-6 West Infill Terminal Expansion



## Airport Maintenance Complex

There is a significant need for additional airport maintenance facilities. The current conditions are limiting staff productivity due to lack of appropriate facilities and a centralized complex from which the entire Airport can be maintained. Further, covered storage for maintenance vehicles is needed to protect these important and expensive assets.

The functional program for this facility is approximately 153,000 square feet. **Figure ES-10** shows the recommended maintenance complex conceptual plan and location. The program involves a consolidation of several divisions currently located in various Airport facilities into a single complex, including:

- Airport Operations
- Landside Maintenance
- Airside Maintenance
- Mechanical Shop Division
- Building Maintenance
- Airline Maintenance
- Public Safety

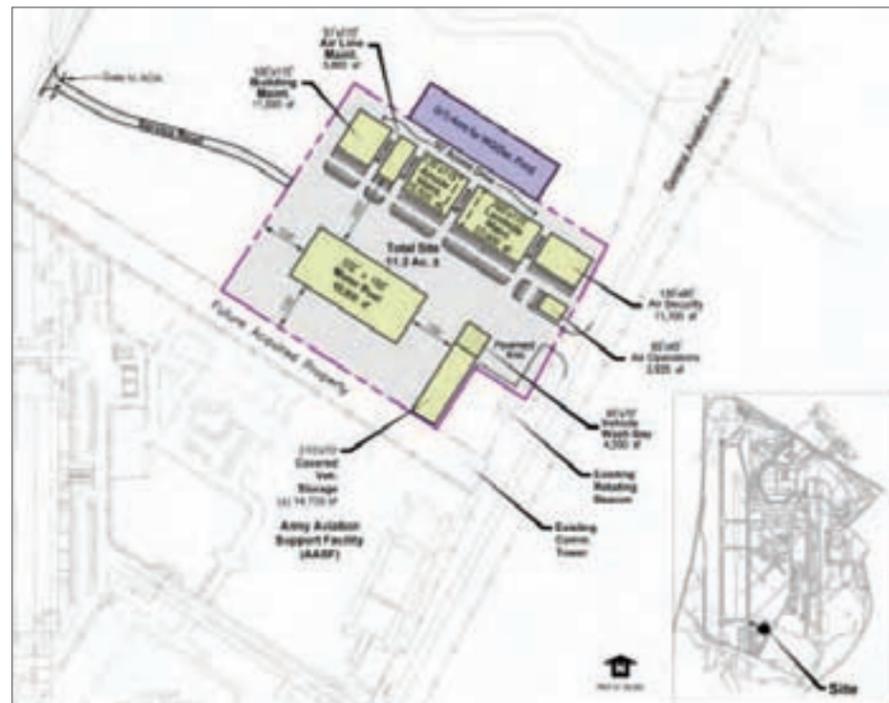


Figure ES-10 Airport Maintenance Complex

## Program Cost

**Table ES-1** shows the recommended CIP program cost summary by project. The program cost estimate has been prepared for the purpose of establishing a probable cost of construction for the various components of the CIP. The program total is estimated to be approximately \$487 million including escalation, soft costs and contingency. The largest project element is the east concourse extension which is estimated at approximately \$117 million.

Apron Expansion	\$ 75,332,800
New Garage in Lot A	\$ 82,558,300
Inbound Baggage Facilities	\$ 8,492,800
Outbound Baggage Facilities	\$ 39,893,700
West Infill Terminal Expansion	\$ 44,922,000
East Infill Terminal Expansion	\$ 39,741,800
East Concourse Extension	\$116,764,200
Cell Phone Lot	\$ 12,605,300
Airport Maintenance Facility	\$ 66,498,600
<b>Program Total</b>	<b>\$486,809,500</b>

Source: Jacobs Consultancy Team.

Costs factors have been added for design, program management, City of Austin support, Art in Public Places and contingency. The construction packages have been escalated to the projected mid-point of construction at a rate of 8% per year to that point to account for inflation. This is a relatively high inflation factor; however it accounts for the robust Austin construction market

known to have elevated construction costs.

## Program Sequencing and Schedule

The scale and scope of the recommended CIP for the Airport is significant. One key aspect of this expansion program is that this development will occur within an operational facility, requiring intensive coordination. Further, the City must establish measures to maintain the high level of passenger comfort and convenience for which the Airport has become known.

The interrelationship of the recommended CIP projects and the need to maintain Airport operations necessitates careful sequencing of the various contracts and projects. A recommended CIP program sequence was established to meet to the most pressing capacity requirements with an efficient overall development program.

The projects that relate directly to the terminal such as the east concourse and landside terminal expansions are interdependent

and must have an orderly sequence. Projects that are remote from the terminal such as the cell phone lot and airport maintenance have more flexibility in sequencing and can be scheduled to help balance the overall program work level and cash flow.

