Chapter Four: ALTERNATIVES

In the previous chapter, the aviation facilities required to satisfy airside and landside demand through the long-term planning period of the master plan were identified. In addition, several Federal Aviation Administration (FAA) standards were discussed that apply to airfield design. The next step in the planning process is to evaluate reasonable ways these facilities can be provided while also meeting design standards. The purpose of this chapter is to formulate and examine rational development alternatives that address the short-, intermediate-, and long-term planning horizon levels. Because there are a multitude of possibilities and combinations, it is necessary to focus on those opportunities that have the greatest potential for success. Each alternative provides a different approach to meeting existing and future facility needs; these layouts are presented for purposes of evaluation and discussion.

Some airports become constrained due to limited availability of space, while others may be constrained due to adjacent land use development or geographical features. Careful consideration should be given to the layout of future facilities and impacts to potential airfield improvements at Scottsdale Airport (SDL). Proper planning at this time can ensure the long-term viability of the airport for aviation and economic growth.

The primary goal of this planning process is to develop a feasible plan to meet the needs of the projected market demand over the next 20 years. The plan of action should be developed in a manner that is consistent with the future goals and objectives of the City of Scottsdale, airport leadership, and airport stakeholders, including users of the airport and the local community and region, all of whom have a vested interest in the development and operation of SDL.

The goal is to develop an underlying rationale that supports the recommended development plan, which will be presented in Chapter Five. Through this process, an evaluation of the highest and best uses of airport property will be made, while also weighing local development goals, efficiency, physical and environmental factors, capacity, and appropriate safety design standards.

The alternatives presented in this chapter have been formulated as potential ways to meet the overall program objectives for the airport, and to do so in a balanced manner. Through coordination with SDL management, the Planning Advisory Committee (PAC), and the public, an alternative (or combination of alternatives) will be refined and modified as necessary into a recommended development concept; therefore, the planning considerations and future alternatives presented in this chapter can be considered as the starting points in the evolution of a recommended development concept for the future of SDL.

It should be noted that all the development alternatives presented in this chapter are conceptual in nature and are subject to further engineering refinement as the projects move to the implementation phase. All the alternatives represent a possible future condition. In fact, the recommended development concept, to be presented in the next chapter, is one option that may be further refined in the future.

PLANNING OBJECTIVES

A set of basic planning objectives has been established to guide the alternatives development process. It is the goal of this master planning effort to produce a development plan for the airport that addresses forecast aviation demand and meets FAA design standards to the greatest degree possible. The aviation department provides the overall guidance for the operation and development of the airport. It is of primary concern that SDL is marketed, developed, and operated for the betterment of the community and its users. The following basic planning principles and objectives will be utilized as general guidelines during this planning effort:

- To develop a safe, attractive, and efficient aviation facility in accordance with applicable federal, state, and local regulations
- To preserve and protect public and private investments in existing airport facilities
- To provide a means for the airport to grow as dictated by demand
- To put into place a plan to ensure the long-term viability of the airport as well as to promote compatible land uses surrounding the airport
- To develop a facility that is readily responsive to the changing needs of all aviation users
- To be reflective and supportive of the long-term planning efforts currently applicable to the region
- To develop a facility with a focus on self-sufficiency in both operational and developmental cost recovery
- To ensure that future development is environmentally compatible

The development alternatives are categorized into two functional areas: airside and landside. The airside relates to runways, taxiways, navigational aids, lighting and marking aids, etc., which require the greatest commitment of land area to meet the physical layout of an airport, as well as the required airfield safety standards. The design of the airfield also defines minimum separation distances from the runway and object clearance standards. These criteria are defined first to ensure the fundamental needs of SDL are met. The landside element includes terminal services, hangars, aircraft parking aprons, as well as utilization of remaining property to provide revenue support for the airport and to benefit the economic development and well-being of the region.

Each functional area interrelates and affects the development potential of the others; therefore, all areas are examined individually, and then as a whole, to ensure the final plan is functional, efficient, and cost-effective. The total impact of all these factors must be evaluated to determine if the investment in SDL will meet the needs of the surrounding area, both during and beyond the planning period of this study.

PREVIOUS AIRPORT PLANS

The previous master plan for SDL was completed in 2015 and had a forecast base year of 2012. **Exhibit 4A** shows the master plan concept from the 2015 master plan. It included numerous proposed development projects, many of which have been completed. It also included various redevelopment plans, including the now existing Aviation Business Center.

The airport layout plan (ALP) from the 2015 master plan has been updated several times. These updates included application of the FAA-approved Modification of Standard (MOS) detailed in Chapter Three, several through-the-fence taxilane connectors, and the completed reconfiguration of the north aircraft holding bays and of Taxiway A13.

The currently approved ALP and data sheet are shown on **Exhibit 4B**. The drawing graphically depicts both airside and landside recommendations based upon previous airport planning efforts that include:

- Planned new Taxiways B2, B9, and B15
- Planned new hangars at the south end of the terminal apron, one of which has been completed
- Redevelopment of certain hangar areas (south end; current Jet Aviation hangar)

The analysis presented in this chapter will revisit the recommendations presented on the ALP, as well as in the previous master plan. Since completion of the last master plan, the FAA has made significant modifications to airfield design standards, as outlined in the previous chapter. As such, some of the previous plan's elements may be carried over to this master plan, while others may be changed or removed from further consideration.

NO ACTION/NON-DEVELOPMENT ALTERNATIVES

The aviation department is charged with managing the airport for the economic betterment of the community and region. SDL is a vibrant facility with a substantial economic impact on the region. **An analysis of the economic benefit of the airport, completed in 2021, found that SDL generates more than $1.0 billion annually in total economic output and nearly 5,970 jobs**.

In any alternatives evaluation, a no-action option should be considered. Under a no-action plan, the airport would remain in its existing condition. No new development would be planned, and no significant investment would be made into existing infrastructure such as the runways, taxiways, and aprons. This would be inconsistent with the long-term goals of the FAA and the City of Scottsdale, which is to maintain a safe and effective facility that is compatible with the surrounding environment. SDL is an important economic engine for the region and choosing not to adequately maintain the facility would ultimately lead to a negative economic impact.

Relocation of services to another airport, or development of a new airport site, is another potential no-action alternative. Closing SDL and moving all aeronautical activity to other airports would not be in the best interest of the City of Scottsdale. More than $1.0 billion in economic output would be lost; therefore, closing SDL and relocating aviation service and aircraft to other airports is not considered viable.

The development of a new airport is a complex and expensive option. A new site will require greater land area, duplication of investment in facilities, installation of supporting infrastructure that is already available at the existing site, and greater potential for negative impacts to natural, biological, and cultural resources. This master plan will not consider relocation of services or development of a new airport as viable alternatives.

The purpose of this master plan is to examine aviation needs at SDL over the course of the next 20 years; therefore, this master plan will examine the needs of the existing airport and present a program of potential capital improvement projects to cover the scope of the plan. The airport is a lucrative business, transportation utility, and economic asset for the region. It can accommodate existing and future demand and should be developed accordingly to support the interests of residents and businesses that rely upon it. Ultimately, the final decision regarding development rests with the City of Scottsdale, ADOT, and the FAA on an individual project basis. The analysis to follow covers airside and landside development alternatives that consider an array of facility demands, including safety, capacity, access, and efficiency.

AIRSIDE ALTERNATIVES

The airside relates to the runway and taxiway system. The airside alternatives analysis will examine specific elements individually, then combine various viable solutions into several consolidated airside alternatives. The alternatives process often includes presenting options that are clearly not feasible to document exactly why those options should not be further considered. Ultimately, a decision will be made following consultation with the various airport stakeholders as to the most appropriate plan.

Exhibit 3J previously presented a summary of the primary airside planning considerations for the alternatives analysis. These considerations are the result of the findings of the aviation demand forecasts and facility requirements evaluations, as well as input from airport stakeholders.

RUNWAY DESIGN CODE (RDC)

As a reminder the RDC for a given runway is a function of the frequency of use of the runway by aircraft type (or family of aircraft with similar design characteristics) and the instrument approach visibility minimums. The established RDC then determines the applicable design standards for that runway.

The FAA-approved RDC for Runway 3-21 is D-II-5000, as detailed in the previous chapter. However, it was established that there are frequent operations by aircraft that fall within RDC D-III-5000. Over many years of study, it has been determined that the runway is incapable of fully meeting the design standards associated with D-III-5000. Because of this, the FAA has approved three Modifications of Standards (MOS) and approved the D-II-5000 RDC. Where feasible, the runway should be planned to accommodate the D-III-5000 design standards; therefore, a review of each design standard is undertaken to determine if incremental improvements can be made toward the D-III-5000 design standards or if the status quo is more appropriate.

CONSIDERATION #1: RUNWAY TO TAXIWAY SEPARATION

Both parallel taxiways are 250 feet, centerline to centerline, from Runway 3-21. The D-III standard is 400 feet, and the D-II standard is 300 feet. The FAA approved an MOS in 2019 for the parallel taxiways to remain in their current location. The analysis to follow will re-examine the feasibility of meeting the D-II standard of 300 feet because D-II is the FAA-approved RDC for the runway.

TABLE 4A: Runway/Taxiway Separation Standards

Design Element	Runway Design Standard: D-III-5000*	Runway Design Standard: D-II-5000**	Currently Available: D-II-5000
Runway to Taxiway Separation	400'	300'	250'***

Table Source: FAA AC 150/5300-13B, Airport Design

*Operational critical aircraft
**FAA-approved critical aircraft (8/28/2025)
***FAA Modification of Standards approved on January 3, 2019

To meet the 300-foot standard for runway to taxiway separation, substantial reconfigurations of facilities on both the east and west sides of the runway system would be needed. These reconfigurations would significantly limit aircraft movements and staging, reduce airfield capacity, increase runway crossings, and incur substantial costs for private land and building acquisition and "buy-back" of airport property leaseholds.

The first alternative considered is to relocate Taxiway A from 250 feet of separation from the runway to 300 feet, as shown on **Exhibit 4C**. This action would affect several facilities located on the west side of the taxiway because of the need to maintain a clear Taxiway Object Free Area (TOFA). The bypass taxilane associated with the main aircraft parking apron would need to be eliminated or shifted farther to the west. This would severely limit aircraft movements and staging associated with the fixed base operators (FBO) on the west side of the airfield, especially during times of significant aircraft activity and special event traffic. Two 14-unit linear box hangars on the north Kilo Ramp area would be affected, since aircraft access to the east-facing hangars would be impacted. Furthermore, aircraft staging on the east side of the linear box hangar complexes could compromise the proposed TOFA. This property is currently being leased to a private entity. To remove the hangars (which were constructed in 2020–2021), the city would be required to "buy back" a portion of the leasehold, which is not eligible under Airport Improvement Program (AIP) funding. The "buy-back" cost of the specific portion of the leasehold is estimated at $7 million. Farther south, the bypass taxilane adjacent to the Kilo aircraft apron would also need to be eliminated. A total of 21 marked tiedown positions on the Kilo aircraft apron would be affected since these tiedowns can only be accessed via the bypass taxilane. This would create additional strain on the main aircraft parking apron to accommodate locally based aircraft, in addition to the high volume of transient aircraft. Likewise, access to the aircraft wash rack would be impacted since the bypass taxilane would need to be eliminated on the Kilo aircraft ramp. A total of 22,585 square yards of apron space, which includes the bypass taxilane on the main aircraft parking apron and the Kilo aircraft apron, would need to be eliminated. Due to the build-out of existing landside facilities on the west side of the airport, the ability to relocate airfield infrastructure affected by the potential relocation of Taxiway A is not practicable.

Exhibit 4D shows the impact of relocating Taxiway B to a separation distance of 300 feet. It would result in even greater facility impacts on the east side of the taxiway in order to maintain a clear TOFA. A total of 107,476 square feet (2.47 acres) of off-airport property, which includes 14 private parcels, would be affected to maintain a clear TOFA associated with the Taxiway B relocation. Within these private parcels, five buildings would need to be removed and/or relocated. The estimated cost of purchasing the affected parcels and facilities to provide standard safety areas associated with the taxiway relocation is $85.42 million. The city can also expect a litigious process in the event that it pursues the acquisition of these private parcels, given the significant investments that have been made. A total of 1,900 square yards of apron space would also need to be eliminated on the east side of Taxiway B, which would affect aircraft parking and staging associated with the fixed base operator (FBO) and airport-owned leaseholds on the east side of the airfield. The city would be required to "buy back" portions of these leaseholds, which are not eligible for FAA funding under the AIP. The "buy-back" cost of the specific portions of the leaseholds is estimated at $1.76 million. The perimeter service on the east side of existing Taxiway B would also need to be removed. This road is important to airport operations and maintenance staff in addition to FBO personnel needing to provide services to aircraft staged on the east and west sides of the airport. The removal of this road would require additional runway crossings and contribute to reductions in airfield capacity and the overall efficiency of the National Airspace System (NAS). Due to the build-out of existing landside facilities on the east side of the airport, the ability to relocate airfield infrastructure affected by the potential relocation of Taxiway B is not practicable.

The alternative of relocating either Taxiway A or B, but not both, to 300 feet of separation is only an incremental improvement, as the untouched parallel taxiway would still be at 250 feet of separation. The following two alternatives consider the feasibility of shifting the runway 50 feet to either side of the current centerline and moving the impacted parallel taxiway to a separation of 300 feet. **Exhibits 4E** and **4F** show these alternatives.

Both scenarios for shifting the runway and one of the taxiways would result in significant displacement of landside facilities, both on and adjacent to the airport, and would require the acquisition of private property as well as airport leasehold buy-backs. In addition, the removal of the perimeter access road would necessitate an increase in runway crossings. The alternatives involving the relocation of the runway and parallel Taxiway B would result in millions of dollars of property acquisition on the east side of the airport. Relocation of Taxiway A results in significant loss of the terminal apron, the NetJets apron, the Kilo apron, and the linear box hangars. Furthermore, the construction and environmental impacts and costs related to relocating Runway 3-21 would be very significant and take years to complete. **Table 4B** summarizes the primary impacts for each of the four alternatives considered for runway-to-taxiway separation.

