

Master Plan WORKING PAPER
JUNE 2019

Table of Contents

| | |
|--|----|
| DEVELOPMENT ALTERNATIVES..... | 1 |
| Chapter Summary | 1 |
| Introduction | 4 |
| Airport Development Objectives | 4 |
| Airside Planning | 5 |
| Landside Planning | 5 |
| Alternatives Development Process | 5 |
| Airport Master Plan Input Committees | 6 |
| Evaluation Categories | 6 |
| Performance Requirements..... | 7 |
| Operational Capabilities..... | 7 |
| Land Use Compatibility | 7 |
| Environmental Impacts..... | 7 |
| Stakeholder Feedback..... | 8 |
| Constructability..... | 8 |
| Evaluation Process | 8 |
| Airport Development Alternatives..... | 9 |
| Airfield Development Alternatives | 9 |
| Airfield Support Facility Alternatives | 17 |
| Westside Development Facility Improvement Alternatives | 30 |
| Replacement Passenger Terminal Alternatives | 44 |
| Recommended Conceptual Development Plan | 63 |

List of Figures

Figure 4-1: Typical Alternatives Development Process6

Figure 4-2: Airfield Development Alternative 114

Figure 4-3: Airfield Development Alternative 215

Figure 4-4: Dependent Aircraft Maintenance Run-up Area - ADG-II/III.....20

Figure 4-5: North GA Run-Up/Holding Bay & Maintenance Run-Up Area.....21

Figure 4-6: Compass Calibration Pad Alternative 126

Figure 4-7: Compass Calibration Pad Alternative 227

Figure 4-8: Compass Calibration Pad Alternative 328

Figure 4-9: Existing Terminal Annex Redevelopment.....34

Figure 4-10: Westside Development Facility Improvements Alternative 1: Short-Term35

Figure 4-11: Westside Development Facility Improvements Alternative 1: Medium-Term36

Figure 4-12: Westside Development Facility Improvements Alternative 1: Long-Term37

Figure 4-13: Westside Development Facility Improvements Alternative 2: Short-Term40

Figure 4-14: Westside Development Facility Improvements Alternative 2: Medium-Term41

Figure 4-15: Westside Development Facility Improvements Alternative 2: Long-Term42

Figure 4-16: Pier-Finger Design (28 Gates)59

Figure 4-17: Curvilinear-Pier Design (30 Gates).....60

Figure 4-18: Linear-Pier Design (28 Gates)61

Figure 4-19: Recommended Conceptual Development Plan.....65

List of Tables

| | |
|--|----|
| Table 4-1: Summary Evaluation Matrix of Airfield Alternatives | 16 |
| Table 4-2: Summary Evaluation Matrix of Aircraft Run-up Area Alternatives..... | 22 |
| Table 4-3: Summary Evaluation Matrix of Compass Calibration Pad Alternatives | 29 |
| Table 4-4: Replacement Departures Concourse Requirements | 31 |
| Table 4-5: Summary Evaluation Matrix of Westside Development Facility Improvement Alternatives | 43 |
| Table 4-6: Terminal Planning Assumptions – Peak Hour Passenger Demand by Development Phase | 45 |
| Table 4-7: Ticketing Hall Requirements | 46 |
| Table 4-8: TSA Security Screening Requirements | 47 |
| Table 4-9: Departures Lounge Requirements | 48 |
| Table 4-10: Baggage Claim Hall Requirements | 48 |
| Table 4-11: Pier-Finger Terminal Planning Assumptions - Arrivals, Departures Demand Profile..... | 50 |
| Table 4-12: Pier-Finger Terminal Component Program..... | 51 |
| Table 4-13: Curvilinear-Pier Terminal Planning Assumptions - Arrivals, Departures Demand Profile | 53 |
| Table 4-14: Curvilinear-Pier Terminal Component Program | 54 |
| Table 4-15: Linear-Pier Terminal Planning Assumptions - Arrivals, Departures Demand Profile..... | 56 |
| Table 4-16: Linear-Pier Terminal Component Program..... | 57 |
| Table 4-17: Summary Evaluation Matrix of Replacement Passenger Terminal Alternatives | 62 |

DEVELOPMENT ALTERNATIVES

Chapter Summary

This chapter evaluates a series of alternative solutions to satisfy the facility requirements described in **Chapter 3 – Facility Requirements** for Phoenix-Mesa Gateway Airport (IWA or “Airport”). The purpose of this analysis is to enable development of airport facilities that can realistically accommodate forecasted demand. The process of defining and evaluating alternatives is iterative, beginning with a broad range of possibilities that are then refined based on alternative evaluation criteria and airport development goals. The process is structured to systematically evaluate options and provide the technical basis for arriving at a recommended conceptual development plan. Criteria used to evaluate development alternatives include:

- ✓ Performance Requirements (Ability to accommodate demand)
- ✓ Operational Capabilities (Specific to Functional Area)
- ✓ Land Use Compatibility
- ✓ Environmental Impacts
- ✓ Stakeholder Feedback
- ✓ Constructability

Various sets of improvement plans were developed for the Airport’s airside, landside and terminal. Although they do not exhaust all the possibilities, the developed alternatives form an appropriate base to produce a recommended conceptual development Plan for the Airport. The recommended conceptual development Plan can be a combination of proposed improvement projects from similar categories. It will serve as a guide for capital improvement planning and as a base for the Airport Layout Plan (ALP). A summary of the recommended alternatives that comprise the recommended conceptual development Plan is included below. The analysis that led to the selection of these alternatives is described in this chapter.

- ✓ Airfield Development Alternative
 - The recommended alternative is a combination of improvement projects from Airfield Development Alternatives 1 and 2, as shown in **Figures 4-2 and 4-3**. Improvements within the recommended Airfield Development alternative include:
 - A 200-foot Runway 12L/30R extension to achieve the runway length requirement and a 1,275-foot Runway 12R/30L extension to provide additional runway length
 - Reconstruction of the taxiway system to incorporate additional taxiways, mitigate taxiway design deficiencies, and strengthen access to future eastside facilities
 - Implementation of 1-mile instrument approaches for Runway 12L/30R to provide for continued operations during weather conditions with low visibility.

✓ Airfield Support Facilities Alternative

- The recommended run-up area alternative, as shown in **Figure 4-5**, restructures the existing run-up area to accommodate Airplane Design Group (ADG) II aircraft and ingress/egress for future hangar development. An ADG III maintenance/run-up area adjacent to the ADG II run-up area is also proposed. This alternative allows for separate and independent Maintenance, Repair, and Overhaul (MRO) operations and pre-flight activities while accounting for future development.
- The recommended compass calibration pad alternative, as shown in **Figure 4-7**, relocates this airfield support facility to the north apron area of the Airport. The new location removes it from a future development project, and provides the greatest access for users. The relocated function will a magnetic survey to meet the magnetic interference requirements presented in Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5300-13A, Change 1, *Airport Design* (AC 150/5300-13A).

✓ Westside Development Facility Improvement Alternative

- The recommended alternative, as shown in **Figures 4-10, 4-11, and 4-12**, identifies a variety of landside improvements to:
 - Hourly, daily, economy, and employee parking
 - Rental car operations
 - Staging lots for cellphone, taxicabs, and transportation network companies (TNC) such as Uber and Lyft
 - Economic development, and facility redevelopment opportunities
 - Pedestrian crossings at strategic locations in the westside roadway network.

As part of these individual improvement projects, approximately 200 Daily Lot parking stalls located on the apron will be repurposed as three ADG-III RON, ROD aircraft parking positions.

The recommended alternative further develops and improves existing westside facilities while preserving space for long-term eastside development projects. Eastside development projects include an eastside replacement passenger terminal served by a new roadway network, passenger vehicle parking, Consolidated Rental Car Center (ConRAC), and supporting fueling and maintenance facilities.

✓ Replacement Passenger Terminal Alternative

- The recommended alternative, as shown in **Figure 4-18**, identifies a 28-gate, linear-pier replacement passenger terminal on the east side of the Airport. The initial terminal development program is based on ADG-III aircraft (A320, B737, and Max 8) and 10 contact gates that can be expanded over time as demand dictates. The terminal program will include expanded ticket counters, number of positions, airline ticket offices, outbound baggage screening and baggage claim, Transportation Security Administration (TSA) security screening, concessions, retail, restrooms, and terminal support facilities.

Introduction

Various IWA facility alternatives are introduced in this chapter coupled with an associated analysis of each alternative. The outcome of the analysis is the selection of preferred development alternatives that formulate the recommended conceptual development Plan for the Master Plan. Once selected, the recommended conceptual development Plan identified in **Figure 4-19** becomes the basis for preparing the implementation plan (to be described in a subsequent chapter). The implementation plan includes phasing of improvements, expected capital costs, and key decision points where the Airport will reevaluate implementation assumptions prior to further development.

The chapter is organized as follows:

- ✓ Airport Development Objectives
- ✓ Alternatives Development Process
- ✓ Evaluation Categories
- ✓ Evaluation Process
- ✓ Airport Development Alternatives
- ✓ Recommended Conceptual Development Plan Summary

Airport Development Objectives

Prior to developing and evaluating specific alternatives, the Airport’s development objectives must be understood. Development objectives for IWA’s Master Plan include:

- ✓ Maximize the safety and efficiency of aircraft operational areas to comply with AC 150/5300-13A
- ✓ Accommodate future demand over the next 20 years and position the Airport to attract additional tenants and businesses
- ✓ Increase revenue generation through the development of non-aeronautical land
- ✓ Develop the passenger terminal and associated facilities to provide high levels of service
- ✓ Develop facilities consistent with stakeholder and airport user needs
- ✓ Develop facilities to be compatible with the environment
- ✓ Develop facilities in accordance with all federal, state, and local regulations

Development to meet long-term demand requires consideration of both the airside and landside needs. Airside facilities include runways, taxiways, and support facilities, while landside facilities include the terminal area, vehicle parking areas, walkways, public access roads, rental car facilities, taxi and ground transportation, and any other areas accessible to the public. Those needs are presented in the following airside and landside planning sections.

Airside Planning

Airside needs include:

- ✓ Analyze existing and future capacity constraints, which include a commercial passenger terminal, apron area, additional supporting taxiways, and runway extensions.
- ✓ Analyze the ability of the Airport to meet design standards identified in AC 150/5300-13A.
- ✓ Incorporate the FAA-approved solution to Hot Spot 1.
- ✓ Incorporate the planned new Air Traffic Control Tower (ATCT).
- ✓ Identify a new building footprint for redevelopment of the existing Terminal Annex (Gates 1 to 4).
- ✓ Identify a new location for a relocated compass calibration pad.
- ✓ Identify a new location for a relocated aircraft engine run-up area for pre-flight and MRO activities.
- ✓ Increase airfield efficiency through improved taxiway locations.
- ✓ Identify aircraft Remain Over Night (RON), Remain Over Day (ROD) parking areas.
- ✓ Identify existing terminal area redevelopment opportunities based on the opening of a new eastside terminal complex.
- ✓ Improve instrument approach capabilities to Runway 12L/30R.

Landside Planning

Landside needs include:

- ✓ Analyze the locations for improved passenger vehicle parking, rental car operators and associated support facilities, employee, and overflow parking.
- ✓ Maximize the buildable property for aeronautical and non-aeronautical development.
- ✓ Analyze the existing landside access and roadway networks to support future development.
- ✓ Identify redevelopment opportunities based on the opening of a new eastside terminal complex.

Alternatives Development Process

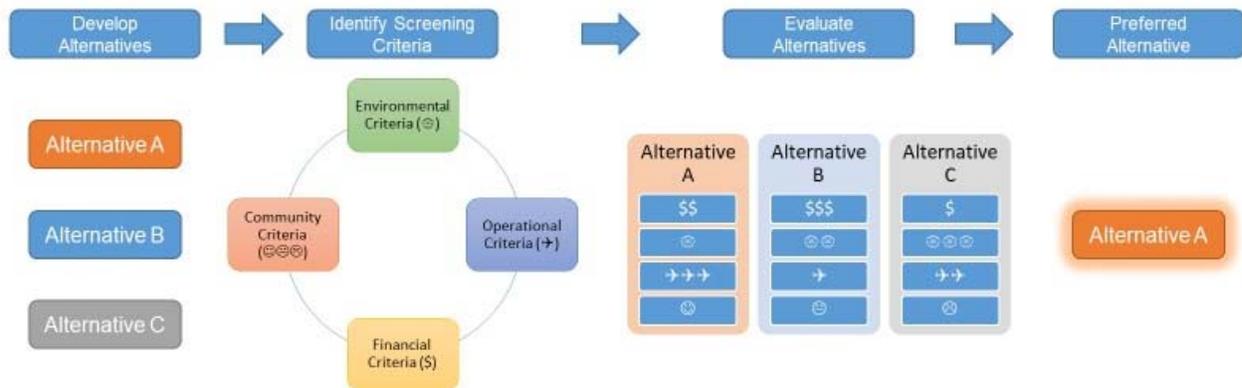
The framework for developing the alternatives was established in **Chapter 1 – Inventory**, **Chapter 2 – Forecast**, and **Chapter 3 – Facilities Requirements**. The information contained in these three chapters guided the development of layouts that support the Airport’s ability to accommodate forecasted demand and to prepare a 20-year facility plan for the Airport. Developing the alternatives included examining these factors:

- ✓ FAA Airport Design Standards
- ✓ Land Development Strategies
- ✓ Revenue-Producing Opportunities
- ✓ Aircraft Operations
- ✓ Passenger Enplanements
- ✓ Vehicular Traffic and Parking Data

- ✓ Stakeholder Working Group (SWG) and Technical Advisory Committee (TAC) input

The typical alternatives development and evaluation process is illustrated in the following **Figure 4-1**.

Figure 4-1: Typical Alternatives Development Process



Airport Master Plan Input Committees

Throughout this planning process, public involvement and stakeholder outreach has been a continuous process involving education, listening, and collaboration. Stakeholder groups include the SWG, TAC, Airport Board & staff, elected officials, on- and off-airport businesses, and members of the public from the city of Mesa and neighboring communities. These groups’ role is to help shape the Master Plan into a document that reflects community goals and interests while satisfying FAA requirements for airport development. Feedback was collected throughout the planning process and is used to qualitatively compare the alternatives.

Evaluation Categories

Alternatives are analyzed using evaluation criteria developed and agreed upon during the initial scoping of the Master Plan. Each alternative was evaluated according to six categories that:

- ✓ Performance Requirements (Ability to accommodate demand)
- ✓ Operational Capabilities (Specific to Functional Area)
- ✓ Land Use Compatibility
- ✓ Environmental Impacts
- ✓ Stakeholder Feedback
- ✓ Constructability

Performance Requirements

This evaluation category gauges the ability of alternatives to support the demand identified in **Chapter 2 – Aviation Activity Forecasts**.

Operational Capabilities

This evaluation category gauges the ability of alternatives to satisfy the facility requirements identified in **Chapter 3 – Facility Requirements**.

Land Use Compatibility

This category evaluates alternatives based on compatible land use and the potential impacts to land or other environmental factors that can influence the success of an alternative.

Environmental Impacts

This category evaluates alternatives based on compatibility with existing environmental assets with the goal of developing in an environmentally sustainable manner. The following impacts to specific environmental elements were considered:

- ✓ Air Quality
- ✓ Biological Resources (including fish, wildlife, and plants)
- ✓ Climate
- ✓ Department of Transportation Act, Section 4(f)
- ✓ Farmland
- ✓ Hazardous Materials, Solid Waste, and Pollution Prevention
- ✓ Historical, Architectural, Archaeological, and Cultural Resources
- ✓ Natural Resources and Energy Supply
- ✓ Socioeconomic, Environmental Justice and Children’s Environmental Health and Safety Risks
- ✓ Water Resources (including Floodplains, Surface Waters, Groundwater)

Early identification of these environmental factors may help avoid impeding future development plans. The analysis is not intended to fulfill the environmental clearance requirements as defined in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, and FAA Order 5050.4B, *National Environmental Policy Act*. Additional analyses or studies will need to be pursued when the Airport is ready to implement the planned development (before construction begins).

Stakeholder Feedback

Stakeholder input was obtained through master plan committee meetings and public open house meetings with stakeholder groups, the Airport, and the FAA to assist in developing and evaluating the alternatives.

Public and committee meetings took place on the following dates:

- ✓ Airport Goals and Objectives Session – March 20, 2018
- ✓ Phoenix-Mesa Gateway Airport Authority (PMGAA) Board Meeting – May 15, 2018
- ✓ SWG Meeting #1 – July 31, 2018
- ✓ TAC Meeting #1 – July 31, 2018
- ✓ PMGAA Board Meeting – September 18, 2018
- ✓ PMGAA Alternatives Development Meeting – December 12, 2018
- ✓ TAC Meeting #2 – January 15, 2019
- ✓ SWG Meeting #2 – January 16, 2019
- ✓ Public Open House Meeting #1 – January 16, 2019
- ✓ PMGAA Board Meeting – April 16, 2019
- ✓ SWG Meeting #3 – June 25, 2019
- ✓ TAC Meeting #3 – June 26, 2019
- ✓ Public Open House Meeting #2 – June 26, 2019

Constructability

This category evaluates alternatives based on implementing the alternative in logical and practical phases. Improper timing and the sequence of construction can create delays, increase cost, and impact airport operations. Each alternative was examined to determine the degree of its impact on airport operations.

Evaluation Process

This section defines the alternatives analysis process used in accordance with FAA AC 150/5070-6B, *Airport Master Plans* (AC 150/5070-6B). Developing multiple alternatives represents the first of a multi-step process. The current FAA-approved ALP for IWA identifies future improvements recommended in a prior master planning effort. This master planning process addresses facility needs, but also allows the components of the previous preferred alternative to be retained or modified, if they still meet current and/or future needs.

Airport development alternatives are created to respond to defined facility needs, with the goal of identifying general preferences for both individual items and the overall concepts being presented. That strategy will allow the widest range of ideas to be considered and the most effective facility development concept to be defined.

From this evaluation process, elements of a preferred alternative will emerge that can best accommodate all required facility improvements. Based on a wide range of input from multiple stakeholders, elements of the various alternatives will be consolidated into a preferred alternative that can be refined further as the Airport proceeds through the process of finalizing the remaining elements of the airport Master Plan. Throughout this process, public input and coordination with the TAC, SWG, FAA, and IWA will also help to shape the preferred alternative.

Once IWA selects the preferred alternatives, and the recommended conceptual development Plan is developed, a detailed capital improvement program will be created that identifies and prioritizes the implementation of specific projects. The elements of the preferred alternative will be integrated into the updated ALP drawings that will guide future improvements at the Airport.

Airport Development Alternatives

The initial conceptual airport development alternatives are intended to facilitate a discussion and evaluation about the most efficient way to meet the facility needs of the Airport. The airport development alternatives are organized into these groups:

- ✓ Airfield Development Alternatives
- ✓ Airfield Support Facilities Alternatives
- ✓ Landside Development Alternatives
- ✓ Replacement Passenger Terminal Alternatives

Figures 4-2 through 4-19 illustrate the airport development alternatives.

Airfield Development Alternatives

Chapters 1 and 2; the identified goals and objectives relative to aviation development and economic enhancement; and input from airport staff, tenants, and operators were considered in the formulation of alternatives that are outlined and discussed in the following sections. Because all airport functions relate to and revolve around the basic runway layout, runway development alternatives must first be carefully examined and evaluated. Specific airside development considerations include runway occupancy, runway length, taxiway design, and airport support facilities needed to support forecast use through the planning period and comply with FAA design standards. Specific development features proposed are not necessarily exclusive to an individual alternative. Each alternative concept discussed below is a collection of features, many of which can be moved from alternative to alternative.

ALTERNATIVE 1: Airfield Development Alternative 1

This alternative, as shown in **Figure 4-2**, involves providing a safe and efficient taxiway system to expedite aircraft movements to and from the runways and apron areas. Layouts must be operationally efficient, enhance safety, improve circulation, increase capacity, and address needs identified in **Chapter 3 – Facility Requirements**. As stated in Chapter 3, Runway 12C/30C offers ¾-mile instrument approaches, and therefore, must be served by a full parallel taxiway. Runways 12R/30L and 12C/30C are served by insufficient exit taxiways. Additionally, non-standard taxiway design such as direct access, high energy intersections, acute-angled entrance taxiways, and expansive pavement exist throughout the airfield. **Chapter 3** identified the taxiways that serve ADG and Taxiway Design Group (TDG) IV and above that are required to have paved shoulders along their entire length. Taxiways G and K between Runways 12R/30L and 12C/30C are not equipped with paved shoulders. Though not a deficiency, Runway 12L/30R, utilized by existing commercial and future cargo aircraft, does not offer instrument approaches. The primary purpose of Airfield Development Alternative 1 is to enhance the taxiway and instrument approach system. **Figure 4-2** showcases Airfield Development Alternative 1 and its proposed developments:

- ✓ Existing runway length and width are maintained.
- ✓ 1-mile instrument approaches are implemented for Runway 12L/30R.
- ✓ A full-length parallel taxiway is constructed west of Runway 12C/30C. A dual full-length parallel taxiway is constructed east of Taxiway C.
- ✓ Taxiway K (between Taxiways A and B) is removed.
- ✓ Taxiway V (between Runway 12R/30L and Taxiway A) and Taxiway G are reconstructed.
- ✓ Taxiways G and K's shoulders between Runways 12R/30L and 12C/30C are paved.
- ✓ Bypass taxiways are constructed for Runways 30L and 12L. A connector taxiway is constructed across Runway 12R.
- ✓ A cross-field taxiway is constructed between Runways 12C/30C and 12L/30R.

Advantages of this alternative:

- ✓ Non-standard taxiway design is corrected.
- ✓ Implementation of 1-mile instrument approaches for Runway 12L/30R enhances the instrument approach system and maintains instrument approach consistency, increases runway utility, and provides for continued operations during inclement and low visibility weather conditions.
- ✓ Hotspot 1 is mitigated with the reconstruction of Taxiway V and partial removal of Taxiway K.
- ✓ Bypass taxiways reduce congestion caused by queued aircraft not ready for takeoff with the provision of an adjacent entrance taxiway.

- ✓ Implementation of cross-field taxiways outside of the middle third of the runway between Runways 12R/30L and 12C/30C reduce runway occupancy; decrease taxi time for aircraft accessing airport facilities located on the west side of the Airport; and assist ATCT personnel in the maneuvering of aircraft.
- ✓ Implementation of a cross-field taxiway outside of the middle third of the runway between Runways 12C/30C and 12L/30R reduces runway occupancy; decreases taxi time for commercial aircraft accessing the future east commercial facilities from Runway 12C/30C; and assists ATCT personnel in the maneuvering of aircraft.
- ✓ The construction of a full-length parallel taxiway west of Runway 12C/30C fulfills the full-length parallel taxiway requirement for runways offering ¾-mile and lower instrument approaches.
- ✓ Construction of a dual full-length parallel taxiway east of Taxiway C expedites the transition of aircraft to and from future east commercial facilities and offers additional support for future eastside development.
- ✓ The construction of additional taxiways mitigates the lack of exit taxiways, serves future terminal facilities, reduces runway occupancy and fuel consumption, and increases efficiency overall.

Disadvantages of this alternative:

- ✓ Taxiway K intersects Runways 12R/30L and 12C/30C in the middle third of the runways, which is a high energy area by FAA definition.
- ✓ AC 150/5300-13A discourages cross-field taxiways. This alternative presents four cross-field taxiways, including Taxiway K.
- ✓ The costs to reconfigure and construct the taxiways are high.

ALTERNATIVE 2: Airfield Development Alternative 2

This alternative, as shown in **Figure 4-3**, involves achieving the 9,500-foot runway length required for B767-300 and B747-400 cargo aircraft that will operate at the Airport within the first five years of the planning period. The primary purpose of Airfield Development Alternative 2 is to satisfy the runway length requirement of critical Airport Reference Code (ARC) aircraft regularly operating at IWA, and to enhance the taxiway and instrument approach system. Similar to Airfield Development Alternative 1 in design and purpose, these are the few differing development changes in Airfield Development Alternative 2:

- ✓ Extending Runway 12L/30R to an ultimate length of 9,500 feet.
- ✓ Implementing ½-mile and ¾-mile instrument approaches for Runways 12C/30C and 12L/30R, respectively.
- ✓ Extending Runway 30L and Taxiway B south to Taxiway P.

