

Chapter 6 – Airfield and Landside Alternative Analysis



INTRODUCTION

The conceptual planning process is designed to evaluate the information gathered to date during the inventory, forecast, and facility requirements stages and use this information to develop alternatives that meet the anticipated demand on Palm Springs International Airport (PSP or the Airport). The airfield and landside alternatives presented in this chapter are the direct result of the collaborative effort of the Consultant Team, Airport Staff, tenants, and the Palm Springs Airport Commission.

The following section outlines the planning assumptions associated with the alternative concepts and the goals that the airfield and landside alternatives are designed to achieve. The Assumptions and Goals section is followed by a summary and a description of the advantages and disadvantages for each alternative concept.

ASSUMPTIONS AND GOALS

A series of both fundamental reasoning assumptions and development goals drive the planning process and influence the basis for the recommended long-term development program for the Airport. The following assumptions and goals were established to help guide the development and analysis of a range of alternatives designed to accommodate current and future demand at the Airport.

Assumption One: *The role of the Airport will remain the same.*

The Airport will continue to serve as a facility that accommodates commercial passenger service activity for the region and internationally as well as general aviation (GA) activity.

Assumption Two: *The Airport will continue to provide a safe and reliable operating environment.*

Alternatives will meet current local, state, and federal recommendations and design standards to maintain a safe and reliable operating environment.

Assumption Three: *Efficient planning is necessary due to the limited available space.*

The Airport is surrounded and constrained by developed infrastructure off airport property. Space on airport property is limited. Therefore, consideration of the highest and best use of on-airport land use is crucial.

Assumption Four: *Utilize existing infrastructure and facilities.*

To the extent possible, alternatives will attempt to utilize existing infrastructure and facilities to keep projects costs low. When it is not possible, the alternative will be carefully evaluated to make sure there is no other solution.

Assumption Five: *The airfield must accommodate the critical aircraft.*

The critical aircraft for each runway determines the airfield's design criteria. Different portions of the airfield will be planned based on the critical aircraft for each runway. The primary runway will drive most of the design standards for the west side of the airfield, while the additional runway will drive the design standards for the east side of the airfield. The future critical aircraft for Runway 13R/31L is the Boeing 737 MAX 9; the future critical aircraft for Runway 13L/31R are the Beechcraft King Air and Cessna Citation CJ2. The resulting runway design codes (RDCs) for the runways are D-III-5000 and B-II (small)-VIS, respectively.

Goals for Development

Accompanying these assumptions are several goals, which have been determined to direct the planning and establish continuity for future airport development. These goals consider several categorical considerations related to the Airport's short-term and long-term needs, including safety, noise, capital improvements, financial and economic conditions, public interest and investment, and community recognition and awareness.

Airport Development Goals

- Provide future facilities that are flexible, cost-effective, and financially feasible.
- Recommend development that can be implemented in a phased approach.
- Recommend development that is responsive to the needs of all stakeholders.
- Reflect the character of the Palm Springs region and the existing airport environs.

PRELIMINARY AIRFIELD ALTERNATIVE CONCEPTS

The primary goals of the airfield alternatives are to meet current the Federal Aviation Administration (FAA) design standards and maintain a safe and efficient airfield system. The airfield alternatives outlined in this section aim to address the issues and non-standard conditions discussed in the **Airside and Landside Facility Requirements** chapter. The exploration of various alternatives encompasses runways, taxiways, and holding bays. Additionally, the relocation of navigational aids (NAVAIDs) is considered, as some adjustments may be necessary due to other proposed projects.

Runway 13R/31L Alternatives

As PSP's primary runway, Runway 13R/31L serves commercial service aircraft and larger GA aircraft. As discussed in the **Airside and Landside Facility Requirements** chapter this runway does not meet the dimensional criteria for the runway object free area (ROFA). The required dimensions for Runway 13R/31L's ROFA are summarized in **Table 6-1**.

Table 6-1: Runway 13R/31L ROFA Dimension Standards

Item	Existing Dimension	FAA Criteria	Standard Met
ROFA			
Length beyond departure end ¹ (Runway 13R)	503'	1,000'	No ²
Length beyond departure end (Runway 31L)	1,000'	1,000'	Yes
Length prior to threshold (Runway 13R)	600'	600'	Yes
Length prior to threshold (Runway 31L)	600'	600'	Yes
Width	800'	800'	Yes

Sources: Mead & Hunt, 2023; FAA Advisory Circular 150/5300-13B.

Notes: ¹ Due to the application of declared distance standards, the length beyond the departure end for Runway 13R begins at the end of the Accelerate-Stop Distance Available (ASDA) and Landing Distance Available (LDA) rather than the physical end of runway.

² The length beyond runway end for Runway 13R's ROFA does not meet standards because of the existing perimeter road.

The required ROFA length beyond departure end for this runway is required to be 1,000 feet. However, only 503 feet is available because the existing perimeter road south of Runway end 31L limits the length beyond the departure end for takeoffs to the south (aircraft departing off Runway 13R).

Three alternatives were explored to resolve the non-standard ROFA: apply for a modification of standard (MOS), relocate the perimeter road, and adjust the declared distances. All three alternatives do not affect the departure runway protection zones (RPZ). This was intentional to not introduce incompatible land uses after determining, in the previous chapter, the existing land use has either no impact or low impact to the surrounding community.

Runway 13R/31L Alternative 1

Alternative 1 is for the Airport to apply for a MOS for the non-standard ROFA. A MOS requires the Airport to complete all applicable paperwork, which is then submitted to the FAA. The FAA evaluates the non-standard condition and determines whether the MOS will provide an equivalent level of safety.

Potential Advantages of Alternative 1

- The alternative does not require construction or relocation of runway or taxiway pavement or road relocations.
- No traffic studies would be required.
- The alternative does not relocate any thresholds or change approach or departure profiles or paths for Runway 13R/31L.

Potential Disadvantages of Alternative 1

- The MOS may not be approved.
- Additional analysis may be required to demonstrate how an equivalent level of safety will be achieved.
- The Airport will need to reapply for the MOS every five years.

Runway 13R/31L Alternative 2

Alternative 2, depicted on **Figure 6-1**, resolves the non-standard ROFA by adjusting the declared distances. The published Accelerate Stop Distance Available (ASDA) and Landing Distance Available (LDA) for Runway 13R are currently 9,857 feet and 6,857 feet, respectively. Alternative 2 shifts the end of both the ASDA and LDA 497 feet so that there is a total of 1,000 feet from the end of the new ASDA/LDA and the existing service road. The alternative also adds 497 feet of takeoff only pavement to Runway 13R's end. So, the ASDA remains 9,857 feet but with a standard ROFA. Finally, the alternative also relocates Runway 13R's threshold 497 feet to the north, so the LDA remains 6,857 feet to meet the landing requirements discussed in the **Airside and Landside Facility Requirements** chapter.