**Figure ES-11** shows the summary program schedule. It is assumed that the City will develop funding resources in 2008 and be ready to fully initiate the program in early 2009. In general, the CIP can be completed by mid-2012 with steady implementation progress.

The City has initiated the terminal apron expansion and this project can be phased to work with the concourse extension. The final phase of the apron expansion would be completed in early 2012.

The parking garage and cell phone lot could be completed by mid-2011. Baggage system expansions, the east and west terminal lobby infill, and the concourse extension will require more time, and would be completed in mid-2012.

The airport maintenance complex and cell phone waiting lot are relatively independent and can be advanced or delayed at the discretion of the City.

## Conclusion

The implementation of the recommended CIP will allow the City to meet growing activity demands through the year 2016. As airline requirements increase and the number of passengers grows, these improvements are required to maintain the high level of customer service and convenience for which the Airport is known. Implementing the recommended CIP prepares the City for the future, enabling Austin to meet the critical demands of the dynamic aviation market.

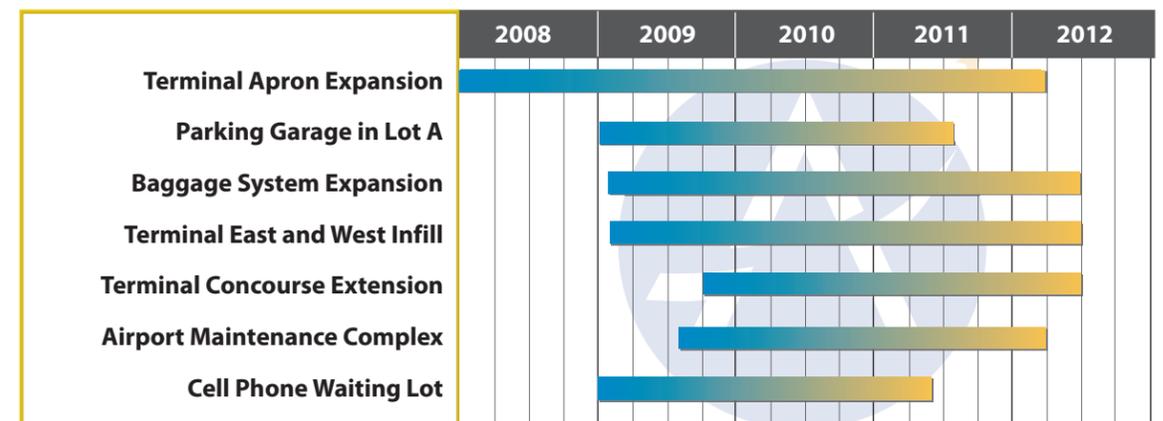


Figure ES-11 Summary Program Schedule

# 1 INTRODUCTION

## 1.1 Background

This Capital Improvement Program (CIP) has been prepared for the first major phase of expansion for Austin-Bergstrom International Airport (ABIA or the Airport). The expansion plans were developed based on the project analyses and recommendations to date as well as recent activity trends and industry changes.

In general, many passenger terminal and associated terminal area facilities are currently at capacity. In the terminal, all passenger gates and ticket counters are leased and expansion of passenger security screening and baggage handling facilities are needed. The existing parking garage also is at capacity much of the time and additional short term parking is needed.

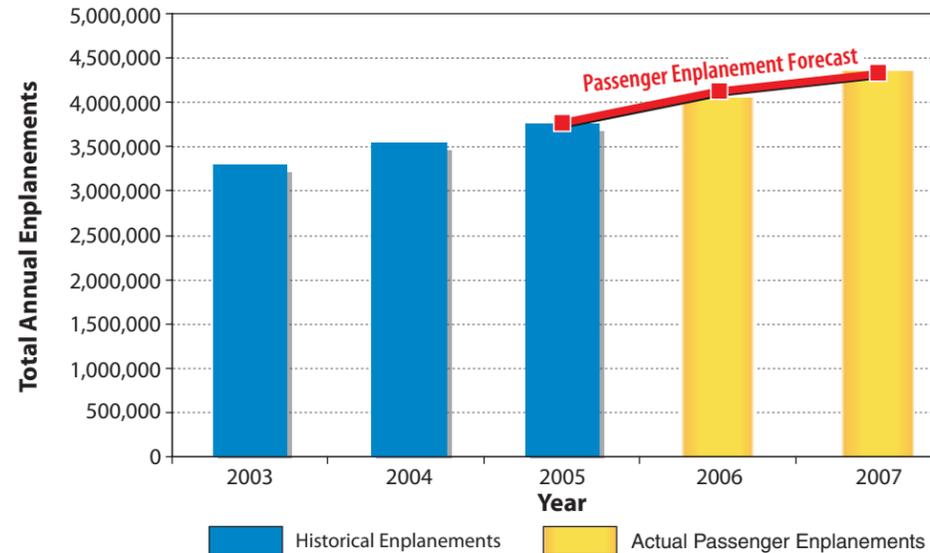
As airport activity continues to grow, airport maintenance facilities must be expanded to provide the appropriate operational base that can facilitate continued high customer service levels with appropriately maintained facilities.