- ✓ Constructing a full-length parallel taxiway east of Runway 12C/30C.
- ✓ Not constructing a connector taxiway across Runway 12R.
- ✓ Constructing a bypass taxiway at Runway 12R.
- ✓ Reconfiguring Taxiway G to accommodate the Runway 12L/30R extension.
- ✓ Not constructing a cross-field taxiway between Runways 12C/30C and 12L/30R.

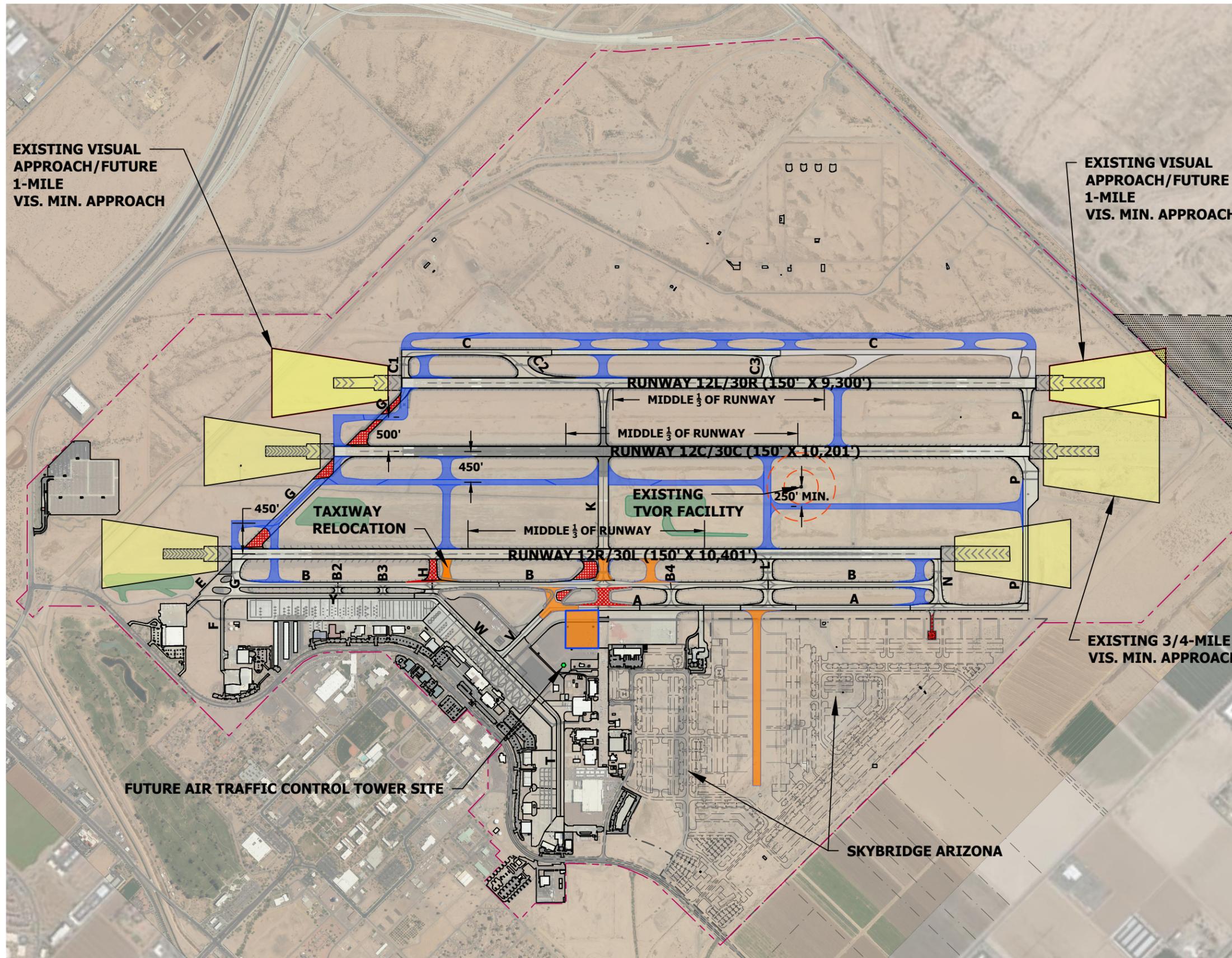
Advantages of this alternative:

- ✓ Non-standard taxiway design is corrected.
- ✓ Hotspot 1 is mitigated with the reconstruction of Taxiway V and partial removal of Taxiway K.
- ✓ Bypass taxiways reduce congestion caused by queued aircraft not ready for takeoff with the provision of an adjacent entrance taxiway.
- ✓ Implementation of cross-field taxiways outside of the middle third of the runway between Runways 12R/30L and 12C/30C reduce runway occupancy; decrease taxi time for aircraft accessing airport facilities located on the west side of the Airport; and assist ATCT personnel in the maneuvering of aircraft.
- ✓ The 9,500-foot runway length requirement is achieved.
- ✓ Improvement of visibility minimums for all runways, excluding Runway 12R/30L, enhances the instrument approach system, increases the utility of multiple runways, and provides for continued operations to multiple runways during inclement and low visibility weather conditions.
- ✓ Construction of a dual full-length parallel taxiway east of Taxiway C expedites the transition of aircraft to and from future east commercial facilities and offers additional support for future eastside development.
- ✓ The construction of additional taxiways mitigates the lack of exit taxiways, serves future terminal facilities, reduce runway occupancy and fuel consumption, and increases efficiency overall
- ✓ Extension of Runway 12R/30L provides additional runway length.

Disadvantages of this alternative:

- ✓ Taxiway K intersects Runways 12R/30L and 12C/30C in the middle third of the runways, which is a high energy area by FAA definition.
- ✓ AC 150/5300-13A discourages cross-field taxiways. This alternative presents three cross-field taxiways, including Taxiway K.
- ✓ The costs to reconfigure and construct the taxiways are high.
- ✓ Runway 30C and Runway 30R's Runway Protection Zone (RPZ) dimensions expand off airport property as a result of the improvement and the introduction of instrument approach procedures.

- ✓ Extension of Runway 12R/30L and Taxiway B south to Taxiway P will repurpose Taxiway P as an entrance taxiway to Runway 12R/30L. This could cause congestion, delayed operations for aircraft needing to use Taxiway P to taxi to Runways 12C/30C and 12L/30R, and/or rerouting of aircraft that will increase taxi time and fuel consumption. The entire extension scenario could increase ATCT personnel workload.
- ✓ Reconfiguration of Taxiway G in this alternative requires a portion of Taxiway G to be constructed through a detention pond requiring mitigation or relocation.
- ✓ The improvement to Runway 12L visibility minimums puts the new full-length parallel taxiway east of Runway 12C/30C in the future RPZ.



- Legend**
- Existing Runway Protection Zone
 - Existing Detention Ponds
 - Existing Avigation Easement
 - Future Runway Protection Zone
 - Future Runway/Taxiway Pavement
 - Existing IWA Programmed Project
 - Pavement to be Removed

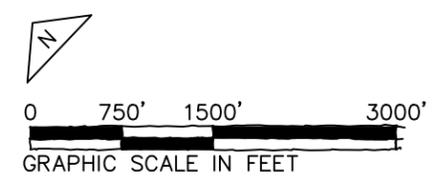
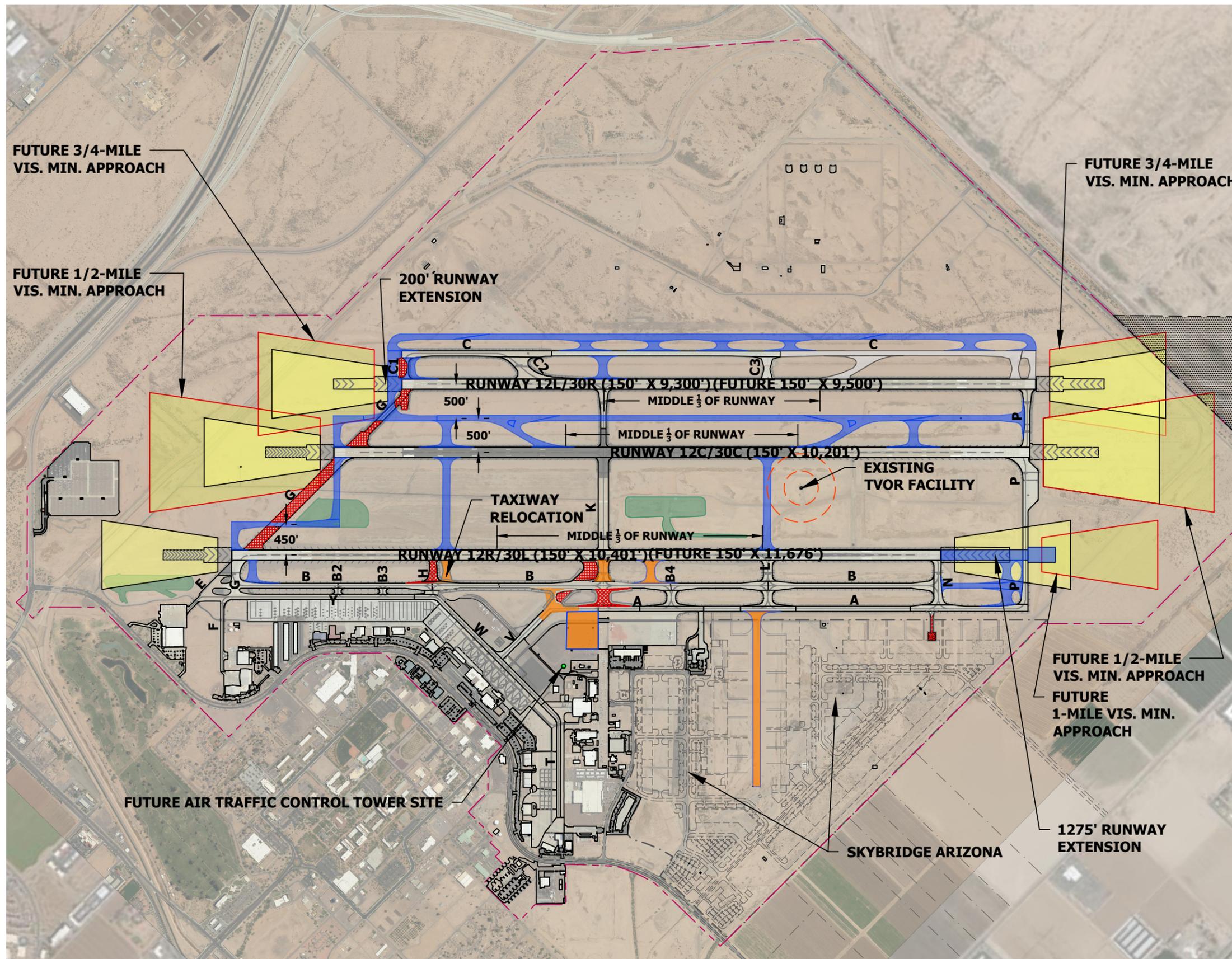


Figure 4-2
**Airfield Development
Alternative 1**



- Legend
- Existing Runway Protection Zone
 - Existing Detention Ponds
 - Existing Avigation Easement
 - Future Runway Protection Zone
 - Future Runway/Taxiway Pavement
 - Existing IWA Programmed Project
 - Pavement to be Removed

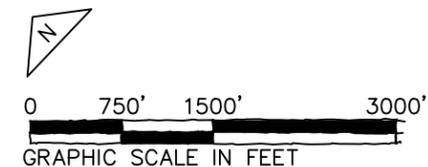


Figure 4-3
**Airfield Development
Alternative 2**

SUMMARY EVALUATION OF AIRFIELD ALTERNATIVES

Table 4-1 presents an evaluation of the various alternatives for the airfield at IWA.

Table 4-1: Summary Evaluation Matrix of Airfield Alternatives

| IMPACT CATEGORY | ALTERNATIVE 1 | ALTERNATIVE 2 |
|---|---------------------------------------|---------------------------------------|
| Description of Improvement | Airfield Development Alternative 1 | Airfield Development Alternative 2 |
| PERFORMANCE REQUIREMENTS | | |
| Addresses Runway Length Requirements | No | Yes |
| Accommodates Forecasted Demand | Yes | Yes |
| OPERATIONAL CAPABILITIES | | |
| Airfield Operability & Access | Improved | Improved |
| Reduces Aircraft Runway Occupancy Times | Yes | Yes |
| Increases Potential for Development | Yes | Yes |
| Resolves 150/5300-13A Deficiencies | Yes | Yes |
| LAND USE COMPATABILITY | | |
| Impact to On-Airport Property | Yes | Yes |
| Impact to Off-Airport Property | No | No |
| Land Acquisitions/Easements | No | No |
| ENVIRONMENTAL IMPACT POTENTIAL | | |
| Increases Impervious Pavement | Yes | Yes |
| Existing Detention Pond Impact | No | Yes |
| STAKEHOLDER FEEDBACK | | |
| Considers Stakeholder Input | Yes | Yes |
| Addresses Stakeholder Concerns | Yes | Yes |
| CONSTRUCTABILITY | | |
| Impact to Airport Operations | Minimal | Minimal |
| ALTERNATIVES EVALUATION | | |
| DETERMINATION | FAVORABLE | NEUTRAL |

Airfield Support Facility Alternatives

This section details the evaluation of alternatives for aviation support facilities including aircraft run-up areas and a compass calibration pad. These facilities are necessary to support existing tenants, airline operators, and the local aviation community with the ability to calibrate an aircraft engine for maintenance, perform pre-flight engine run-ups prior to takeoff, and calibrate an aircraft's on-board compass prior to flight. Key factors in the siting of these facilities were to minimize runway crossings, separate GA aircraft from commercial aircraft, and comply with applicable operational and safety requirements.

Aircraft Run-Up Area Alternatives

The function of a run-up area is to provide a place for aircraft to perform preflight operations and, for some aircraft, maintenance checks. Pilots using run-up areas for preflight or maintenance operations must orient their aircraft into prevailing winds. Winds at IWA tend to blow south and southeast, therefore favoring Runways 12R, 12C, and 12L. Currently, only one run-up area for all local and itinerant aircraft utilization exists at IWA. It is located on the furthest north end of the North Apron. In spite of its existence, ATCT personnel have reported that aircraft are using movement areas near runway ends and Taxiway K to perform run-up tasks. Additionally, future hangar development will be located adjacent to the existing T-hangars resulting in the current run-up area being used for ingress/egress to the hangars. Two run-up area alternatives have been developed to alleviate undesirable use of the movement area for preflight operations and meet future needs.

ALTERNATIVE 1: Dependent Aircraft Run-Up Area – ADG-II/III

This alternative, as shown in **Figure 4-4**, involves developing a run-up area for ADG II and III aircraft. The proposed run-up area is south of Taxilane F adjacent to the existing run-up facility located on the North Apron. Functionality of this run-up area is dependent on the aircraft that use it at a given time due to limited spacing, design and separation criteria, and jet blast. Multiple non-jet ADG II and ADG III aircraft are capable of using the run-up area concurrently; however, jet engine ADG II and III aircraft will need to use the facility separately for preflight and maintenance operations. Ingress and egress to the run-up apron is offset from Taxiway G and adjoining Taxiways E, B, and Y. AC 150/5300-13A recommends consideration for the effects of jet blast be made as jet aircraft power up to move out of parking/stationary positions. Jet blast from aircraft engines may require Taxilane F operations to cease until the aircraft has concluded preflight operations or maintenance checks. Blast fence on the other side of Taxilane F was identified to protect tenant apron area. The purpose of the Dependent Aircraft Run-Up Area – ADG-II/III alternative is to provide an alternate run-up area location that is compatible for both preflight and maintenance operations and discontinues the use of movement areas for preflight operations.

Advantages of this alternative:

- ✓ The run-up area meets ADG III separation criteria.
- ✓ The area is close to the aircraft that will use the run-up area.
- ✓ This alternative addresses ATCT personnel concern by providing a consolidated run-up area for GA aircraft in the non-movement area.
- ✓ This alternative does not affect future development.
- ✓ The area offers multiple access points.
- ✓ Jet blast fencing is incorporated.

Disadvantages of this alternative:

- ✓ The layout and positioning of the run-up area precludes the inclusion of a ground run-up enclosure, if the Airport desires to incorporate one in the future.

ALTERNATIVE 2: North GA Run-Up/Holding Bay & Maintenance Run-Up Area

This alternative, as shown in **Figure 4-5**, involves redesigning the current run-up area for ADG II preflight utilization and constructing an ADG III maintenance run-up area on adjacent land for preflight and maintenance operations. Redesign of the existing run-up area includes three holding bay positions that concurrently act as individual run-up positions. Access to the run-up apron is offset from Taxiway G and adjoining Taxiways E, B, and Y. Ingress/egress spacing for future hangar tenants is provided west of the ADG II designated run-up area and a taxilane that routes future hangar-based aircraft to Taxiway Y is provided. The purpose of the North GA Run-Up/Holding Bay & Maintenance Run-Up Area alternative is to provide an alternate run-up design that accommodates GA and MRO facility needs and aligns with future development.

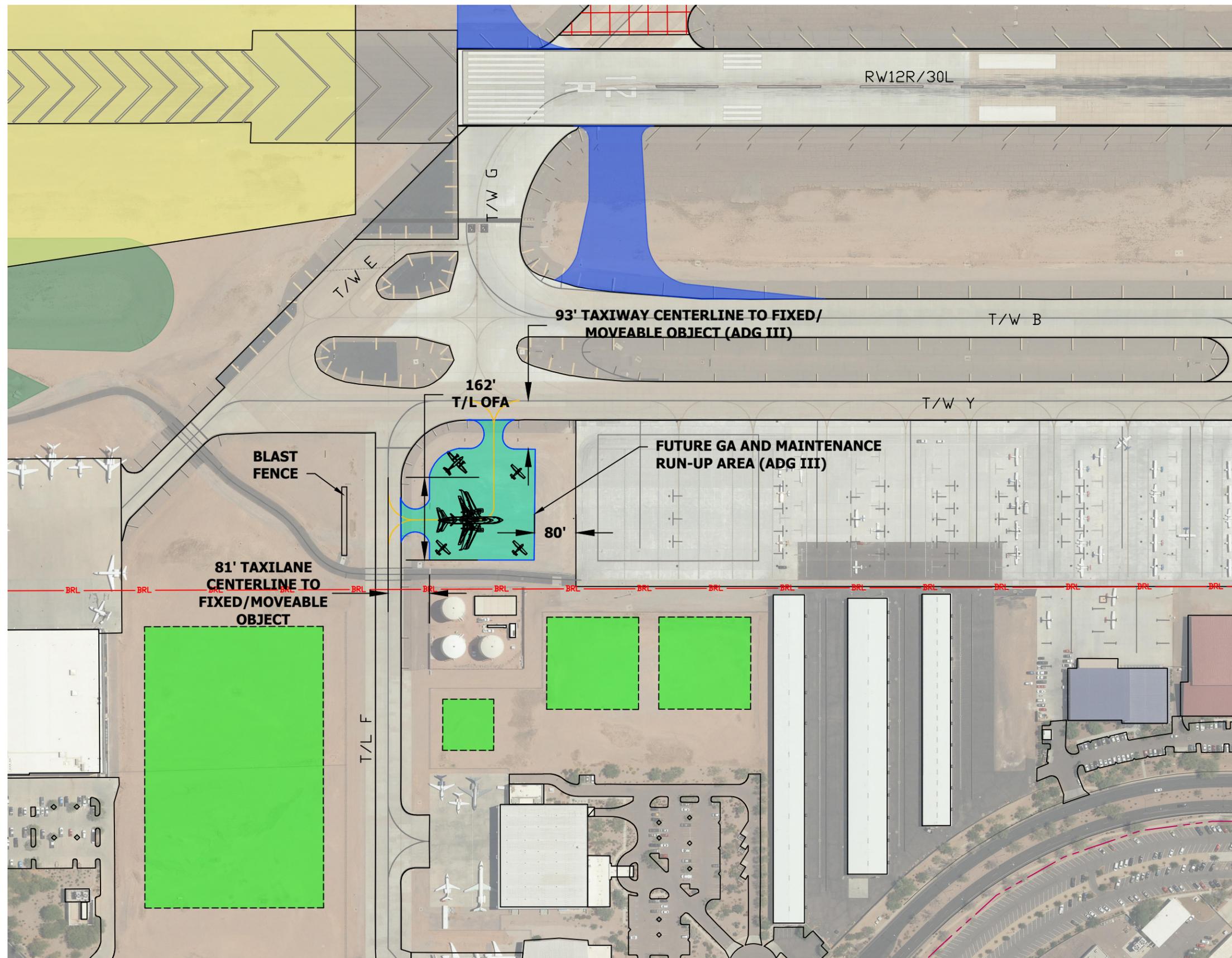
Advantages of this alternative:

- ✓ It is close to the aircraft that will use the GA and maintenance run-up areas.
- ✓ It addresses ATCT personnel concern by providing a consolidated run-up area for GA aircraft in the non-movement area.
- ✓ Multiple ADG aircraft can use the areas at a given time.
- ✓ Jet blast fencing is incorporated.

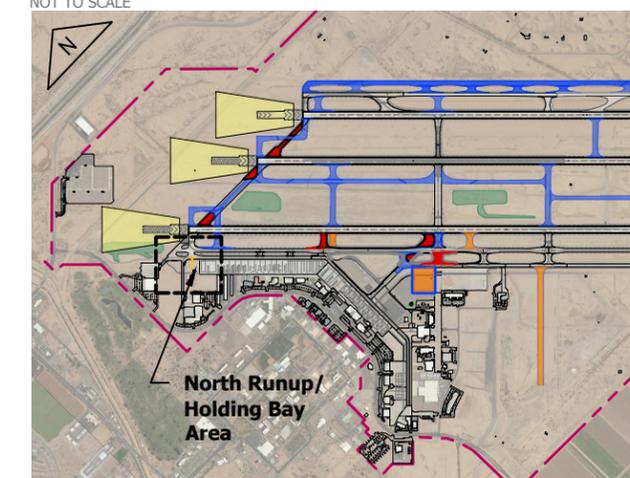
Disadvantages of this alternative:

- ✓ Prop wash from preflight operations by ADG II aircraft may affect hangar tenants.
- ✓ Tie down positions will be removed to meet taxilane separation criteria. Apron-based aircraft will need to be relocated.

- ✓ Due to future apron development, the proposed taxiway will intersect a holding bay position rendering that holding bay position inoperable during taxi operations.