Potential Advantages of Alternative 2

- The alternative provides a standard ROFA of 1,000 feet beyond the takeoff end of the published ASDA and LDA.
- The alternative does not require relocation of road.

Potential Disadvantages of Alternative 2

- The alternative requires construction of additional airfield pavement (both runway and taxiway).
- The alternative relocates the Runway 13R threshold so aircraft would be lower on approach from the north.

- While noise impacts would likely be minimal, lower aircraft on approach could be perceived as a noise impact by airport neighbors.
- The alternative may require changes to the FAA-approved and published approach procedure to Runway 13R.

Runway 13R/31L Alternative 3

Alternative 3, depicted on **Figure 6-2**, resolves the non-standard ROFA by relocating a portion of the perimeter service road and fence. This relocation requires a portion of Kirk Douglas Way, between Airport Center Drive and Ramon Road, to be realigned. The new alignment of Kirk Douglas Way would intersect Ramon Road at a new signaled four-way intersection at CII Santa Cruz. Due to the proximity of Runway 13R/31L to Ramon Road, the relocation of the perimeter service road and fence does not provide the full standard 1,000 feet, it only provides 977 feet. To get the standard 1,000 feet, this alternative shortens the ASDA and LDA for operations in south flow (arrivals and takeoffs off Runway 13R) by 23 feet. The resulting ASDA is a total of 9,834 feet; the resulting LDA is a total of 6,834 feet. It is important to note that, even with the reductions, these lengths still meet the runway length requirements for takeoffs and landings that were evaluated in the **Airside and Landside Facilities Requirements** chapter.

Potential Advantages of Alternative 3

- The alternative provides a standard ROFA of 1,000 feet beyond the takeoff end of the published ASDA and LDA.
- The alternative does not relocate any thresholds or change approach or departure profiles or paths for Runway 13R/31L.

Potential Disadvantages of Alternative 3

- The alternative would require coordination with the City of Palm Springs (City) transportation department to relocate a major signalized intersection.
- The alternative would likely require further traffic studies.

Figure 6-1: Runway 13R/31L - Alternative 2

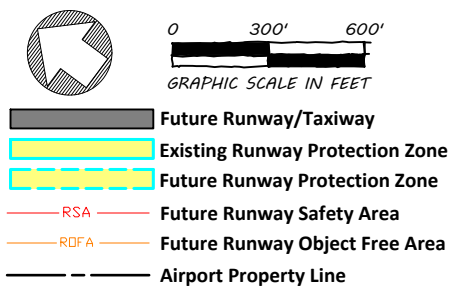
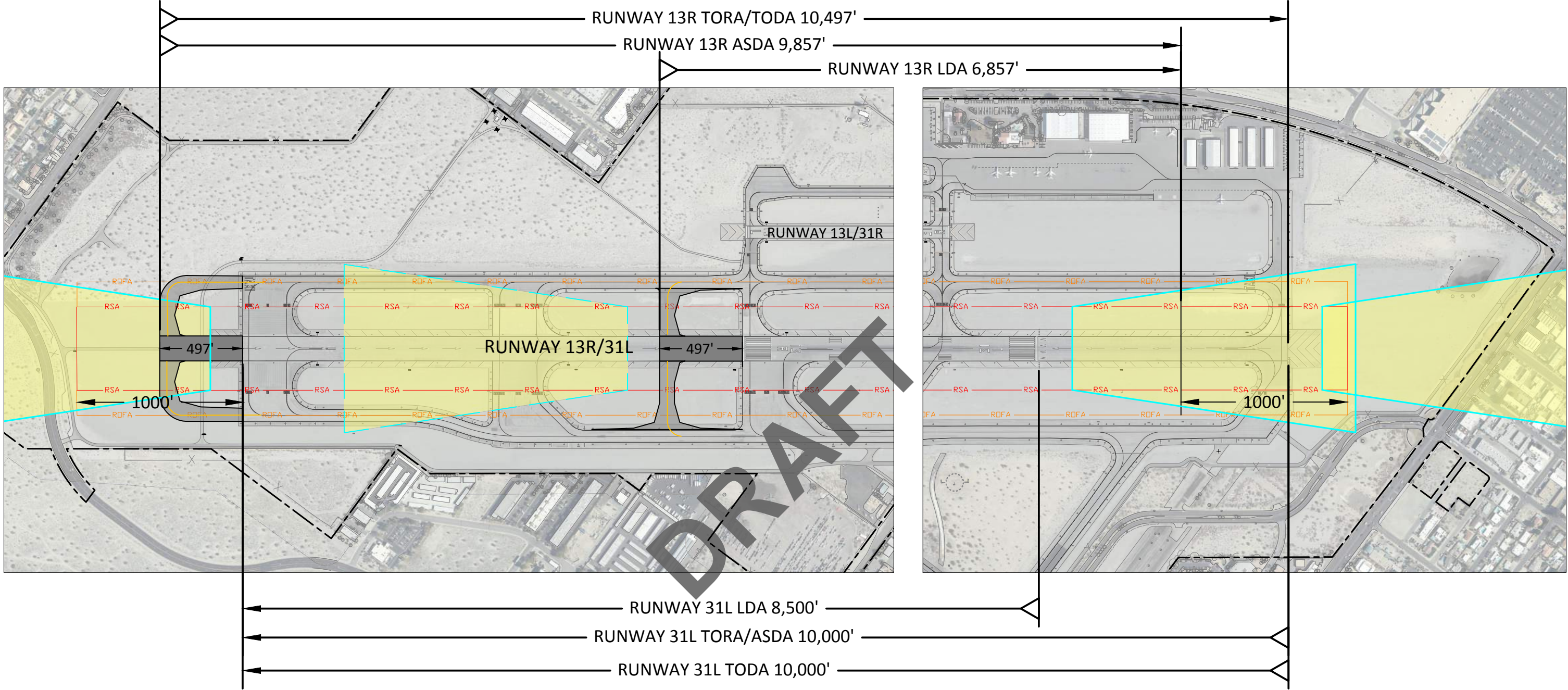
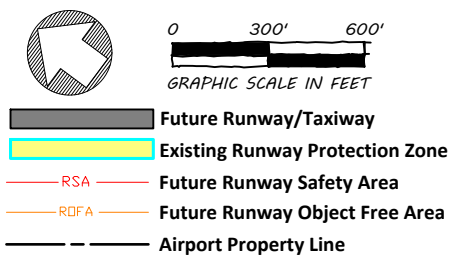
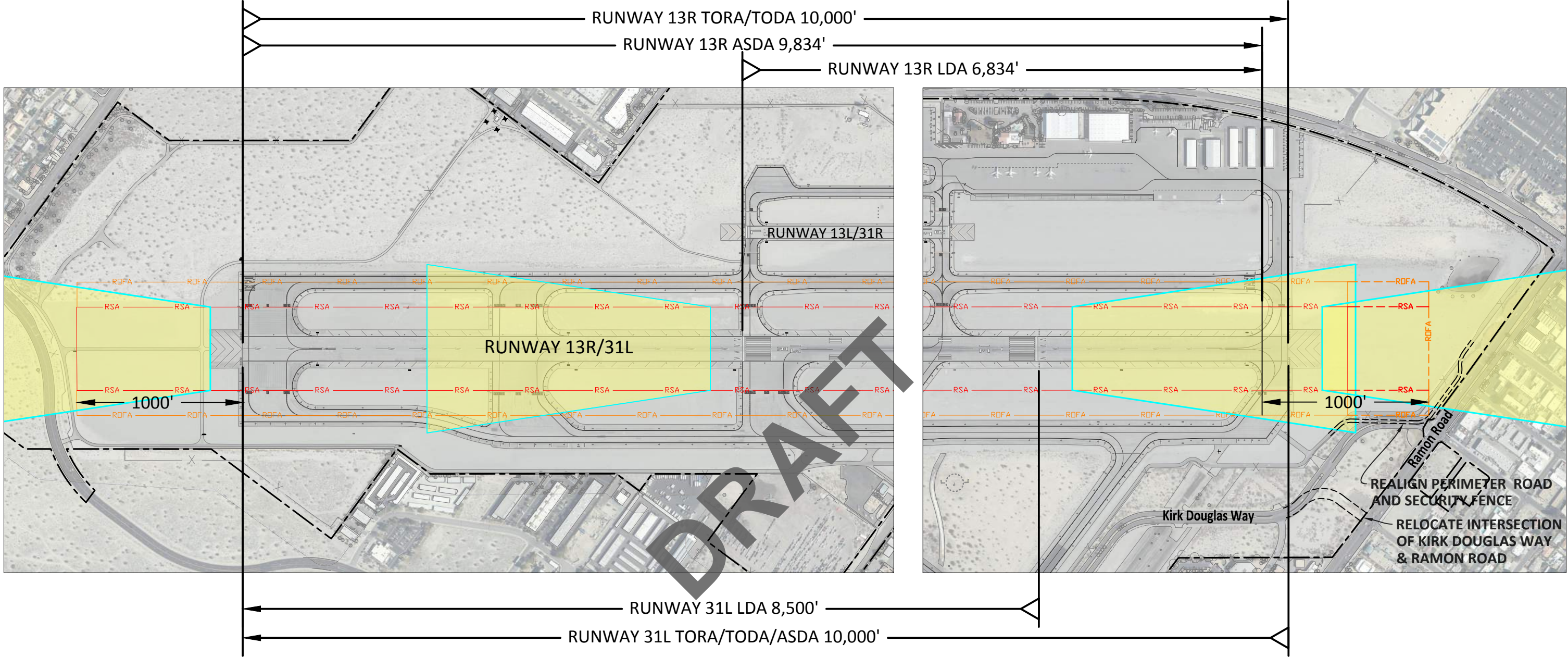