## 1.2 Activity Growth Summary

Forecasts of enplaned passengers and passenger aircraft operations were developed in 2006 and presented in Interim Report 1. The forecasts were prepared for the period 2005 through 2026 and calendar year 2005 was selected as the base year since it was the most recent full year for which activity statistics were available. Table 1 provides a summary of the recommended forecast.

To assess the current activity growth characteristics, the forecast for the years 2006 and 2007 was compared to the actual traffic data for these

Figure 1  
COMPARISON OF FORECAST AND ACTUAL PASSENGER ENPLANEMENTS



two years. The results are presented in Table 2 and are illustrated graphically in Figure 1.

The forecast of passenger enplanements under the Master Plan Level 1 Phasing Plan Forecast varies only modestly from the actual passenger enplanements for the years 2006 and 2007. The Airport traffic is ahead of forecast: in 2007, enplanements are expected to be about 1% above forecast levels.



**Table 1**  
**Recommended Forecast Summary**  
Austin-Bergstrom International Airport Master Plan Level 1 Phasing Plan

	Base Case Annual Forecast			
	2006	2011	2016	2026
<b>Total Passengers</b>	8,261,310	10,232,000	12,384,000	17,470,000
<b>Passenger Aircraft Operations</b>	96,273	124,300	148,400	202,000

Sources: City of Austin, Jacobs Consultancy Team.



**Table 2**  
**Forecast vs. Actual Activity Comparison**  
Austin-Bergstrom International Airport Master Plan Level 1 Phasing Plan

	Forecasted Passenger Enplanements	Actual Passenger Enplanements (a)	% Variance Forecast vs. Actual Activity
<b>Passenger Enplanements</b>			
2005 (Base year)	3,766,017	3,766,017	0.0%
2006	4,128,000	4,046,706	-2.0%
2007	4,313,000	4,348,848	0.8%
<b>Passenger Aircraft Operations</b>			
2005 (Base year)	95,574	95,574	0.0%
2006	98,300	96,273	-2.1%
2007	104,600	100,245	-4.3%

(a) 2007 is an estimate based on year to date information.

Sources: City of Austin Department of Aviation, Jacobs Consultancy Team.

### 1.3 Requirements vs. Maximum Capacity

Facility requirements were developed in April 2007 and presented in Interim Report 2. As noted, there is a significant need for expanded passenger terminal and terminal area facilities.

Since completion of the 2003 Airport Master Plan, the City of Austin has made a policy decision to expand facilities north of the crossfield taxiways to the maximum extent possible before developing passenger facilities in the south portion of the Airport (this does not apply to any third-party passenger facility development). The recommendations in this CIP were prepared to meet this objective. Figure 2 shows the recommended CIP projects.

In general, the full build-out of the existing passenger terminal within the existing envelope is recommended. This includes maximizing the number of airline gates and ticket counter space as well as adding concessions space to enhance revenue growth. Figure 3 shows the current terminal area development.

The original planning for ABIA anticipated the future expansions of the existing terminal and concourses similar to those being recommended in the CIP. Much of the utility infrastructure was sized and located for this ultimate buildout. Each of the elements will need to be designed for connection to the existing infrastructure; however the existing infrastructure (water, sanitary sewer, storm water drainage) generally is planned to accept the connections.

Electrical distribution should be sufficient for most CIP development. The terminal development will require a recalculation of the loads and potential modification of the existing transformers and distribution within the terminal and this should be considered during the design phase.