Key Map
NOT TO SCALE



Legend

- Existing Runway Protection Zone
- Future Runway Protection Zone
- Existing Detention Ponds
- Future Runway/Taxiway Pavement
- Future Apron Area
- Pavement to be Removed
- Future Buildings/Development

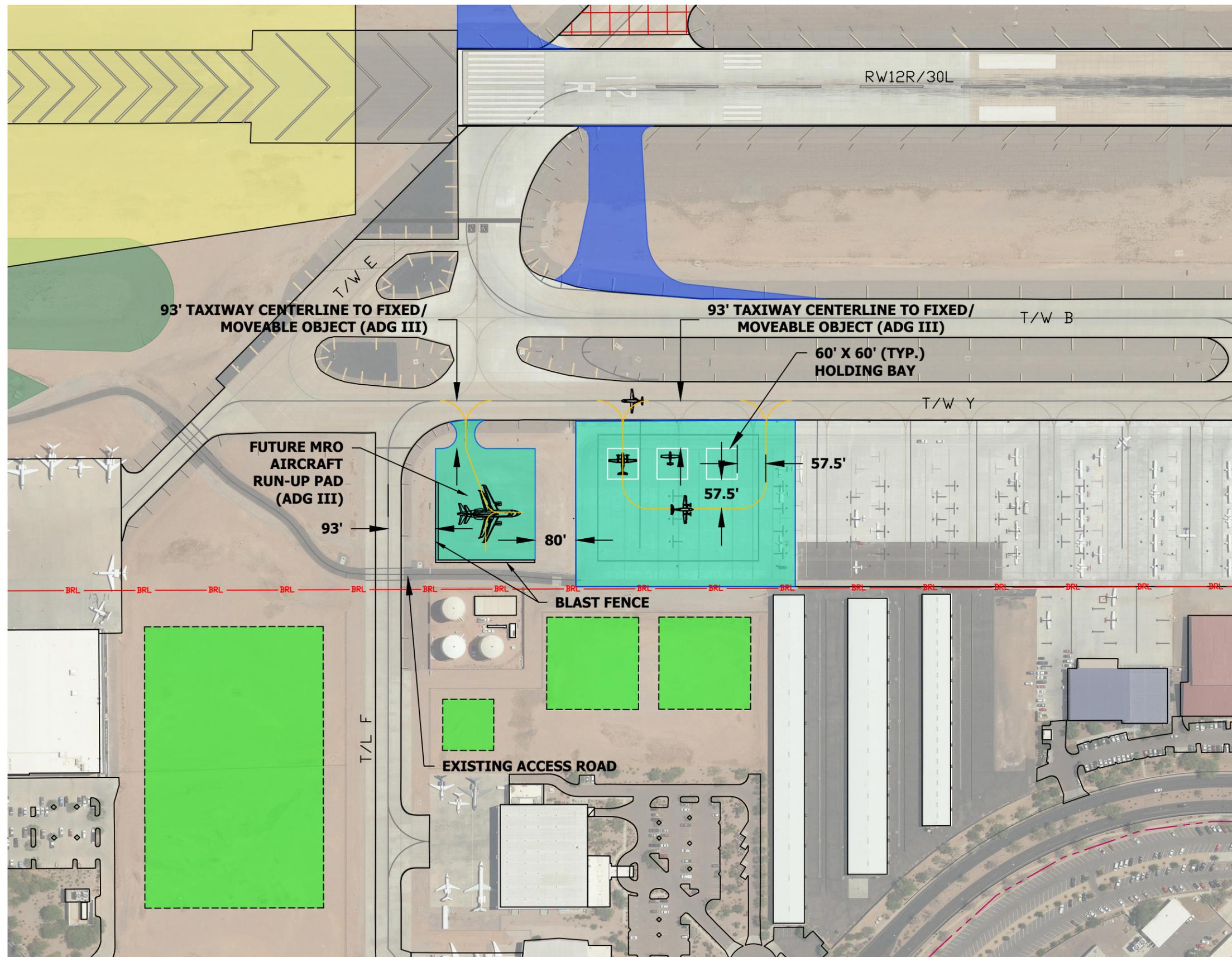


0 100' 200' 400'
GRAPHIC SCALE IN FEET

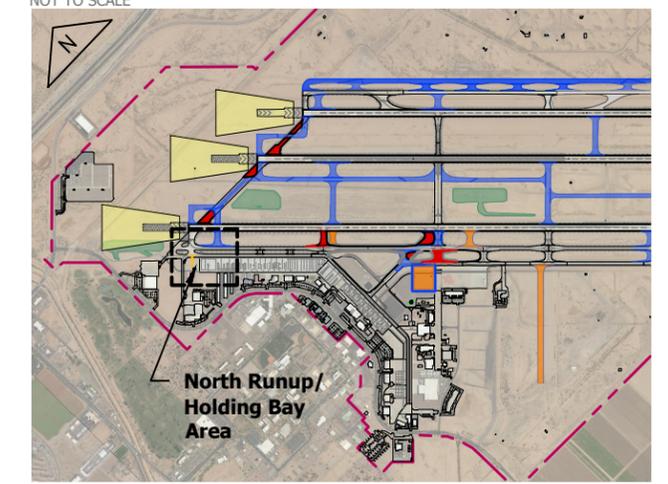
GA and Maintenance Run-up Area Design Criteria

- Illustrates ADG III TOFA Criteria

Figure 4-4
**Dependent Aircraft Run-Up Area -
ADG II/III
Alternative 1**

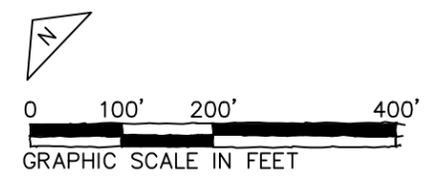


Key Map
NOT TO SCALE



Legend

- Existing Runway Protection Zone
- Future Runway Protection Zone
- Existing Detention Ponds
- Future Runway/Taxiway Pavement
- Future Apron Area
- Pavement to be Removed
- Future Buildings/Development



- GA Run-up/Holding Bay Design Criteria**
- Illustrates ADG II & III TOFA Criteria
- MRO Run-up Pad Design Criteria**
- Illustrates ADG III TOFA Criteria

Figure 4-5
North GA Run-up/Holding Bay & Maintenance Run-up Area Alternative 2

SUMMARY EVALUATION OF AIRFIELD ALTERNATIVES

Table 4-2 presents an evaluation of the various alternatives for the airfield at IWA.

Table 4-2: Summary Evaluation Matrix of Aircraft Run-up Area Alternatives

| IMPACT CATEGORY | ALTERNATIVE 1 | ALTERNATIVE 2 |
|--|---|---|
| Description of Improvement | Dependent Aircraft Maintenance Run-up Area - ADG-II/III | North GA Run-Up/Holding Bay & Maintenance Run-up Area |
| PERFORMANCE REQUIREMENTS | | |
| Category Is Not Applicable | | |
| OPERATIONAL CAPABILITIES | | |
| Operability & Access | Consolidated Run-up Area | Consolidated Run-up Area |
| Accommodates Anticipated ADG-II/III Aircraft | Yes | Yes |
| Compatible with Existing / Future Facilities | Yes | No |
| Simultaneous Operations | No | Yes |
| LAND USE COMPATABILITY | | |
| Impact to On-Airport Property | Yes | Yes |
| Land Acquisitions/Easements | No | No |
| Relocation of Existing Facilities Required | No | Yes |
| ENVIRONMENTAL IMPACT POTENTIAL | | |
| Increases Impervious Pavement | Yes | Yes |
| Jet Blast/Prop Wash Impacts | Moderate | Moderate |
| STAKEHOLDER FEEDBACK | | |
| Considers Stakeholder Input | Yes | Yes |
| Addresses Stakeholder Concerns | Yes | Yes |
| CONSTRUCTABILITY | | |
| Impact to Airport Operations | Yes | Yes |
| ALTERNATIVES EVALUATION | | |
| DETERMINATION | NEUTRAL | FAVORABLE |

Compass Calibration Pad Alternatives

A compass calibration pad enables pilots to calibrate their on-board magnetic compass by aligning their aircraft on known magnetic headings and to adjust the compass and/or placard markings to indicate the required corrections. A compass calibration pad located west of Taxiway A is currently available to all tenants and users of the Airport. Future SkyBridge Arizona development will surround the existing compass calibration pad possibly resulting in magnetic interference, inoperability, and need for relocation. Aircraft tenants and operators have expressed concern with the possible decommissioning of this airport support facility. The concern has prompted compass calibration relocation alternatives outlined in the following section.

AC 150/5300-13A, Appendix 6, specifies detailed requirements for the siting of a compass calibration pad. The FAA recommends the following design and separation criteria:

- ✓ Locate the center of the pad at least:
 - 600 feet from magnetic objects such as large parking lots, busy roads, railroad tracks, high voltage electrical transmission lines or cables carrying direct current (either above or below ground)
 - 300 feet from buildings, aircraft arresting gear, fuel lines, electrical or communication cable conduits when they contain magnetic (iron, steel, or ferrous) materials and from other aircraft
 - 150 feet from runway and taxiway light bases, airfield signs, ducts, and grates for drainage that contain iron, steel, or ferrous materials
- ✓ Avoid Navigational Aid (NAVAID) interference in accordance with other NAVAID siting criterion.
- ✓ Locate the compass calibration pad outside airport design surfaces to satisfy the runway and taxiway clearances applicable to the airport on which it is located.
- ✓ Conduct a comprehensive magnetic survey of the area to ensure compliance with magnetic interference requirements.

Three alternative compass calibration pad locations are presented in **Figure 4-6, 4-7, and 4-8**. All three alternatives will require construction of an access taxiway.

ALTERNATIVE 1: Compass Calibration Pad Option 1

This alternative, as shown in **Figure 4-6**, involves relocating the compass calibration pad between Taxiways W and B. Relocation of the compass calibration pad to this location requires the MRO hardstand apron to be relocated. As part of this alternative, the MRO hardstand apron is proposed to relocate to the existing ROD/RON apron, as shown in **Figure 4-6**, once the portion of the south apron currently used for the Daily Lot

is repurposed as apron space. The ROD/RON aircraft will relocate to the repurposed apron space. The repurpose of this apron and relocation of the ROD/RON aircraft are detailed in subsequent sections.

Advantages of this alternative:

- ✓ Design and separation criteria are met.
- ✓ The compass calibration pad is in a remote location that does not interfere with operations or require aircraft to cross active runways.
- ✓ The new ATCT is located outside of the 600-foot radius required to clear magnetic objects.

Disadvantages of this alternative:

- ✓ Relocation of MRO hardstand apron is required.
- ✓ Pavement will need to be constructed and reconstructed based upon identified FAA criteria for a compass calibration pad.

ALTERNATIVE 2: Compass Calibration Pad Option 2

This alternative, as shown in **Figure 4-7**, involves relocating the compass calibration pad east of the reconfigured Taxiway G and Runway 12R/30L. This location is in an undeveloped area of the Airport.

Advantages of this alternative:

- ✓ Design and separation criteria are met.
- ✓ The compass calibration pad is in a remote location.
- ✓ The compass calibration pad is close to the aircraft that will use it.

Disadvantages of this alternative:

- ✓ Relocating the compass calibration pad in this area requires aircraft to cross an active runway. Aircraft could possibly mistake the access taxiway to the compass calibration pad as the connecting/entrance taxiway to Runway 12C/30C.
- ✓ It increases ATCT personnel workload.
- ✓ Pavement will need to be constructed based upon identified FAA criteria for a compass calibration pad.

ALTERNATIVE 3: Compass Calibration Pad Option 3

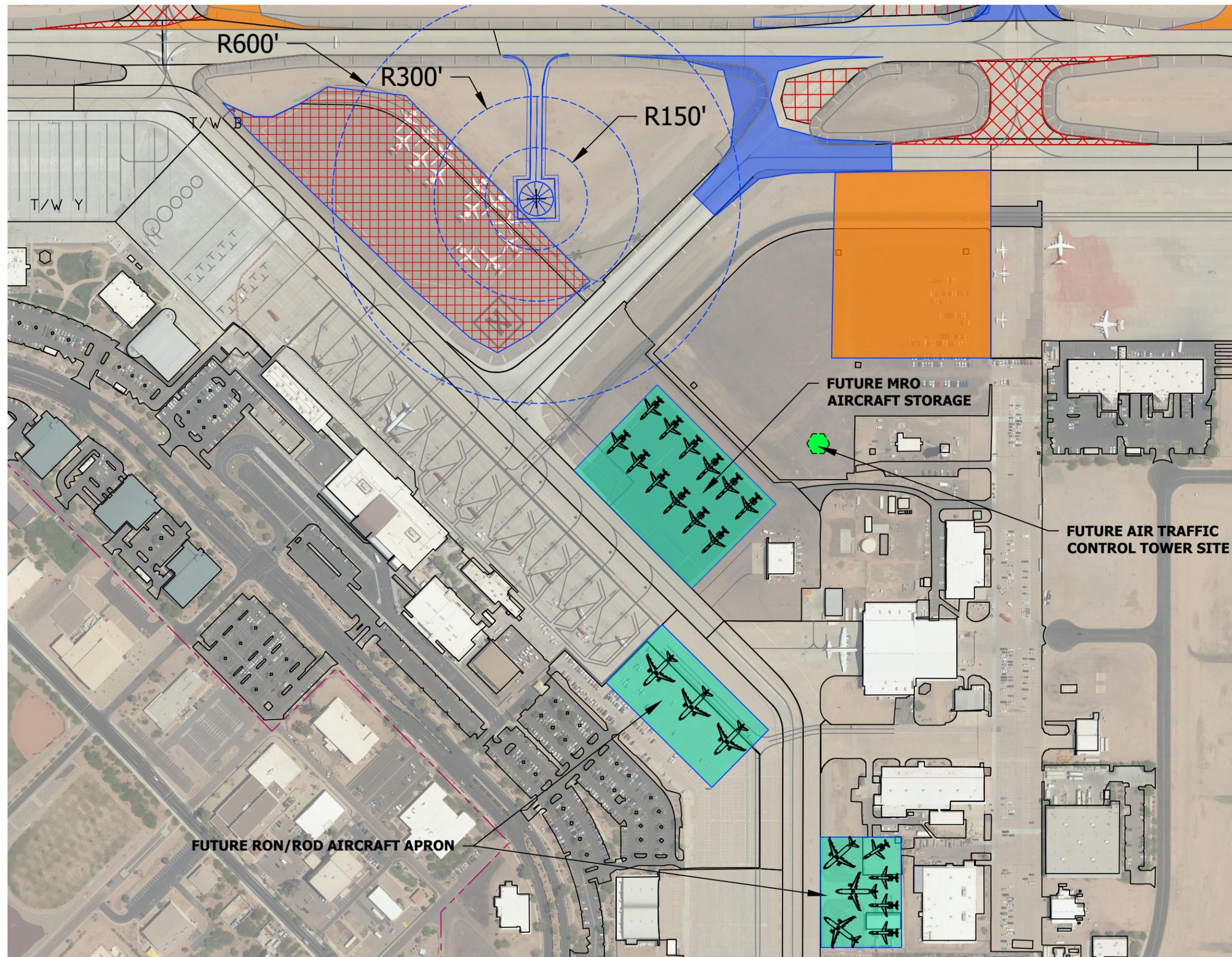
This alternative, as shown in **Figure 4-8**, involves relocating the compass calibration pad east of the proposed dual taxiway that will serve Runway 12L/30R. This location is in an undeveloped area of the Airport and underlies a powerline.

Advantages of this alternative:

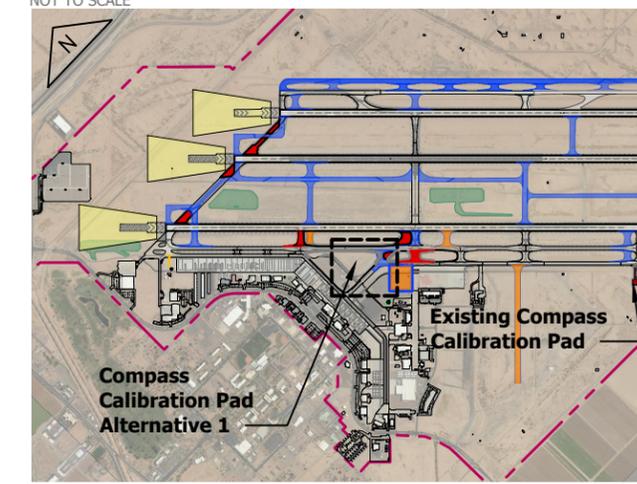
- ✓ Design and separation criteria are met.
- ✓ The compass calibration pad is in a remote location.
- ✓ The positioning of the compass calibration pad aligns with future development as the pad is located in an area designated for future airport support facilities.

Disadvantages of this alternative:

- ✓ It requires aircraft to cross several active runways.
- ✓ It increases ATCT personnel workload.
- ✓ It increases taxi operations and fuel consumption.
- ✓ It is far from the aircraft that will use the compass calibration pad.
- ✓ Pavement will need to be constructed based upon identified FAA criteria for a compass calibration pad.
- ✓ The existing powerline could cause magnetic interference and therefore will need to be relocated outside of the 600-foot radii.

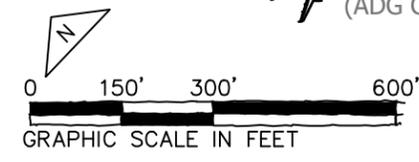


Key Map
NOT TO SCALE



Legend

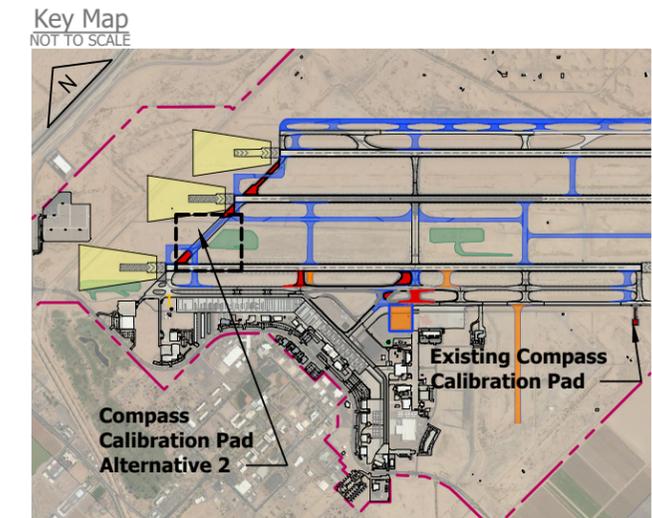
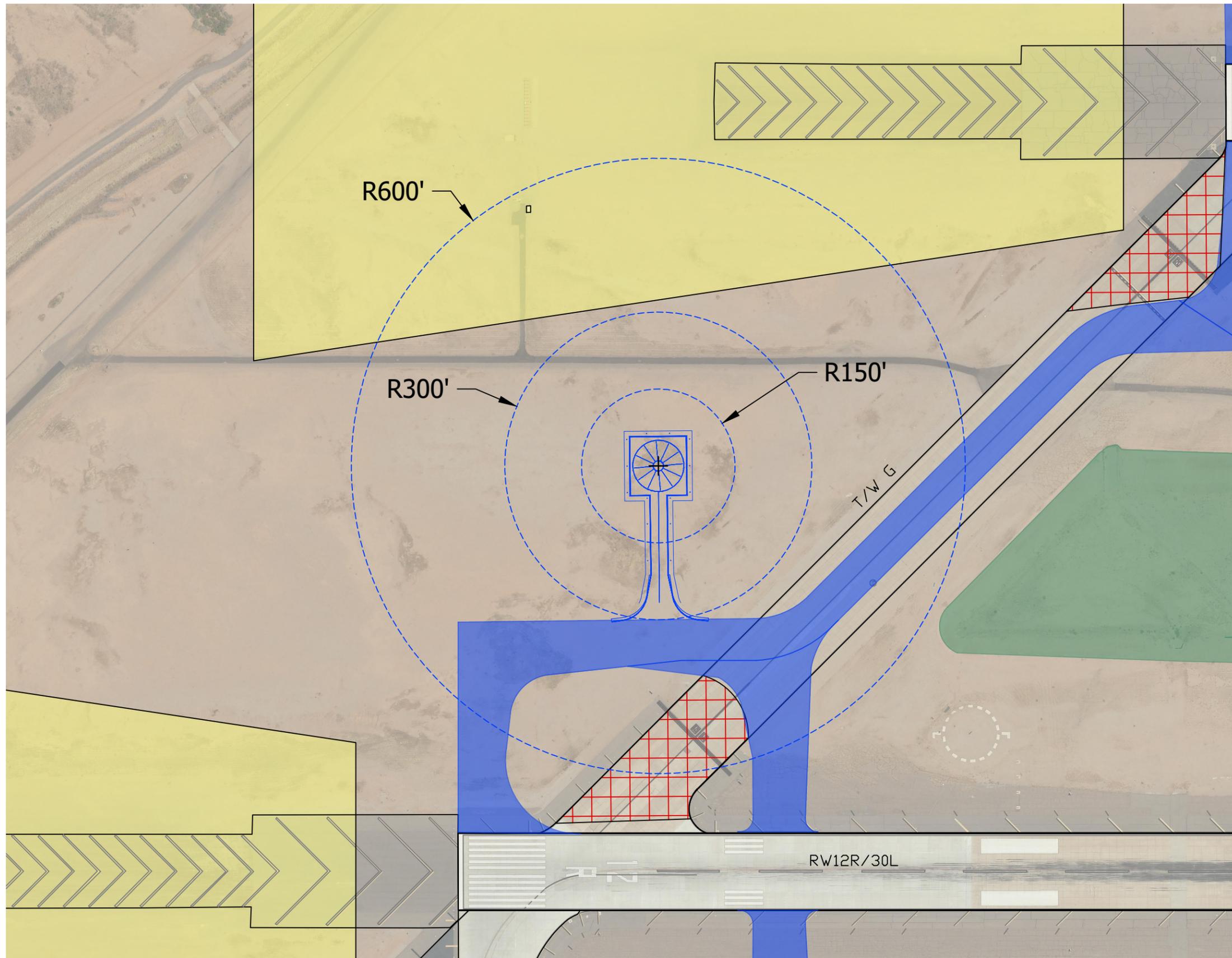
- Existing Runway Protection Zone
- Existing Detention Ponds
- Future Runway/Taxiway Pavement
- Future Apron Area
- Existing IWA Programmed Project
- Pavement to be Removed
- Future Buildings/Development
- ERJ-145 (ADG C-II)
- ERJ-135 (ADG C-II)
- A-320 (ADG C-III)



Compass Calibration Setback Criteria

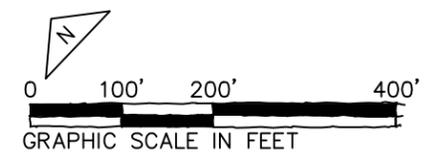
- 150 feet from runway and taxiway light bases, airfield signs, ducts, grates for drainage when they contain iron, steel, or ferrous materials
- 300 feet from buildings, aircraft arresting gear, fuel lines, electrical or communication cable conduits when they contain magnetic (iron, steel, or ferrous) materials and from other aircraft
- 600 feet from magnetic objects including large parking lots, busy roads, railroad tracks, and high voltage electrical transmission lines