These alternatives are not seen as practicable and the current airfield configuration provides acceptable levels of safety based on operational activity at the airport. Under the current configuration, both the runway safety area (RSA) and runway obstacle free zone (ROFZ) meet design standards. In addition, there is adequate buffer between the wingtips of two ADG III aircraft (wingspan of 118 feet), which is 132 feet, and for ADG II aircraft (wingspans of 79 feet) the buffer is 171 feet. Furthermore, the current locations of the parallel taxiways provide for the appropriate TOFA of 124 feet and TSA of 79 feet for ADG II aircraft. It also provides the ADG III TOFA of 171 feet and TSA of 118 feet.

TABLE 4B: Runway/Taxiway Alternatives Impacts

Category	Alternative 1 (Exhibit 4C)	Alternative 2 (Exhibit 4D)	Alternative 3 (Exhibit 4E)	Alternative 4 (Exhibit 4F)
Description	Shift Taxiway A to 300'	Shift Taxiway B to 300'	Shift Runway and Taxiway B	Shift Runway and Taxiway A
Apron Area Impacted	22,585 sy	1,900 sy	7,895 sy	70,117 sy
Tiedowns Removed	21	N/A	N/A	67
Hangar/Buildings Removed	14 Box Hangars	5 Buildings	16 Buildings	14 Box Hangars
Private Land Acquisition Cost	N/A	2.47 Acres/ 14 Private Parcels/ $85.42 million	9.49 Acres/ 21 Private Parcels/ $125.1 million	N/A
Leasehold Buy-Back Cost*	$7 million	$1.76 million	$4.61 million	$7 million
Other Impacts	Wash Rack, Taxilane, Terminal Apron, NetJets Apron, Kilo Apron	Service Road	ATCT, ARFF, Service Road	Wash Rack, Taxilane, Terminal Apron, NetJets Apron, Kilo Apron

N/A = not applicable
sy = square yards
*Not eligible for FAA funding.

As previously noted, the FAA approved an MOS on January 3, 2019, that permitted the parallel taxiways to remain at their current 250-foot separation distance. The airport has resubmitted this MOS via the FAA's Airport Data Information Portal (ADIP), which is the new process for documenting and maintaining MOS.

CONSIDERATION #2: HOLD LINE LOCATION

The aircraft hold lines on taxiways leading to the runway are positioned 152 feet from the runway centerline. The standard distance for RDC D-II and D-III is 250 feet. Extensive analysis of this issue was undertaken during the 2015 master plan. That master plan also references a Safety Risk Management Document (SRMD) that addressed this issue. As noted previously in Chapter Three of this master plan, the SRMD concluded that a hold line change could not be introduced into the National Airspace System (NAS) with an acceptable level of risk. Essentially, moving the hold lines would cause such congestion in the area airspace that it would cause more safety risks than it would solve. Any effort or recommendation to relocate the hold lines at SDL going forward should be vetted through another SRMD that includes regional airspace experts.

On the ground, the challenge of relocating the hold lines to the standard of 250 feet is obvious. The hold lines would be in the middle of both parallel taxiways since they too are 250 feet from the runway centerline. Holding aircraft would block other aircraft from passing behind them on the taxiway. At a busy airport like SDL, this situation would lead to significant congestion, and it would increase safety concerns.

To meet these typical requirements, the hold lines would need to be at least 200 feet from the runway centerline, since both the RSA and ROFZ are 400 feet wide as centered on the runway. However, the airport traffic control tower (ATCT) currently views the 152-foot hold lines as the acceptable hold location. No aircraft that are at a holding line are reported by ATCT as runway incursions. The current hold line location is essentially the dividing line between the active runway environment and the taxiway system.

CONSIDERATION #3: RUNWAY SAFETY AREA DIMENSIONS

As discussed in detail in Chapter Three, the standard RSA is 500 feet wide, and it extends 1,000 feet beyond each runway end. At SDL, it is not feasible to provide the standard RSA. FAA guidance indicates that the width of the RSA may be reduced to 400 feet when the 500-foot standard cannot be met, therefore the RSA at SDL is 400 feet wide. The 1,000-foot standard length beyond the runway ends cannot be modified in its dimensions, so adjustments to the available runway length for takeoff and landing have been made through use of declared distances to provide the 1,000-foot RSA. Exhibit 3E previously showed this current configuration for the RSA.

To provide the 1,000-foot RSA behind Runway 3 (for arrivals and departures using Runway 21), the declared end of the runway is 180 feet short of the pavement end, and an additional 820 feet is available behind the pavement end. While it does appear that the RSA behind the Runway 3 pavement end could be extended to the full 1,000 feet, it likely needs to be reduced by 180 feet to either clear obstructions or for missed approach purposes.

To provide the 1,000-foot RSA behind the Runway 21 end (for arrivals and departures using Runway 3), the declared end of the runway is 400 feet short of the pavement end, and an additional 600 feet is available behind the pavement end. Due to the location of the perimeter service road, there is no space for additional RSA behind Runway 3.

The current RSA dimensions are the maximum available for the airfield at SDL and are planned to be maintained. If the airport were to engage in another SRMD study related to the hold line location as discussed above, they could also consider the implications of extending the RSA to the south behind Runway 3. The airspace factors that impact the hold line location would also impact the RSA length (and thus the declared runway length).

CONSIDERATION #4: RUNWAY OBJECT FREE AREA DIMENSIONS

The current airfield geometry and airport property does not allow for the full runway object free area (ROFA) width of 800 feet. A perimeter service road, a blast fence, and Frank Lloyd Wright Boulevard limit the length beyond Runway 3 to 470 feet. The length beyond Runway 21 is limited to 30 feet due to the proximity to the airport's perimeter service road and Redfield Road.

To meet the ROFA standards for D-II design (800-foot width [400 feet either side of runway centerline] and 1,000-foot length beyond each runway end), substantial reconfigurations of facilities on both the east and west sides of the runway system would be needed. These reconfigurations would significantly limit aircraft movements and staging, reduce airfield capacity, increase runway crossings, and incur substantial costs on land acquisition and airport property "buy-back" leaseholds. The alternatives discussed below are not seen as practicable, and the current airfield configuration provides acceptable levels of safety based on operational activity at the airport.

The alternatives that were evaluated focused on two areas of the ROFA, which included the width on either side of Runway 3-21 as well as the length beyond each end of Runway 3-21. Obtaining the full width of the ROFA (400 feet either side of runway centerline) would require displacement of several

facilities both on and off airport property. On the west side of the runway, 21 marked tiedown positions on the Kilo aircraft apron would need to be removed and/or relocated. Although no marked tiedown positions on the main aircraft parking apron would be situated in the ROFA, apron space is affected that would negatively impact the aircraft staging for fixed base operators (FBOs) and private entities. A total of 57,025 square yards of apron space would fall within the ROFA and be deemed unusable for aircraft parking. Furthermore, two linear box hangar complexes at the north end would be impacted.

Farther north, the tiedowns on the Kilo apron are at the edge of the 400-foot ROFA standard. Aircraft staging for the linear box hangars and aircraft wash rack would compromise the ROFA, necessitating the removal of these facilities. These hangars were recently constructed in 2020-2021. To remove the hangars, the city would be required to "buy back" the leasehold, which is not eligible under Airport Improvement Program (AIP) funding. The "buy-back" cost of the leasehold is estimated at approximately $7 million. There are no viable alternatives to relocate the affected facilities and apron space without the need for property acquisition.

On the east side of the runway, a total of 614,837 square feet (14.11 acres) of off-airport property that includes 20 private parcels and seven buildings would be affected to meet ROFA width standards. The total acquisition cost associated with all parcels and facilities adjacent to the east side of the airport is estimated at $117.18 million. The on-airport ATCT and fire station would also need to be relocated to meet the ROFA width standard. In addition, 8,370 square yards of apron space associated with the FBO (Signature) and other private operators would need to be displaced. Already constrained for apron space on the east side of the airport, the loss of additional parking area would negatively impact the ability of the FBO and airport property leaseholds on the east side of the airfield from being able to stage and park aircraft. Furthermore, the city would be required to "buy back" portions of two leaseholds on the east side of the airport, at an approximate cost of $3 million. This cost is not eligible for FAA funding. There are no viable alternatives to relocate the affected facilities without the need for property acquisition. Finally, the removal of the perimeter access road adjacent to the east side of Taxiway B would require additional runway crossings associated with airport and FBO personnel. These runway crossings would reduce airfield capacity as well as the overall capacity and efficiency of the National Airspace System (NAS).

Alternatives that would meet ROFA standards beyond each runway end include the removal/relocation of Redfield Road and the perimeter service road for full southerly extension of the ROFA length. Removal/relocation of the blast fence, perimeter service road, Frank Lloyd Wright Boulevard, and the Central Arizona Project (CAP) canal would be needed for full northerly extension of the ROFA length. The environmental impacts and construction costs associated with relocating the roadways and CAP canal would be tremendous. The relocation of these facilities would create significant impacts to adjacent off-airport properties as well, including several commercial and industrial parcels adjacent to the southeast side of the airport and the golf course north of the airport.

Finally, the alternative of reducing runway length through declared distances was evaluated. Declared distances are currently implemented on the airfield to obtain full RSA standards associated with Runway 3-21. Decreasing the usable length of runway to gain additional ROFA would negatively impact aircraft operator needs, especially those associated with the significant number of jet aircraft operations that utilize the airport on a regular basis.

Through the analysis of alternatives discussed, the only practicable viable alternative is to modify the ROFA dimensions associated with Runway 3-21 as follows:

- 630 feet (width): 315 feet on the east side and 315 feet on the west side
- 470 feet (length beyond runway end): beyond the Runway 3 end only
- 500 feet (length beyond runway end): beyond the Runway 21 end only

Exhibit 4G shows the extent of the standard D-II and D-III ROFA, and it shows the limits of the current ROFA based on an FAA-approved MOS dated January 3, 2019. The airport has resubmitted this MOS via the FAA's Airport Data Information Portal (ADIP), which is the new process for documenting and maintaining MOS.

CONSIDERATION #5: DECLARED DISTANCES

Declared distances have been implemented at SDL to maximize runway length while meeting various design standards, primarily the RSA and ROFA, and for obstruction clearance. Without increasing the area beyond the runway ends available to be used for RSA and ROFA, the current declared distances reflect the maximum available runway length; therefore, any change to the declared distances would require a regional airspace analysis, typically in association with an SRMD process. As a result, no changes are planned for the existing declared distances.

CONSIDERATION #6: TAXIWAY/TAXILANE SEPARATION AND AIRCRAFT PARKING APRON

Between Taxiways A3 and A7, there is an apron edge taxilane situated on the east edge of the aircraft parking apron. The taxilane centerline is 105 feet from the centerline of parallel Taxiway A. When there are two aircraft with wide wingspans (+100 feet), there is little buffer space between the wingtips.

FAA AC 150/5300-13B, *Airport Design*, provides guidance on the separation standards. For ADG II, the separation standard from a taxiway to a parallel taxilane is 101.5 feet, centerline to centerline. For ADG III, the separation standard is 144.5 feet, centerline to centerline. The existing separation distance of 105 feet exceeds the ADG II design standard, but does not fully meet the ADG III design standard; however, there is 3.5 feet of buffer space with the current separation distance of 105 feet.

Taxiways and taxilanes have a surrounding object free area. For ADG II, the taxiway object free area (TOFA) is 124 feet wide (Taxiway A) and the taxilane object free area (TLOFA) is 110 feet, as centered on the taxiway. For ADG III, the TOFA is 171 feet wide (Taxiway A) and the TLOFA is 158 feet wide.

Aircraft are classified by the FAA, and one component of aircraft classification is based on the applicable airplane design group (ADG), which corresponds to the wingspan of aircraft. Based upon the applicable ADG of an aircraft, there are different design standards for separation distances. **Table 4C** summarizes the ADGs of common business jets, most of which operate at SDL.

TABLE 4C: Airplane Design Groups

ADG	Includes Wingspans Between:	Example Aircraft	Wingspan
ADG II	49'<79'	Cessna Citation V/Ultra/Encore	54.1'
ADG II	49'<79'	Citation Sovereign	63.1'
ADG II	49'<79'	Citation Latitude	72.3'
ADG II	49'<79'	Citation X	63.6'
ADG II	49'<79'	Challenger 350	68.9'
ADG II	49'<79'	Embraer 145	65.8'
ADG II	49'<79'	Falcon 900	63.4'
ADG III	79'<118'	Gulfstream 500	87.1'
ADG III	79'<118'	Gulfstream 550	93.5'
ADG III	79'<118'	Gulfstream 600	95.0'
ADG III	79'<118'	Gulfstream 650	99.6'
ADG III	79'<118'	Gulfstream 700/800	103.0'
ADG III	79'<118'	Global 5000/6000	94.0'
ADG III	79'<118'	Global 7500	104.3'
ADG III	79'<118'	Global 8000	104.0'
ADG III	79'<118'	Falcon 8X	86.4'
ADG III	79'<118'	Falcon 10X	110.4'

ADG = airplane design group

The airfield is currently designed around an ADG II critical aircraft. This means most of the design standards applied to the airfield are based on ADG II; however, the airport does get operations from business jets in ADG III with wider wingspans. At times, it is feasible that one of these wide wingspan aircraft could be on Taxiway A and another could be on the apron edge taxilane, and the available separation distance between the centerlines could lead to wingtips colliding. The following analysis is specifically intended to address the simultaneous use of Taxiway A and the apron edge taxilane by wide wingspan business jets.

Taxilane Alternatives

Because the taxiway and taxilane centerlines are 105 feet apart, if there are two aircraft with greater than 102.5 wingspans, their wingtips could collide. As an example, if there is a Global 7500 (105-foot rounded wingspan) on Taxiway A and another Global 7500 on the apron edge taxilane at the same time, their wings could collide if one of the aircraft slightly deviates from the centerline, because there is exactly 105 feet of separation between the centerlines currently. **Figure 4-1** shows how close the wingtips of two Global 7500 aircraft passing would be; therefore, several alternatives are considered that would allow these aircraft to safely pass by each other. Each alternative is focused on the apron edge taxilane because it is more feasible to make changes to the taxilane, rather than Taxiway A, in the immediate term.