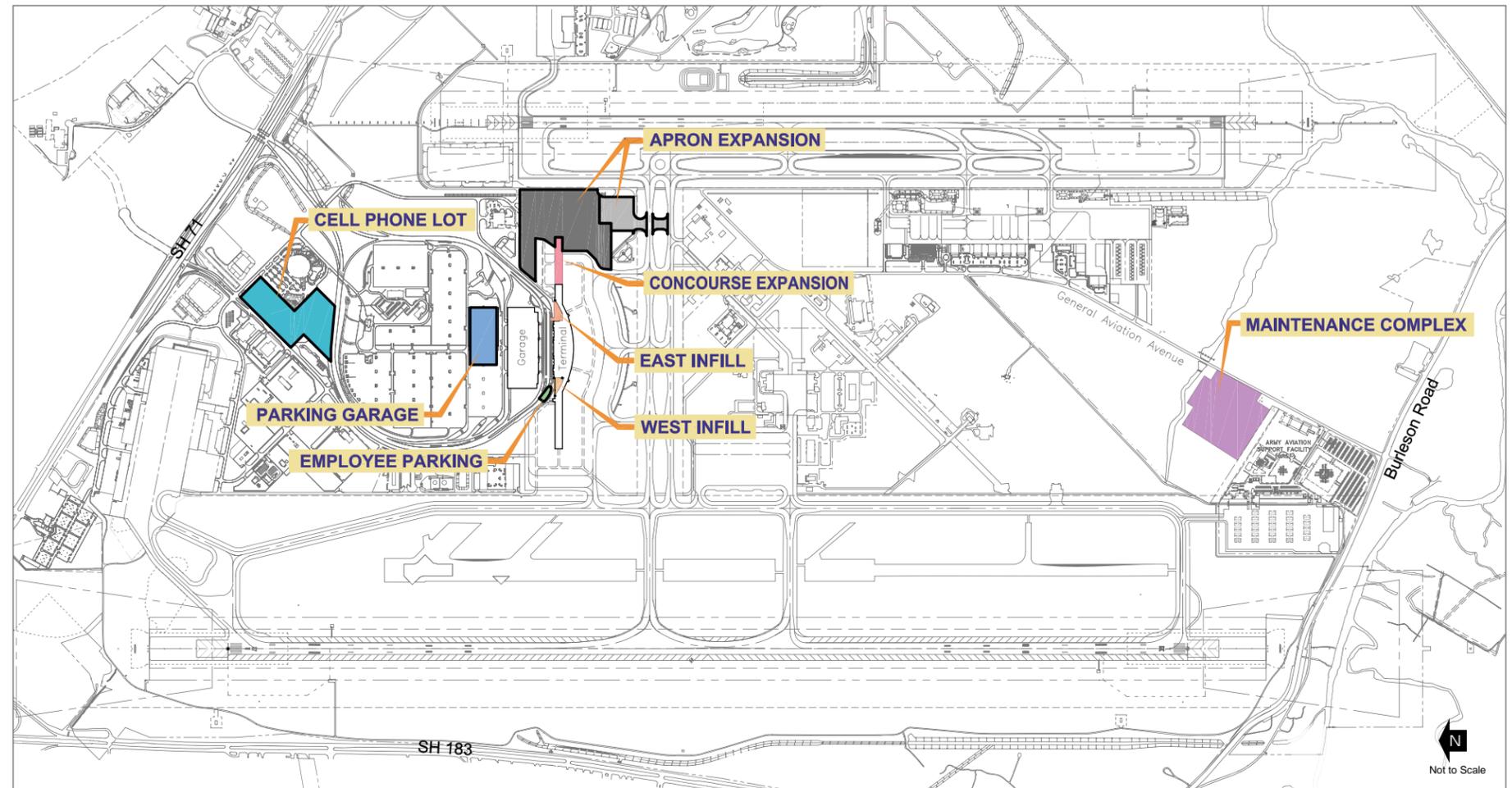


Figure 2 Proposed CIP Projects



Figure 3 Existing ABIA Terminal Area

The heating and cooling loads of the terminal are supplied by the central plant. The central plant facility has existing capacity available and also has space for additional chiller equipment if needed. Distribution within the terminal requires analysis based on the facility design.

The cell phone lot will need new drainage facilities on site. The new airport maintenance complex will also require new onsite drainage systems. The parking garage expansion will require modification of some drainage but can be located between two large interceptors to minimize impact. The apron project will also require expansion of the existing detention and separation facility.

The fire pump and water storage for the Regional Corrosion Control Facility (RCCF) will be taken out of service by the RON

apron expansion. If it is desired to maintain the fire protection system at the RCCF these will need to be refurbished and relocated.

### 1.4 Efficiency in Development

There are several elements in this CIP that are somewhat optional in that they are not needed immediately, but will be needed within the foreseeable future. However, multiple expansion elements can be developed within a single construction program more cost effectively than individual projects. Therefore, the optional elements are included in the CIP, but have been clearly identified in the event that they cannot be funded by the City's current and projected financial resources.

## 2 APRON/GATE PLANNING

### 2.1 Design Aircraft

The original design aircraft for the passenger terminal gate configuration was the B757 which is classified by the Federal Aviation Administration (FAA) as Airport Design Group III. The design aircraft for the existing pavement design was the B727. While there has been a fairly significant increase in the regional jet fleet mix by carriers serving the Airport, the B757 aircraft size has been maintained for apron/gate planning in this CIP. The B727 is no longer prevalent in passenger airline service.

The dominant design aircraft for all new gates to the east will remain the B757. Each new gate can therefore accommodate a mix of aircraft including any narrow-body or regional jet. In addition, one position has been provided for a wide-body Group IV aircraft, intended for international use.

It should be noted that the FAA has revised the design standards for Group III slightly since the original terminal design, increasing the setbacks somewhat. This is further discussed under Taxiway/Taxilane planning below.

Figure 4 shows the existing passenger terminal and terminal apron configuration.

Figure 5 shows the proposed terminal area development with future taxilanes and the recommended concourse extension.