Figure 4-6
**Compass Calibration Pad
Relocation Alternative 1**



Legend

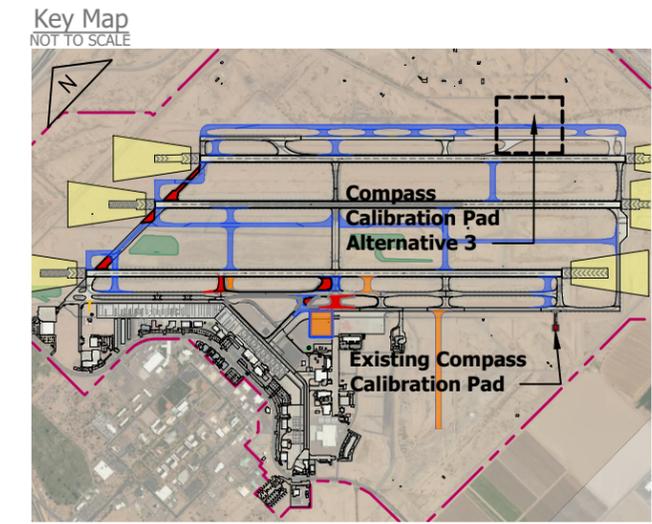
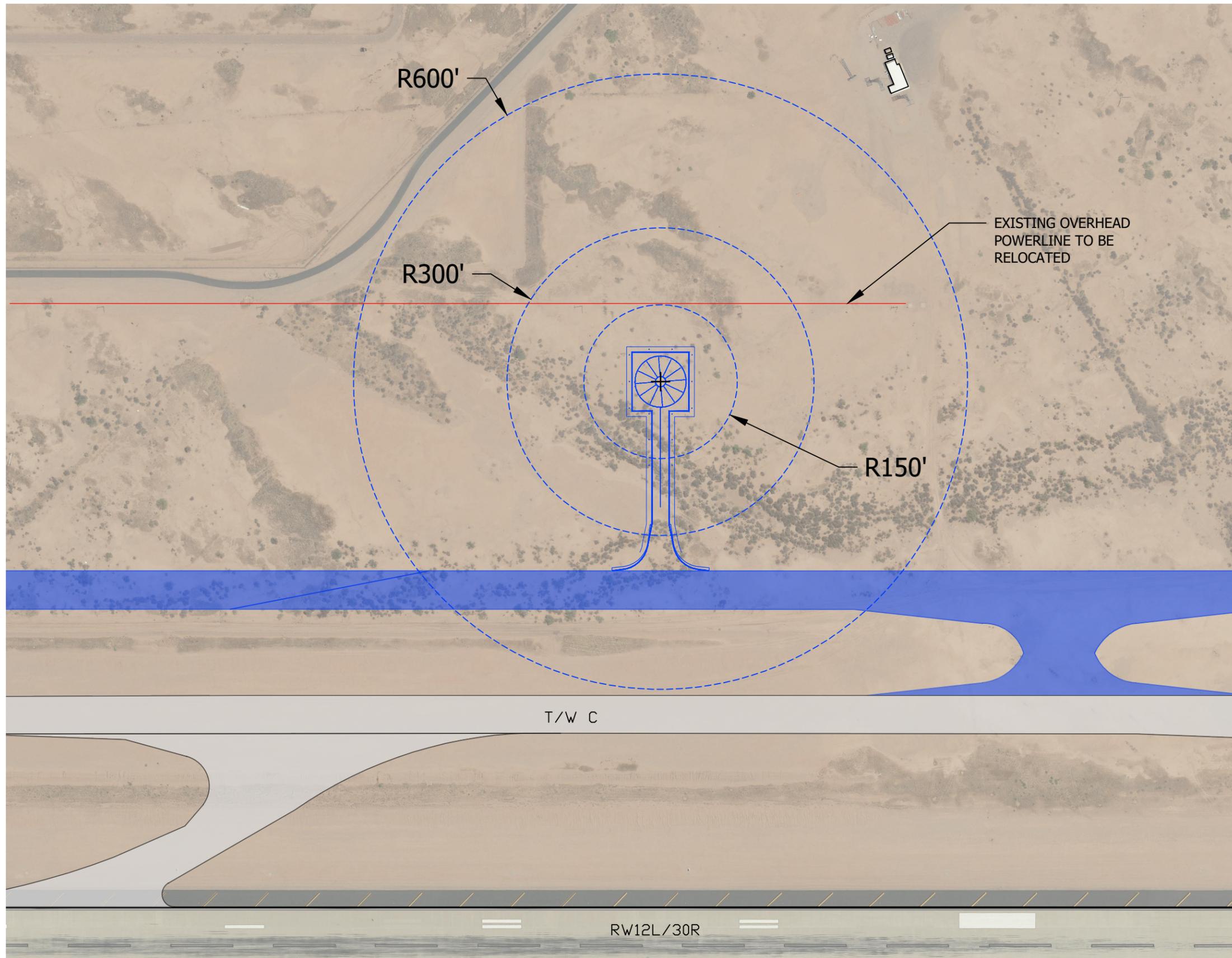
-  Existing Runway Protection Zone
-  Existing Detention Ponds
-  Future Runway/Taxiway Pavement
-  Future Apron Area
-  Existing IWA Programmed Project
-  Pavement to be Removed



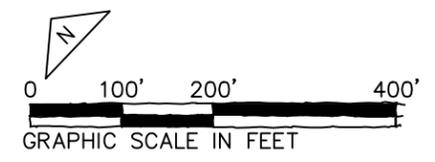
Compass Calibration Setback Criteria

- 150 feet from runway and taxiway light bases, airfield signs, ducts, grates for drainage when they contain iron, steel, or ferrous materials
- 300 feet from buildings, aircraft arresting gear, fuel lines, electrical or communication cable conduits when they contain magnetic (iron, steel, or ferrous) materials and from other aircraft
- 600 feet from magnetic objects including large parking lots, busy roads, railroad tracks, and high voltage electrical transmission lines

Figure 4-7
**Compass Calibration Pad
 Relocation Alternative 2**



- Legend**
- Existing Runway Protection Zone
 - Existing Detention Ponds
 - Future Runway/Taxiway Pavement
 - Future Apron Area
 - Existing IWA Programmed Project
 - Pavement to be Removed



- Compass Calibration Setback Criteria**
- 150 feet from runway and taxiway light bases, airfield signs, ducts, grates for drainage when they contain iron, steel, or ferrous materials
 - 300 feet from buildings, aircraft arresting gear, fuel lines, electrical or communication cable conduits when they contain magnetic (iron, steel, or ferrous) materials and from other aircraft
 - 600 feet from magnetic objects including large parking lots, busy roads, railroad tracks, and high voltage electrical transmission lines

Figure 4-8
**Compass Calibration Pad
 Relocation Alternative 3**

SUMMARY EVALUATION OF SUPPORT FACILITY ALTERNATIVES

Table 4-3 presents an evaluation of the various alternatives for the Support Facility Alternatives at IWA.

Table 4-3: Summary Evaluation Matrix of Compass Calibration Pad Alternatives

| IMPACT CATEGORY | ALTERNATIVE 1 | ALTERNATIVE 2 | ALTERNATIVE 3 |
|---|----------------------------------|----------------------------------|----------------------------------|
| Description of Improvement | Compass Calibration Pad Option 1 | Compass Calibration Pad Option 2 | Compass Calibration Pad Option 3 |
| PERFORMANCE REQUIREMENTS | | | |
| Category Is Not Applicable | | | |
| OPERATIONAL CAPABILITIES | | | |
| Meets 150/5300-13A, Appendix 6 Requirements | Yes | Yes | Yes |
| Airfield Operational Impacts | No | No | No |
| LAND USE COMPATABILITY | | | |
| Impact to On-Airport Property | Yes | No | Yes |
| Land Acquisitions/Easements | No | No | No |
| Relocation of Existing Facilities Required | Yes | No | Yes |
| ENVIRONMENTAL IMPACT POTENTIAL | | | |
| Increases Impervious Pavement | Yes | Yes | Yes |
| STAKEHOLDER FEEDBACK | | | |
| Considers Stakeholder Input | Yes | Yes | Yes |
| Addresses Stakeholder Concerns | Yes | Yes | Yes |
| CONSTRUCTABILITY | | | |
| Impact to Airport Operations | Moderate | Minimal | Minimal |
| ALTERNATIVES EVALUATION | | | |
| DETERMINATION | NEUTRAL | FAVORABLE | NOT FAVORABLE |

Westside Development Facility Improvement Alternatives

Chapter 3 – Facilities Requirements identified the need for the redistribution of public parking, and additional parking for rental car operators, and employees. Peak daily demand at the Airport reached effective capacity for the Hourly Express Lot and near effective capacity for the Daily Lot and Rental Parking during 2018. Due to increased activity at the Airport, projections indicate deficits for each in the short-term, increasing in significance throughout the 20-year planning horizon. An additional 1,009 parking stalls will be needed to meet demand for public, employee, and rental parking through 2038. This coincides with a substantial surplus of parking supply at the Ray Road Economy Lot (1,135 stalls).

In addition to parking needs, vehicular access to the terminal and parking facilities is stunted as a result of traffic along S. Sossaman Road. Interim improvements made to ingress/egress at the terminal and parking facilities are helping, though a supplemental operational analysis conducted as part of **Chapter 3 – Facility Requirements** found that the roadway is anticipated to experience a failing level of service by 2030.

This section analyzes westside development alternatives focused on addressing parking deficits adjacent to the terminal and maximizing the use of facilities elsewhere at the Airport. This includes the relocation of employee parking, a change in parking fee structure to encourage use of the Economy Lot, adding hourly and premium vehicle parking, and expanding rental operator parking capacity.

TNCs such as Uber and Lyft both operate at the Airport. TNC's have the potential to influence or alter future demand for taxicab, ride-share vans, limousines, car rental services, and parking. Service by TNCs theoretically reduce future parking demand if passengers opt to take TNCs to and from the Airport rather than using their own vehicles.

Turo, a new company, that can also influence or alter future demand for taxicab, ride-share vans, limousines, car rental services, and parking, offers peer-to-peer car sharing. This business allows private car owners to rent out their personal vehicles to airport passengers for a fee. Airports are typically accommodating this service at designated locations within designated rental car areas.

It is recommended that the Airport monitor how TNCs and peer-to-peer type rental car operations impact parking demand and adjust planning assumptions accordingly.

Alternatives 1 and 2 were developed to identify short-, medium- and long-term development and the repurpose of existing parking facilities as future economic development opportunities once a new 28-gate eastside terminal becomes operational. The alternatives maintain approximately the same parking supply in the short term. In the mid-term, parking is reduced by approximately 200 stalls as a result of reclaiming

portions of the Daily Lot Annex for aeronautical purposes. This loss of supply is accommodated by the transition of parking facility types between rental, employee parking, and temporary parking (Cell phone Lot), coinciding with a parking fee change to encourage use of the Economy Lot. In the long term, the eastside terminal development will provide parking supply for each use type adjacent to the terminal. The Ray Road Economy lot will continue to provide long-term and daily parking.

During the existing rental parking capacity analysis, the analysts determined that rental car tenants anticipate a need for additional drop-off and pick-up parking supply. Due to the variability of projecting the distribution of this demand, Alternatives 1 and 2 highlight locations for “Rental Flex.” These areas provide dedicated supply for future rental parking demand, while allowing flexibility in programming between future pick-up, drop-off needs, and support facility needs.

ALTERNATIVE 1: Westside Development Facility Improvements Alternative 1 – Short, Medium, and Long Term

In the short term (five years), as identified in **Figure 4-9**, the redevelopment of the existing Terminal Annex building (Gates 1 through 4) is anticipated as the facility has reached its useful life. This facility is a single-story building, with three departure lounges serving four gates and supported by a food and beverage concession, and restrooms. The building is set within the existing site, allowing for aircraft ground service vehicle access to inbound and outbound baggage make-up and drop-off areas at the terminal, and respecting the boundary set by the Fergie and Feller Field gardens.

The proposed concourse is larger than the one it is replacing, although the total building size is 23,250 square feet. **Table 4-4** identifies the basic planning assumptions used in developing the space requirements.

Table 4-4: Replacement Departures Concourse Requirements

| | |
|---|-----|
| Departing Flights | 4 |
| Design Aircraft Seats | 177 |
| Total Departing Seats | 708 |
| Design Load Factor | 85% |
| Peak Hour Departing Passenger | 602 |
| Departures Lounge Area/Passenger ¹ | 17 |

| | |
|--|--------|
| Departures Lounge Area (SF) ² | 13,000 |
| Concourse Area (SF) | 6,500 |
| Concessions/Food & Beverage (SF) | 1,500 |
| Restrooms 2 @ 1,125 SF | 2,250 |
| Total Concourse Area (SF) | 23,250 |

1] 18 SF/Passenger is IATA standard for a high level of service.

2] Maximum allowable on site.. Includes ticket lifts and boarding corridors

The departures lounges provide a good level of service and will allow for a variety of seating, from standard airport bench seats to worktables and soft furnishings allocated throughout the space. The concourse is narrower than a standard double-loaded concourse, set at twenty-feet wide, and with little cross-flow from entrances at concessions and restrooms, it will serve both arriving and departing passengers at peak periods with a good level of service.

Food and beverage concessions are recommended at the concourse given their higher demand and limited area to work within the concourse. The restrooms are located to best serve passengers arriving and departing, a short distance to walk from all points.

The building layout will allow the designers to take advantage of the adjacent gardens. The site orientation would also provide an opportunity to build a higher volume of space, allowing the gardens to extend onto the concourse and the sun to contribute light into the space.

Other westside facility development opportunities, within the short-term timeframe are identified in **Figure 4-10**, to include converting the existing Cell Phone Lot to employee parking spaces designed to American Disabilities Act (ADA) standards close to the terminal. Associated pedestrian improvements will ensure safe crossing from the new employee parking.

The Cell Phone Lot and rideshare/taxi staging are moved to a parcel to the north of the terminal along S. Sossaman Road. Additional demand for rental parking supply will be accommodated by the Economy Lot and/or expansion of the rental support and staging facilities south of the terminal on S. Sossaman Road.

In the mid-term (10 years), as identified in **Figure 4-11**, the Rental Drop-Off will be converted to a Daily Lot and Rental Pick-up to a Flex Lot with premium covered hourly parking and value-added service. This will shift the majority of rental parking supply to the economy lot, with Rental Flex Space remaining with the support and staging facilities to the south of the terminal. Pedestrian crossing improvements will ensure the safe crossing from the new daily parking to the terminal. Additional Employee Parking demand will also be shifted to the Economy Lot. An increase in Economy Lot shuttle service may be needed during peak times. Demand is expected to shift to added Daily and Economy Lots, approximately 200 vehicle parking stalls are reclaimed for aeronautical purposes in the Daily Lot Annex to support three ADG-III remain-over-night (RON), remain-over day (ROD) aircraft parking positions.

In the long term (20 years), as identified in **Figure 4-12**, failing roadway operation of S. Sossaman Road is anticipated to require relocation of the terminal to the east side of the Airport. This coincides with the repurposing of parking on the south side of S. Sossaman road for future economic development

opportunities. The Flex Lot will be converted to private aviation parking, and the Daily Lot Annex will be redeveloped for future aeronautical uses. The existing passenger terminal will be redeveloped for private and GA uses. Considerations for future uses of the passenger terminal include:

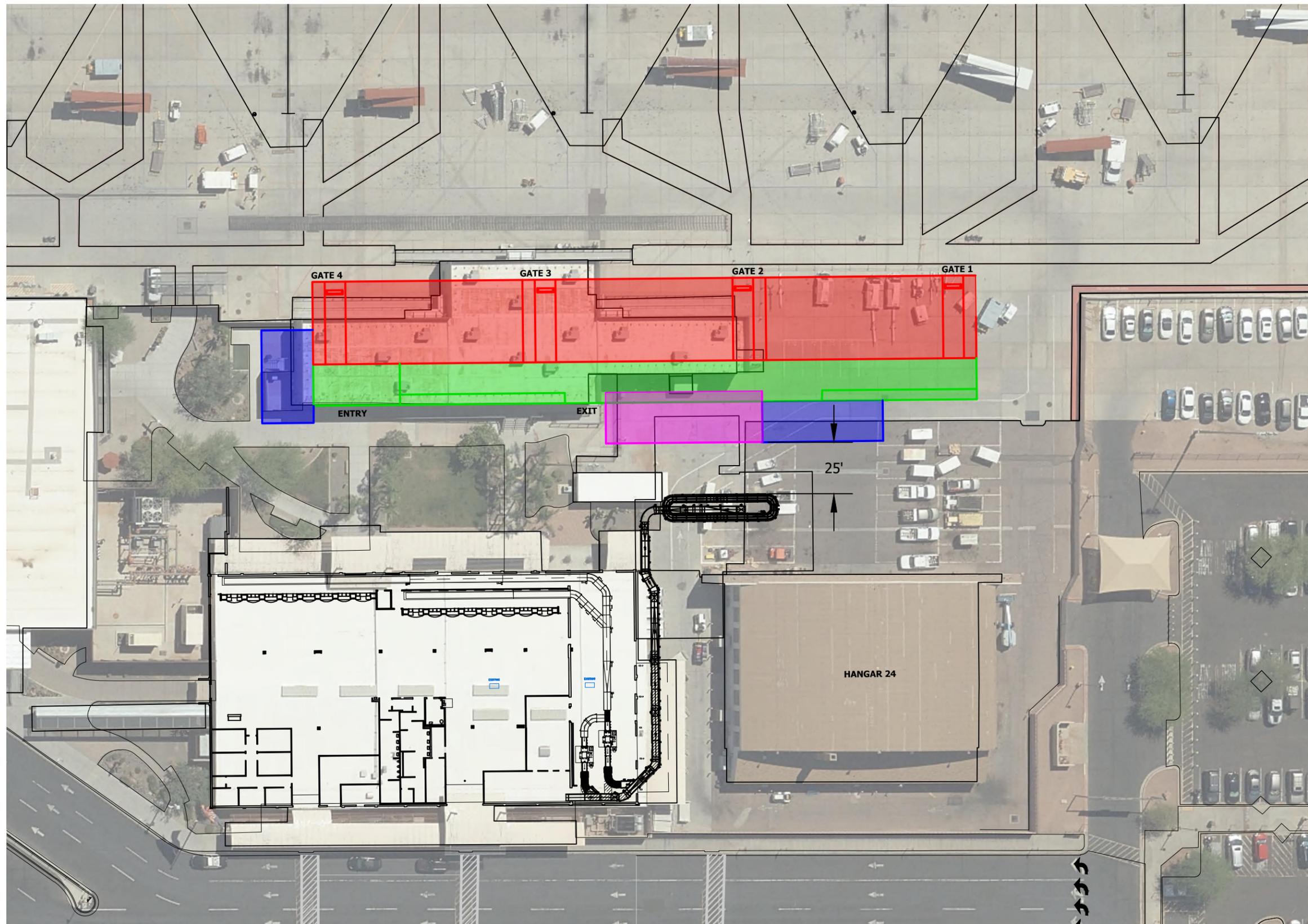
- ✓ Relocation of the Gateway Aviation Center, an Airport owned Fixed Base Operator (FBO), or similar type facility
- ✓ Additional hangar facilities

Advantages of this alternative:

- ✓ Addresses short- and mid-term deficits with minimal infrastructure and construction costs
 - Striping in the Cell Lot for employee parking
 - Striping and modification of Rental Drop-Off
 - Improved pedestrian crossings
 - Improvements to the proposed northern cell-phone Lot
- ✓ Addresses short- and mid-term deficits while maintaining passenger parking proximity to terminal and “Just Plane Easy” Theme
- ✓ Capitalizes on covered parking in Rental Pick-Up by providing value added service for hourly parking
- ✓ Provides rental operators with choice and flexibility based on developing needs
 - Economy Lot: Rental Flex, or
 - S. Sossaman Road Support Facilities: Rental Flex
- ✓ Westside terminal redevelopment
- ✓ Simplicity in phasing

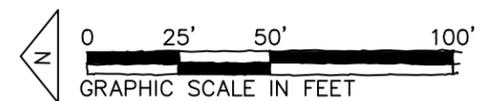
Disadvantages of this alternative:

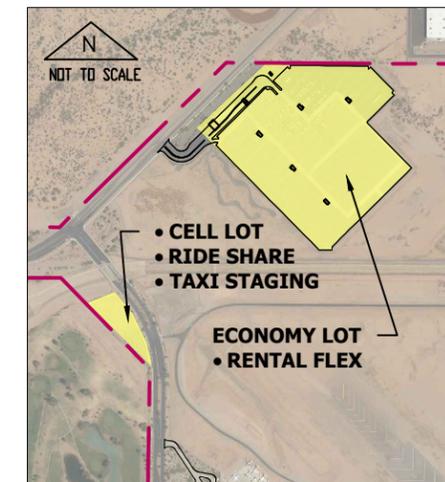
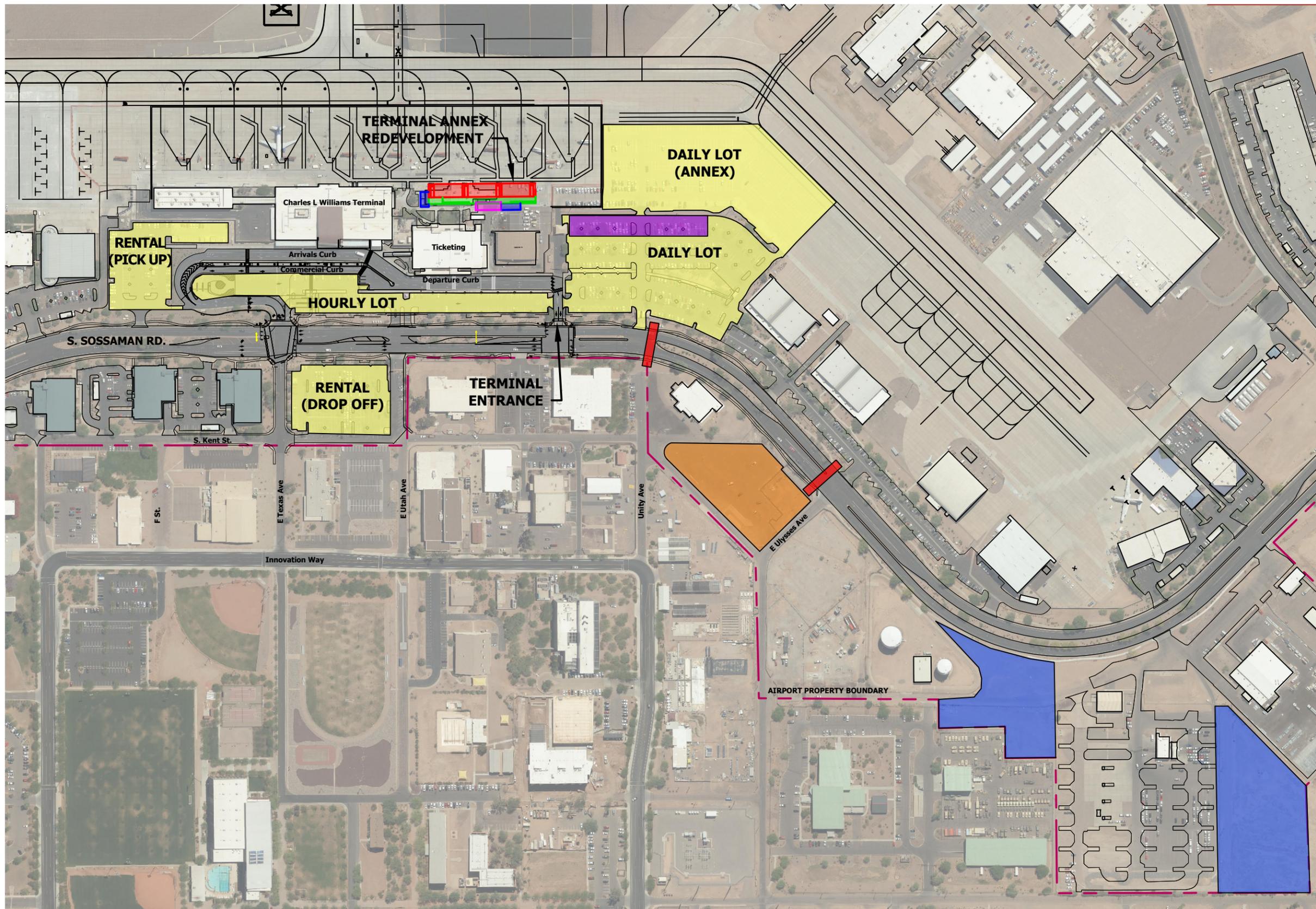
- ✓ Requires increased shuttle service from Economy Lot, for both passengers and Airport employees
- ✓ Daily Parking Lot in two locations during Mid-Term
 - Former Rental Drop-Off
 - Existing Daily Parking Lot
- ✓ Relocates rental car operators



Legend

- Departure Lounges
- Food & Beverage
- Concourse
- Restroom





Northern Lots

Legend

- Existing Parking Facilities
- Future Economic Development Opportunity
- Future ADA Employee Parking
- Future Employee Parking
- Improved Pedestrian Crossing

Terminal Annex Legend

- Departure Lounges
- Food & Beverage
- Concourse
- Restroom

Note: Accompanied by changes to parking fee structure to encourage use of the Economy Lot.