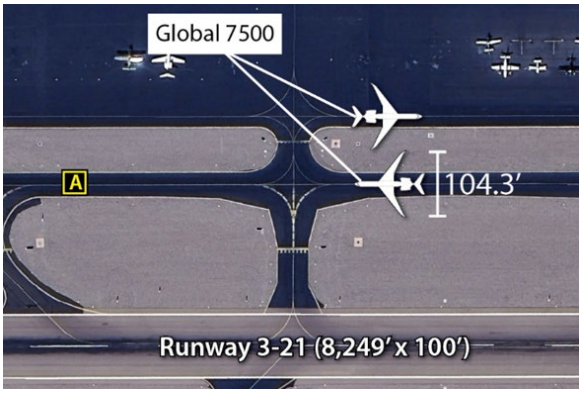


Figure 4-1: Taxiway A and Apron Edge Taxilane in Simultaneous Use by Two Global 7500 Aircraft

The taxiway and taxilane design standards are based on the ADG of the critical aircraft for the airport. Currently the critical aircraft is designated as ADG II (D-II). As such, the separation distance between Taxiway A and the apron edge taxilane not only meets this standard but exceeds it by 3.5 feet.

The TOFA, which applies to Taxiway A, is 124 feet wide. The TLOFA, which applies to the apron edge taxilane, is 110 feet wide. Both safety surfaces must be clear of penetrating objects except for required navigation aids like edge lighting mounted on frangible bases; therefore, aircraft parking begins at the outside edge (west) of the TLOFA, which is currently 72.5 feet from the apron edge and 55 feet from the apron edge taxilane centerline.

The top panel of **Exhibit 4H** shows this existing condition.

Alternative 1: Meeting ADG III Separation Standards

The first alternative that should be considered is to fully meet the ADG III design standard. The ADG III separation standard between a taxiway and a taxilane is 144.5 feet. That means the apron edge taxilane would be shifted 39.5 feet to the west. The TLOFA for ADG III is 158 feet wide as centered on the taxilane. Therefore, the aircraft apron parking can begin 79 feet from the relocated apron edge taxilane centerline and 136 feet from the existing apron edge. A total depth of 63.5 feet of existing aircraft parking apron would be removed from service as compared to what is available today. This is calculated by subtracting the distance from the outer edge of the TLOFA in this alternative (136 feet) from the existing condition (72.5 feet). The middle panel of **Exhibit 4H** shows this alternative.

Alternative 2: Relocate the Taxilane Centerline to Maintain the Safety Margin

Appendix J of FAA AC 150/5300-13B, *Airport Design*, provides a methodology where taxiway/taxilane object free areas (TOFA/TLOFA) can be modified based on the wingspan of specific aircraft. The key safety margins are determined by the ADG of the aircraft. For ADG III aircraft, like the Global 7500, the lateral deviation is 10 feet and the safety buffer is 16.5 feet, for a total wingtip clearance of 26.5 feet for the TOFA. For the ADG III TLOFA the lateral deviation is eight feet, and the safety buffer is 12 feet.

For two Global 7500 aircraft to pass each other using Taxiway A and the apron edge taxilane, the taxiway-to-taxilane centerline should be a minimum of 131.5 feet apart (105 feet + 26.5 feet = 131.5 feet).

In addition to identifying the separation distance between Taxiway A and the apron edge taxilane, the TLOFA for the apron edge taxilane must be determined so that the wing of the Global 7500 will safely remain clear of parked aircraft.

Appendix J of FAA AC 150/5300-13B, *Airport Design*, presents a methodology where the TLOFA may be modified based on the wingspan of a specific aircraft. Based on this methodology, the TLOFA should be 145 feet wide for an ADG III aircraft with a 105-foot wingspan. This is calculated as half the wingspan + the lateral deviation + safety buffer (52.5 feet + 8 feet + 12 feet = 72.5 feet x 2 = 145 feet); therefore, the apron edge TLOFA can be reduced from the ADG III standard of 158 feet to 145 feet based on the 105-foot wingspan of the example aircraft. Under this scenario, aircraft on the apron should be parked no

closer than 116.5 feet from the apron edge taxilane. This is calculated by adding 17.5 feet, which is the distance from the current apron edge to the taxilane centerline to the centerline shift distance of 26.5 feet, and half the TLOFA, which is 72.5 feet, for a total of 116.5 feet. The bottom panel of **Exhibit 4H** shows this alternative.

It should be noted that while FAA guidance does allow for a TLOFA based on a specific aircraft wingspan, it does not allow for modification of the lateral deviation and safety buffer standards; therefore, the width of the TLOFA may be modified based on the specific aircraft, but the lateral deviation and safety buffer may not.

Table 4D summarizes the applicable taxiway/taxilane design standards by comparing them to the first two alternatives with the existing condition.

TABLE 4D: Taxiway/Taxilane Separation Standards

Standards	ADG II	ADG III
Taxiway A to Apron Edge Taxilane	101.5'	144.5'
Taxiway Object Free Area (TOFA)	124'	171'
Taxilane Object Free Area (TLOFA)	110'	158'
Taxilane to Fixed/Movable Object	55'	79'
Existing Condition: Taxiway A to Apron Edge Taxilane	105'	N/A
Existing Condition: Apron Edge TLOFA	110'	N/A
Existing Condition: Apron Edge Taxilane Centerline to Fixed/Movable Object	55'	N/A
Existing Condition: Apron Edge to Aircraft Parking	72.5'	N/A
ADG III Standard: Taxiway A to Apron Edge Taxilane Centerline	N/A	144.5'
ADG III Standard: Apron Edge TLOFA	N/A	158'
ADG III Standard: Apron Edge Taxilane Centerline to Fixed/Movable Object	N/A	79'
ADG III Standard: Apron Edge to Aircraft Parking	N/A	136'
ADG III Standard (Modified):* Taxiway A to Apron Edge Taxilane Centerline	N/A	131.5'
ADG III Standard (Modified):* Apron Edge TLOFA	N/A	145'
ADG III Standard (Modified):* Apron Edge Taxilane Centerline to Fixed/Movable Object	N/A	72.5'
ADG III Standard (Modified):* Apron Edge to Aircraft Parking	N/A	116.5'

*See Appendix J, FAA AC 150/5300-13B, *Airport Design*. Modification based on 105-foot wingspan.

Alternative 3: Remove the Taxilane Centerline

The apron edge taxilane centerline could be removed altogether to increase available space for parking aircraft. With no apron edge taxilane, aircraft would have to use Taxiway A to move north or south, which could increase congestion on Taxiway A. An additional 72.5 feet of apron depth would be available for aircraft parking.

Alternative 4: Letter of Agreement (LOA) with ATCT

This alternative would involve an agreement with ATCT personnel to not allow certain aircraft with wider wingspans to use the apron edge taxilane. For example, the LOA might say aircraft with wingspans greater than 100 feet must use Taxiway A to proceed north or south. The downside to this is a loss of ground movement efficiency, which could negatively impact overall airfield capacity.

CONSIDERATION #7: TAXIWAY GEOMETRY

As discussed in Chapter Three, to improve pilot situational awareness and to prevent runway incursions, the FAA has outlined several recommendations for taxiway geometry. The following are applicable to SDL:

- Direct Access: Taxiways A3, A4, A5, A6, and A7 allow direct access from an apron area to the runway.
- High-Energy Runway Crossings: Taxiways A7/B7 and A10/B10 allow runway crossings in the high-energy portion (middle third) of the runway.
- Angled Taxiways: Taxiways A2, A4, A6, A9, A11, A12, B5, B6, B11, and B12 are angled taxiways.

None of these taxiway considerations for SDL is non-standard, but they do not follow the current design recommendations. For example, the FAA has prioritized removing direct-access configurations where feasible. Angled taxiways have been less of a priority and, in some cases, are justified by capacity needs at an airport. Even runway crossings may be acceptable if removal of them would significantly diminish ground movement efficiency.

Exhibit 4J shows some possible changes to the taxiway system that address these FAA recommendations for taxiway geometry. These are summarized as follows:

- Taxiway A2 is an existing angled taxiway. It is located at the far end of the runway for those landing on Runway 21. Because it is at the end of the runway, aircraft would be travelling very slow and would not benefit from an angled taxiway at this location; therefore, this taxiway is reconfigured to 90 degrees, which will allow it to also serve as a bypass taxiway, affording pilots full peripheral views.
- Taxiway B2 does not currently exist, but when needed, it would serve as a bypass taxiway. The current ALP shows this future Taxiway B2 at an angle; however, an angled taxiway in this location is not beneficial because existing aircraft will have to turn backwards onto the parallel taxiway.
- The taxilanes (A3, A4, and A5) connecting the main terminal apron to Taxiway A are shown to be relocated for the purpose of eliminating the existing geometry that allows for direct access to the runway from an apron area. The new configuration will force pilots to make a turn onto parallel Taxiway A prior to turning again toward the runway environment. This is the recommended FAA procedure and geometry.
- Taxiway A7, between the runway and Taxiway A, is shown to be relocated to eliminate the taxiway crossing in the middle third of the runway. This portion was chosen for relocation over the taxilane portion leading to the apron because the taxilane appropriately directs pilots to the edge of the apron.
- Taxiway A10 is shown to be removed. This will eliminate the crossing taxiway located within the middle third of the runway. Taxiway A10 is close to both Taxiway A9 and A11 and may be redundant.

- Taxiway B15 is a planned future bypass taxiway. The current ALP shows this future Taxiway B15 at an angle; however, an angled taxiway in this location is not beneficial because existing aircraft will have to turn backwards onto the parallel taxiway.

- The remaining angled taxiways (A4, A6, A9, A11, A12, B5, B6, B11, and B12) are planned to remain. They provide for quick runway exits thus improving overall airfield capacity. They are also in appropriate locations to allow landing aircraft to exit quickly after slowing to an acceptable speed.

- The ALP currently shows a future Taxiway B9 that is angled and mirrors Taxiway A9.

CONSIDERATION #8: RUNWAY VISUAL AIDS

Both ends of the runway at SDL are equipped with two-light precision approach path indicator (PAPI-2L) lighting. Busy general aviation airports with heavy business jet activity benefit from the more informative four light PAPI-4L system. It is recommended that the airport plan to upgrade to the PAPI-4L system.

CONSIDERATION #9: RUNWAY PAVEMENT WEIGHT-BEARING CAPACITY

The weight-bearing capacity of a runway does not preclude operations by aircraft that weigh more; however, frequent activity by heavier aircraft can shorten the useful life of that pavement. FAA AIP Grant Assurance #11, *Pavement Prevention Maintenance-Management*, requires that airport sponsors maintain the useful life of any pavement partially funded with a federal investment. Repeated use of a runway by aircraft exceeding the actual pavement weight-bearing capacity can shorten the useful life of the pavement.

The current published weight-bearing capacity for Runway 3-21 is 45,000 pounds for single-wheel landing type gear (S) and 75,000 pounds for dual-wheel (D) type landing gear. Most small general aviation aircraft have landing gear struts with one wheel on each. Small business jets also may have a single-wheel landing gear strut. Most medium and large business jets have dual-wheel landing gear struts.

According to the FAA publication, Airport/Facility Directory, “Runway strength-rating is not intended as a maximum allowable weight or as an operating limitation. Many airport pavements are capable of supporting limited operations with gross weights in excess of the published figures.” The directory goes on to say that those aircraft exceeding the pavement weight-bearing capacity should contact the airport sponsor for permission to operate at the airport. This is the case at Scottsdale Airport, as the Airport/Facility Directory states that “Runway 3-21 is limited to 75,000 pounds (D) except with prior permission requested.” Aircraft can operate with maximum gross weights in excess of 75,000 pounds and up to 100,000 pounds at the airport under these conditions:

- They can operate up to 100,000 pounds on a prior permission required (PPR) basis; or

- They can operate with a placard certifying they are operating at or below a weight of 75,000 pounds.

The weight-bearing capacity of a runway can change over time. Regular usage by heavier aircraft can decrease the weight-bearing capacity, while periodic runway resurfacing or reconstructing can increase the weight-bearing capacity. Given the high volume of large business jets that utilize the airport, future planning should consider providing a pavement weight-bearing capacity of at least 100,000 pounds (D).

During the 2015 master plan process, the aviation department and the FAA determined that increasing the weight-bearing capacity up to 100,000 pounds (D) may require the airport to meet D-III design standards. As discussed previously, the airport cannot fully meet D-III design standards, and for runway-to-taxiway separation and runway object free area, FAA-approved modifications of standards are in place.

With more than 1,700 operations by these heavier aircraft, it is recommended that the weight-bearing capacity be increased to accommodate them. While many of these aircraft will fall in ADG III, it is already recognized that the airport cannot fully meet those standards, and there is not a direct relationship between the aircraft weight and the ADG III design standards; therefore, the airport and the FAA should reconsider the feasibility of increasing the runway pavement weight-bearing capacity so that the runway can maintain its useful life while accommodating the mix of aircraft that are using the airport on a regular basis.

CONSIDERATION #10: NEXT GENERATION BUSINESS JETS

Numerous business jet operators and service providers at the airport have engaged airport management about the feasibility of allowing the newest generation of business jets to operate at SDL. Several of the newest business jets have a maximum takeoff weight (MTOW) greater than 100,000 pounds. **Table 4E** summarizes the length, wingspan, and maximum takeoff weight of these aircraft types.

TABLE 4E: Next Generation Business Jet Details

Aircraft	Length	Wingspan	MTOW
Gulfstream 700	109'10"	103'	107,600 lbs.
Gulfstream 800	99'9"	103'	105,600 lbs.
Global 7500	111'	104'	114,850 lbs.

Table Source: Aircraft Specification Manuals

MTOW = maximum takeoff weight

Aircraft with MTOWs greater than 100,000 pounds are not permitted to use the airport because the weight exceeds the runway weight-bearing capacity of 75,000 pounds. Regular use of a runway by aircraft that exceed the weight-bearing capacity will shorten the useful life of the runway. Maintaining the useful life of a runway that has been constructed or maintained with federal funds is a grant assurance condition of that federal investment.

At SDL currently, there are many operations by aircraft that exceed the weight-bearing capacity of the runway. Operations by these newest generation aircraft would add more of these types of operations to the runway, further reducing the useful life of the pavement.

SDL has evolved into an airport that has a significant impact on the local and regional economy. Operators of large business jets desire to use the airport. Airport staff will have to determine if they want to allow these heavier general aviation aircraft to use the airport. If they do, they risk the early deterioration of the airfield pavements in which there are federal investments. If they do not, the airport will not realize the positive economic impact that allowing these operations offers.