Figure 6-2: Runway 13R/31L - Alternative 3



Runway 13R/31L Alternatives Summary

Each alternative is summarized below. **Table 6-2** provides a comparison of the alternatives presented above.

- **Alternative 1** – apply for MOS.
- **Alternative 2** – adjust published declared distances.
- **Alternative 3** – realign Kirk Douglas Way to relocate the existing perimeter service road and fence.

Table 6-2: Runway 13R/31L Alternatives Comparison

Item	Alt 1	Alt 2	Alt 3
Meets ROFA dimensional standard	No ¹	Yes	Yes
Shortens published declared distances	No	No	Yes ²
Requires relocation/construction of infrastructure	No	Yes ³	Yes ⁴
Potentially requires further studies	No	Yes ⁵	Yes ⁶

Source: Mead & Hunt, 2023.

Notes: ¹ Would be MOS assuming FAA approval.

² ASDA and LDA for operations to south shortened by 23 feet.

³ Requires construction of additional runway and taxiway pavement.

⁴ Requires relocation of existing perimeter road and fence and relocation of Kirk Douglas Way.

⁵ Potentially requires a noise study because of shifted RPZ.

⁶ Potentially requires a traffic study because of relocation of Kirk Douglas Way.

Runway 13R/31L Recommendation

The recommended Runway 13R/31L alternative is to apply for a MOS (Alternative 1). If approved, this resolves the non-standard ROFA quickly because it does not require any construction or any further studies. As discussed above, the MOS would need to be resubmitted to FAA every five years. Therefore, as a long-term solution, it is also recommended to realign Kirk Douglas Way, the perimeter fence, and the service road (Alternative 3).

Runway 13L/31R Alternatives

Runway 13L/31R currently serves smaller GA aircraft at PSP. Its length does not allow for larger corporate jets to operate. This forces most large jet activity to operate on Runway 13R/31L. This section discusses three alternatives that extend Runway 13L/31R to allow some small and mid-size jets to operate. All alternatives provide an approximate 1,000-foot extension to a future runway length greater than 5,000 feet.

Runway 13L/31R Alternative 1

Alternative 1, depicted on **Figure 6-3**, adds 1,000 feet of pavement to the south end of the runway. A new taxiway would extend south onto the taxilane to provide access to the extended runway, eliminating this portion of the Fixed Base Operator (FBO) apron.

Potential Advantages of Alternative 1

- The alternative allows additional use by small and mid-size jets.

Potential Disadvantages of Alternative 1

- The alternative's new taxiway and taxiway object free area restrict parking on FBO apron.
- The alternative's potential loss of a dual taxilane impacts circulation on FBO apron.
- The ROFA impacts FBO helicopter parking positions.
- Aircraft arriving Runway 13L/31R from the south and departing Runway 13L/31R to the south would be lower over noise sensitive land uses south of the Airport.

Runway 13L/31R Alternative 2

Alternative 2, depicted on **Figure 6-4**, adds 500 feet of pavement to both ends of Runway 13L/31R. A new taxiway would extend south onto the FBO's taxilane to provide access to the extended runway, eliminating this portion of the FBO's apron. A new taxiway would be constructed on Runway 13L's end.

Potential Advantages of Alternative 2

- The alternative allows additional use by small and mid-size jets.
- Both 31 Runway thresholds align, which could make it easier for pilots to identify runways and avoid mistaking taxiways for runways.
- The alternative impacts less of the FBO apron compared to Alternative 1.

Potential Disadvantages of Alternative 2

- The new taxiway and taxiway object free area restrict parking on the FBO apron.
- The potential loss of a dual taxilane impacts circulation on the FBO apron.
- Aircraft arriving and departing Runway 13L/31R in both directions would be lower over noise sensitive land uses both north and south of the Airport.
- The alternative leads to the need to relocate helicopter parking positions.