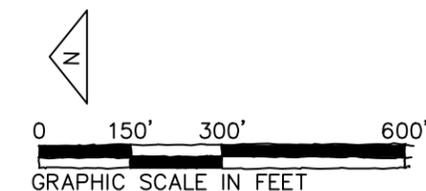
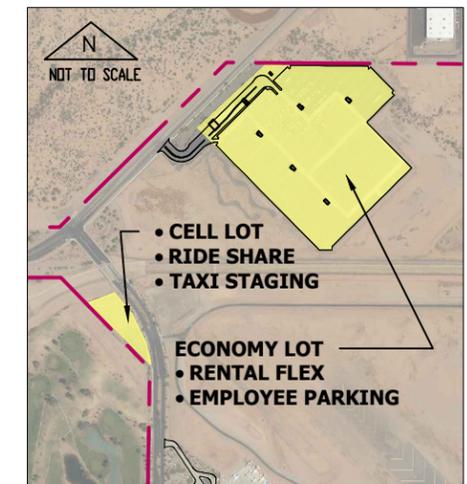
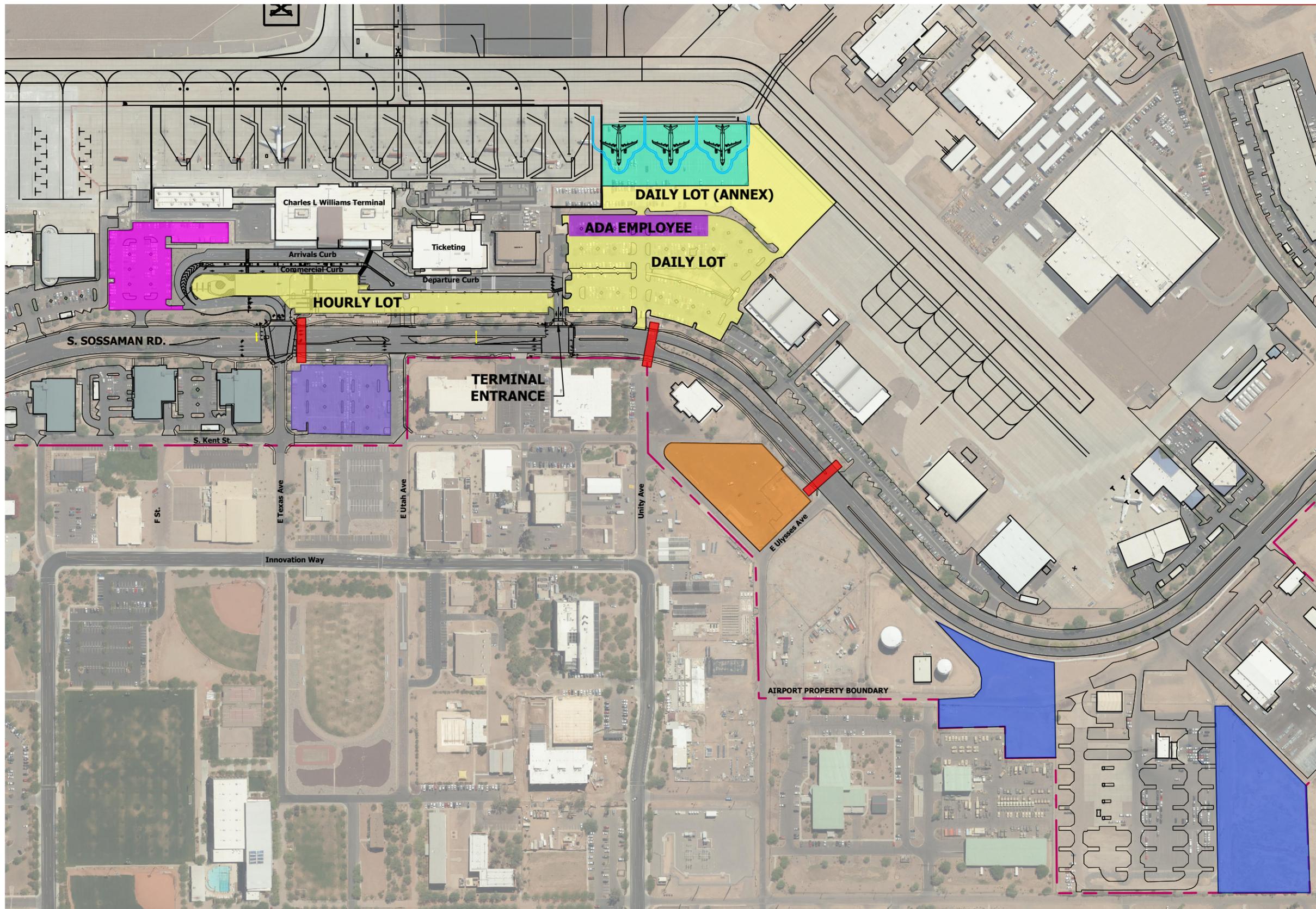


Figure 4-10
**Westside Development -
 Facility Improvement
 Alternative 1 Short Term**



Northern Lots

Legend

- Existing Parking Facilities
- Future Economic Development Opportunity
- Future ADA Employee Parking
- Future Employee Parking
- Future Additional Daily Lot Parking
- Future Flex Lot Parking
 - Hourly
 - Value Added
- Future Reclaimed Apron
- Improved Pedestrian Crossing

Note: Presumed loss of ± 219 Daily Lot parking stalls in the annex. Demand expected to shift to added Daily Lot and Economy Lot.

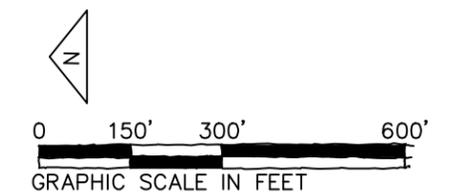
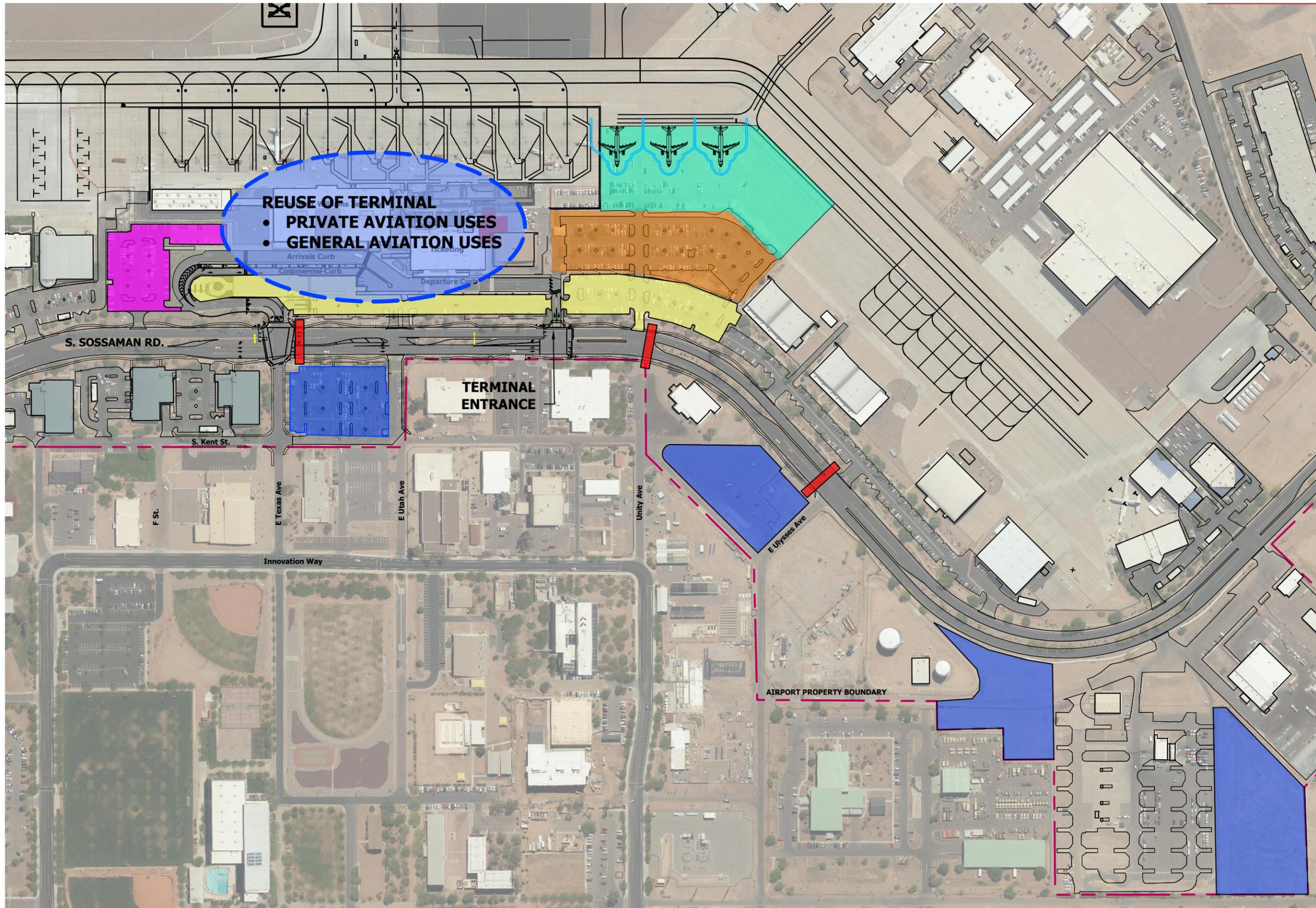


Figure 4-11
**Westside Development -
 Facility Improvement
 Alternative 1 Mid Term**



Northern Lots

Legend

- Existing Parking Facilities
- Future Economic Development Opportunity
- Potential Future Aeronautical Use
- Private Aviation Parking
- Future Reclaimed Apron
- Improved Pedestrian Crossing

Note: Long-term changes dependent on terminal relocation.

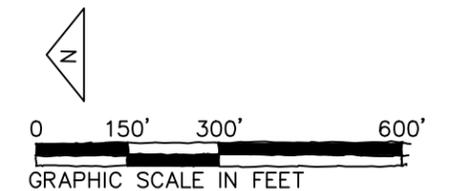


Figure 4-12
**Westside Development -
 Facility Improvement
 Alternative 1 Long Term**

ALTERNATIVE 2: Westside Development Facility Improvements Alternative 2 – Short-, Medium-, and Long-Term

In the short term (five years), as identified in **Figure 4-13**, the existing Cell Phone Lot will be converted to employee parking, keeping ADA employee parking close to the terminal. Pedestrian improvements will ensure the safe crossing from the new employee parking. The Cell Phone Lot and rideshare/taxi staging will be moved to a parcel to the north of the terminal along S. Sossaman Road. The existing Rental Drop-Off lot will be converted to a Rental Flex Lot, and along with the expansion of the rental support, and staging facilities will accommodate any additional Rental Parking demand. The Economy Lot will accommodate the bulk of Rental Drop-Off supply.

In the mid-term (10 years), as identified in **Figure 4-14**, the Rental Drop-Off/ Flex Lot will be converted to additional Employee Parking and Rental Pick-up to a Flex Lot with premium covered hourly parking and value-added service. All rental parking demand will be accommodated in the Rental Flex areas of the Economy Lot in the form of a ConRAC facility. The existing Rental Car support and flex facilities to the south of the terminal will be relocated as part of the ConRAC facility. These areas will be made available for future economic development opportunities at that time. Pedestrian crossing improvements will ensure the safe crossing from the new Employee Parking to the terminal. An increase in Economy Lot shuttle service may be needed during peak times.

During this timeframe, demand is expected to shift to the converted lots, approximately 200 vehicle parking stalls are reclaimed for aeronautical purposes in the Daily Lot Annex to support three ADG-III RON, ROD aircraft parking positions.

In the long term (20 years), as identified in **Figure 4-15**, failing roadway operation of S. Sossaman Road is anticipated to require relocation of the terminal to the east side of the Airport. This coincides with the repurposing of parking on the south side of S. Sossaman road for future economic development opportunities. The Flex Lot will be converted to private aviation parking, and the Daily Lot will be converted to general parking.

The passenger terminal itself will be redeveloped for private and GA uses. Considerations for future uses include:

- ✓ Relocation of the Gateway Aviation Center, an Airport owned FBO, or similar type facility
- ✓ Additional hangar facilities

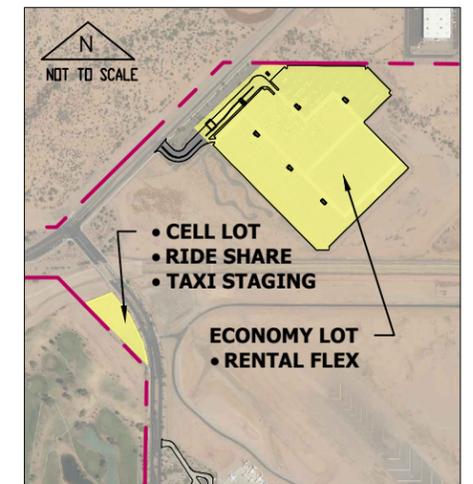
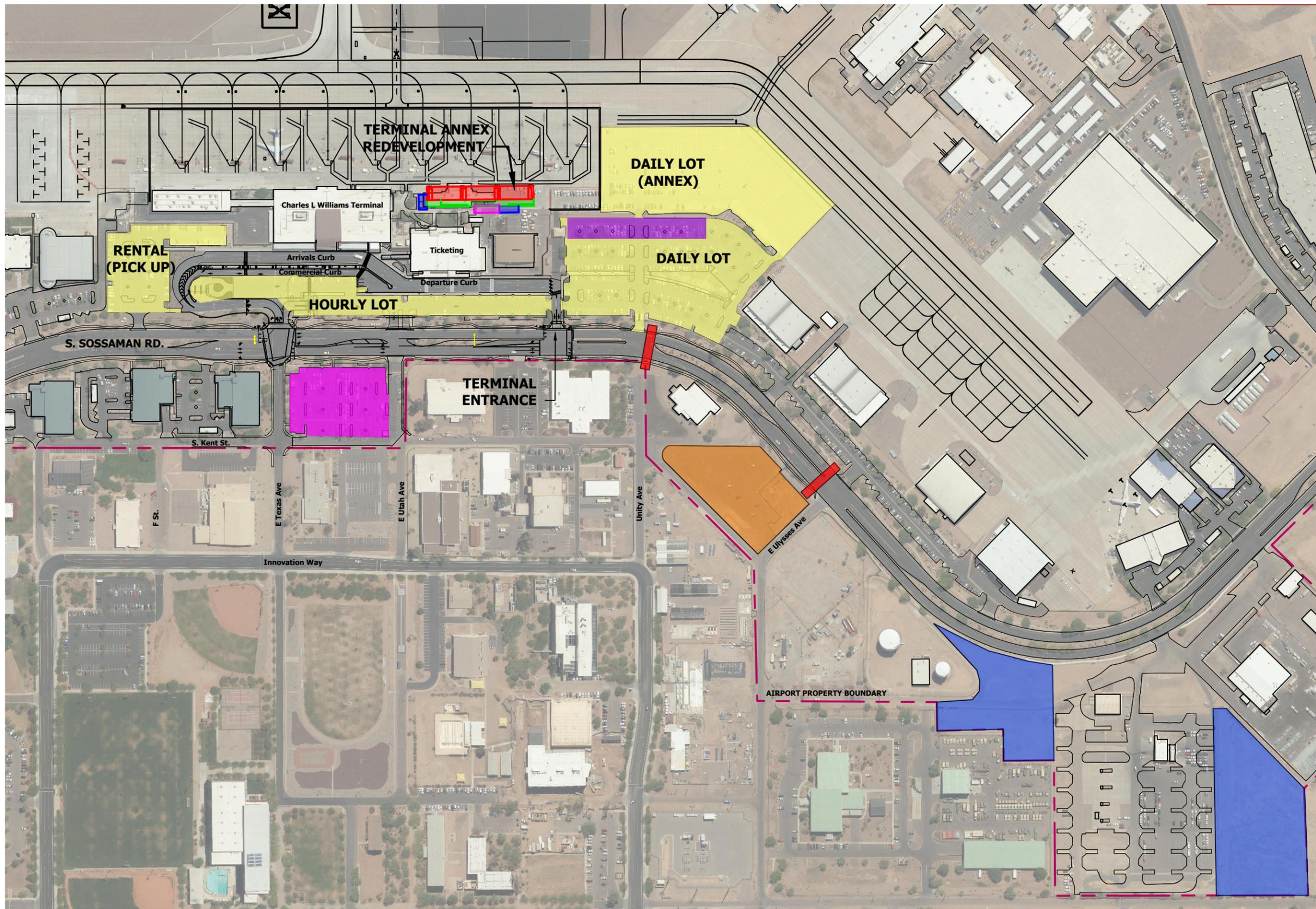
Advantages of this alternative:

- ✓ Addresses most short and mid-term deficits with minimal infrastructure and construction costs

- Striping in the Cell Lot for employee parking
- Striping and modification of Rental Drop-Off
- Improved pedestrian crossings
- Improvements to proposed northern Cell-phone Lot
- ✓ Capitalizes on covered parking in Rental Pick-Up by providing value added service for hourly parking
- ✓ Location of Employee Parking is in close proximity to the terminal
- ✓ Provides Rental Car Operators with a permanent home by the mid-term
 - ConRAC Facility at Economy Lot
- ✓ Westside terminal redevelopment in the mid-term timeframe

Disadvantages of this alternative:

- ✓ Requires increased shuttle service from Economy Lot, for both passengers and Airport employees
 - More significant impact than Alternative 1
- ✓ Requires significant infrastructure and construction costs for Rental Car Facilities
 - ConRAC Facility in economy lot
 - Removal of fueling and car wash station



Northern Lots

Legend

- Existing Parking Facilities
- Future Economic Development Opportunity
- Future ADA Employee Parking
- Future Employee Parking
- Future Flex Lot Parking
 - Hourly
 - Value Added
- Improved Pedestrian Crossing

Terminal Annex Legend

- Departure Lounges
- Food & Beverage
- Concourse
- Restroom

Note: Accompanied by changes to parking fee structure to encourage use of the Economy Lot.

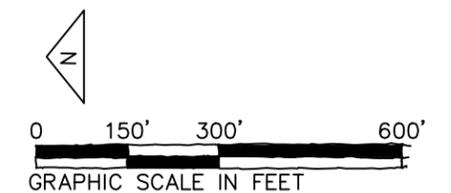
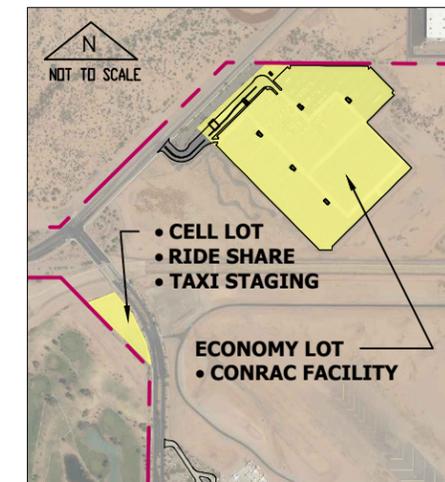
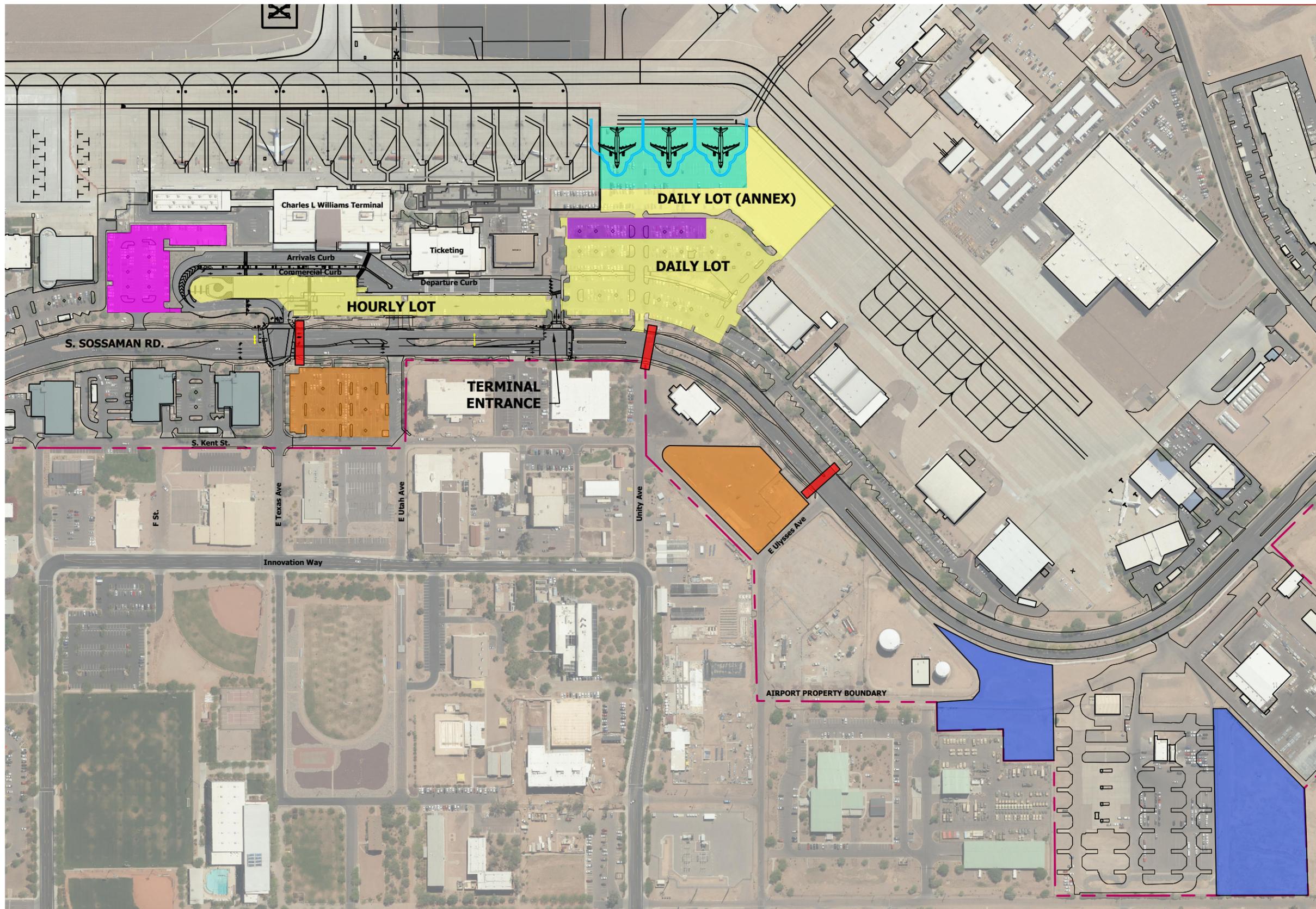


Figure 4-13
**Westside Development -
 Facility Improvement
 Alternative 2 Short Term**



Northern Lots

Legend

- Existing Parking Facilities
- Future Economic Development Opportunity
- Future ADA Employee Parking
- Future Employee Parking
- Future Flex Lot Parking
 - Hourly
 - Value Added
- Future Reclaimed Apron
- Improved Pedestrian Crossing

Note: Presumed loss of ± 219 Daily Lot parking stalls in the annex. Demand expected to shift to added Daily Lot and Economy Lot.