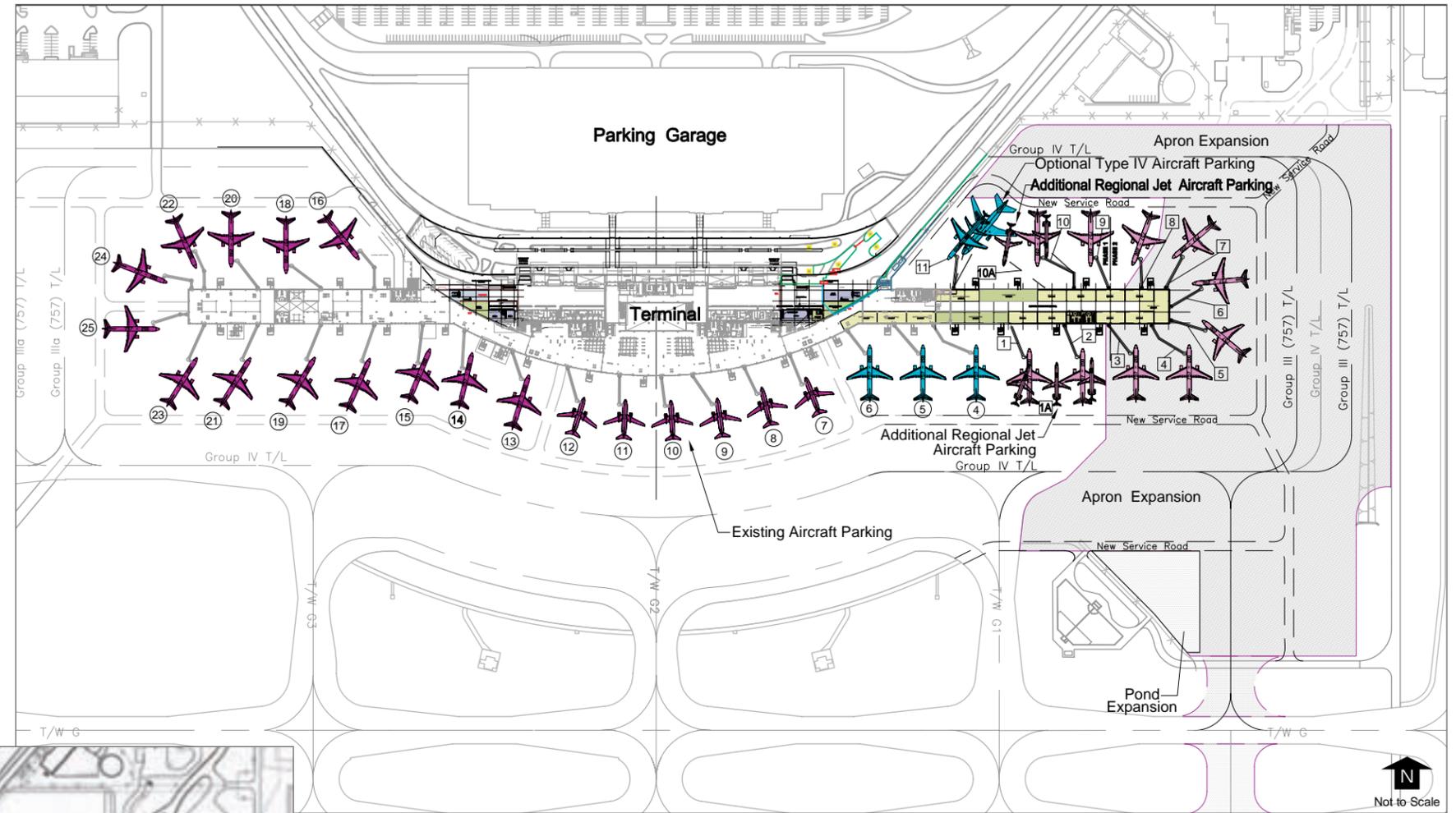


Figure 5 Terminal Site Plan



Figure 4 Existing Passenger Terminal and Apron Configuration



## Apron Planning

The City is preparing to start an apron expansion project to accommodate Remain Overnight (RON) aircraft and to serve the passenger terminal expansion. This project does not conflict with the projects proposed in this CIP. Since the apron expansion has not yet started, recommendations for project limits and development phasing are included in this CIP.

There currently are 15 RON aircraft parking positions on the southern edge of the terminal apron and 5 RON positions on the commuter apron; there is high demand for additional spaces. The RON apron should accommodate B737 aircraft, the predominant aircraft of most air carriers. Regional jets are currently in use to some degree by all of the airlines and three RJs could be parked in the space required for two B737s. RON parking for the B757 should be provided in limited number and parking for one wide-body B767 should be provided.

Figure 6 shows the apron expansion and potential RON aircraft parking positions. See section 11 for apron phasing.