Another question related to the possibility of allowing the next generation of business jets to use the airport is the potential impact on the various design and separation standards. The runway-to-taxiway separation would not be impacted by the wider wingspan because the ATCT considers the hold line location to the demarcation line for runway incursions; therefore, a holding aircraft would be 100 feet from the wing of an aircraft with a 104-foot wingspan on the runway, rather than the 102 feet currently permitted.

An aircraft with a 104-foot wingspan on the runway and one on a parallel taxiway would still have 146 feet of separation, rather than the 150 feet currently permitted.

Perhaps the most significant impact of allowing these next generation business jets with wider wingspans is the operation of the aircraft parking apron. Each aircraft would take up more space than is currently permitted, which would likely reduce apron parking capacity somewhat. Because the FBOs manage the aircraft parking aprons, their opinions on permitting the wider wingspans to operate at the airport should be considered.

The Falcon 10X is a large next generation business jet that is currently in the assembly phase and is expected to enter service in 2027. This aircraft has a MTOW of 115,000 pounds, a wingspan of 110 feet four inches, and a length of 109 feet seven inches. This aircraft would represent a more significant change in the airfield operating condition than the business jets with 104-foot wingspans and additional analysis, and evaluation should be undertaken in the future to assess the safety impact if it were allowed to operate at SDL in the future.

AIRSIDE SUMMARY

Scottsdale Airport has become one of the premier business airports in the country. As a reliever airport, it should be designed to accommodate all general aviation aircraft, including business jets, to the greatest extent possible. Under ideal circumstances, the runway would meet RDC D-III design standards. During the previous master plan, it was determined by the FAA that the airport could not fully meet the D-III design standards. As a result, the FAA approved several modifications of standards and approved a D-II RDC classification. Once again, for the current master plan project, the FAA reviewed the appropriate RDC and again concluded that the airport could not reasonably meet D-III design standards; therefore, the FAA approved D-II classification.

The alternatives analysis has been presented in a manner to maximize compliance with D-III, then D-II design standards. The following design elements were covered:

1. Runway-to-Taxiway Separation: The D-III standard is 400 feet. The D-II standard is 300 feet. An FAA-approved MOS permits the existing 250-foot separation to remain.

2. Hold Line Location: The hold lines are 152 feet from the runway centerline. The D-II and D-III standard is 250 feet from the runway centerline. A previously completed SRMD indicated that the hold lines could not be relocated due to negative impacts to the regional airspace; therefore, the ATCT personnel use the current hold line location as the safety area boundary. Holding aircraft are not incursions, but an aircraft that proceeds past the hold line toward the runway without ATCT clearance could be an incursion.

3. Runway Safety Area: Declared distances are in place so that the airport meets RSA design standards. The D-II and D-III RSA standard width is 500 feet; however, for D-II airports, a 400-foot-wide RSA is permissible, and SDL implements a 400-foot-wide RSA.

4. Runway Object Free Area: The standard D-III and D-II ROFA is 800 feet wide, extending 1,000 feet beyond the declared ends of the runway. At SDL, an FAA-approved MOS is in place. The MOS defines the ROFA width at 630 feet, extending 470 feet beyond the Runway 3 end and 500 feet beyond the Runway 21 end.

5. Declared Distances: Declared distances are implemented at SDL to maximize runway length and the various safety areas.

6. Taxiway/Taxilane Separation and Aircraft Parking Apron: Portions of main terminal apron have an edge taxilane that runs parallel to Taxiway A, and they are separated by 105 feet. The D-III separation standard is 144.5 feet. The D-II separation standard is 101.5 feet. Several alternatives to increase the separation between the apron edge taxilane and Taxiway A were presented.

7. Taxiway Geometry: The FAA has changed its recommendation for taxiway geometry over time. As a result, there are several taxiways that do not meet the current design guidelines. Consideration was given in this alternatives chapter to mitigate three primary issues:

    - Direct access from an apron to the runway: Taxiways A3, A4, A5, A6, and A7
    - High-energy runway crossings: Taxiways A7/B7 and A10/B10
    - Angled taxiways: Taxiways A2, A4, A6, A9, A11, A12, B5, B6, B11, B12

8. Runway Visual Aids: Both ends of the runway are equipped with PAPI-2L. If feasible, it is recommended that they be upgraded to the more sophisticated PAPI-4L.

9. Runway Pavement Weight-Bearing Capacity: Currently, the runway weight-bearing capacity of the runway is 45,000 pounds for single wheel landing gear and 75,000 pounds for dual-wheel landing gear. With prior permission, aircraft up to 100,000 pounds can operate at the airport. There are regular operations by aircraft with a maximum takeoff weight above these levels, which can reduce the useful life of the pavement; therefore, the pavement weight-bearing capacity is recommended to be increased to at least 100,000 pounds (D) to accommodate existing activity.

10. Next Generation Business Jets: Several models of new business jets exceed the 100,000-pound limit for operation at the airport. There is no design standard safety reason to prohibit these business jets from operating at the airport. It is recommended that the airport consider allowing slightly heavier aircraft or aircraft up to 114,999 pounds to operate, in response to evolving business aviation needs. The primary concern is the potential for increased wear on the runway pavement, which may shorten its useful life; however, this impact can be effectively managed through the airport's ongoing program of monitoring and routine maintenance.

LANDSIDE CONSIDERATIONS

Generally, landside issues are related to facilities necessary or designed for the safe and efficient parking and storage of aircraft, movement of pilots and passengers to and from aircraft, airport support facilities, and overall revenue support functions. To maximize airport efficiency, it is important to locate facilities together that are intended to serve similar functions. The best approach to landside facility planning is to consider the development to be like that of a community where land use planning is the guide. For airports, the land use guide in the terminal area should generally be dictated by aviation activity levels.

HANGAR NEEDS

Scottsdale Airport is somewhat unusual in that many of the hangar facilities are located off airport property. The Scottsdale Airpark has approximately 140 parcels with taxiway access. While not all of these parcels have hangars, most do. In an FAA-funded master plan, only facility needs located on airport property may be considered.

There is approximately 500,000 square feet of aircraft hangar space on airport property currently. Previous analysis estimated that within the next 20 years, an additional 394,000 square feet of hangar space may be needed. Any new hangar facilities in the Scottsdale Airpark would reduce that estimated hangar need. Developing a plan for additional hangars on existing airport property is challenging, because nearly all on-airport property has already been developed with hangars, aprons, and taxiways. In addition, there is a need to balance hangar space versus apron space, both of which are deficient to meet projected demand.

Figure 4-2 shows three potential locations for new hangar development. Each of these locations is current aircraft parking apron that is under tenant lease; therefore, any development of these hangars would be at the discretion of the tenant.

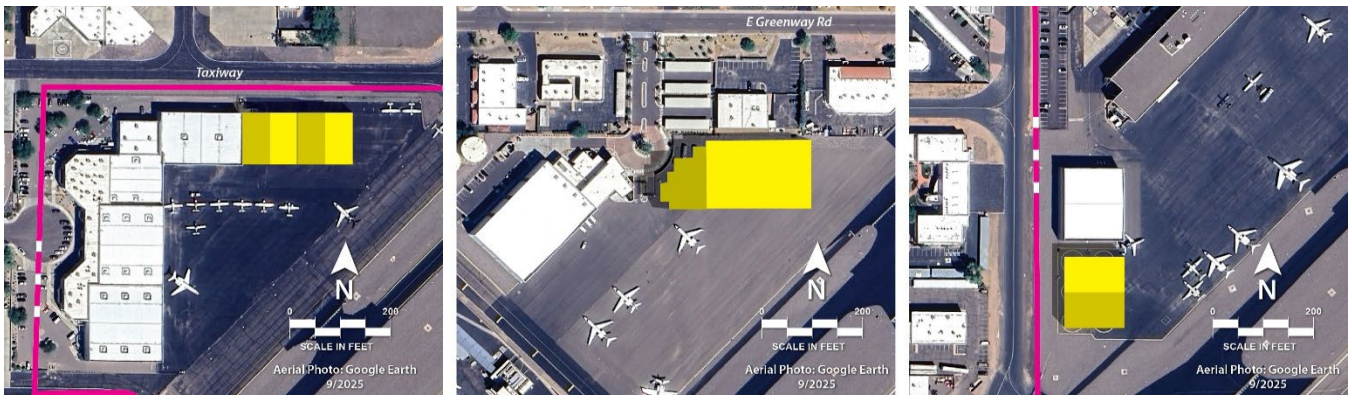


Figure 4-2: Potential Locations for New Hangars

APRON NEEDS

The FBOs manage the use of most of the public apron areas at the airport. During interviews, each FBO operator independently indicated an immediate need for additional aircraft parking apron areas. The challenge is that the airport is largely built out with hangars and aprons. As a result, a delicate balancing must occur between providing hangar space or apron space. Any new hangar space constructed necessarily means there is less apron space.

Chapter Three presented apron space analysis, which concluded that approximately 67,000 square yards of apron space would be needed over the next 20 years. Some portion of the total apron need may be provided by private developers in the Scottsdale Airpark. There are no undeveloped areas at the airport that could be used for aircraft parking aprons. It is feasible that tenants could decide to remove an older hangar and replace it with aircraft parking apron.

AUTO PARKING NEEDS

There has long been an acute need for more vehicle parking at the airport. There are numerous airport businesses that serve the public and have a need for public parking. The challenge is that there is limited airport property available for expansion of vehicle parking. One avenue that may be available is for the airport to acquire private property and to convert that property to vehicle parking. One such area is surrounding the existing surface parking lot across the street from the Aviation Business Center. **Figure 4-3** shows this area.

Figure 4-3: Potential Surface or Structured Vehicle Parking

Another consideration is the possibility of acquiring land and building a multi-level parking garage. Such a facility could be revenue-producing, as parking spaces could be leased to airport tenants to fulfill their overflow parking needs.

VERTIPORT CONSIDERATION

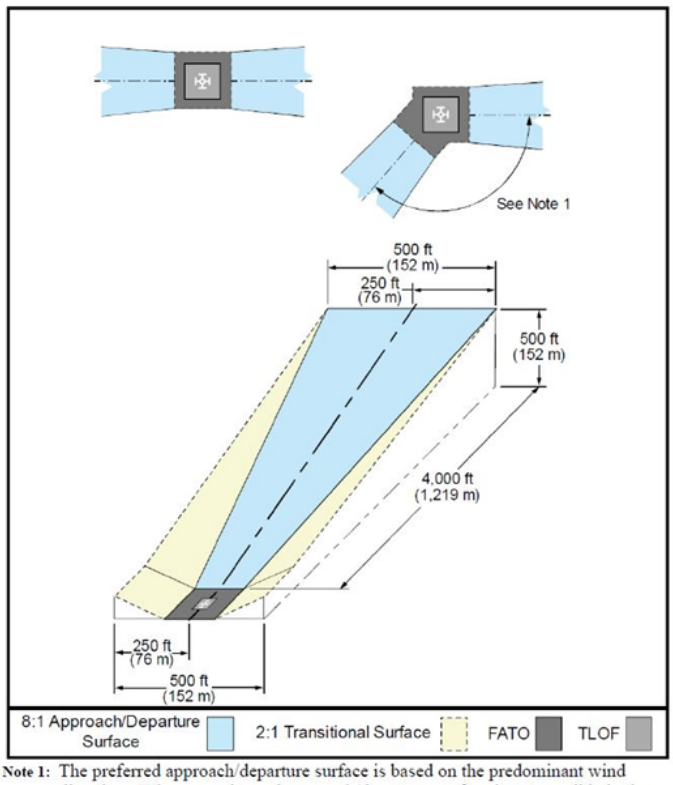
Some airports may want to consider a dedicated vertiport that can accommodate not only helicopters but also the newly emerging advanced air mobility (AAM) aircraft. Vertiport design is based on guidance in FAA Engineering Brief #105, *Vertiport Design*. This engineering brief is written for vertical takeoff and landing (VTOL) aircraft powered by electric motors. The vertiport design considerations are very similar to the guidance provided in FAA AC 150/5390-2D, *Heliport Design*. The size of the landing area and the associated safety areas are a function of the controlling dimensions of the aircraft, typically the smallest enclosing circle that can surround the aircraft. This is similar to heliport design where the circumference of the helicopter rotor defines the landing area.

Vertiports and heliports have approach and departure surfaces associated with the landing area. The preferred approach/departure surface is based on the predominant wind direction. Where a reciprocal approach/departure surface is not possible in the opposite direction, a minimum 135-degree angle should be used. **Figure 4-4** shows the dimensions of the approach/departure surfaces for vertiports.

The approach and departure surface are the same and they rise at a ratio of 8:1. The approach/departure surface can rise above other structures.

Having a dedicated vertiport is a choice that airport sponsors can make. The trigger to considering a dedicated heliport is when an airport experiences sustained high volumes of activity by helicopters (or future AAM aircraft) that creates a safety concern. Vertiports can enhance safety by directing arriving and departing vertical lift aircraft to a single location. From that location, they typically hover-taxi to/from their final location.

Vertiports can be restrictive in that they take up valuable ramp space and cause flights to go to/from a single location. Most airports will follow existing helicopter flight paths, which may be to a runway end, taxiway, or apron location, typically close to their final destination. This current operating procedure at SDL allows greater flexibility for operators and ATCT personnel.



Note 1: The preferred approach/departure surface is based on the predominant wind direction. Where a reciprocal approach/departure surface is not possible in the opposite direction, use a minimum 135-degree angle between the two surfaces.

Figure 4-4: Vertiport Design Considerations

Establishment of a vertiport also requires dedicated airspace. Thus, when the FAA performs an airspace analysis for any development in the vicinity of the airport, the vertiport could be restrictive to that particular development.

At SDL, there have not been any safety concerns regarding helicopter operations. If operations by helicopters or future AAM activity becomes a safety concern, then the airport should consider a dedicated vertiport at that time. For this master plan, a dedicated vertiport is not considered necessary and may not be necessary during the 20-year term of this study; therefore, a dedicated vertiport is not planned to be included in the ALP.

REDEVELOPMENT OPPORTUNITIES

Airports that are more mature, meaning fully built out, need to consider opportunities for redevelopment of older and less efficient hangars and buildings. SDL has pursued several redevelopment opportunities in the past. Redevelopment is necessary for the airport to maximize revenue and to address changes in the aviation industry, and more specifically, changes in the operating characteristics at SDL. The local changes are toward higher volumes of large business jets.