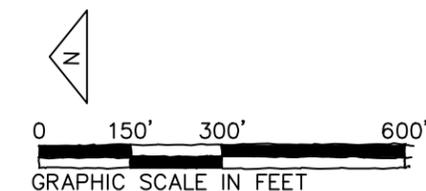
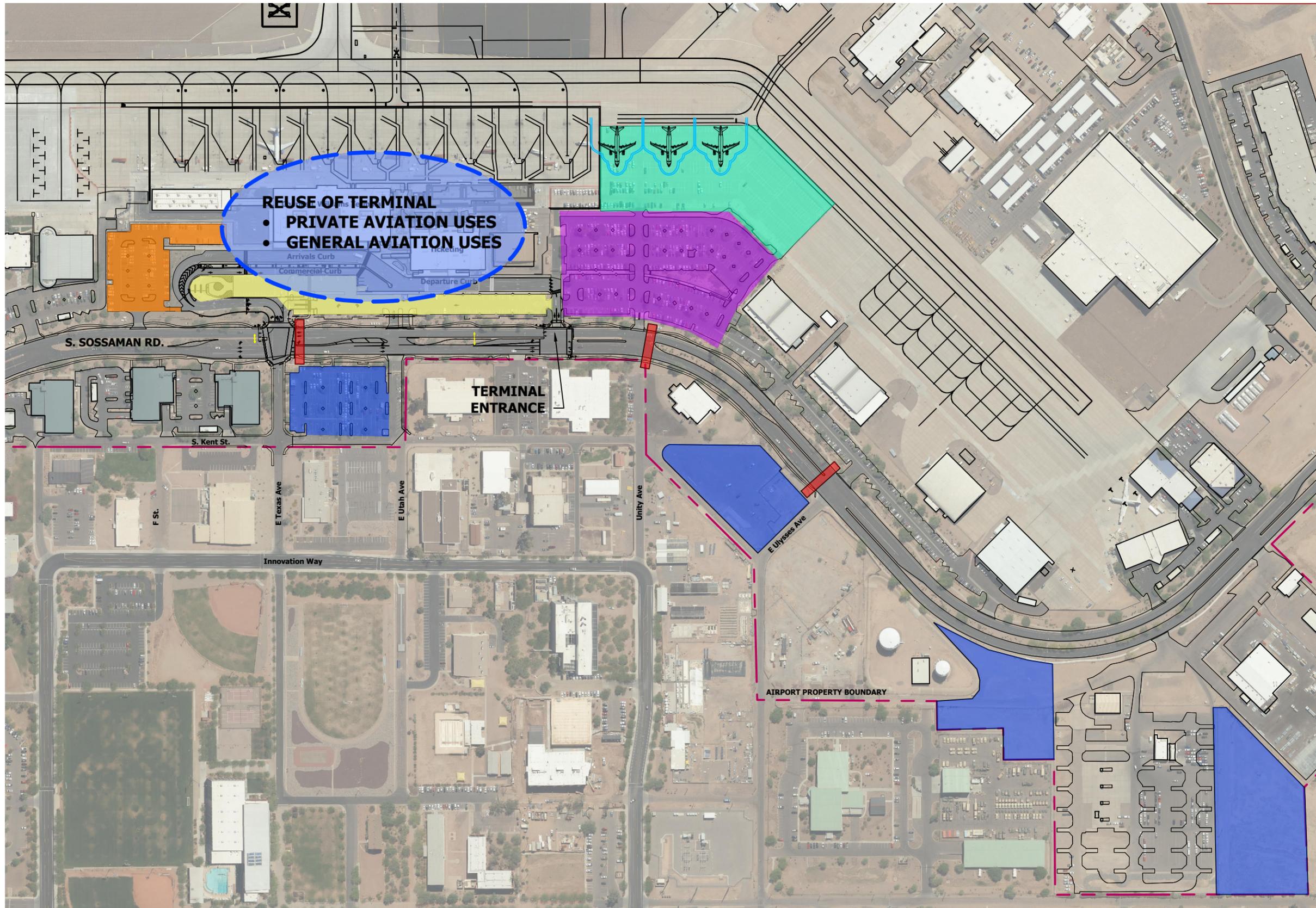


Figure 4-14
**Westside Development -
 Facility Improvement
 Alternative 2 Mid Term**



N Northern Lots

Legend

- Existing Parking Facilities
- Future Economic Development Opportunity
- General Parking to be Determined
- Private Aviation Parking
- Future Reclaimed Apron
- Improved Pedestrian Crossing

Note: Long-term changes dependent on terminal relocation.

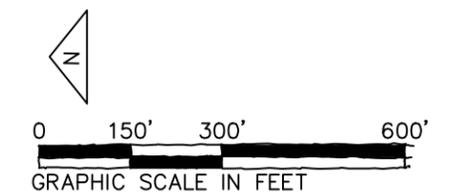


Figure 4-15
**Westside Development -
 Facility Improvement
 Alternative 2 Long Term**

SUMMARY EVALUATION OF WESTSIDE DEVELOPMENT FACILITY IMPROVEMENT ALTERNATIVES

Table 4-5 presents an evaluation of the various alternatives for the westside development facility improvements at IWA.

Table 4-5: Summary Evaluation Matrix of Westside Development Facility Improvement Alternatives

| IMPACT CATEGORY | ALTERNATIVE 1 | ALTERNATIVE 2 |
|--|---|---|
| Description of Improvement | Landside Development <i>(Short, Medium, and Long-Term)</i> | Landside Development <i>(Short, Medium, and Long-Term)</i> |
| PERFORMANCE REQUIREMENTS | | |
| Accommodates Forecasted Parking Demand | Yes | Yes |
| Estimated Distance from Terminal to Vehicle Parking Lot/CONRAC | Shorter | Longer |
| OPERATIONAL CAPABILITIES | | |
| Operability & Access to the Terminal | Yes | Yes |
| Operability & Access to Tenants | Yes | Yes |
| Surface Transportation Requirement Tenant/Airport Busing | Yes | Yes |
| LAND USE COMPATABILITY | | |
| Impacts to Airport Property Use | Yes | Yes |
| Property Acquisition | No | No |
| Business Relocation | Yes | Yes |
| Impacts to Off-Airport Land Use | No | No |
| ENVIRONMENTAL IMPACT POTENTIAL | | |
| Property Acquisitions/Easements | None | None |
| NEPA Compliance | Required | Required |
| Tenant Relocation | Yes | Yes |
| Existing Support/Utilities Infrastructure | Site Specific | Site Specific |
| STAKEHOLDER FEEDBACK | | |
| "Just Plane Easy" Theme | Yes | No |
| Compatible with Existing Development | Yes | Yes |
| CONSTRUCTABILITY | | |
| Impact to Airport Operations | Yes | Yes |
| Impact to Tenant Operations | Yes | Yes |
| Building/Facility Demolition | Yes | Yes |
| Phasing Complexity | Medium | High |
| ALTERNATIVES EVALUATION | | |
| DETERMINATION | FAVORABLE | NEUTRAL |

Replacement Passenger Terminal Alternatives

As discussed in **Chapter 3 – Facility Requirements**, a new replacement passenger terminal, located on the Airport’s east side, is identified as a long-term solution in meeting anticipated passenger demand, airport service level goals, and providing growth for the future. The forecasted passenger growth will require a 28-gate passenger replacement terminal to provide additional space in almost every functional terminal area component. The initial 10 gates serve as one-for-one replacement gates with the remaining 18-gates to be phased in over time to provide maximum flexibility. The overall terminal area was designed to represent a maximum-build scenario. It was determined that the new replacement terminal will consist of an 28 contact gates, supporting aircraft apron area, passenger vehicle parking, ConRAC with a supporting Quick Turn Area (QTA) for maintenance and fueling facilities, an airport owned fuel farm, and a supporting roadway network to support the growth in future aeronautical and non-aeronautical development. This section describes the evaluation of alternatives for an eastside replacement passenger terminal and identified support facilities.

Overview of Terminal Concepts and Planning Assumptions

Development of an airport terminal program involves specific operational considerations that create a unique environment. These considerations include air carriers serving the public, passenger population characteristics and needs, and the number of daily flights. Air carriers have a proprietary brand that defines their culture and service. Most carriers maintain customer service standards for processing passengers in acceptable wait and processing times. Over time, these standards have become similar across air carrier service models, with an acceptable level of service closely tied to company metrics on staffing. For this master plan, multiple carriers are considered to be operating from this replacement passenger terminal. Improvements in all processes over time are included, given the timeframe within which they will be developed. Generally, the analysis reflects these assumptions and standards:

- ✓ Design Aircraft: Airbus 320-200, Boeing 737-800, and Boeing Max 8 aircraft
- ✓ Aircraft Seats: 177–178 Seats
- ✓ Design Load Factor: 85 percent
- ✓ Peak Hour Passenger Demand: 65 percent

Peak hour demand is determined by factoring aircraft seat capacity, a total of all aircraft arriving or departing within the period. With air carrier load factors increasing over the past ten years, the design load factor was set at 85 percent of the total aircraft seats, corresponding to the existing terminal planning criteria.

Passengers arrive at the Airport over a period of two-to-three hours prior to their departure time. Recent experience at destination airports indicates that the greatest number of passengers arrive approximately 100-to-60 minutes prior to their flights’ scheduled departures. The figure used in planning for this future terminal is approximately 65 percent of departing passengers. This reflects passenger behavior in response to

factors such as distance traveled to the airport, access from parking to the terminal, processing time through check-in and security screening, amenities offered post-security, and distance to gates.

The terminal planning assumptions are identified in **Table 4-6**.

Table 4-6: Terminal Planning Assumptions – Peak Hour Passenger Demand by Development Phase

| PEAK HOUR DEPARTING PASSENGERS | PHASE 1 | PHASE 2 | PHASE 3 |
|--------------------------------------|---------|---------|---------|
| Departing Flights | 10 | 9 | 9 |
| Total Aircraft Seats | 1,770 | 3,363 | 5,310 |
| Design Load Factor (85%) | 1,505 | 2,859 | 4,514 |
| Peak Hour Departing Passengers (65%) | 978 | 1,858 | 2,934 |
| Passenger Checking Bags (30%) | 293 | 557 | 880 |
| Security Screening Capacity/Lane/HR | 180 | 200 | 220 |
| Departures Lounge Area/Passenger | 20 | 20 | 20 |

| PEAK HOUR ARRIVING PASSENGERS | PHASE 1 | PHASE 2 | PHASE 3 |
|--------------------------------|---------|---------|---------|
| Arriving Flights | 8 | 9 | 10 |
| Total Aircraft Seats | 1,416 | 1,593 | 1,770 |
| Design Load Factor (85%) | 1,204 | 1,354 | 1,505 |
| Passengers Claiming Bags (30%) | 361 | 406 | 451 |
| Baggage Claim Display Frontage | 542 | 609 | 677 |
| Baggage Claim Area/Passenger | 25 | 25 | 25 |

Ticketing Hall

The terminal ticketing and baggage check-in hall processing and space requirements were determined using assumptions for departing flights, using the first outbound bank of morning departures as the peak period, a time when all gates are occupied and anticipated to depart within the hour. For opening day of the new terminal, all flights were assumed to depart in this period, reflecting an evolution in the flight schedule over time.

Other factors affecting this terminal component are check-in preference and bag check-in processes, the former moving toward passenger self-check-in over the past ten years and continuing this trend over the next ten years. Baggage check-in will move toward self-check as well, using facial recognition as the vehicle to make it secure based on current work by Customs & Border Protection, with passengers managing the process. Ticket counters will include traditional agent, kiosk and self-check baggage machines.

These trends are expected to produce gains in processing such that the number of positions will increase at a slower pace than has traditionally been the case, one of a direct correlation between increasing number of passengers and additional ticket positions. In future, check-in positions will process more passengers, absorbing growth.

The following table, **Table 4-7**, is a summary of the ticket hall requirements.

Table 4-7: Ticketing Hall Requirements

| TICKETING | PHASE 1 | PHASE 2 | PHASE 3 | TOTAL |
|---|---------------|---------------|---------------|---------------|
| Kiosks | 36 | 32 | 32 | 101 |
| Counter Positions | 27 | 25 | 25 | 75 |
| Total Positions | 63 | 57 | 57 | 176 |
| Airline Ticket Office Public Space-Passenger Contact & Q (SF) | 2,616 | 2,454 | 2,502 | 7,572 |
| Airline Ticket Office Public Counter Space (SF) | 2,616 | 2,454 | 2,502 | 7,572 |
| Airline Ticket Office Operations Areas (SF) | 6,540 | 6,135 | 6,255 | 18,930 |
| Ticket Hall Circulation (SF) | 6,540 | 6,135 | 6,255 | 18,930 |
| Ticket Hall Waiting Area (SF) | 5,450 | 5,113 | 5,213 | 15,775 |
| Ticketing Check-In / Baggage Check-In Area | 24,852 | 23,313 | 23,769 | 71,934 |

Security Screening Checkpoint

The Transportation Security Administration (TSA) has installed passenger security screening checkpoint (SSCP) advanced imaging technology (AIT) to assist with the detection of weapons, explosives, and other objects concealed under a person’s clothing that may not trigger a metal detector. AIT creates a visual image of an individual showing the surface of the skin and revealing other objects on the body; and may include devices using backscatter x-rays, millimeter waves, and/or devices referred to as “whole-body imaging technology” or “body scanning machines”. Security screening will transform over the next ten years as new screening technologies are introduced, such as automated security lanes (ASL), which have already reduced the time it takes to screen passengers dramatically. The TSA is working on programs that will incorporate biometric identification and computed tomography screening systems that will continue to streamline passenger identification and baggage screening, respectively. The TSA’s Pre✓[®] program subscription will also continue to grow, further reducing overall wait and processing times, allowing fewer machines required for security screening.

The security checkpoint lane area detailed in **Table 4-8** will include additional depth over the traditional TSA layouts in the checkpoint design guide, mainly for queuing and re-composure, leading to longer lanes.

Table 4-8 is a summary of the security screening requirements.

Table 4-8: TSA Security Screening Requirements

| PASSENGER SECURITY SCREENING CHECKPOINT | PHASE 1 | PHASE 2 | PHASE 3 | TOTAL |
|--|----------------|----------------|----------------|--------------|
| Peak Hour Originating Aircraft Seats | 1,770 | 1,593 | 1,593 | 4,956 |
| Peak Hour Design Load Factor | 85% | 85% | 85% | |
| Peak Hour Originating Passengers (PHOP) | 1,505 | 1,354 | 1,354 | 4,213 |
| Peak 10 Minutes Arriving Percentage of PHOP | 10% | 10% | 10% | 10% |
| Peak 10 Minutes Arriving PHOP | 151 | 136 | 136 | 423 |
| Passenger Security Screening 10 Minute Screening Capacity Per Lane | 30 | 33 | 36 | 33 |
| Total Security Screening Checkpoint (SSCP) Lanes Required | 6 | 5 | 4 | 13 |
| SSCP PreCheck Lanes | 1 | 1 | 1 | 3 |
| SSCP Advanced Imaging Technology (AIT) Machines Required | 3 | 2 | 2 | 7 |

Gate Departures Lounges

The lounge area for gate departures is determined by the aircraft type at each gate. The design aircraft is an Airbus 320. Generally, the ADG III maximum wingspan plus wingtip separation is multiplied by a 30-foot departure lounge depth to yield the total area required for the departure lounge. This component has been evolving as more amenities are inserted into the lounge or set at the perimeter. Planning for this program assumed a central market concept with smaller concessions along the concourse, providing a greater concentration of options for customers and a higher revenue for vendors. A combination of embedded concessions and a central market will become more relevant as the concourses expand and distance to lounges factors into passengers' decisions to visit concessions.

Total concourse area was calculated using a 120-foot-wide concourse, allowing for center concourse concessions as well as those embedded in the lounges.

Table 4-9 is a summary of the departures lounge requirements.

Table 4-9: Departures Lounge Requirements

| PASSENGER GATE DEPARTURE LOUNGE | PHASE 1 | PHASE 2 | PHASE 3 | TOTAL |
|---|----------------|----------------|----------------|---------------|
| Peak Hour Originating Aircraft Seats | 1,770 | 1,593 | 1,593 | 4,956 |
| Peak Hour Design Load Factor | 85% | 85% | 85% | |
| Peak Hour Originating Passengers | 1,505 | 1,354 | 1,354 | 4,213 |
| Passenger Gate Departure Lounge Area Per Passenger (SF) | 18.3 | 18.3 | 18.3 | 18.3 |
| Passenger Gate Departure Lounge Recommended Area (SF) | 27,532 | 24,779 | 24,779 | 77,091 |
| Total Narrow-Body Aircraft Group III Gates | 10 | 9 | 9 | 28 |
| Passenger Gate Departure Lounge Area (SF) | 27,532 | 24,779 | 24,779 | 77,091 |
| Passenger Gate Departure Lounge Average Area Per Gate (SF) | 2,753 | 2,753 | 2,753 | |
| Gate Ticket Lift Area (SF) | 240 | 240 | 240 | 240 |
| Passenger Boarding Corridor (SF) | 180 | 180 | 180 | 180 |
| Total Gate Ticket Lift and Passenger Boarding Corridor Area | 4,200 | 3,780 | 3,780 | 11,760 |
| Total Passenger Departure Lounge Area Required | 31,732 | 28,559 | 28,559 | 88,851 |

Baggage Claim Hall

Inbound baggage claim devices operate for relatively short periods of time. When bags are delivered to the device, passengers can quickly reclaim their luggage and move on to car rental counters or leave the claim hall. Overlapping arrivals generate congestion. Providing sufficient display frontage and capacity for the baggage claim device can be addressed by the type of device used. Because a sloped palette provides more capacity than flat-plate devices, the sloped palette was assumed for this master plan.

The baggage claim hall also will include airline baggage service offices, car rental counters, restrooms, the concourse and waiting area.

Table 4-10 is a summary of the baggage claim hall area requirements.

Table 4-10: Baggage Claim Hall Requirements

| BAGGAGE CLAIM AREA & CLAIM HALL | PHASE 1 | PHASE 2 | PHASE 3 | TOTAL |
|---|----------------|----------------|----------------|--------------|
| Peak Hour Arriving Aircraft Seats | 1,770 | 1,593 | 1,593 | 4,956 |
| Peak Hour Design Load Factor | 85% | 85% | 85% | |
| Peak Hour Arriving Passengers | 1,505 | 1,354 | 1,354 | 4,213 |
| Peak Hour Arriving Passengers Terminating | 100% | 100% | 100% | |
| Peak Hour Terminating Passengers w/Bags (Percent) | 30% | 30% | 30% | |
| Peak Hour Terminating Passengers w/Bags | 452 | 407 | 407 | 1,266 |
| Peak Twenty Minute Terminating Passengers w/Bags (Percent) | 100% | 100% | 100% | |
| Peak Twenty Minute Terminating Passengers w/Bags | 452 | 407 | 407 | 1,266 |
| Bags Per Passenger Claiming | 1.0 | 1.0 | 1.0 | |
| Sub-Total Baggage Claim Area (SF) | 14,072 | 12,836 | 12,836 | 39,743 |
| Baggage Claim Hall Area Circulation Factor (Adjacent Concourse) | 25% | 25% | 25% | |
| Baggage Claim Hall Area | 3,518 | 3,209 | 3,209 | |
| Total Baggage Claim Area Recommended (SF) | 17,590 | 16,045 | 16,045 | 49,679 |

Summary

The terminal building program will be supplemented by other components and ancillary space. The estimates above will drive terminal development to achieve performance and space requirements. The main hall between the ticketing and baggage claim halls serves as a central entrance to the terminal, providing a gathering point for departing passengers and leading to security screening. Although passenger processing may change, the sequential flow through the terminal will remain the same.

TSA inspection services for checked baggage and make-up areas for air carrier outbound baggage are proposed in lower level space under the concourse or vertical circulation hall. Airline line cargo and aircraft maintenance areas are proposed to be contained under the concourses, as are mechanical, electrical and plumbing/fiber and telecom (MEP/FT) and concessions stores. Airport maintenance areas will also be housed under the terminal area.

ALTERNATIVE 1: Pier-Finger Design (28 Gates)

This alternative, shown in **Figure 4-16**, will replace the terminal with a pier-finger passenger terminal. The concept of a pier-finger terminal is a simple passenger terminal with “fingers” or concourses attached to the terminal building with gates for aircraft parking. Ticketing and security screening occur in the main area of the terminal, and then passengers walk to the holding areas of the concourse to board an aircraft. Baggage claim is also be accomplished in the main terminal area. The pier-finger terminal design will offer a centralized passenger processing concept.

Two concourses will serve the terminal with a total of 28 contact gates that accommodate ADG-III aircraft such as the Airbus A320, Boeing B737, and the Max 8. The initial terminal program will require 10 contact gates with supporting infrastructure. Demand will dictate when the remaining 18 gates will be developed. All passenger boarding bridges will have 400 Hertz power, pre-conditioned air, and potable water. Hydrant fueling capability is possible for each aircraft parking position, if so desired. The terminal apron will be designed according to ADG-III dual taxiway criteria to facilitate efficient aircraft movements to and from the airfield. Support facilities for the replacement terminal will be:

- ✓ A dedicated fuel farm
- ✓ Passenger vehicle parking
- ✓ A ConRAC with supporting QTA for maintenance and fueling facilities
- ✓ A new roadway network with the main entrance to the terminal from Hawes Road
- ✓ Indirect access from Ellsworth Road
- ✓ A supporting roadway network to allow access to the landside areas.

This terminal concept will support 244 acres of aeronautical development, and 360 acres of non-aeronautical development.

Table 4-11 details the planning assumptions used in the pier-finger terminal design.

Table 4-11: Pier-Finger Terminal Planning Assumptions - Arrivals, Departures Demand Profile

| ARRIVALS/DEPARTURES DEMAND PROFILE | PHASE 1 | PHASE 2 | PHASE 3 | TOTAL |
|--|--------------|--------------|--------------|--------------|
| Design Aircraft | A320/B737 | A320/B737 | A320/B737 | A320/B737 |
| Design Aircraft Seats | 177 | 177 | 177 | 177 |
| Peak Hour Design Load Factor | 85% | 85% | 85% | 85% |
| Peak Hour Originating Aircraft Seats ¹ | 1,770 | 1,593 | 1,593 | 4,956 |
| Total Peak Hour Passengers | 1,505 | 1,354 | 1,354 | 4,213 |
| Peak Hour Originating Passengers (PHOP) | 1,505 | 1,354 | 1,354 | 4,213 |
| Peak Ten Minute Percent of Originating Passengers | 20% | 20% | 20% | 20% |
| Peak Ten Minute Originating Passengers | 301 | 271 | 271 | 843 |
| Peak Hour Arriving Flights | 8 | 9 | 10 | 27 |
| Peak Hour Terminating Aircraft Seats | 1,416 | 1,593 | 1,770 | |
| Peak Hour Terminating Passengers (PHTP) | 1,204 | 1,354 | 1,505 | 1,505 |
| Peak Hour Terminating Passengers w/Bags Percent | 30% | 30% | 30% | 30% |
| Peak Hour Terminating Passengers w/Bags | 361 | 406 | 451 | 451 |
| Peak Twenty Minute Terminating Passengers w/Bags | 361 | 406 | 451 | 451 |
| Peak Twenty Minute Terminating Passengers w/Bags Percent | 100% | 100% | 100% | 100% |

Source: Mead & Hunt & InterVistas, 2019

1] Mead & Hunt Master Plan Options, 2019

As identified in **Table 4-12**, a detailed terminal component program summary was developed for the pier-finger terminal alternative.