Figure 6-3: Runway 13L/31R - Alternative 1 - Extend 31R 1,000 feet

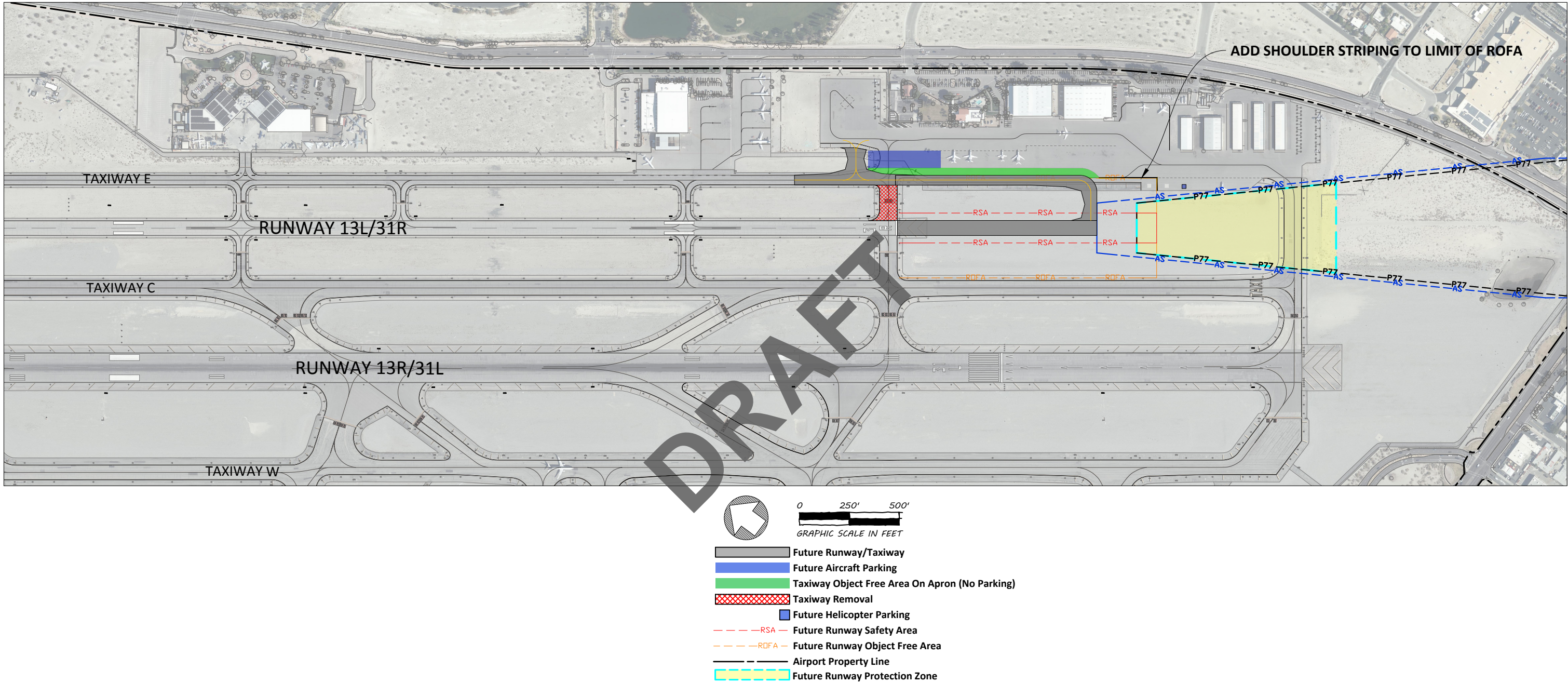
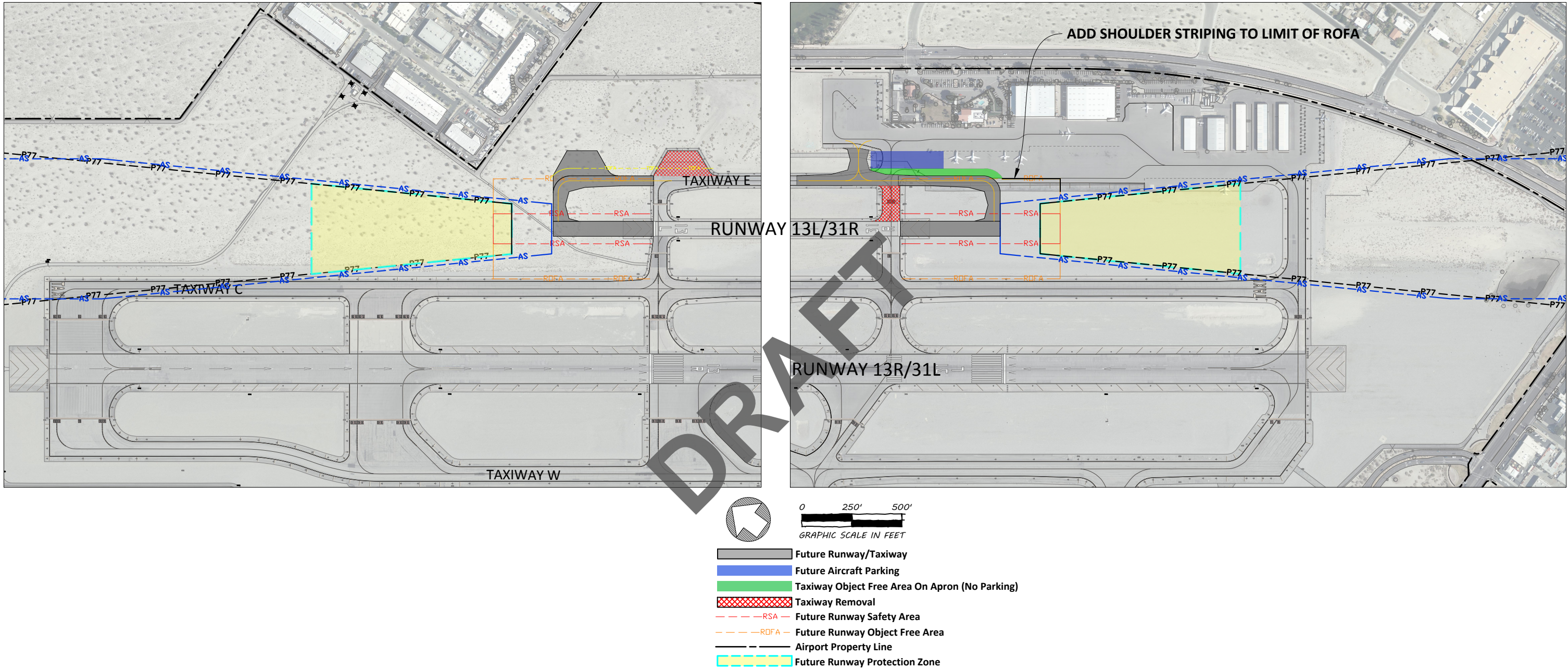


Figure 6-4 Runway 13L/31R - Alternative 2 - Extend Both Runway Ends 500 feet



Runway 13L/31R Alternative 3

Alternative 3, depicted on **Figure 6-5**, adds 825 feet of pavement to the end of Runway 13L. This alternative attempted to minimize the impacts to the FBO's apron.