POTENTIAL PROPERTY ACQUISITION

The master plan is ultimately a long-term vision for the airport. Part of that vision may include acquisition of various adjacent land parcels to accommodate forecasted growth in activity. SDL is significantly constrained from accommodating the projected growth. The airport has identified several adjacent parcels it feels SDL would benefit from owning and would position the airport for changes in demand at the airport. **Exhibit 4K** is a map that shows the parcels identified by the airport for potential acquisition. Land surrounding SDL is very valuable; so valuable that it may not be feasible for the airport to acquire any of these parcels. Nevertheless, if the opportunity arises to incrementally acquire adjacent properties, the airport should pursue them.

LANDSIDE SUMMARY

Scottsdale Airport is a mature aviation facility that is fully built out. It is also a facility that has transitioned to a significant degree to a business jet airport. There is still significant activity by operators of smaller aircraft and there are on-going flight training activities; therefore, future landside planning for hangars, apron space, and vehicle parking is limited. There may be some opportunities for redevelopment of existing facilities or tenant construction on their leaseholds.

SUMMARY

This chapter is intended to present an analysis of various options that may be considered for specific airport elements. The need for alternatives is typically spurred by projections of aviation demand growth and/or by the need to resolve non-standard airport elements. FAA design standards are frequently updated with the intent of improving the safety and efficiency of aircraft movements on and around airports, which can lead to certain pavement geometries now being classified as non-standard when they previously met standards.

Several development alternatives related to both the airside and the landside have been presented. On the airside, the major considerations involve resolving non-standard safety area conditions on the airfield and improving airfield geometry to meet proper taxiway design standards. For the landside, alternatives were presented to consider additional aviation development on the east and west sides of the airport. As the airport already accommodates the full array of GA aircraft, and with the potential for increased operations and based aircraft, it will be important to clearly delineate development areas for facilities to accommodate airport users. This becomes even more critical with the potential introduction of AAM/UAM operations into the mix, and segregating operators by type of aircraft will contribute to operational safety and present a more organized and efficient airport.

The next step in the master plan development process is to arrive at a recommended development concept. Participation of the PAC and the public will be important considerations, and additional consultation with the FAA may also be required. Once a consolidated development plan is identified, a 20-year capital improvement program, with a list of prioritized projects tied to aviation demand and/or necessity, will be presented. Finally, a financial analysis will be presented to identify potential funding sources and show airport management what local funds will be necessary to implement the plan.

LEGEND

- Airport Property Line
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Obstacle Free Zone (ROFZ)
- Departure Runway Protection Zone
- Approach Runway Protection Zone
- Potential Property Acquisition for Landside Development
- Ultimate Airfield Pavement
- Ultimate Building
- Ultimate Parking/Road
- Implement improvements to address taxiway geometry standards per FAA *AC 150/5300-13A, Change 1, Airport Design*

EXISTING/ULTIMATE DECLARED DISTANCES

Category	Runway 3	Runway 21
TORA	8,249′	8,249′
TODA	8,249′	8,249′
ASDA	7,849′	8,069′
LDA	7,110′	7,669′

Total Pavement Length: 8,249′

KEY

ASDA - Accelerate-Stop Distance Available
LDA - Landing Distance Available
TODA - Takeoff Distance Available
TORA - Take Off Run Available

0 800 1600
SCALE IN FEET

NORTH

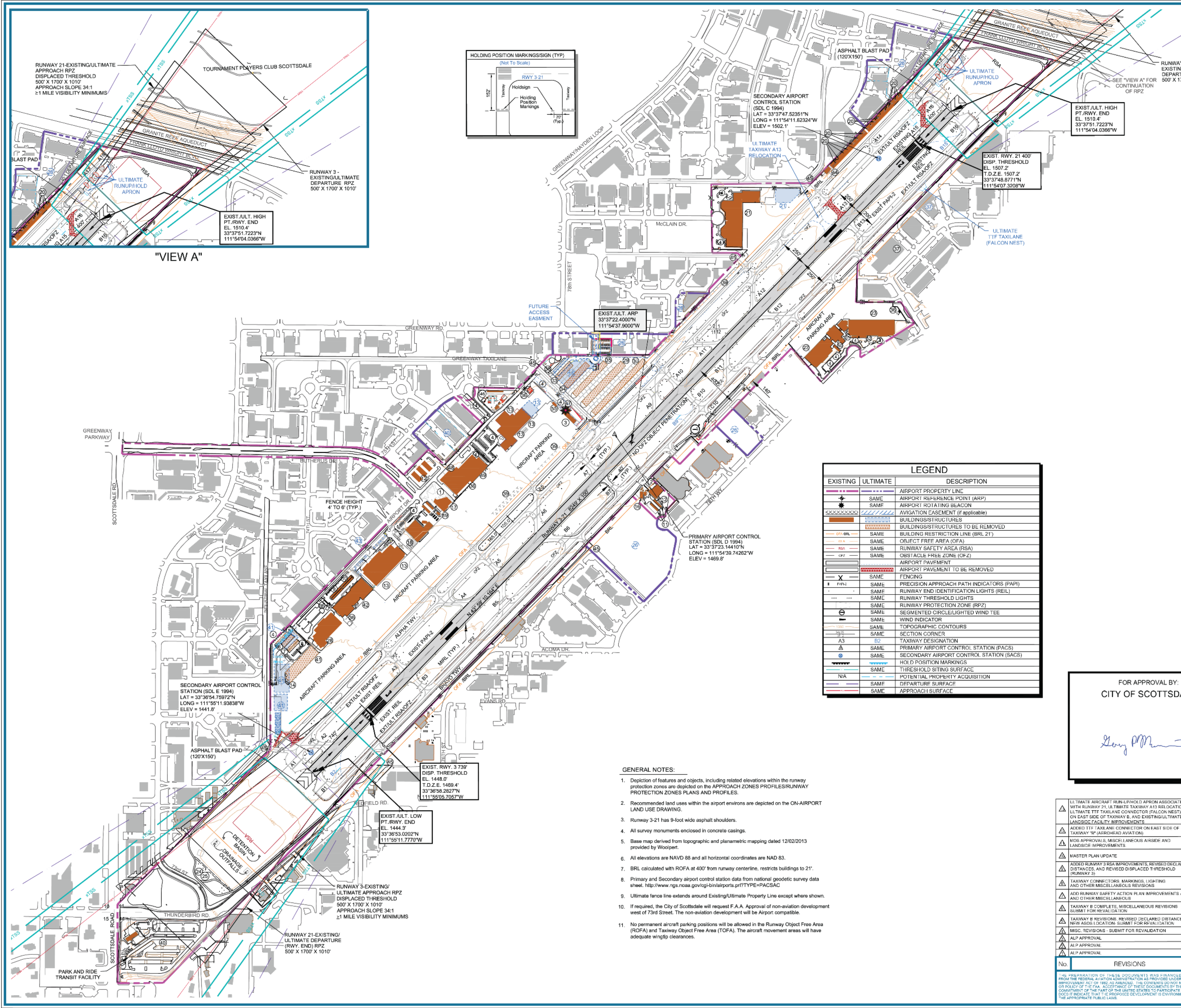
RUNWAY 3-21 (8,249′ X 100′)

Self-Service Fuel Facility
Self-Service Fuel Facility
Terminal Area Redevelopment
Airport Operations Center
Wash Rack/ Maintenance Bay

Scottsdale Rd.
Evans Rd.
73rd St.
Acoma Dr.
74th St.
Buteros Rd.
75th St.
Greenway Rd.
Frank Lloyd Wright Blvd.
80th St.
81st St.
82nd St.
Thunderbird Rd.
Redfield Rd.
76th Pl.
Gelding Dr.
Evans Dr.
Acoma Dr.
82nd St.
Hayden Rd.
83rd Way
84th St.
Central Arizona Project

1.51 acres
1.38 acres
1.82 acres
0.80 acres
1.17 acres
1.09 acres
0.56 acres
2.11 acres
5.14 acres
8.95 acres
1.98 acres
1.60 acres
1.61 acres
1.32 acres
1.44 acres
1.49 acres

Exhibit 4A
2015 MASTER PLAN CONCEPT



BUILDINGS/FACILITIES

EXISTING	ULTIMATE	DESCRIPTION	ELEVATION [1]
1	--	ADMINISTRATION/AVIATION BUSINESS CENTER	1503.5'
2	--	AIRCRAFT RESCUE and FIREFIGHTING (ARFF)	1500.0'
3	--	AIRPORT OPERATIONS CENTER	1502.0'
4	--	AUTOMOBILE PARKING LOTS	NA
5	--	AUTOMOBILE PARKING SHADE STRUCTURE	1458.9'
6	--	AUTOMOBILE PARKING SHADE STRUCTURE	1459.9'
7	--	AUTOMOBILE PARKING SHADE STRUCTURE	1459.2'
8	--	AUTOMOBILE PARKING SHADE STRUCTURE	1458.9'
9	--	AUTOMOBILE PARKING SHADE STRUCTURE	1462.9'
10	--	AUTOMOBILE PARKING SHADE STRUCTURE	1463.4'
11	--	AUTOMOBILE PARKING SHADE STRUCTURE	1474.2'
12	--	AUTOMOBILE PARKING SHADE STRUCTURE	1476.2'
13	13	CONVENTIONAL HANGAR/FBO FACILITY	1494.5'
14	--	CORPORATE HANGAR/FBO FACILITY	1494.5'
--	15	CORPORATE HANGAR/FBO FACILITY	1479.4'
16	--	AIR TRAFFIC CONTROL TOWER (ATCT)	1567.2'
17	--	US CUSTOMS AND BORDER PROTECTION	1481.6'
18	--	FIXED BASE OPERATION (FBO) FACILITY	1479.4'
19	--	AUTOMOBILE PARKING SHADE STRUCTURE	1487.5'
20	20	LINEAR BOX HANGARS	1531.61'
21	21	CORPORATE HANGAR/FBO FACILITY	1532.0'
22	--	FIXED BASE OPERATION (FBO) FACILITY	1528.3'
23	--	FIXED BASE OPERATION (FBO) FACILITY	1525.0'
24	--	AUTOMATED SURFACE OBSERVATION SYSTEM (ASOS)	1465.0'
25	--	STAND ALONE WEATHER STATION (SAWS)	1460.0'
--	26	AVIATION RELATED DEVELOPMENT	NA
27	--	HELICOPTER PARKING	NA
28	--	FIXED BASE OPERATION (FBO) FACILITY	1491.98'
29	--	T-HANGARS/FBO FACILITY	1495.0'
30	--	T-HANGARS/FBO FACILITY	1493.5'
33	--	COVERED TIE DOWN HANGARS/FBO FACILITY	1491.1'
34	--	COVERED TIE DOWN HANGARS/FBO FACILITY	1491.7'
35	--	COVERED TIE DOWN HANGARS/FBO FACILITY	1492.4'
36	--	UNDERGROUND FUEL STORAGE FACILITY	NA
37	37	AIRPARK RELATED DEVELOPMENT	NA
38	--	WATER/WELL - SCOTTSDALE	1512.0'
39	--	AIRCRAFT PARKING (TIEDOWNS)	NA
40	40	NON-AVIATION RELATED DEVELOPMENT	NA
41	41	CONVENTIONAL HANGAR/COMMERCIAL OFFICE BLDG. /FBO FACILITY	1494.5'
42	--	FIXED BASE OPERATION (FBO) FACILITY	1489.2'
--	43	AUTOMOBILE PARKING SHADE STRUCTURE	1476.2'
44	--	AIRCRAFT WASH RACK	NA
45	--	AIRPARK AIRCRAFT ACCESS GATE(THROUGH-THE-FENCE)	NA
46	--	WATER TREATMENT FACILITY	1489.9'
47	--	AIRPORT ROTATING BEACON	1519.7'
48	--	CORPORATE HANGAR	1507.5'
49	--	CORPORATE HANGAR	1507.5'
50	--	AUTOMOBILE PARKING SHADE STRUCTURE	1495.0'
51	--	AUTOMOBILE PARKING SHADE STRUCTURE	1495.0'
52	--	AUTOMOBILE PARKING SHADE STRUCTURE	1495.0'
--	--		
--	--		
55	--	ELECTRICAL VAULT	1483.2'

1. The elevation represents the maximum elevation of each building or structure.

NA - Not Applicable

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		AIRPORT PROPERTY LINE
	SAME	AIRPORT REFERENCE POINT (ARP)
	SAME	AIRPORT ROTATING BEACON
		AVIGATION EASEMENT (if applicable)
		BUILDINGS/STRUCTURES
		BUILDINGS/STRUCTURES TO BE REMOVED
OFA/BRL	SAME	BUILDING RESTRICTION LINE (BRL 21')
OFA	SAME	OBJECT FREE AREA (OFA)
RSA	SAME	RUNWAY SAFETY AREA (RSA)
OFZ	SAME	OBSTACLE FREE ZONE (OFZ)
		AIRPORT PAVEMENT
		AIRPORT PAVEMENT TO BE REMOVED
X	SAME	FENCING
PAPI-2	SAME	PRECISION APPROACH PATH INDICATORS (PAPI)
	SAME	RUNWAY END IDENTIFICATION LIGHTS (REIL)
	SAME	RUNWAY THRESHOLD LIGHTS
	SAME	RUNWAY PROTECTION ZONE (RPZ)
	SAME	SEGMENTED CIRCLE/LIGHTED WIND TEE
	SAME	WIND INDICATOR
1080	SAME	TOPOGRAPHIC CONTOURS
34 35 / 3 2	SAME	SECTION CORNER
A3	B2	TAXIWAY DESIGNATION
	SAME	PRIMARY AIRPORT CONTROL STATION (PACS)
	SAME	SECONDARY AIRPORT CONTROL STATION (SACS)
		HOLD POSITION MARKINGS
	SAME	THRESHOLD SITING SURFACE
N/A		POTENTIAL PROPERTY ACQUISITION
	SAME	DEPARTURE SURFACE
	SAME	APPROACH SURFACE

GENERAL NOTES:

1. Depiction of features and objects, including related elevations within the runway protection zones are depicted on the APPROACH ZONES PROFILES/RUNWAY PROTECTION ZONES PLANS AND PROFILES.
2. Recommended land uses within the airport environs are depicted on the ON-AIRPORT LAND USE DRAWING.
3. Runway 3-21 has 9-foot wide asphalt shoulders.
4. All survey monuments enclosed in concrete casings.
5. Base map derived from topographic and planametric mapping dated 12/02/2013 provided by Woolpert.
6. All elevations are NAVD 88 and all horizontal coordinates are NAD 83.
7. BRL calculated with ROFA at 400' from runway centerline, restricts buildings to 21'.
8. Primary and Secondary airport control station data from national geodetic survey data sheet. http://www.ngs.noaa.gov/cgi-bin/airports.prl?TYPE=PACSAC
9. Ultimate fence line extends around Existing/Ultimate Property Line except where shown.
10. If required, the City of Scottsdale will request F.A.A. Approval of non-aviation development west of 73rd Street. The non-aviation development will be Airport compatible.
11. No permanent aircraft parking positions will be allowed in the Runway Object Free Area (ROFA) and Taxiway Object Free Area (TOFA). The aircraft movement areas will have adequate wingtip clearances.