Table 4-12: Pier-Finger Terminal Component Program

| TERMINAL COMPONENT PROGRAM SUMMARY | PHASE 1 | PHASE 2 | PHASE 3 | TOTAL |
|---|----------------|----------------|----------------|----------------|
| Ticketing | | | | |
| Kiosks | 22 | 19 | 19 | 101 |
| Counter Positions | 13 | 12 | 12 | 75 |
| Total Positions | 35 | 31 | 31 | 97 |
| Airline Ticket Office Public Space-Passenger Contact & Q (SF) | 2,616 | 2,454 | 2,502 | 7,572 |
| Airline Ticket Office Public Counter Space (SF) | 2,616 | 2,454 | 2,502 | 7,572 |
| Airline Ticket Office Operations Areas (SF) | 6,540 | 6,135 | 6,255 | 18,930 |
| Ticket Hall Circulation (SF) | 6,540 | 6,135 | 6,255 | 18,930 |
| Ticket Hall Waiting Area (SF) | 5,450 | 5,113 | 5,213 | 15,775 |
| Ticketing Check-In / Baggage Check-In Area | 30,302 | 28,426 | 28,982 | 87,709 |
| Outbound Checked Baggage Screening | | | | |
| EDS Inline Checked Baggage Screening Machines | 4 | 2 | 2 | 8 |
| ETD Machines | 5 | 5 | 5 | 15 |
| Total Area | 10,000 | 5,000 | 5,000 | 20,000 |
| Departing Passenger Security Screening | | | | |
| Total SSCP Lanes Required | 6 | 5 | 4 | 13 |
| SSCP PreCheck Lanes | 1 | 1 | 1 | 3 |
| SSCP AIT Machines Required | 3 | 2 | 2 | 7 |
| Total SSCP Area Required | 9,900 | 8,250 | 6,600 | 21,450 |
| Passenger Gate Departure Lounge | | | | |
| Total Recommended Aircraft Gates | 10 | 10 | 8 | 28 |
| Passenger Gate Departure Lounge Area (SF) | 27,532 | 24,779 | 24,779 | 77,091 |
| Total Gate Ticket Lift and Passenger Boarding Corridor Area | 4,200 | 4,200 | 3,360 | 11,760 |
| Total Passenger Departure Lounge Area Required | 31,732 | 28,979 | 28,139 | 88,851 |
| Baggage Claim Hall | | | | |
| Recommended Number of Baggage Claim Devices | 3 | 3 | 3 | 8 |
| Active Claim Area (SF) | 8,678 | 7,814 | 7,814 | 24,307 |
| Area of Baggage Claim Devices | 4,339 | 3,907 | 3,907 | 12,154 |
| Meeter/Greeter Area @ 20 SF Each (SF) | 904 | 814 | 814 | 0 |
| Smarte Cart Staging/Storage Device Area (SF) | 150 | 300 | 300 | 750 |
| Airline Baggage Services Offices | 5 | 6 | 7 | 0 |
| Airline Baggage Services Offices Area (SF) | 825 | 990 | 1,155 | 2,970 |
| Baggage Claim Hall Area (Adjacent Concourse) | 3,518 | 3,209 | 3,209 | 0 |
| Total Baggage Claim Area Recommended (SF) | 18,415 | 16,045 | 16,045 | 49,679 |
| Concessions/Retail | | | | |
| Central Hall Marketplace | 12,000 | - | - | 12,000 |
| Concourse Food & Beverage | 2,000 | 2,000 | 2,000 | 6,000 |
| Concourse Retail News/Gifts | 1,000 | 1,200 | 1,200 | 3,400 |
| Total Concessions/Retail | 15,000 | 3,200 | 3,200 | 21,400 |
| Restrooms | | | | |
| Arrivals Hall | 1,875 | - | - | 1,875 |
| Departures Hall | 1,875 | - | - | 1,875 |
| Concourse | 3,751 | 3,751 | 3,751 | 11,252 |
| Total Restrooms | 7,501 | 3,751 | 3,751 | 15,002 |
| Total Functional Component Area Requirements | 115,349 | 86,699 | 84,765 | 286,813 |
| Support Function Area Requirements | | | | |
| Concourse Circulation | 40,500 | 40,500 | 32,400 | 113,400 |
| North & South Halls | 22,400 | 22,400 | - | 44,800 |
| Other Circulation @ 20% of Total Component Area | 23,070 | 17,340 | 16,953 | 57,363 |
| Airline Operations Ground Support Areas @ 20% of Concourse | 14,446 | 13,896 | 12,108 | 40,450 |
| Airport Facilities Maintenance | 10,000 | 5,000 | 5,000 | 20,000 |
| Total Support Functions Area Requirements | 110,416 | 99,136 | 66,461 | 276,013 |
| Sub-Total Support Function Area Requirements | 225,765 | 185,835 | 151,226 | 562,826 |
| Building MEP/FT @ 8% of Total Area [Enclosed Area] | 18,061 | 14,867 | 12,098 | 45,026 |
| Sub-Total | 243,826 | 200,702 | 163,324 | 607,852 |
| Building Structure & Envelope @ 5% of Total Area | 12,191 | 10,035 | 8,166 | 30,393 |
| Total Building | 256,018 | 210,737 | 171,490 | 638,244 |

Advantages associated with this alternative are:

- ✓ Shorter passenger walking distances for transfer passengers
- ✓ Greater efficiency of double-loaded concourses over single-loaded concourses
- ✓ Efficient use of land and economical construction
- ✓ Dual ADG-III taxilane criteria supporting the terminal
- ✓ Potential to expand the terminal to accommodate additional gates and larger ADG-IV aircraft
- ✓ Consolidated equipment rooms and utility runs.

Disadvantages associated with this alternative:

- ✓ Longer walking distances for passengers from vehicle to aircraft gate
- ✓ Future expansion limited by alleyway that the Pier-finger concept creates between concourses
- ✓ Greater roadway congestion at terminal curbs for passenger pick-up and drop-off due to short curb frontage
- ✓ Reduced aircraft circulation for ingress/egress to/from taxiway system.

ALTERNATIVE 2: Curvilinear-Pier Design (30 Gates)

This alternative, shown in **Figure 4-17**, will replace the existing terminal with a curvilinear-pier passenger terminal. The curvilinear-pier terminal concept is considered a hybrid of the “pier-finger” and “linear-pier” terminal concepts. Many of the design attributes for the curvilinear-pier terminal are the same as the pier-finger terminal concept. Certain portions of the concourse area will be either double- or single-loaded, which determine the efficiencies and inefficiencies relative to aircraft parking. The main functions of the terminal, passenger processing (ticketing and security screening), and baggage claim, are accomplished in the main terminal area, with passenger holding areas in the concourse. This hybrid concept design will centralize passenger processing.

Ultimately, three concourses will serve the terminal with a total of 30 contact gates that accommodate ADG-III aircraft such as the Airbus A320, Boeing B737, and the Max 8. The initial terminal program requires 10 contact gates with supporting infrastructure. Demand will dictate when the remaining 20 gates will be developed. All passenger boarding bridges will have 400 Hertz power, pre-conditioned air, and potable water. Hydrant fueling capability is possible for each aircraft parking position, if so desired. The terminal apron will be designed according to ADG-III dual taxilane criteria to facilitate efficient aircraft movements to and from the airfield. An important differentiator between the pier-finger and the curvilinear terminal design is that aircraft using gates in the vicinity of the building curvature may experience delays accessing and leaving the airfield due to reduced ingress/egress access routes to aircraft parking positions.

Support facilities for the replacement terminal will be:

- ✓ A dedicated fuel farm
- ✓ Passenger vehicle parking
- ✓ A ConRAC with supporting QTA for maintenance and fueling facilities
- ✓ A new roadway network with the main entrance to the terminal from Hawes Road
- ✓ Indirect access from Ellsworth Road
- ✓ A supporting roadway network to allow access to the landside areas.

This terminal concept supports 244 acres of aeronautical development, and 360 acres of non-aeronautical development.

Table 4-13 details the planning assumptions used in the curvilinear-pier terminal design.

Table 4-13: Curvilinear-Pier Terminal Planning Assumptions - Arrivals, Departures Demand Profile

| ARRIVALS/DEPARTURES DEMAND PROFILE | PHASE 1 | PHASE 2 | PHASE 3 | PHASE 4 | PHASE 5 | TOTAL |
|--|--------------|--------------|--------------|--------------|--------------|--------------|
| Design Aircraft | A320/B737 | A320/B737 | A320/B737 | A320/B737 | A320/B737 | A320/B737 |
| Design Aircraft Seats | 177 | 177 | 177 | 177 | 177 | 177 |
| Peak Hour Design Load Factor | 85% | 85% | 85% | 85% | 85% | 85% |
| Peak Hour Originating Aircraft Seats ¹ | 1,770 | 1,239 | 1,239 | 531 | 531 | 5,310 |
| Total Peak Hour Passengers | 1,505 | 1,053 | 1,053 | 451 | 451 | 4,514 |
| Peak Hour Originating Passengers (PHOP) | 1,505 | 1,053 | 1,053 | 451 | 451 | 4,514 |
| Peak Ten Minute Percent of Originating Passengers | 20% | 20% | 20% | 20% | 20% | 20% |
| Peak Ten Minute Originating Passengers | 301 | 211 | 211 | 90 | 90 | 903 |
| Peak Hour Arriving Flights | 8 | 9 | 10 | 11 | 12 | - |
| Peak Hour Terminating Aircraft Seats | 1,416 | 1,593 | 1,770 | 1,947 | 2,124 | 2,124 |
| Peak Hour Terminating Passengers (PHTP) | 1,204 | 1,354 | 1,505 | 1,655 | 1,805 | 1,805 |
| Peak Hour Terminating Passengers w/Bags Percent | 30% | 30% | 30% | 30% | 30% | 30% |
| Peak Hour Terminating Passengers w/Bags Percent | 361 | 406 | 451 | 496 | 542 | 542 |
| Peak Twenty Minute Terminating Passengers w/Bags | 361 | 406 | 451 | 496 | 542 | 542 |
| Peak Twenty Minute Terminating Passengers w/Bags Percent | 100% | 100% | 100% | 100% | 100% | 100% |

Source: Mead & Hunt & InterVistas, 2019

1) Mead & Hunt Master Plan Options, 2019

As identified in **Table 4-14**, a detailed terminal component program summary was developed for the curvilinear-pier terminal design.

Table 4-14: Curvilinear-Pier Terminal Component Program

| TERMINAL COMPONENT PROGRAM SUMMARY | PHASE 1 | PHASE 2 | PHASE 3 | PHASE 4 | PHASE 5 | TOTAL |
|---|----------------|----------------|----------------|---------------|---------------|----------------|
| Ticketing | | | | | | |
| Kiosks | 22 | 15 | 15 | - | - | 52 |
| Counter Positions | 13 | 9 | 9 | - | - | 31 |
| Total Positions | 35 | 24 | 24 | - | - | 83 |
| Airline Ticket Office Public Space-Passenger Contact & Q (SF) | 2,616 | 1,908 | 1,956 | - | - | 6,480 |
| Airline Ticket Office Public Counter Space (SF) | 2,616 | 1,908 | 1,956 | - | - | 6,480 |
| Airline Ticket Office Operations Areas (SF) | 6,540 | 4,770 | 4,890 | - | - | 16,200 |
| Ticket Hall Circulation (SF) | 6,540 | 4,770 | 4,890 | - | - | 16,200 |
| Ticket Hall Waiting Area (SF) | 5,450 | 3,975 | 4,075 | - | - | 13,500 |
| Ticketing Check-In / Baggage Check-In Area | 30,302 | 22,101 | 22,657 | - | - | 75,060 |
| Outbound Checked Baggage Screening | | | | | | |
| EDS Inline Checked Baggage Screening Machines | 4 | 3 | 3 | 2 | 2 | 10 |
| ETD Machines | 5 | 4 | 4 | 2 | 2 | 17 |
| Total Area | 10,000 | 7,500 | 7,500 | 5,000 | 5,000 | 25,000 |
| Departing Passenger Security Screening | | | | | | |
| Total SSCP Lanes Required | 6 | 4 | 3 | 2 | 2 | 17 |
| SSCP PreCheck Lanes | 1 | 1 | 1 | 1 | 1 | 5 |
| SSCP AIT Machines Required | 3 | 2 | 1 | 1 | 1 | 8 |
| Total SSCP Area Required | 9,900 | 6,600 | 4,950 | 3,300 | 3,300 | 28,050 |
| Passenger Gate Departure Lounge | | | | | | |
| Total Recommended Aircraft Gates | 10 | 7 | 7 | 3 | 3 | 30 |
| Passenger Gate Departure Lounge Area (SF) | 27,532 | 19,273 | 19,273 | 8,260 | 8,260 | 82,597 |
| Total Gate Ticket Lift and Passenger Boarding Corridor Area | 4,200 | 2,940 | 2,940 | 1,260 | 1,260 | 12,600 |
| Total Passenger Gate Departure Lounge Area Required | 31,732 | 22,213 | 22,213 | 9,520 | 9,520 | 95,197 |
| Baggage Claim Hall | | | | | | |
| Recommended Number of Baggage Claim Devices | 3 | 2 | 2 | 1 | 1 | 9 |
| Active Claim Area (SF) | 8,678 | 6,067 | 6,067 | 2,611 | 2,611 | 26,035 |
| Area of Baggage Claim Devices | 4,339 | 3,034 | 3,034 | 1,306 | 1,306 | 13,018 |
| Meeter/Greeter Area @ 20 SF Each (SF) | 904 | 632 | 632 | 272 | 272 | 0 |
| Smarte Cart Staging/Storage Device Area (SF) | 150 | 300 | 300 | 300 | 300 | 1,350 |
| Airline Baggage Services Offices | 5 | 6 | 7 | 7 | 7 | 0 |
| Airline Baggage Services Offices Area (SF) | 825 | 990 | 1,155 | 1,155 | 1,155 | 5,280 |
| Baggage Claim Hall Area (Adjacent Concourse) | 3,518 | 2,508 | 2,508 | 1,122 | 1,122 | 10,779 |
| Total Baggage Claim Area Recommended (SF) | 18,415 | 12,541 | 12,541 | 5,611 | 5,611 | 53,894 |
| Concessions/Retail | | | | | | |
| Central Hall Marketplace | 12,000 | - | - | - | - | 12,000 |
| Concourse Food & Beverage | 2,000 | 2,000 | 2,000 | 1,200 | 1,200 | 8,400 |
| Concourse Retail News/Gifts | 1,000 | 1,200 | 1,200 | 600 | 600 | 4,600 |
| Total Concessions/Retail | 15,000 | 3,200 | 3,200 | 1,800 | 1,800 | 25,000 |
| Restrooms | | | | | | |
| Arrivals Hall | 1,875 | - | - | - | - | 1,875 |
| Departures Hall | 1,875 | - | - | - | - | 1,875 |
| Concourse | 3,751 | 3,751 | 3,751 | 1,875 | 1,875 | 15,002 |
| Total Restrooms | 7,501 | 3,751 | 3,751 | 1,875 | 1,875 | 18,753 |
| Total Functional Component Area Requirements | 122,850 | 77,905 | 76,811 | 3,751 | 3,751 | 320,954 |
| Support Function Area Requirements | | | | | | |
| Concourse Circulation | 40,500 | 28,350 | 28,350 | 12,150 | 12,150 | 121,500 |
| Other Circulation @ 20% of Total Component Area | 24,570 | 15,581 | 15,362 | 750 | 750 | 55,513 |
| Airline Operations Ground Support Areas @ 20% of Concourse | 14,446 | 10,113 | 10,113 | 4,334 | 4,334 | 34,672 |
| Airport Facilities Maintenance | 10,000 | 5,000 | 5,000 | 5,000 | 5,000 | 20,000 |
| Total Support Functions Area Requirements | 89,516 | 59,044 | 58,825 | 22,234 | 22,234 | 231,685 |
| Sub-Total Support Function Area Requirements | 212,367 | 136,949 | 135,636 | 25,985 | 25,985 | 552,638 |
| Building MEP/FT @ 8% of Total Area [Enclosed Area] | 16,989 | 10,956 | 10,851 | 0 | 0 | 44,211 |
| Sub-Total | 229,356 | 147,905 | 146,487 | 25,985 | 25,985 | 596,849 |
| Building Structure & Envelope @ 5% of Total Area | 11,468 | 7,395 | 7,324 | 0 | 0 | 29,842 |
| Total Building | 240,824 | 155,300 | 153,811 | 25,985 | 25,985 | 626,692 |

Advantages associated with this alternative are:

- ✓ Less roadway congestion due to long curb frontage at terminal curbs for passenger pick-up and drop-off
- ✓ Expansion of terminal is possible to accommodate ADG-IV and greater aircraft, if necessary
- ✓ Dual ADG-III taxilane criteria supporting the terminal
- ✓ Simplistic design and layout of aircraft parking.

Disadvantages associated with this alternative are:

- ✓ Longer walking distances for transfer passengers
- ✓ Longer walking distances for passengers from vehicle to aircraft gate
- ✓ Less efficient passenger processing due to size and vertical circulation requirement
- ✓ Limited expansion capabilities beyond 30 gates
- ✓ Hybrid design yields less efficient, single-loaded concourses compared to more efficient, double-loaded concourses
- ✓ Reduced aircraft circulation for ingress/egress to/from taxiway system as a result of the building design (building curve).

ALTERNATIVE 3: Linear-Pier Design (28 Gates)

This alternative, shown in **Figure 4-18**, will replace the existing terminal with a linear-pier passenger terminal. The linear-pier terminal concept allows for aircraft to be positioned in a perpendicular, noise-in relationship to the pier. This type of configuration works well for airports that predominately serve origin and destination travelers, and hub characteristics. Access to the terminal area will be at the base of the concourse or pier. Pedestrian circulation will move down the center of the pier through a corridor with holdrooms. Various services and amenities will be arranged along both sides of the circulation spine to serve enplaning and deplaning passengers. This concept will fully separate the passenger processing functions from the concourse activities, thus enabling each element to develop according to its own requirements.

Ultimately, a single concourse will serve the terminal with a total of 28 contact gates accommodating ADG-III aircraft such as the Airbus A320, Boeing B737, and the Max 8. The initial terminal program will require 10 contact gates with supporting infrastructure. Demand will dictate when the remaining 18 gates will be developed. All passenger boarding bridges will have 400 Hertz power, pre-conditioned air, and potable water. Hydrant fueling capability is possible for each aircraft parking position, if so desired. The terminal apron will be designed according to ADG-III dual taxilane criteria to facilitate efficient aircraft movements to and from the airfield. Backside gates, however, will only meet ADG-III single taxilane criteria due to space and setback requirements, which may lead to increased aircraft taxi times to the active airfield.

Support facilities for the replacement terminal will be:

- ✓ A dedicated fuel farm
- ✓ Passenger vehicle parking
- ✓ A ConRAC with supporting QTA for maintenance and fueling facilities
- ✓ A new roadway network with the main entrance to the terminal from Hawes Road
- ✓ Indirect access from Ellsworth Road
- ✓ A supporting roadway network to allow access to the landside areas.

This terminal concept will support 244 acres of aeronautical development, and 360 acres of non-aeronautical development.

Table 4-15 details the planning assumptions used in the linear-pier terminal design.

Table 4-15: Linear-Pier Terminal Planning Assumptions - Arrivals, Departures Demand Profile

| ARRIVALS/DEPARTURES DEMAND PROFILE | PHASE 1 | PHASE 2 | PHASE 3 | TOTAL |
|--|--------------|--------------|--------------|--------------|
| Design Aircraft | A320/B737 | A320/B737 | A320/B737 | A320/B737 |
| Design Aircraft Seats | 177 | 177 | 177 | 177 |
| Peak Hour Design Load Factor | 85% | 85% | 85% | 85% |
| Peak Hour Originating Aircraft Seats ¹ | 1,770 | 1,593 | 1,593 | 4,956 |
| Total Peak Hour Passengers | 1,505 | 1,354 | 1,354 | 4,213 |
| Peak Hour Originating Passengers (PHOP) | 1,505 | 1,354 | 1,354 | 4,213 |
| Peak Ten Minute Percent of Originating Passengers | 20% | 20% | 20% | 20% |
| Peak Ten Minute Originating Passengers | 301 | 271 | 271 | 843 |
| Peak Hour Arriving Flights | 8 | 9 | 10 | 27 |
| Peak Hour Terminating Aircraft Seats | 1,416 | 1,593 | 1,770 | |
| Peak Hour Terminating Passengers (PHTP) | 1,204 | 1,354 | 1,505 | 1,505 |
| Peak Hour Terminating Passengers w/Bags Percent | 30% | 30% | 30% | 33% |
| Peak Hour Terminating Passengers w/Bags Percent | 361 | 406 | 451 | 451 |
| Peak Twenty Minute Terminating Passengers w/Bags | 361 | 406 | 451 | 451 |
| Peak Twenty Minute Terminating Passengers w/Bags Percent | 100% | 100% | 100% | 100% |

Source: Mead & Hunt & InterVistas, 2019

1] Mead & Hunt Master Plan Options, 2019

As identified in **Table 4-16**, a detailed terminal component program summary was developed for the linear-pier terminal design.

Table 4-16: Linear-Pier Terminal Component Program

| TERMINAL COMPONENT PROGRAM SUMMARY | PHASE 1 | PHASE 2 | PHASE 3 | TOTAL |
|---|----------------|----------------|----------------|----------------|
| TICKETING | PHASE 1 | PHASE 2 | PHASE 3 | TOTAL |
| Kiosks | 22 | 19 | 19 | 60 |
| Counter Positions | 13 | 12 | 12 | 37 |
| Total Positions | 35 | 31 | 31 | 97 |
| Airline Ticket Office Public Space-Passenger Contact & Q (SF) | 2,616 | 2,454 | 2,502 | 7,572 |
| Airline Ticket Office Public Counter Space (SF) | 1,616 | 2,454 | 2,502 | 7,572 |
| Airline Ticket Office Operations Areas (SF) | 6,540 | 6,135 | 6,255 | 18,930 |
| Ticket Hall Circulation (SF) | 6,540 | 6,135 | 6,255 | 18,930 |
| Ticket Hall Waiting Area (SF) | 5,450 | 5,113 | 5,213 | 15,775 |
| Ticketing Check-In / Baggage Check-In Area | 30,302 | 28,426 | 28,982 | 87,709 |
| Outbound Checked Baggage Screening | | | | |
| EDS Inline Checked Baggage Screening Machines | 4 | 2 | 2 | 8 |
| ETD Machines | 5 | 5 | 4 | 13 |
| Total Area | 10,000 | 5,000 | 5,000 | 20,000 |
| Departing Passenger Security Screening | | | | |
| Total SSCP Lanes Required | 6 | 5 | 4 | 13 |
| SSCP PreCheck Lanes | 1 | 1 | 1 | 3 |
| SSCP AIT Machines Required | 3 | 2 | 2 | 7 |
| Total SSCP Area Required | 9,900 | 8,250 | 6,600 | 21,450 |
| Passenger Gate Departure Lounge | | | | |
| Total Recommended Aircraft Gates | 10 | 9 | 9 | 28 |
| Passenger Gate Departure Lounge Area (SF) | 27,352 | 24,779 | 24,770 | 77,091 |
| Total Gate Ticket Lift and Passenger Boarding Corridor Area | 4,200 | 3,780 | 3,780 | 11,760 |
| Total Passenger Departure Lounge Area Required | 31,732 | 28,559 | 28,559 | 88,851 |
| Baggage Claim Hall | | | | |
| Recommended Number of Baggage Claim Devices | 3 | 3 | 3 | 9 |
| Active Claim Area (SF) | 8,678 | 7,814 | 7,814 | 24,307 |
| Area of Baggage Claim Devices | 4,339 | 3,907 | 3,907 | 12,154 |
| Meeter/Greeter Area @ 20 SF Each (SF) | 904 | 814 | 814 | 0 |
| Smarter Cart Staging/Storage Device Area (SF) | 150 | 300 | 300 | 750 |
| Airline Baggage Services Offices | 5 | 6 | 7 | |
| Airline Baggage Services Offices Area (SF) | 825 | 990 | 1,155 | 2,970 |
| Baggage Claim Hall Area (Adjacent Concourse) | 3,581 | 3,209 | 3,209 | 9,936 |
| Total Baggage Claim Area Recommended (SF) | 18,415 | 16,045 | 16,045 | 49,679 |
| Concessions/Retail | | | | |
| Central Hall Marketplace | 12,000 | - | - | 12,000 |
| Concourse Food & Beverage | 2,000 | 2,000 | 2,000 | 6,000 |
| Concourse Retail News/Gifts | 1,000 | 1,200 | 1,200 | 3,400 |
| Total Concessions/Retail | 15,000 | 3,200 | 3,200 | 21,400 |
| Restrooms | | | | |
| Arrivals Hall | 1,875 | - | - | 1,875 |
| Departures Hall | 1,875 | - | - | 1,875 |
| Concourse | 3,750 | 3,750 | 3,750 | 11,250 |
| Total Restrooms | 7,500 | 3,750 | 3,750 | 15,000 |
| Total Functional Component Area Requirements | 115,349 | 86,280 | 85,186 | 286,815 |
| Support Function Area Requirements | | | | |
| Concourse Circulation | 40,500 | 36,450 | 36,450 | 113,400 |
| Other Circulation @ 20% of Total Component Area | 23,070 | 17,256 | 17,037 | 57,363 |
| Airline Operations Ground Support Areas @ 30% of Concourse | 21,670 | 19,503 | 19,503 | 60,676 |
| Airport Facilities Maintenance | 10,000 | 5,000 | 5,000 | 20,000 |
| Total Support Functions Area Requirements | 95,240 | 78,209 | 77,990 | 251,439 |
| Sub-Total | 210,589 | 159,489 | 158,176 | 538,254 |
| Building MEP/FT @ 8% of Total Area [Enclosed Area] | 16,847 | 12,759 | 12,654 | 43,060 |
| Sub-Total | 227,436 | 172,248 | 170,830 | 581,314 |
| Building Structure & Envelope @ 12% of Total Area | 11,372 | 8,612 | 8,541 | 29,066 |
| Total Building | 238,808 | 180,860 | 179,371 | 610,380 |

Advantages associated with this alternative are:

- ✓ Shorter walking distances for passengers from vehicle to aircraft gate
- ✓ Less roadway congestion due to longer curb frontage at the terminal curbs for passenger pick-up and drop-off
- ✓ Expansion of the terminal is possible to accommodate additional gates and larger ADG-IV aircraft
- ✓ Efficient passenger processing due to size
- ✓ Clear passenger orientation and wayfinding
- ✓ Simplistic construction methodology
- ✓ Dual ADG-III taxiway system on the apron supporting terminal.