The existing apron to the northeast of the existing terminal concourse is asphalt and will only accommodate smaller aircraft and regional jets (see Figure 3). The asphalt pavement is to be replaced with concrete to accommodate aircraft taxiing to the gates on the north face of the terminal and allow for larger RON aircraft.

The RON apron project consists of the following components, to be confirmed during the apron design project:

- Pave the existing commuter aircraft asphalt apron (152,500 sf) on the north edge with concrete.
- Demolish and abate hazardous materials in buildings 7390 (27,600 sf), 7380 (1,500 sf) and tank 7385 (2,100 sf). Some hazardous materials (lead paint and asbestos) may have already been abated in these facilities. Building 7380 housed the fire pumps for the RCCF Building 8070; the tank is the 500,000 gallon water storage for the RCCF deluge system. Other structures to be removed are 7396 and 7398, bus stop shelters (120 sf each).
- Demolish the parking lot and associated drainage infrastructure (old hangar apron).
- Relocate at least two AOA access gates.
- Relocate the trash compactors to a new site.
- Reconstruct the existing storm water drainage ditch east of the existing AOA perimeter road into a culvert structure.
- Extend the apron eastward to the maximum extent possible. Construct a retaining wall along the existing AOA service road, 1,509 feet long, 11 feet high at the north end and 6.5 feet high at

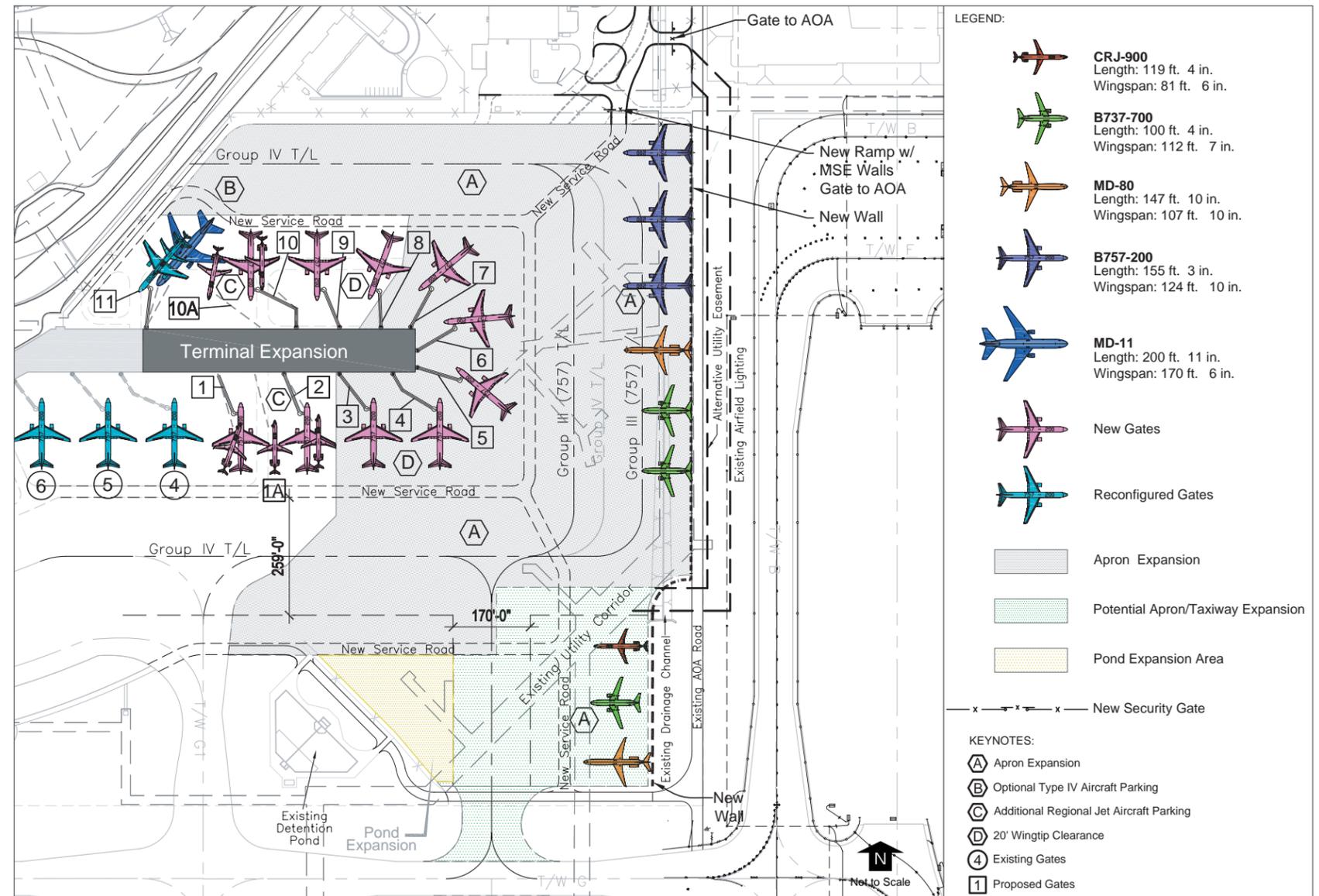


Figure 6 Remain Over Night Plan

the south end, approximately 14,700 sf of wall. The southern limit would be along the line of the south edge of the existing terminal apron.