FOR APPROVAL BY:
CITY OF SCOTTSDALE

Gary P. Mascaro

FAA APPROVAL STAMP

Approved conditionally March 31, 2022
Subject to comments contained in our letter dated: 03-31-2022
FEDERAL AVIATION ADMINISTRATION
Western-Pacific Region
By

No.	REVISIONS	DATE	BY	APP'D.
13	ULTIMATE AIRCRAFT RUN-UP/HOLD APRON ASSOCIATED WITH RUNWAY 21, ULTIMATE TAXIWAY A13 RELOCATION, ULTIMATE TTF TAXILANE CONNECTOR (FALCON NEST) ON EAST SIDE OF TAXIWAY B, AND EXISTING/ULTIMATE LANDSIDE FACILITY IMPROVEMENTS	02/11/2022	GPM	--
12	ADDED TTF TAXILANE CONNECTOR ON EAST SIDE OF TAXIWAY "B" (AEROHEAD AVIATION)	11/24/20	GPM	--
11	MOS APPROVALS, MISCELLANEOUS AIRSIDE AND LANDSIDE IMPROVEMENTS.	3/26/20	GPM	--
10	MASTER PLAN UPDATE	5/12/15	GPM	--
9	ADDED RUNWAY 3 RSA IMPROVEMENTS, REVISED DECLARED DISTANCES, AND REVISED DISPLACED THRESHOLD (RUNWAY 3)	5/22/13	GPM	FAA
8	TAXIWAY CONNECTORS, MARKINGS, LIGHTING AND OTHER MISCELLANEOUS REVISIONS	1/25/12	GPM	FAA
7	ADD RUNWAY SAFETY ACTION PLAN IMPROVEMENTS AND AND OTHER MISCELLANEOUS	08/27/08	STG	FAA
6	TAXIWAY B COMPLETE, MISCELLANEOUS REVISIONS SUBMIT FOR REVALIDATION	5/01/02	STG	FAA
5	TAXIWAY B REVISIONS, REVISED DECLARED DISTANCES, NEW ASOS LOCATION- SUBMIT FOR REVALIDATION	4/06/01	STG	FAA
4	MISC. REVISIONS - SUBMIT FOR REVALIDATION	8/30/00	STG	FAA
3	ALP APPROVAL	2/20/97	JSK	FAA
2	ALP APPROVAL	11/3/95	JSK	FAA
1	ALP APPROVAL	3/25/93	JSK	FAA

THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT OF THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH THE APPROPRIATE PUBLIC LAWS.

SCOTTSDALE AIRPORT
AIRPORT LAYOUT PLAN DRAWING
SCOTTSDALE, ARIZONA

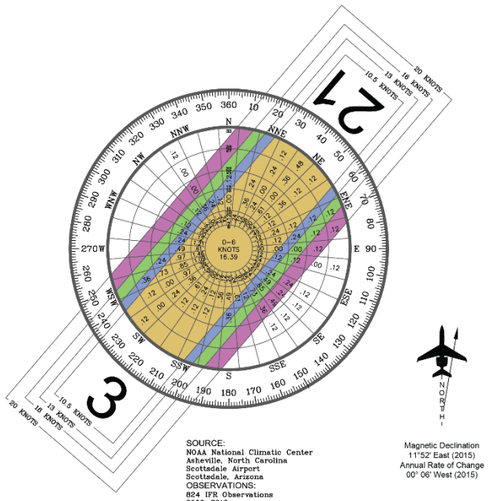
PLANNED BY: Matt Quick
DETAILED BY: Maggie Beaver
February 2022 SHEET 3 OF 10

Coffman Associates
Airport Consultants
www.coffmanassociates.com

Exhibit 4B
CURRENTLY APPROVED AIRPORT LAYOUT PLAN (ALP)

IFR WIND COVERAGE

Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 3-21	92.17%	95.17%	97.53%	98.93%



SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Scottsdale Airport
Scottsdale, Arizona
OBSERVATIONS:
824 IFR Observations
2002-2012

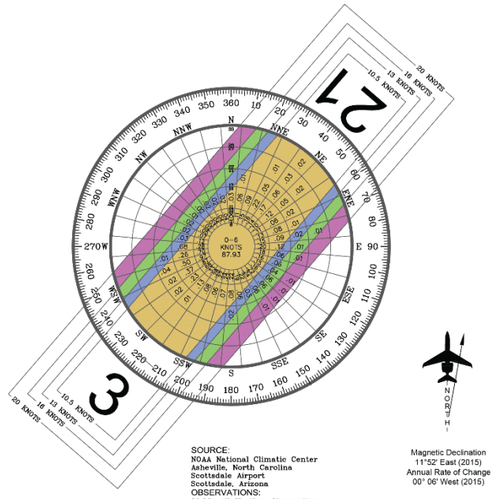
Magnetic Declination
11°52' East (2015)
Annual Rate of Change
00° 06' West (2015)

RUNWAY DATA	RUNWAY 3-21			
	EXISTING		ULTIMATE	
	3	21	3	21
RUNWAY DESIGN CODE (RDC)	D-II-5000		SAME	
APPROACH REFERENCE CODE	B/II/5000		SAME	
DEPARTURE REFERENCE CODE	B/II		SAME	
RUNWAY AZIMUTH (TRUE)	43.99°	224.00°	SAME	SAME
RUNWAY BEARING (TRUE)	N 43°59'10.164" E		SAME	
APPROACH TYPE	NON-PRECISION	NON-PRECISION	SAME	SAME
PART 77 APPROACH CATEGORY	34:1	34:1	SAME	SAME
APPROACH VISIBILITY MINIMUMS	≥1 MILE	≥1 MILE	SAME	SAME
RUNWAY DEPARTURE SURFACE	40:1	40:1	SAME	SAME
TYPE OF AERONAUTICAL SURVEY REQUIRED	NON-VERTICALLY GUIDED		SAME	
THRESHOLD SITING SURFACE	20:1	20:1	SAME	SAME
DESIGN AIRCRAFT	GULFSTREAM IV		SAME	
DESIGN AIRCRAFT UNDERCARRIAGE WIDTH (FEET)	13.66'		SAME	
DESIGN AIRCRAFT WINGSPAN	77.83'		SAME	
DESIGN AIRCRAFT TAIL HEIGHT	24.42'		SAME	
RUNWAY LENGTH	8249'		SAME	
RUNWAY WIDTH	100'		SAME	
RUNWAY END ELEVATION	1444.3'	1510.4'	SAME	SAME
TOUCH DOWN ZONE ELEVATION	1469.4'	1507.2'	SAME	SAME
DISPLACED THRESHOLD	740'	400'	SAME	SAME
EFFECTIVE RUNWAY GRADIENT	0.81%		SAME	
MAXIMUM GRADIENT	0.98%		SAME	
RUNWAY SURFACE TYPE	ASPHALT		SAME	
RUNWAY PAVEMENT STRENGTH (in thousand lbs.)[3]	45(S), 75(D)		SAME	
RUNWAY SURFACE TREATMENT	NONE		NONE	
RUNWAY LIGHTING	MIRL	MIRL	SAME	SAME
RUNWAY MARKING	NON-PRECISION	NON-PRECISION	SAME	SAME
VISUAL AND NAVIGATIONAL AIDS	PAPI-2 REILs GPS RNP VOR ROTATING BEACON		SAME SAME SAME SAME SAME SAME	
RUNWAY SAFETY AREA BEYOND STOP END [1]	1000'	1000'	SAME	SAME
RUNWAY SAFETY AREA WIDTH	400'		SAME	
OBJECT FREE AREA BEYOND STOP END [2]	800'	800'	SAME	SAME
OBJECT FREE AREA WIDTH[2]	1000'		SAME	
OBSTACLE FREE ZONE BEYOND STOP END (ACTUAL)	200'	200'	SAME	SAME
OBSTACLE FREE ZONE WIDTH	400'		SAME	
RUNWAY PROTECTION ZONE	500'x1700' x1010'	500'x1700' x1010'	SAME	SAME
TAXIWAY DESIGN GROUP (TDG)	TDG-2		SAME	
TAXIWAY WIDTH	40'-50'		SAME	
TAXIWAY OBJECT FREE AREA WIDTH	131'		SAME	
TAXIWAY SAFETY AREA WIDTH	79'		SAME	
TAXIWAY WING TIP CLEARANCE	26'		SAME	
TAXIWAY CL TO FIXED OR MOVEABLE OBJECT	65.5		SAME	
TAXIWAY LIGHTING	MITL		SAME	

[1] Based on the Declared Distances.
[2] Runway Object Free Area does not reflect existing conditions. Actual width is 630'. Actual distance beyond each runway end is 470' for Runway 3 and is 30' for Runway 21.
[3] Pavement strengths are expressed in Single(S), Dual(D) wheel loading capacities.

ALL WEATHER WIND COVERAGE

Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 3-21	99.22%	99.63%	99.91%	99.98%



SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Scottsdale Airport
Scottsdale, Arizona
OBSERVATIONS:
80,921 All Weather Observations
2002-2012

Magnetic Declination
11°52' East (2015)
Annual Rate of Change
00° 06' West (2015)

DECLARED DISTANCES

DECLARED DISTANCES	RUNWAY	
	3	21
TAKEOFF RUN AVAILABLE (TORA)	8249'	8249'
TAKEOFF DISTANCE AVAILABLE (TODA)	8249'	8249'
ACCELERATE-STOP DISTANCE AVAILABLE (ASDA)	7849'	8069'
LANDING DISTANCE AVAILABLE (LDA)	7110'	7669'

RUNWAY END COORDINATES (NAD 83)		EXISTING	ULTIMATE
RUNWAY 3	Latitude	33°36'53.0202"N	SAME
	Longitude	111°55'11.7770"W	SAME
RUNWAY 21	Latitude	33°37'51.7223"N	SAME
	Longitude	111°54'04.0366"W	SAME
RUNWAY 3 DISPLACED THRESHOLD	Latitude	33°36'58.2827"N	SAME
	Longitude	111°55'05.7057"W	SAME
RUNWAY 21 DISPLACED THRESHOLD	Latitude	33°37'46.8771"N	SAME
	Longitude	111°54'07.3208"W	SAME

NOTE: Existing runway and ARP coordinates provided by the FAA's Aviation System Standards (AVN) (2015).

MODIFICATIONS OF AIRPORT DESIGN STANDARDS APPROVAL TABLE

STANDARD TO BE MODIFIED (NON-STANDARD CONDITION)	AFFECTED DESIGN STANDARD	STANDARD	EXISTING	DESCRIPTION OF MODIFICATION	SUBMITTAL DATE	APPROVAL DATE	APPROVAL NO.	AIRSPACE CASE NO.
Runway 3 Object Free Area Length Beyond Runway End	AC 150/5300-13A-Change 1	1,000'	470'	The airport's blast fence and perimeter service road as well as Frank Lloyd Wright Boulevard and Central Arizona Project (CAP) canal penetrate the ROFA beyond the departure end of Runway 3. It is not practicable to remove/relocate these facilities due to the environmental impacts, construction costs, and impacts to adjacent off-airport facilities.	10/29/2014	12/3/2018	SDL-MOS1	--
Runway 21 Object Free Area Length Beyond Runway End	AC 150/5300-13A-Change 1	1,000'	30'	The airport's perimeter service road as well as Redfield Road penetrate the ROFA beyond the departure end of Runway 21. It is not practicable to remove/relocate these facilities due to construction costs and impacts to adjacent off-airport facilities.	10/29/2014	12/3/2018	SDL-MOS1	--
Runway Object Free Area - Width	AC 150/5300-13A-Change 1	800'	630'	Several on-airport and off-airport facilities penetrate the ROFA on the east and west sides of the runway system. It is not practicable to remove/relocate these facilities due to reduced airfield efficiency and capacity, property acquisition costs, and impacts to off-airport facilities.	10/29/2014	12/3/2018	SDL-MOS1	--
Runway Centerline to Parallel Taxiway Centerline	AC 150/5300-13A-Change 1	300'	250'	The relocation of parallel Taxiways A and B would create significant impacts to on-airport and off-airport facilities. It is not practicable to relocate the taxiways due to property acquisition costs, reduced airfield efficiency and capacity, and impacts to off-airport facilities.	10/29/2014	12/3/2018	SDL-MOS3	--
Runway Centerline to Holding Position Location	AC 150/5300-13A-Change 1	250'	152'	The holding position location is dependent on the runway-to-parallel taxiway separation. It is not practicable to relocate parallel Taxiways A and B. The Safety Risk Management Document (August 2013) further indicated that a hold position relocation change cannot be introduced into the National Airspace System with an acceptable level of risk.	10/29/2014	Pending	Pending	--
Runway Centerline to Aircraft Parking Area	AC 150/5300-13A-Change 1	400'	325'	Several on-airport and off-airport facilities penetrate the runway centerline to aircraft parking area on the east and west sides of the runway system. It is not practicable to remove/relocate these facilities due to reduced airfield efficiency and capacity, property acquisition costs, and impacts to off-airport facilities.	10/29/2014	12/3/2018	SDL-MOS4	--

AIRPORT DATA

SCOTTSDALE AIRPORT (SDL)