Disadvantages associated with this alternative are:

- ✓ Longer walking distances for transfer passengers
- ✓ Less efficient, single-loaded concourses compared to more efficient, double-loaded concourses
- ✓ Single ADG-III taxiway on all backside gates
- ✓ Longer minimum connection time requirements
- ✓ Longer conduit runs for supporting utility infrastructure
- ✓ Duplication of facilities and amenities due to length of concourse.

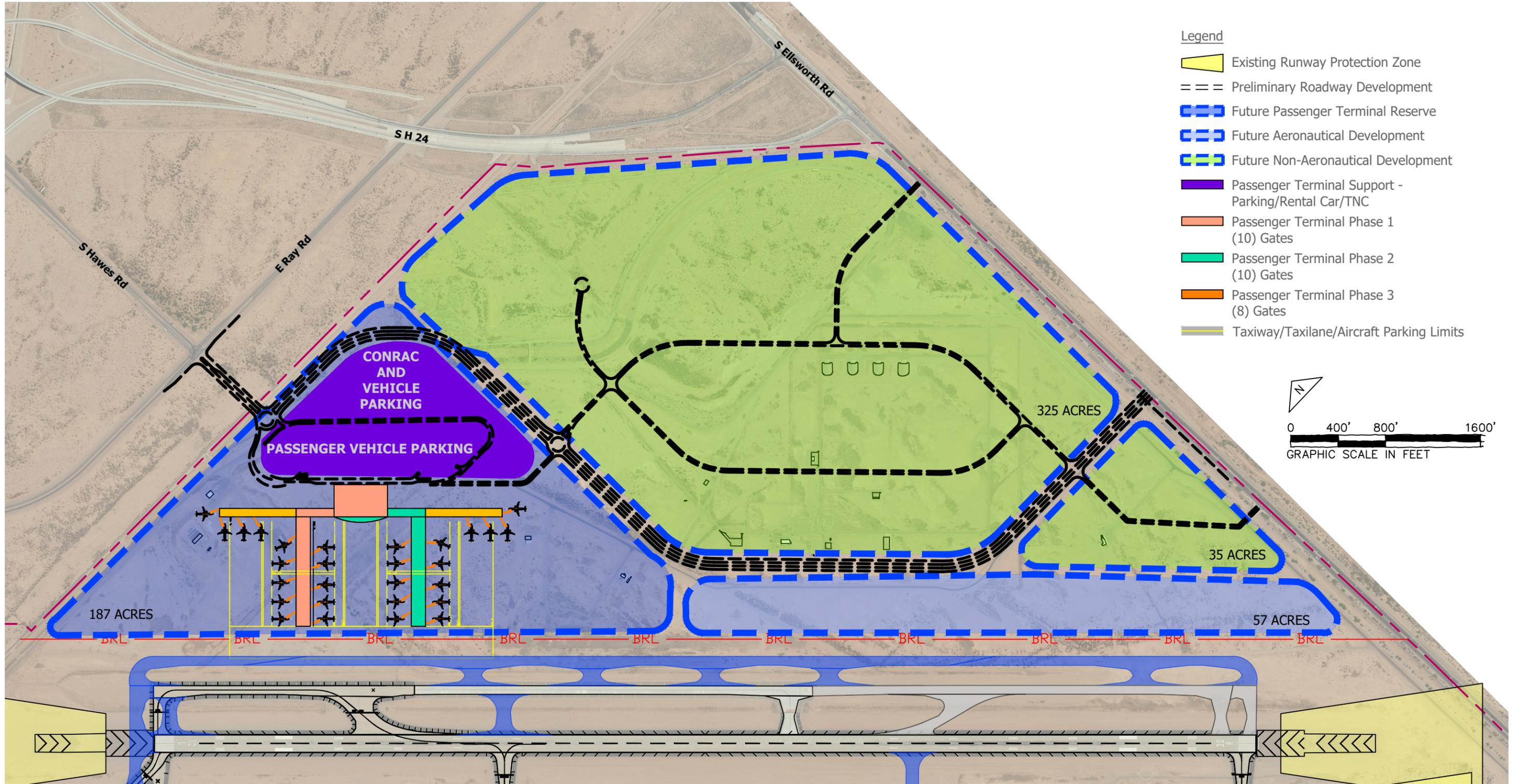


Figure 4-16
**Terminal Development
 Alternative 1
 Pier-Finger Design - 28 Gates**

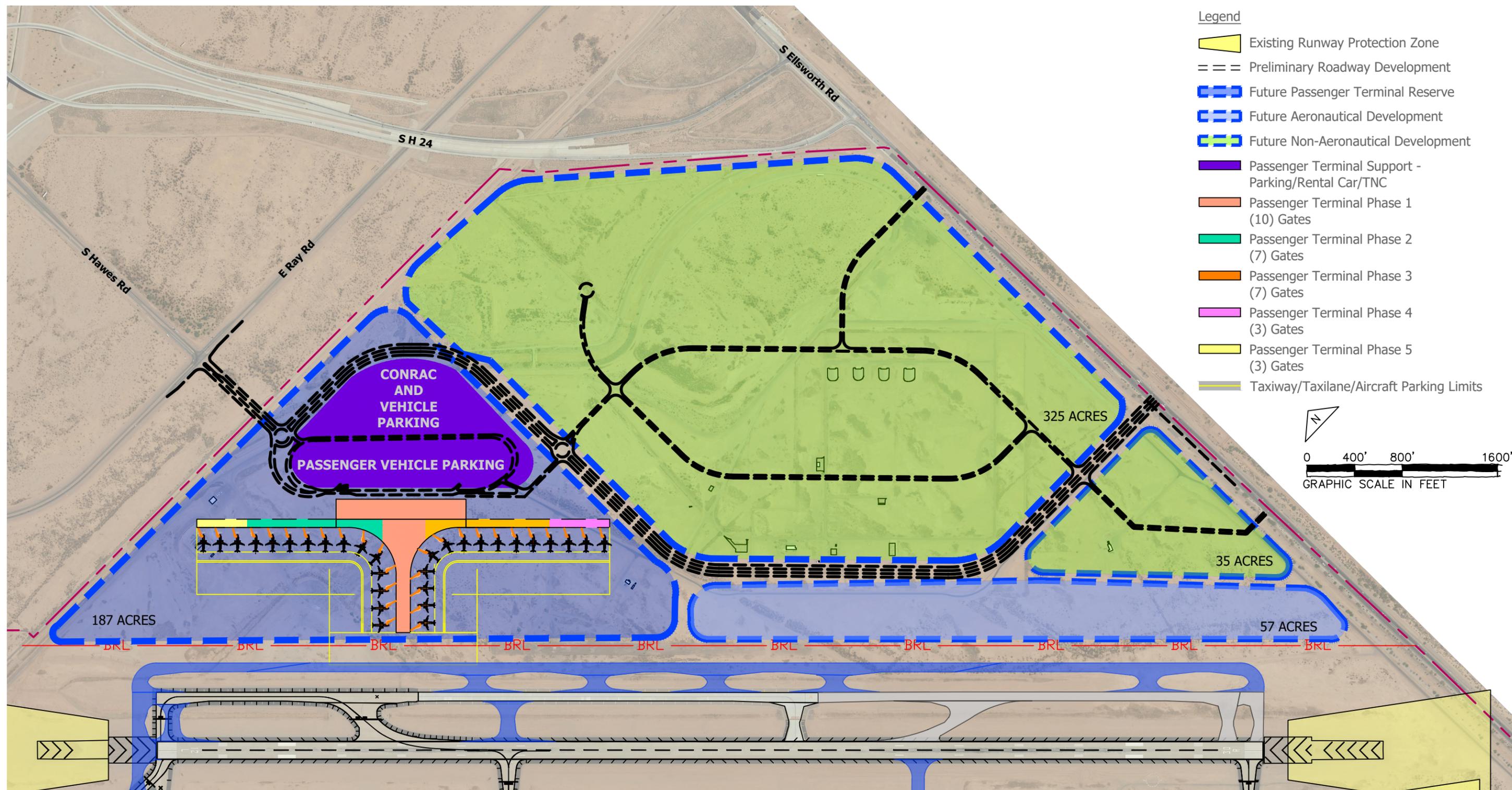
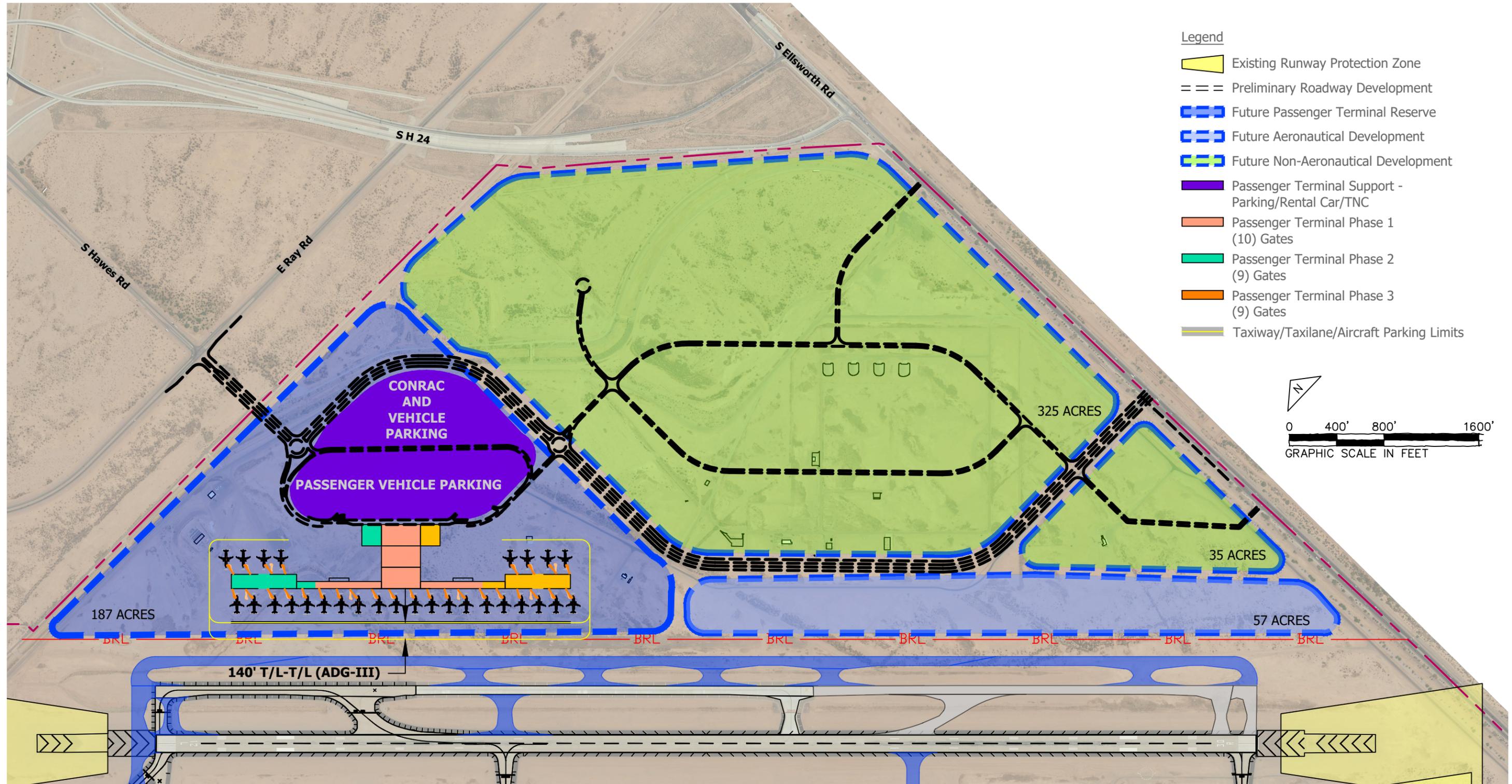


Figure 4-17
**Terminal Development
 Alternative 2
 Curvilinear-Pier Design - 28 Gates**



- Legend
- Existing Runway Protection Zone
 - Preliminary Roadway Development
 - Future Passenger Terminal Reserve
 - Future Aeronautical Development
 - Future Non-Aeronautical Development
 - Passenger Terminal Support - Parking/Rental Car/TNC
 - Passenger Terminal Phase 1 (10) Gates
 - Passenger Terminal Phase 2 (9) Gates
 - Passenger Terminal Phase 3 (9) Gates
 - Taxiway/Taxilane/Aircraft Parking Limits

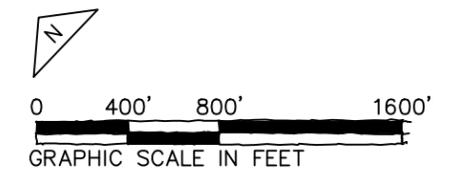


Figure 4-18
**Terminal Development
 Alternative 3
 Linear-Pier Design - 28 Gates**

SUMMARY EVALUATION OF REPLACEMENT PASSENGER TERMINAL ALTERNATIVES

Table 4-17 presents an evaluation of the various alternatives for the replacement of the commercial passenger terminal at IWA.

Table 4-17: Summary Evaluation Matrix of Replacement Passenger Terminal Alternatives

| IMPACT CATEGORY | ALTERNATIVE 1 | ALTERNATIVE 2 | ALTERNATIVE 3 |
|---|---|---|--|
| Description of Improvement | Pier-Finger Terminal Design (28 Gates) | Curvilinear-Pier Terminal Design (30 Gates) | Linear-Pier Terminal Design (28 Gates) |
| PERFORMANCE REQUIREMENTS | | | |
| Accommodates Anticipated Passenger Demand | Yes | Yes | Yes |
| Accommodates Anticipated ADG-III Aircraft (A320 / B737) | Yes | Yes | Yes |
| OPERATIONAL CAPABILITIES | | | |
| Passenger Walk Distance (Full Terminal Buildout) | Shortest | Medium Length | Longest |
| Terminal Curb Length | Shortest | Longest | Medium Length |
| Aircraft Taxilane Entry Point (Degree of Difficulty) | Somewhat Restrictive | Somewhat Restrictive | Least Restrictive |
| Accommodates ADG-III and Greater Aircraft | Yes | Yes | Yes |
| Aircraft Maneuverability | Potential Delay for Aircraft Entering Movement Area | Potential Aircraft Delay on Pushback Based on Gate Location | Single ADG-III Taxilane on Backside Terminal Gates |
| Operational Impacts | Terminal Design Creates Dual ADG-III Taxilane in Alleyway | Potential Restriction on Curved Portion of Concourse | Single ADG-III Taxilane on Backside Terminal Gates |
| LAND USE COMPATABILITY | | | |
| Impacts to Airport Property Use | No | No | No |
| Property Acquisitions/Easements | No | No | No |
| Impact to Other Facilities | No | No | No |
| ENVIRONMENTAL IMPACT POTENTIAL | | | |
| NEPA Compliance (Initial Development Phase) | Yes | Yes | Yes |
| Tenant Relocation | No | No | No |
| Utilities and Support Infrastructure | Required | Required | Required |
| STAKEHOLDER FEEDBACK | | | |
| Supports "Just Plane Easy" Theme | Yes | Yes | Yes |
| Compatible with Existing Development | Yes | Yes | Yes |
| CONSTRUCTABILITY | | | |
| Roadway Upgrades | Required | Required | Required |
| Expansion Potential | Simplistic | Simplistic | Simplistic |
| Impact to Airport Operations | No | No | No |
| Phasing Complexity | Simplistic | Simplistic | Simplistic |
| ALTERNATIVES EVALUATION | | | |
| DETERMINATION | NEUTRAL | NEUTRAL | FAVORABLE |

Recommended Conceptual Development Plan

The recommended conceptual development plan outlines the proposed development and facility improvements that will not only meet the forecasted demand presented in **Chapter 2 – Forecast** and mitigate the deficiencies presented in **Chapter 3 – Facility Requirements**, but ultimately support competitiveness and financial viability for the Airport. These improvement alternatives are recommended:

Airfield

- ✓ Extend Runway 12R/30L by 1,275 feet and Runway 12L/30R by 200 feet.
- ✓ Construct a dual full-length parallel taxiway east of Taxiway C.
- ✓ Construct a full-length parallel taxiway system west of Runway 12C/30C.
- ✓ Construct a cross-field taxiway between Runways 12C/30C and 12L/30R.
- ✓ Implement the FAA-approved solution to Hot Spot 1.
- ✓ Implement 1-mile approach minimums for Runway 12L/30R.
- ✓ Reconstruct Taxiway G.
- ✓ Construct bypass taxiways for Runways 12L and 30L, and a taxiway connector across Runway 12R.

Airfield Support Facilities

- ✓ Construct Compass Calibration Pad Option 2.
- ✓ Construct the GA and Maintenance run-up areas proposed in the North GA Run-Up/Holding Bay & Maintenance Run-Up Area Alternative.

Westside Development Facility Improvements

Arterial Roadway System

- ✓ Discourage additional traffic along S. Sossaman Road by encouraging alternative access to development that may increase traffic volumes.

Parking (Short-Term)

- ✓ Restructure fees to discourage overnight parking in Hourly Lot (shift to Daily Lot) and to encourage increased use of Economy Lot.
- ✓ Monitor parking preference changes (impact to Daily Lot) with the addition of Covered Parking.
- ✓ Transition employee parking out of the Daily Lot as soon as feasible:
 - Can temporarily be in Economy Lot during anticipated peak month/ events
 - Permanent location at existing Cell/Ride Share/Taxi lot.
- ✓ Relocate the Cell/Ride Share/Taxi Lot to the northern parcel off S. Sossaman Road.
- ✓ Accommodate additional rental parking demand in expanded Rental Support Facility on S. Sossaman Road, and/or Economy Lot based on operator needs/wants (Rental Flex).

- ✓ Make improvements to pedestrian crossings:
 - Pavement Markings
 - Refuge Islands
 - Signal/crosswalk timing at controlled intersection.

Parking (Mid-Term)

- ✓ Relocate all rental parking supply to the expanded Rental Support Facility on S. Sossaman Road, and/or Economy Lot based on operator needs/wants (Rental Flex).
- ✓ Convert Rental Pick-Up to a Premium Hourly Flex Lot with value added covered parking.
- ✓ Convert Rental Drop-Off lot to additional Daily Lot parking in anticipation of reclaiming a portion of the Daily Lot Annex for Aeronautical use (RON/ROD aircraft parking positions).

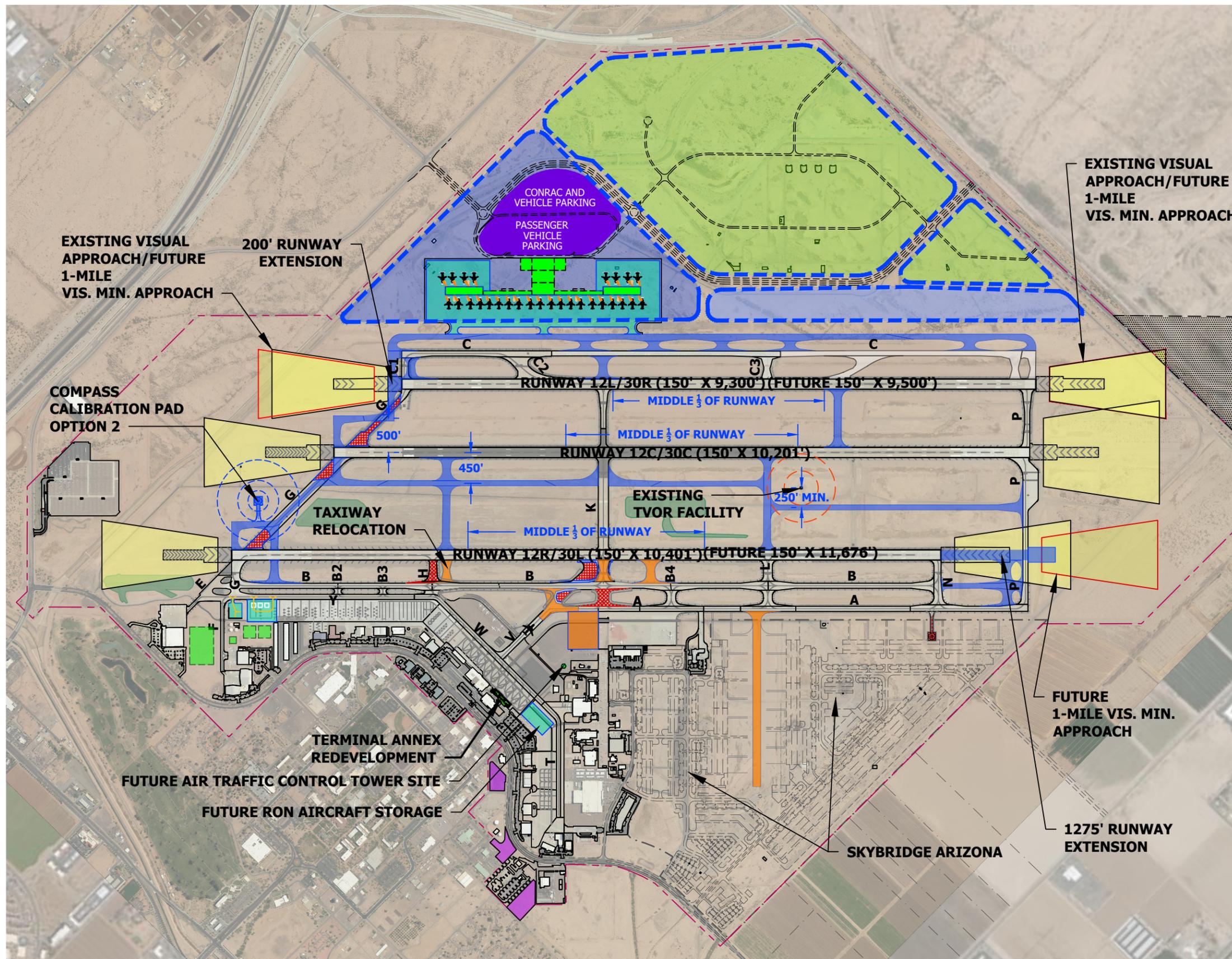
Parking (Long-Term)

- ✓ Relocate the terminal to the east side.
- ✓ Convert the westside terminal to accommodate private and general aviation uses.
- ✓ Transition westside parking facilities to alternative support and value-added uses:
 - Private aviation parking
 - Future aeronautical uses
 - Future economic development opportunities.

Replacement Passenger Terminal

- ✓ Develop a linear-pier passenger terminal on the east side of the Airport.
- ✓ Develop adequate support facilities for the initial Phase 1 development program.

The Airport’s conceptual development plan will successfully satisfy the Airport’s needs through 2038. The Preferred Conceptual Development Plan is shown in **Figure 4-19**. Capital costs will be calculated and added to the improvement projects identified in the conceptual development plan. A list of projects and the associated environmental documentation requirements will be incorporated into the subsequent Facilities Implementation and Financial Feasibility Chapter. An ALP will be developed to identify the airport layout options through the end of the planning period in 2038.



- Legend
- Existing Runway Protection Zone
 - Preliminary Roadway Development
 - Future Passenger Terminal Reserve
 - Future Aeronautical Development
 - Future Non-Aeronautical Development
 - Passenger Terminal Support - Parking/Rental Car/TNC
 - Existing Detention Ponds
 - Existing Avigation Easement
 - Future Runway Protection Zone
 - Future Runway/Taxiway Pavement
 - Future Apron Pavement
 - Existing IWA Programmed Project
 - Pavement to be Removed
 - Future Buildings/Development
 - Future Economic Development Opportunity

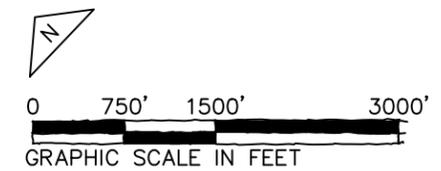


Figure 4-19
**Preferred Airport
Conceptual Development Plan**



Mead
& Hunt

8777 E. Via de Ventura, Suite 398
Scottsdale, AZ 85258
480-718-1896
www.meadhunt.com

PSM2
InterVistas
Unison Consulting
Martinez Geospatial