- Provide a service road on the apron and construct a service road from the holding ponds to Taxiway B.
- Construct new water quality collection ponds adjacent to the existing ponds. It is believed that additional capture capacity will be needed to serve the expanded apron area, although this should be

determined during the design phase.

- Construct a Phase II to the RON apron by paving to the south the maximum extent possible.
- Construct a new connection to Taxiways G and H.
- Relocate the utilities, water, high voltage electrical distribution, sewer, communications, and natural gas from below the new apron to a new easement between the apron retaining wall and Taxiway B.

## 2.2 Taxiway/Taxilane Planning

It is recommended that the apron expansion to the east be developed to accommodate dual Group III (B757) taxilanes. The taxilane closest to the concourse is located 350 feet east of the end of the concourse extension. The separation between the 25-foot wide new service road and the taxilane is 85 feet. The FAA requires a minimum separation of 81 feet between a Group III taxilane and any fixed or movable object. The separation between the two taxilanes is 150 ft 7 in., where the FAA requires 140 feet. The second taxilane cannot be used when aircraft are parked at the RON positions due to insufficient separation. Only one Group IV airplane will be able to taxi at any one time on the east end of the apron. The area at the east end of the apron will accommodate RON aircraft which will limit the taxilane to one-way traffic. It is recommended that the RON aircraft be parked with their tails not extending

bridge at gate 4, probably with a fixed link. The stands and parking positions at each of the reconfigured gates will need to be re-stripped. Ten new B757 gates will be provided at the new east concourse, providing a net gain of nine gates. Four of the new positions, two north and two south, can be interchanged with six regional jet

**Table 3**  
**Recommended Taxiway/Taxilane Standards**  
Austin-Bergstrom International Airport Master Plan Level 1 Phasing Plan

Taxiway Centerline to:	Group III	Group IV
Parallel taxiway/taxilane centerline	152 ft	215 ft
Fixed or movable object	93 ft	129.5 ft
Taxilane Centerline to:		
Parallel taxilane centerline	140 ft	198 ft
Fixed or movable object	81 ft	112.5 ft

Source: Federal Aviation Administration, Advisory Circular 150/5300-13, "Airport Design."

beyond the apron edge so that existing perimeter road is available for emergency traffic. Table 3 shows the recommended taxiway/taxilane standards.

The areas north and south of the new concourse can accommodate a Group IV taxilane. The plan provides for a 112.5-foot separation between the taxilanes and any object, which is consistent with FAA requirements.

Figure 7 shows the dimensions of the proposed taxilane layout.

## 2.3 Gate Layout

Existing gates 2, 3, 4, 5 and 6 will be reconfigured. This will involve relocation of two boarding bridges at gates 2 and 3, and extension of one

positions. A minimum wingtip clearance of 20 feet has been used for planning purposes, although typically with predominant narrow-body aircraft use, a clearance closer to 25 feet will be available.

## 2.4 Apron Grade and Interfaces

Preliminary analysis indicates that the grade across the apron should match the existing grade of 0.6%. This should be confirmed and modified as necessary during the apron design phase. The potential for a