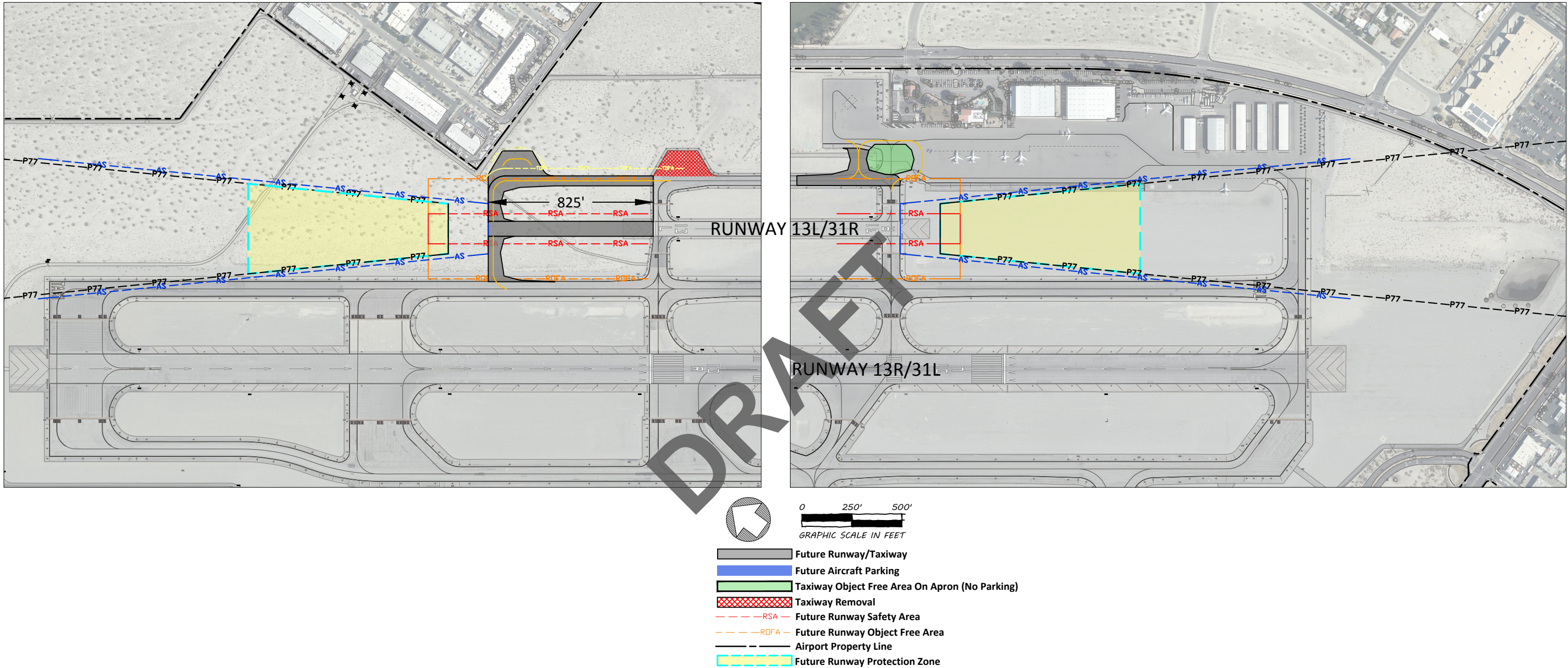
Potential Advantages of Alternative 3

- The alternative allows additional use by small and mid-size jets.
- The alternative impacts less of the FBO apron compared to Alternatives 1 and 2.
- The alternative does not impact existing helicopter parking positions.
- The alternative maintains the ability for airfield circulation in that aircraft can cross at the Runway 31R threshold.

Potential Disadvantages of Alternative 3

- The alternative leads to the need to relocate helicopter parking positions.
- Aircraft arriving Runway 13L/31R from the north and departing Runway 13L/31R to the north would be lower over noise sensitive land uses north of the Airport.

Figure 6-5: Runway 13L/31R - Alternative 3 - Extend Runway 13L End 825 feet



Runway 13R/31L Alternatives Summary

Each alternative is summarized below. **Table 6-3** provides a comparison of the alternatives presented above.

- **Alternative 1** – add 1,000 feet of pavement to Runway 31R’s end.
- **Alternative 2** – add 500 feet of pavement to Runway 13L’s end; add 500 feet of pavement to Runway 31R’s end.
- **Alternative 3** – maximize the additional pavement to 13L’s end by adding 825 feet.

Table 6-3: Runway 13L/31R Alternatives Comparison

Item	Alt 1	Alt 2	Alt 3
Allows some small and medium size jets to operate on runway	Yes	Yes	Yes
Impacts FBO apron and aircraft parking	Yes ¹	Yes ¹	Yes ¹
Impacts FBO circulation	Yes ²	Yes ²	No

Source: Mead & Hunt, 2023.

Notes: ¹ FBO parking impacted by the RPZ, ROFA, and Taxiway Object free area (TOFA) shifting with the runway/taxiway extension.

² The greater the extension to Runway 31R’s end, the higher the potential for apron and circulation impacts.

Runway 13L/31R Recommendation

The recommended Runway 13L/31R alternative is to add 825 feet of additional runway pavement to the north end of the runway (Alternative 3). This is the recommended alternative because this does not impact the existing FBO’s apron.

Taxiway and Holding Bay Alternatives

As discussed in the **Airside and Landside Facility Requirements** chapter, several taxiways do not meet current FAA design standards and recommendations. The issues that will be addressed in this section are summarized below.

- **Wide Expanses of Pavement.** Taxiways A, G, H, J, K, and L currently have wide expanses of pavement that exceed FAA design standards.
- **Crossings in Middle Third of Runway.** Taxiway H crosses Runway 13R/31L in the middle third of the runway.
- **Pilot Visibility.** Taxiway A is a non-right-angle entrance and Taxiway H is an angled crossing point, making it more difficult for pilots to see both runway ends.
- **Direct Access.** PSP has several locations of direct access including:
 - Taxiway A from east apron to Runway 31L.
 - Taxiway B from both aprons to both runways.
 - Taxiway D from east apron to Runway 31R.
 - Taxiway G from west apron Runway 13R/31L.

- **Hot Spots.** As discussed in the **Airside and Landside Facility Requirements** chapter, the Runway Safety Action Team (RSAT) recently completed a hot spot study. Four alternatives were developed, and the recommended preferred alternative has been determined to be Alternative 4 depicted in **Figure 6-6**.