CITY: SCOTTSDALE, ARIZONA — COUNTY: MARICOPA COUNTY, ARIZONA
RANGE: 4 EAST — TOWNSHIP: 3 NORTH — CIVIL TOWNSHIP: N/A

		EXISTING	ULTIMATE
NPIAS SERVICE LEVEL		RELIEVER	SAME
STATE SERVICE ROLE		GENERAL AVIATION/RELIEVER	SAME
CRITICAL DESIGN AIRCRAFT		GULFSTREAM IV	SAME
AIRPORT REFERENCE CODE (ARC)		D-II	SAME
AIRPORT ELEVATION (ABOVE MEAN SEA LEVEL)		1510.3'	SAME
MEAN MAXIMUM TEMPERATURE OF HOTTEST MONTH		104.8°F (July)	SAME
AIRPORT REFERENCE POINT (ARP) COORDINATES (NAD 83)	Latitude	33°37'22.4000"N	SAME
	Longitude	111°54'37.9000"W	SAME
AIRPORT NAVIGATIONAL AIDS		PAPI-2 REILs GPS RNP VOR ROTATING BEACON	SAME SAME SAME SAME SAME SAME
MISCELLANEOUS FACILITIES		LIGHTED WIND CONE ASOS ATCT	SAME SAME SAME

No.	REVISIONS	DATE	BY	APP'D
7	ULTIMATE AIRCRAFT RUN UP/HOLD APRON ASSOCIATED WITH RUNWAY 21, ULTIMATE TAXIWAY A13 RELOCATION, ULTIMATE TIT TAXILANE CONNECTOR (FALCON NEST) ON EAST SIDE OF TAXIWAY S, AND EXISTING/ULTIMATE LANDSIDE FACILITY IMPROVEMENTS	02/11/2022	GPM	--
6	ADDED TIT TAXILANE CONNECTOR ON EAST SIDE OF TAXIWAY "B" (AEROHEAD AVIATION)	11/24/20	GPM	--
5	MOS APPROVALS, MISCELLANEOUS AIRSIDE AND LANDSIDE IMPROVEMENTS	3/26/20	GPM	--
4	MASTER PLAN UPDATE	5/13/15	GPM	--
3	ADDED RUNWAY 3 RSA IMPROVEMENTS, REVISED DECLARED DISTANCES, AND REVISED DISPLACED THRESHOLD (RUNWAY 3)	5/22/13	GPM	FAA
2	TAXIWAY CONNECTORS, MARKINGS, LIGHTING AND OTHER MISCELLANEOUS REVISIONS	1/25/12	GPM	FAA
1	ADD RUNWAY SAFETY ACTION PLAN IMPROVEMENTS AND OTHER MISCELLANEOUS	09/27/06	STG	FAA
0	TAXIWAY B COMPLETE, MISCELLANEOUS REVISIONS SUBMIT FOR REVALIDATION	5/01/02	STG	FAA
0	TAXIWAY B REVISIONS, REVISED DECLARED DISTANCES, NEW ASOS LOCATION. SUBMIT FOR REVALIDATION	4/06/01	STG	FAA
0	MISC. REVISIONS - SUBMIT FOR REVALIDATION	8/30/00	STG	FAA
0	ALP APPROVAL	2/20/97	JSK	FAA
0	ALP APPROVAL	11/3/95	JSK	FAA
0	ALP APPROVAL	3/25/93	JSK	FAA

THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA AND DO NOT CONSTITUTE A STANDARD, SPECIFICATION OR REGULATION. ACCEPTANCE OF THE COMMITMENT OF THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREON NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH THE APPROPRIATE PUBLIC LAWS.

SCOTTSDALE AIRPORT

AIRPORT DATA SHEET

SCOTTSDALE, ARIZONA

PLANNED BY: Matt Quick
DETAILED BY: Maggie Beaver

February 2022 — SHEET 2 OF 10

Coffman Associates
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LEGEND

- Airport Property Line
- Taxiway Object Free Area (TOFA)
- Taxiway Pavement
- Private "Buy-Back" Leasehold

EXISTING LANDSIDE INFRASTRUCTURE AFFECTED

- 22,585 sq. yds. of Apron
- 21 Marked Tiedowns
- 2 Linear Box Hangar Complexes (14 units)
- Aircraft Wash Rack
- Bypass Taxilane Associated with Main Aircraft Parking Apron, Netjet Apron, and Kilo Ramp
- Private "Buy-Back" Leasehold Estimated at $7 Million *(not eligible for FAA funding)*

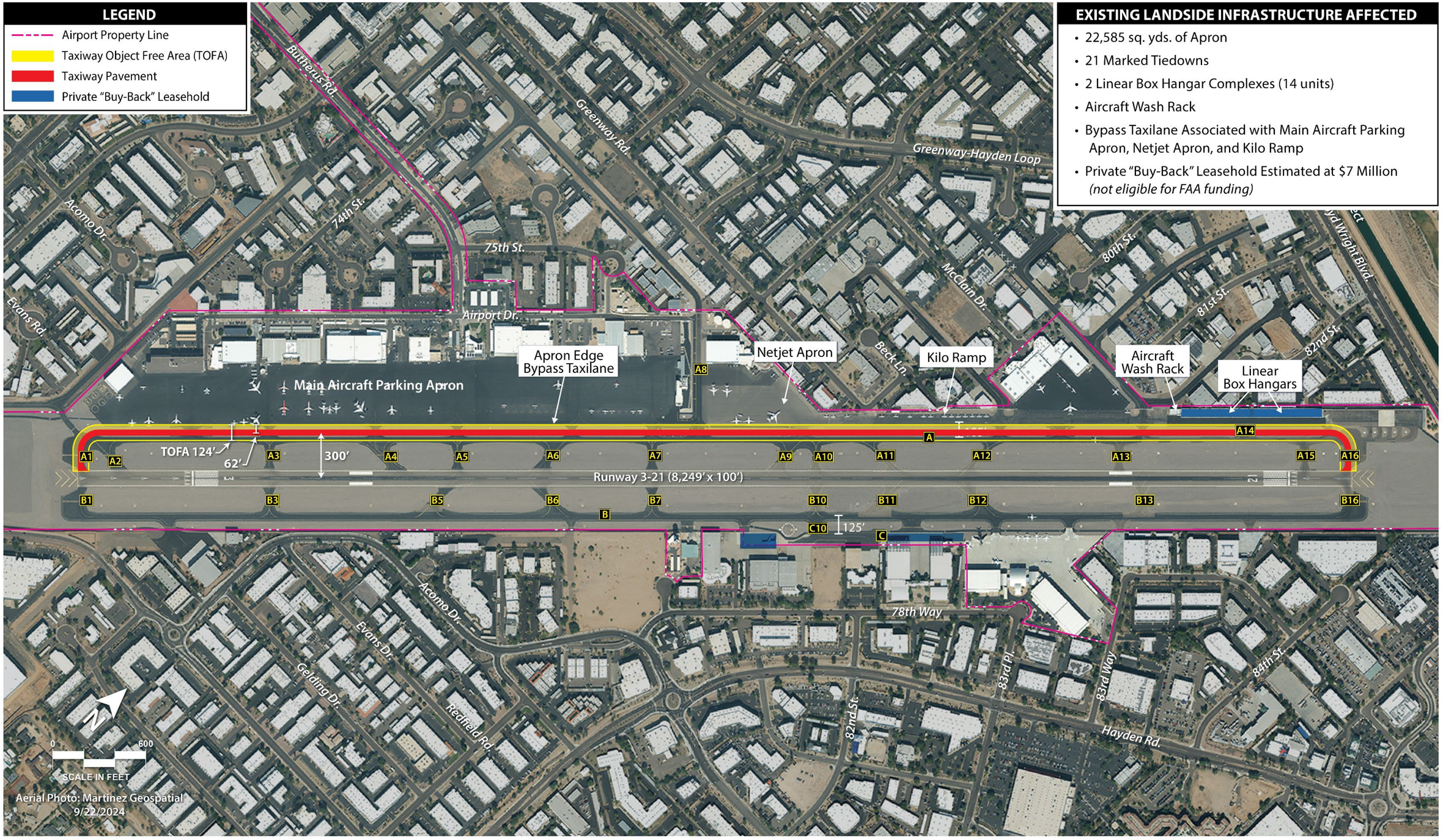


Exhibit 4C
RUNWAY/TAXIWAY SEPARATION ALTERNATIVE 1 - SHIFT TAXIWAY A TO 300′ SEPARATION

LEGEND

- Airport Property Line
- Taxiway Object Free Area (TOFA)
- Taxiway Pavement
- Affected Off-Airport Property Parcels
- Private "Buy-Back" Leasehold

EXISTING LANDSIDE INFRASTRUCTURE AFFECTED

- 1,900 sq. yds. of Apron
- 107,476 sq. ft. (2.47 Acres) of Off-Airport Property including 14 Private Parcels and 5 Buildings
- Purchase of Off-Airport Parcels and Facilities Estimated at $85.42 Million
- Private "Buy-Back" Leaseholds Estimated at $1.76 Million *(not eligible for FAA funding)*

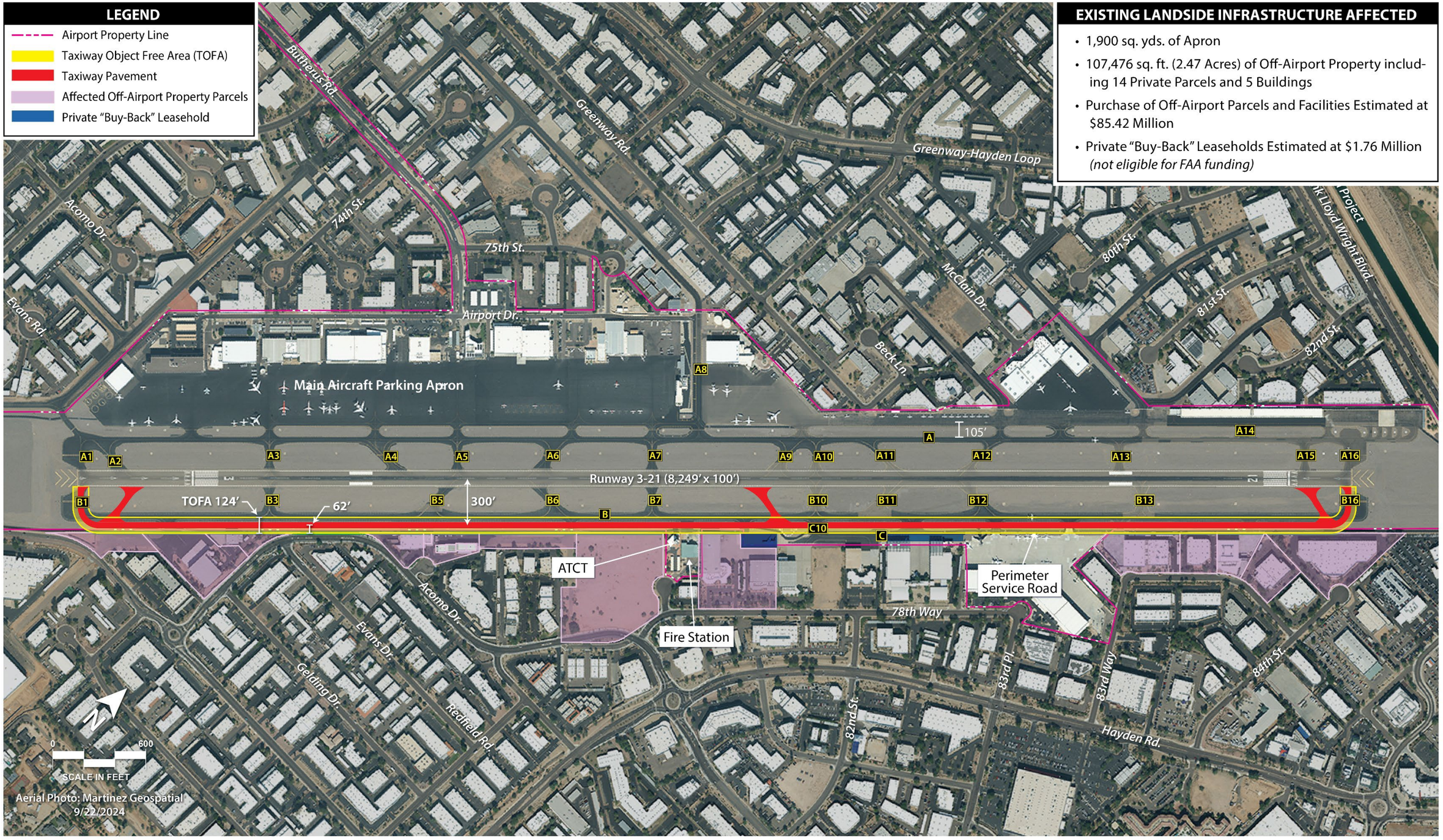


Exhibit 4D
RUNWAY/TAXIWAY SEPARATION ALTERNATIVE 2 - SHIFT TAXIWAY B TO 300' SEPARATION

LEGEND

- Airport Property Line
- Taxiway Object Free Area (TOFA)
- Taxiway/Runway Pavement
- To Be Removed
- Affected Off-Airport Property Parcels
- Private "Buy-Back" Leasehold

EXISTING LANDSIDE INFRASTRUCTURE AFFECTED

- 7,895 sq. yds. of Apron
- Airport Traffic Control Tower
- Fire Station
- 413,452 sq. ft. (9.49 acres) of Off-Airport Property including 21 Private Parcels and 16 Buildings
- Purchase of Off-Airport Parcels and Facilities Estimated at $125.1 Million
- Private "Buy-Back" Leaseholds Estimated at $4.61 Million *(not eligible for FAA funding)*