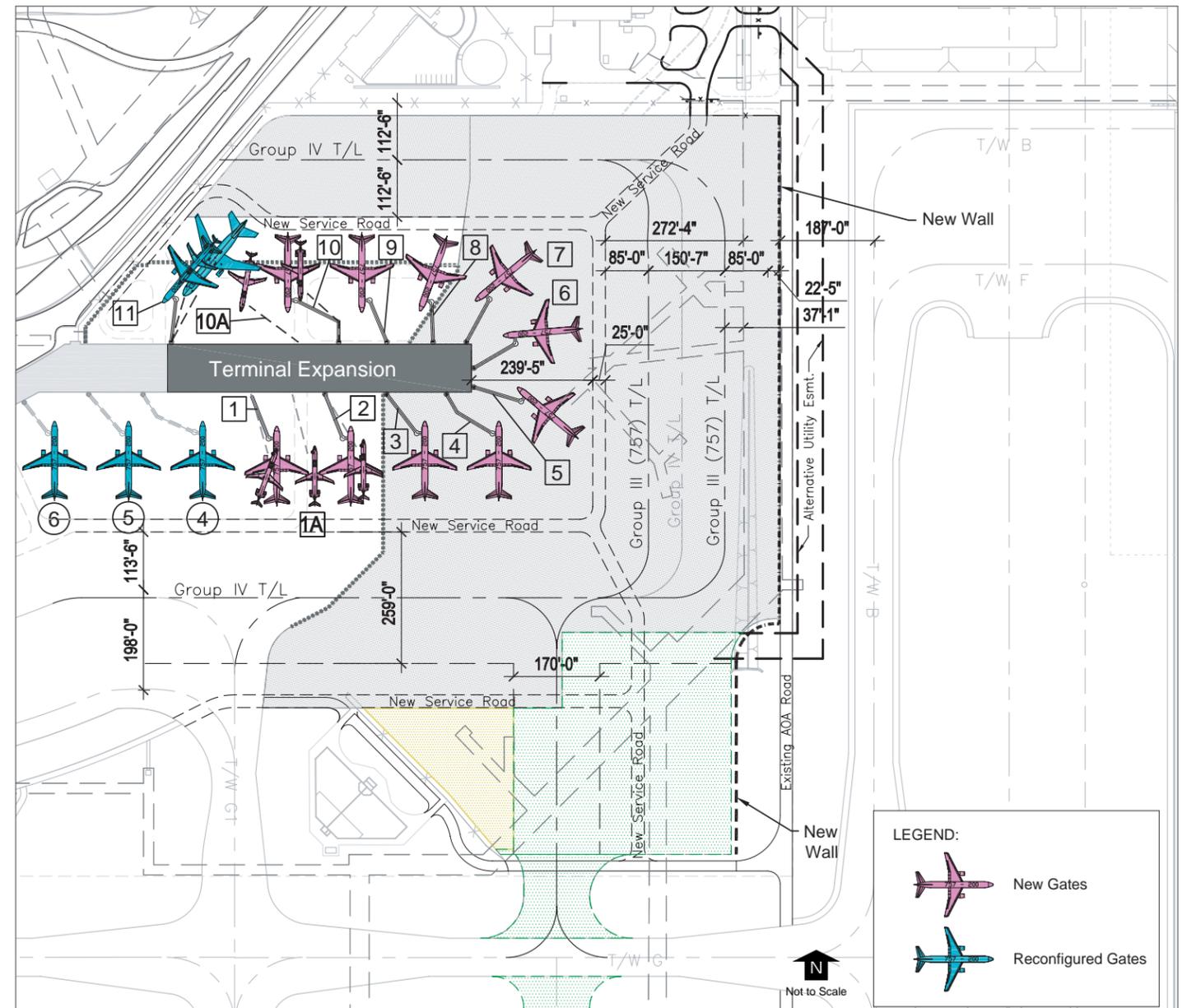


Figure 7 Dimensional Plan

direct taxiway connection to Taxiway B from the expanded apron was evaluated. However, the grade differential between the two pavements would result in unacceptable slopes (exceeding 1.5%) and therefore this is not believed to be feasible based on the preliminary analysis.

Access to Taxiways G and H (south across the RON apron) is possible and should have approximately a 1.5% slope (to be confirmed during apron design). Therefore a new taxiway exit to the south is recommended.

## 2.5 Utility Corridor Relocation

When expanding the apron to the east, the existing utility corridor would be underneath the expanded apron and should be relocated to facilitate future service activities. The east side loop of the main utility corridor is located on the west side of the AOA perimeter road. The utilities in this corridor include a high voltage transmission duct bank (4/6-inch and 5/4-inch), a 6-inch natural gas line, a 16-inch water distribution main, an 8-inch water line serving the detention pond complex, telecommunications ducts (14/4 way), fire water for the RCCF hangar (20 -inches), and a 12-inch wastewater line.

The utilities should be moved to a location between Taxiway B and the AOA perimeter road outside of the apron footprint. The fire water line to the RCCF is not in use and is not required to be relocated. Following construction of the new utility corridor, the existing corridor should be abandoned in place.

## 2.6 Service Road Relocation

The existing service road that extends alongside Taxiway B can remain in place; however it will be adjacent to the edge of the new apron. There will be a significant grade difference between the expanded apron and the road which could cause limited sight distances on the service road. This should be evaluated during the apron design project.

An additional service road for aircraft service vehicles will be located on the new apron pavement, similar to the service road on the west side of the apron. Figure 6 shows a proposed re-alignment of the AOA access in this area from the north and the new service road access along the east apron.

The service road entering the north side of the apron, providing access to the flight kitchen and to the trash compactor site will be relocated to the north edge of the RON apron. An AOA gate to the trash compactor should be accessed from the flight kitchen parking lot on the land side. The access road will have a ramp and AOA gate near the trash compactor location to access the apron. Two AOA gates may be needed due to heavy traffic activity in this location.

## 2.7 Drainage and Capture Ponds Capacity

The apron expansion will require an addition to the existing water quality ponds. The purpose of the ponds is to collect contaminants such as oil and glycol and prevent their entry in the adjacent streams and the ground water. The new ponds can be co-located with the existing facility. The apron design project should establish the requirements and sizing for this facility.



*New Access to East Concourse*