Figure 6-7 through **Figure 6-9** depict a preliminary taxiway and holding bay alternative with the following improvements:

- A portion of Taxiway L and Taxiway K is painted with a green island to eliminate the wide expanse of pavement.
- The excessive pavement on Taxiway A and Taxiway K is demolished.
- Taxiway A and Taxiway K centerlines are realigned so the critical aircraft can hold perpendicular to Runway 13R/31L.
- Taxiway G is reconfigured so aircraft taxiing on Taxiway G need to turn on Taxiway W before accessing the runway.
- The western portion of Taxiway H is demolished so aircraft do not cross the middle third of the runway.
- Taxiways D and H are relocated to eliminate the direct access from SkyWest Maintenance and the Palm Springs (PS) Air Museum's aprons to Runway 13L/31R, respectively.
- The holding bay located on Taxiway A is reconfigured to eliminate what the FAA considers as a high-risk holding bay configuration. An additional runway entrance is provided so one aircraft can bypass another for departure.

Since the taxiway system depends on both the runway and landside alternatives, this alternative will be refined/altered further as the runway and landside alternatives are narrowed down to a preferred alternative.

Figure 6-6: Hot Spot Study

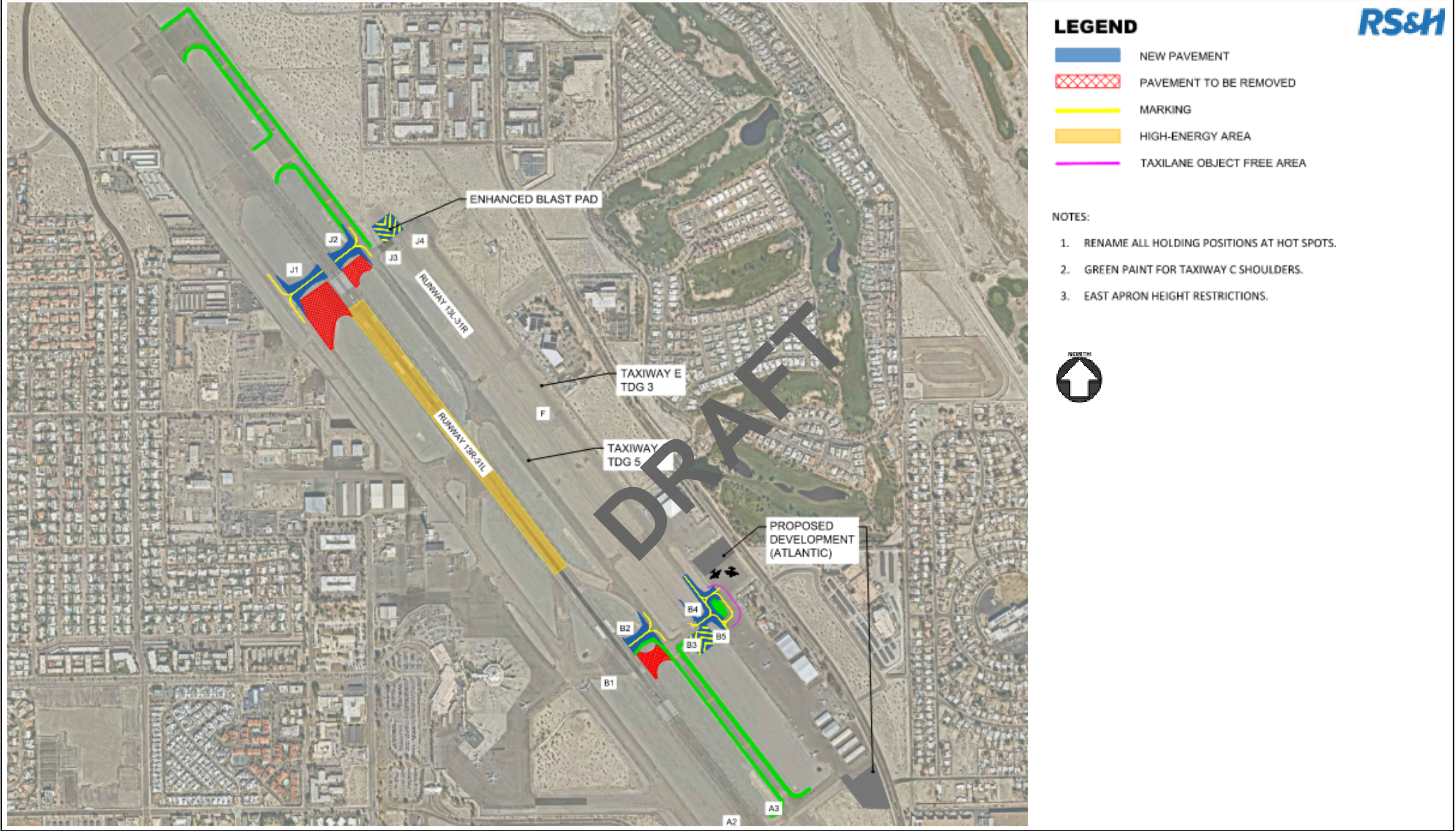
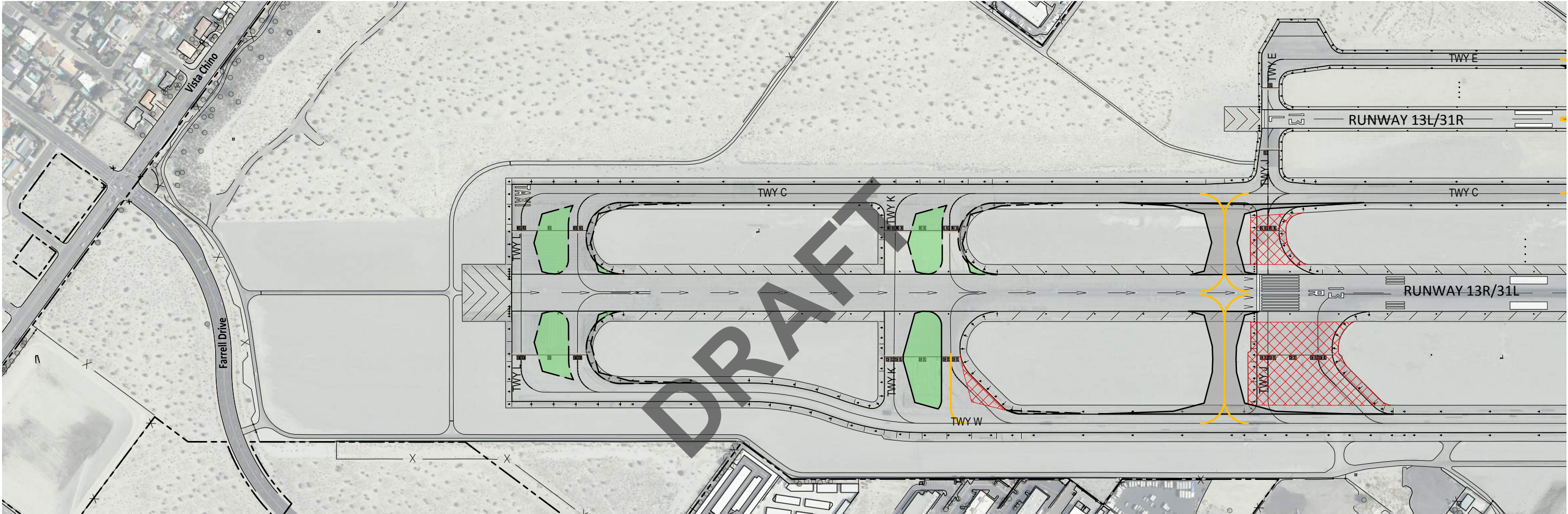
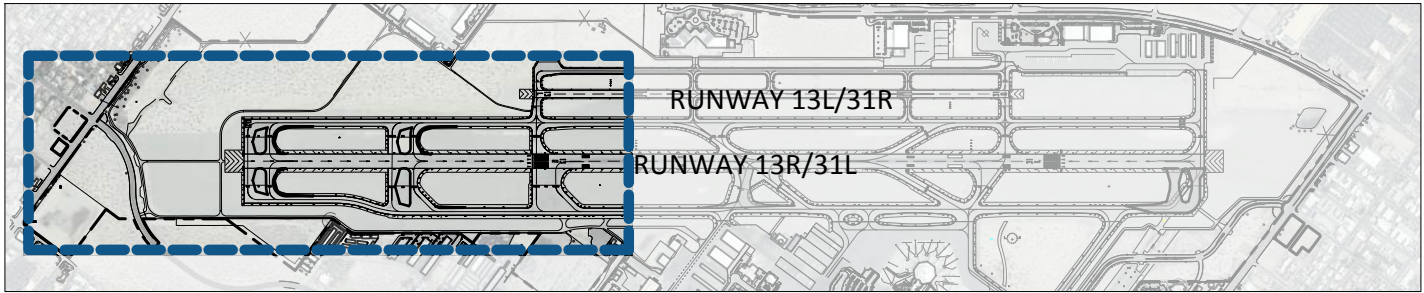