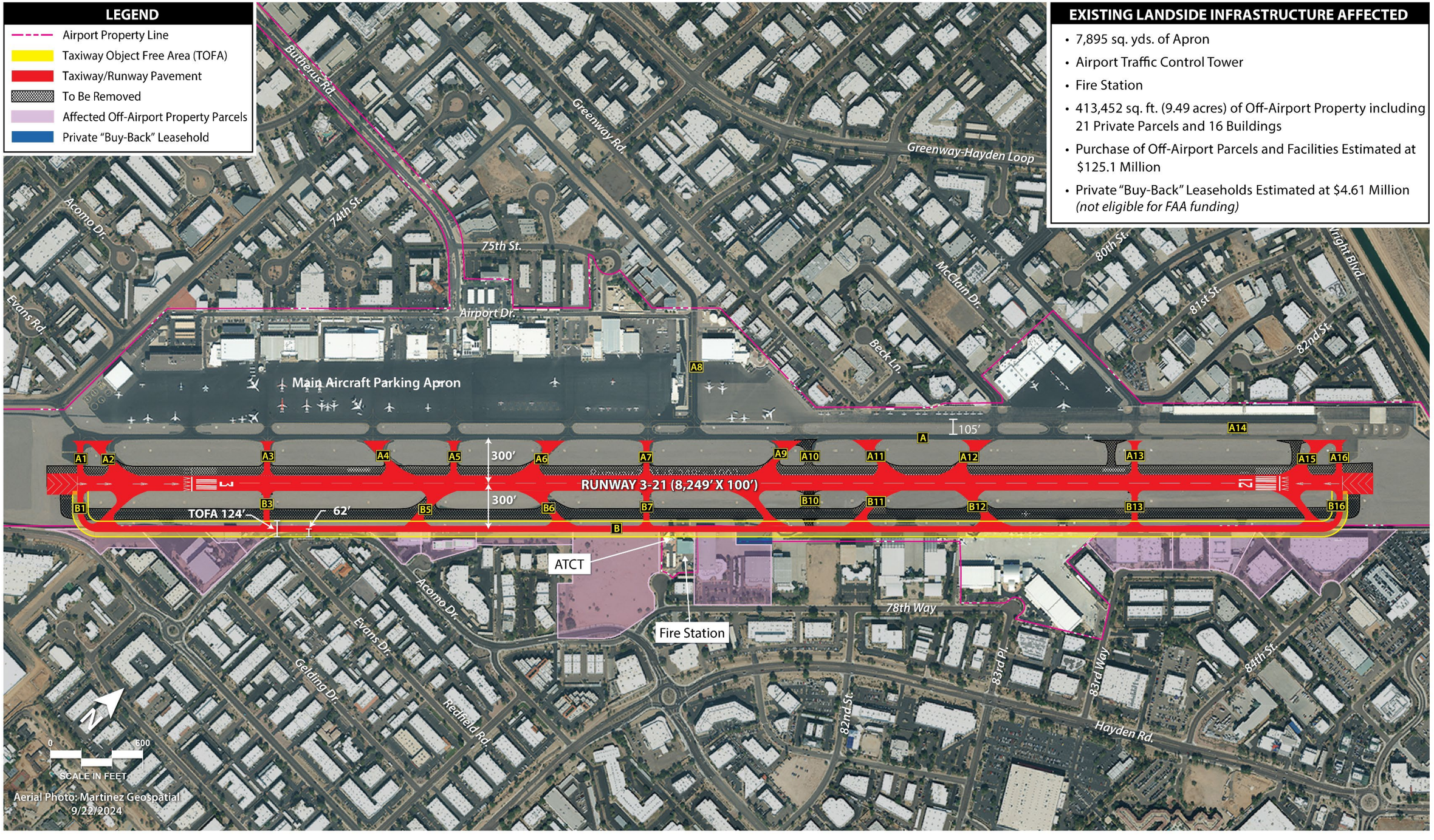


Exhibit 4E
RUNWAY/TAXIWAY SEPARATION ALTERNATIVE 3 - SHIFT RUNWAY 50' AND TAXIWAY B

LEGEND

- Airport Property Line
- Taxiway Object Free Area (TOFA)
- Taxiway/Runway Pavement
- To Be Removed
- Private "Buy-Back" Leasehold

EXISTING LANDSIDE INFRASTRUCTURE AFFECTED

- 70,117 sq. yds. of Apron
- 67 Marked Tiedowns
- 2 Linear Box Hangar Complexes (14 units)
- Aircraft Wash Rack
- Bypass Taxilane Associated with Main Aircraft Parking Apron, Netjet Apron, and Kilo Ramp
- Private "Buy-Back" Leasehold Estimated at $7 Million *(not eligible for FAA funding)*

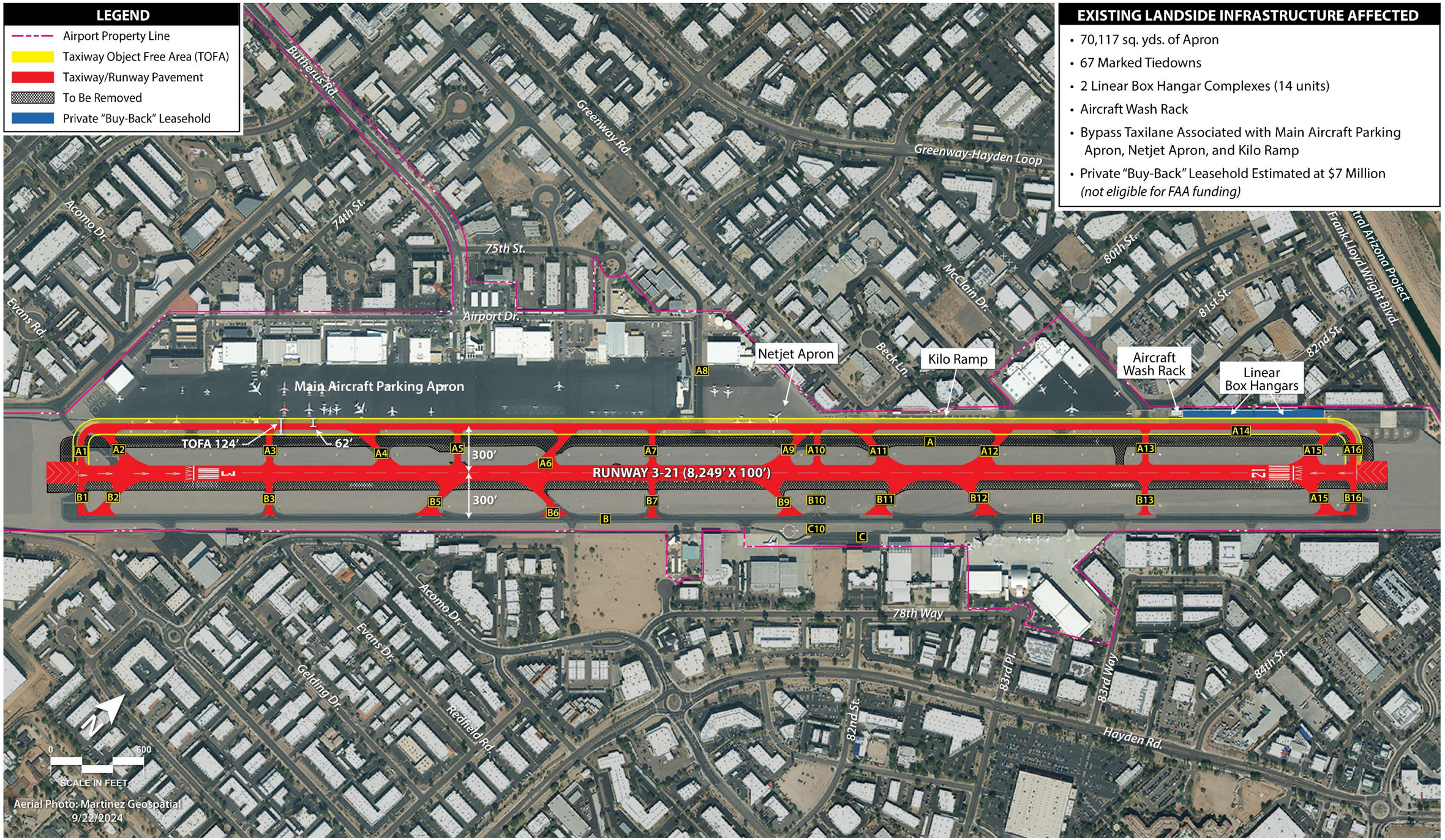


Exhibit 4F
RUNWAY/TAXIWAY SEPARATION ALTERNATIVE 4 - SHIFT RUNWAY 50' AND TAXIWAY A

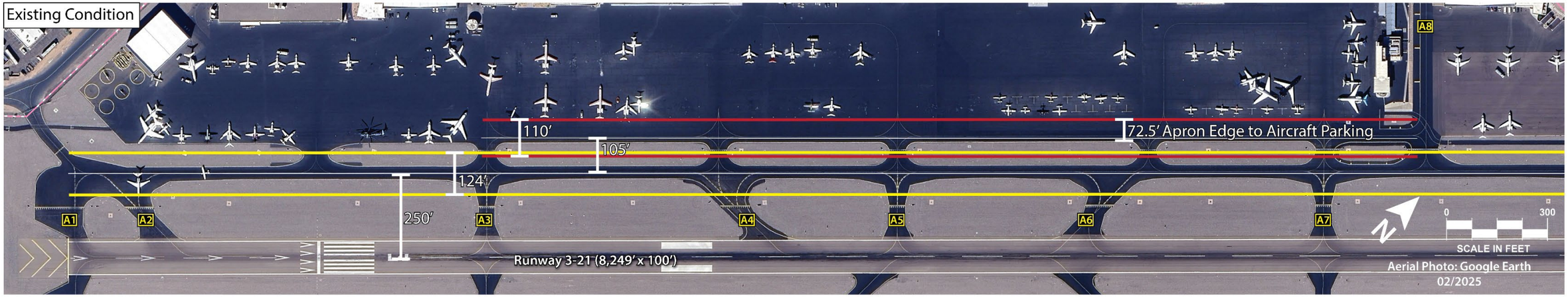
LEGEND

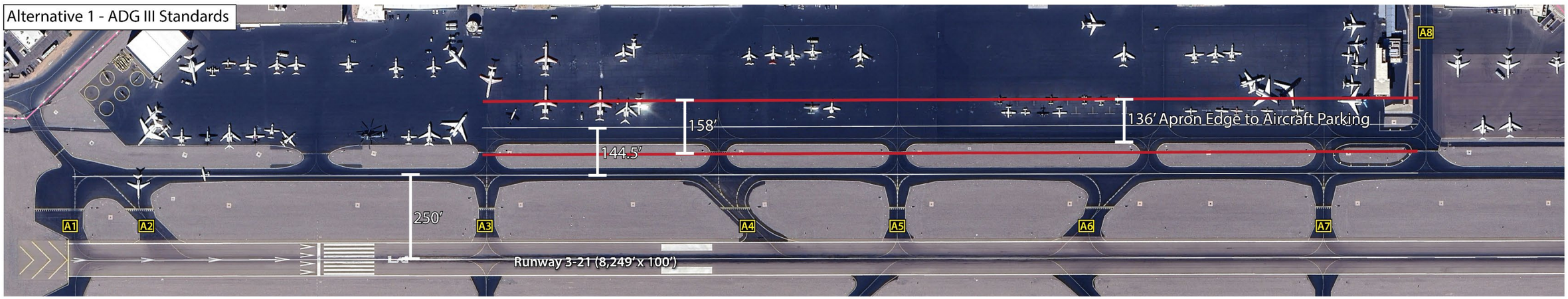
- Airport Property Line
- Runway Object Free Area (D-II Standard)
- Proposed Modification of Standard - Runway Object Free Area
- Affected Off-Airport Property Parcels
- Public Roadways and CAP Canal Obstructions
- Private "Buy-Back" Leasehold

EXISTING LANDSIDE INFRASTRUCTURE AFFECTED

- 65,395 sq. yds. of Apron
- 21 Marked Tiedowns
- 2 Linear Box Hangar Complexes (14 units)
- Aircraft Wash Rack
- Airport Traffic Control Tower
- Fire Station
- 614,837 sq. ft. (14.11 Acres) of Off-Airport Property including 20 Private Parcels and 7 Buildings
- Private "Buy-Back" Leaseholds Estimated at $10 Million *(not eligible for FAA funding)*
- Purchase of Off-Airport Parcels and Facilities Estimated at $117.18 Million

Exhibit 4G
ROFA ALTERNATIVES MODIFICATION OF STANDARDS





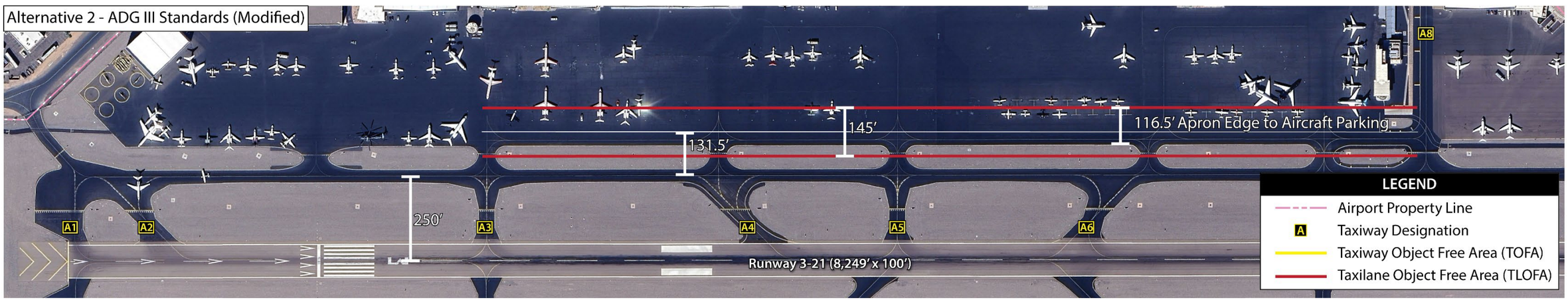


Exhibit 4H
APRON EDGE TAXILANE ALTERNATIVES

1. Reconfigure Angled Taxiway A2 to 90-Degree Bypass Taxiway
2. Construct 90-Degree Bypass Taxiway (B2)
3, 4, 5. Relocate Apron Access Taxilanes to Eliminate Direct Access
6. Reconfigure Taxiway A7 to Eliminate Direct Access
7. Remove Taxiway A10 to Eliminate Middle Third Runway Crossing
8. Construct Bypass Taxiway B15

Note: Angled Taxiways A6, A9, A11, A12, B5, B6, B11, and B12 are maintained for airfield capacity improvement purposes.

Exhibit 4J
TAXIWAY ALTERNATIVES

Exhibit 4K
POTENTIAL PROPERTY ACQUISITION