Figure 6-7: Taxiway Alternative 1 - North Detail



Legend

- Future Taxiway Pavement
- Future Taxiway Demo
- Future Painted Island
- Airport Property Line



Keymap

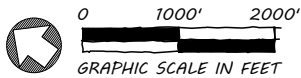
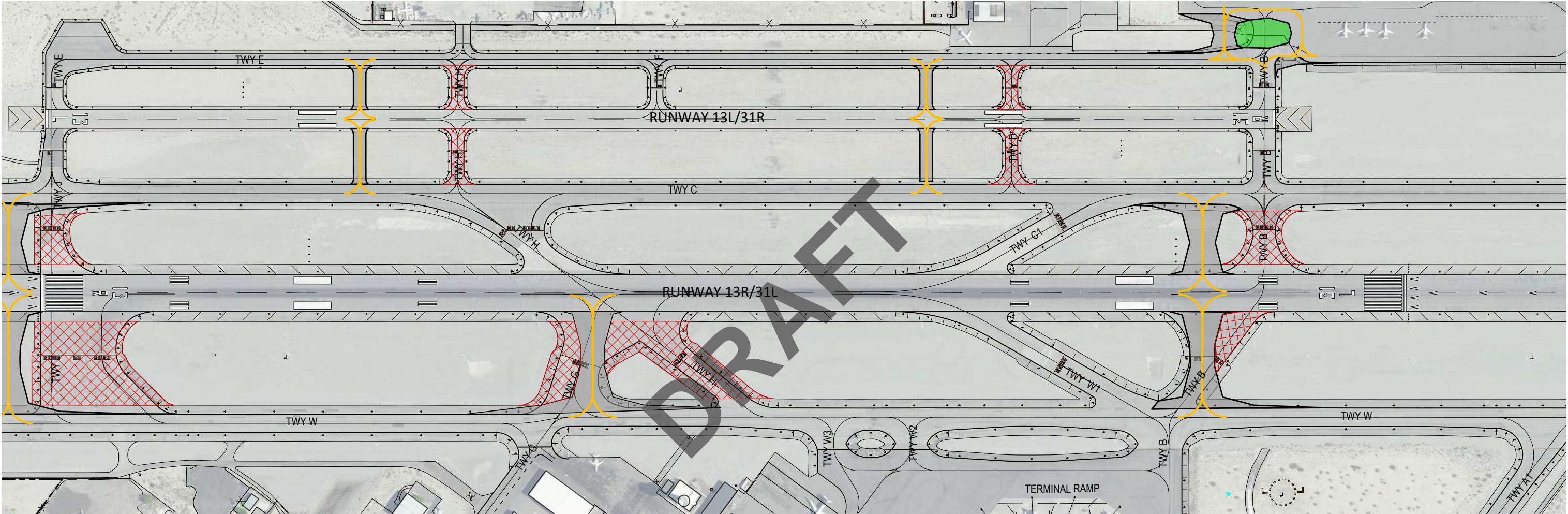
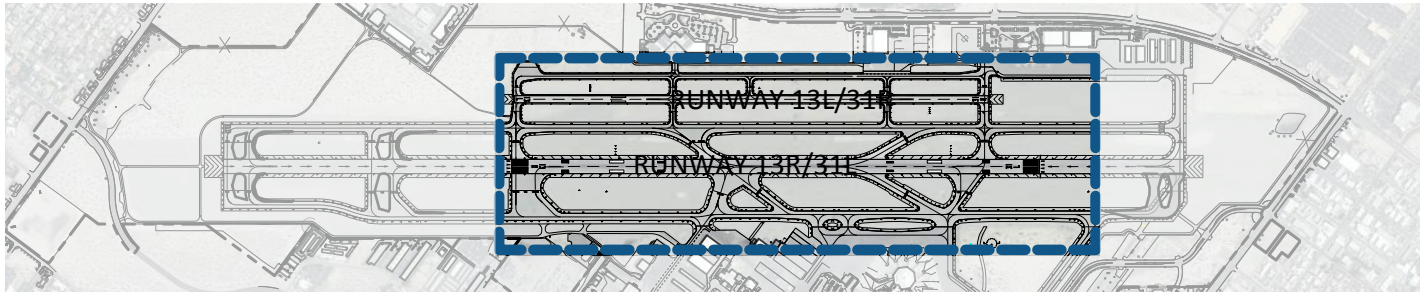


Figure 6-8: Taxiway Alternative 1 - Central Detail



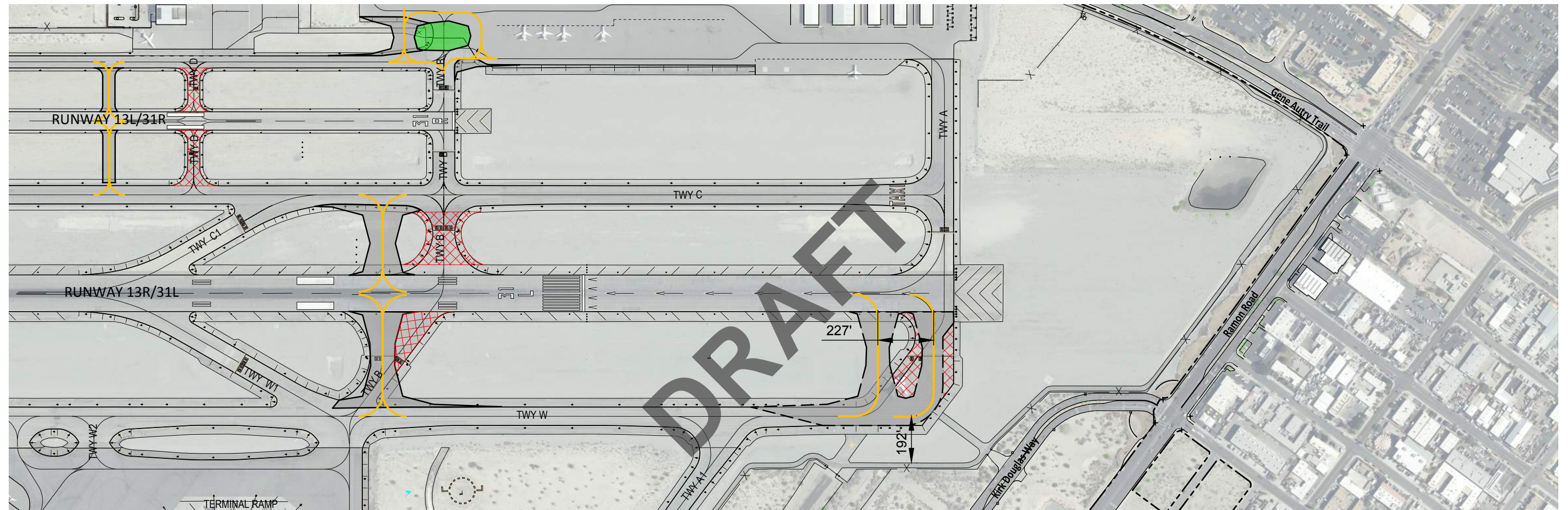
- Legend
- Future Taxiway Pavement
 - Future Taxiway Demo
 - Future Painted Island
 - Airport Property Line





Keymap

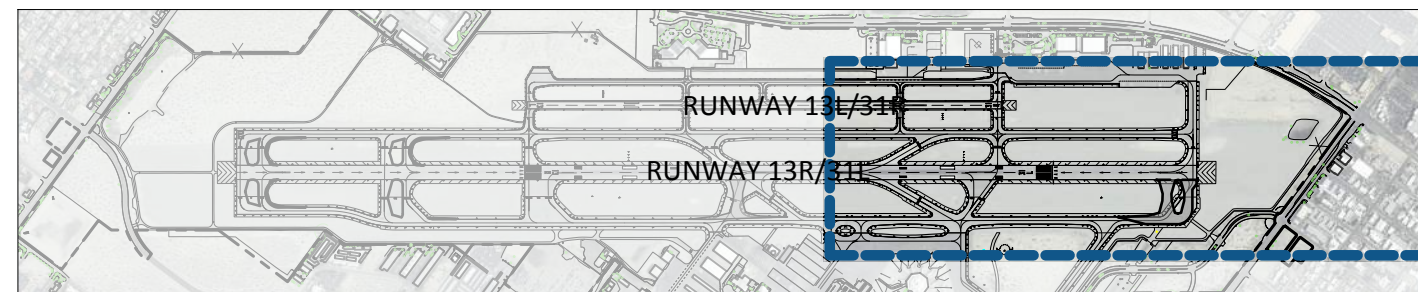


Figure 6-9: Taxiway Alternative 1 - South Detail



Legend

-  Future Taxiway Pavement
 Future Taxiway Demo
 Future Painted Island
 Airport Property Line



Keymap



PRELIMINARY LANDSIDE ALTERNATIVE CONCEPTS

The primary goals of the landside alternatives are to meet tenants' goals to the extent possible and determine the highest and best use of limited, on-airport developable property. This section explores the various alternatives associated with both FBOs, the PS Air Museum, the undeveloped land on the east side of the airfield, and the aircraft rescue and firefighting (ARFF).

Aircraft Storage Development Alternatives

Aircraft storage/hangar alternative concepts were developed to meet the growing demand for aviation-related development as described in previous chapters. PSP needs additional large hangars to meet the projected based aircraft demand. This section explores one potential site for development of additional aircraft storage hangars. Additional aircraft storage hangars are provided with two of the Signature Aviation Alternative concepts below. If PSP desires, more than one alternative site could be developed.

Aircraft Storage Development Alternative 1

Alternative 1, depicted on **Figure 6-10**, shows hangar development in the parcel between the PS Museum and SkyWest Maintenance. This alternative provides two 150-foot-by-150-foot hangars and four 100-foot-by-100-foot hangars. This alternative also provides a GA customs facility that will process international passengers. These hangars would accommodate most of the projected based aircraft requirements, which are expected to be primarily corporate jet type aircraft. The apron provides two connectors to Taxiway E and space for a taxilane on the apron running parallel to Taxiway E, which would provide good aircraft circulation to and from the hangars. This site provides excellent landside and airfield access.

Potential Advantages of Alternative 1

- The alternative meets future based jet aircraft storage requirements.
- The alternative provides excellent airfield and landside access.
- Aircraft tails clear the Part 77 transitional surface and therefore can be parked on the apron in front of the hangars.

Potential Disadvantages of Alternative 1

- There may be higher revenue producing, aviation-related development opportunities for this parcel.
- Medium and large jet aircraft may need to cross the GA runway to operate to/from primary runway.

Legend

- Future Hangars
- Future Pavement
- Taxiway Object Free Area
- Airport Property Line

0 100' 200'

GRAPHIC SCALE IN FEET

GA CUSTOMS FACILITY

HANGAR 150' x 150'

ACCESS ROAD

HANGARS 100' x 100'

HANGAR 150' x 150'

35' PART 77 BRL

AIRCRAFT APRON

TAXIWAY F

TAXIWAY E

TAXIWAY C

RUNWAY 13L/31R

Gene Autry Trail

Signature Aviation Alternative Concepts

As described in the previous chapter, the relocation of Signature Aviation’s terminal and aircraft parking apron is necessary to accommodate future passenger terminal facilities. This section explores multiple potential FBO relocation sites. These alternative concepts, to the extent possible, incorporate Signature Aviation’s goals, which are listed below:

- Expand fuel farm capacity.
- Maintain operational efficiency.
- Maximize apron and hangar capacity.
- Minimize cost.

Each alternative assumes that the fuel farm remains on the west side of the Airport just south of Taxilane G and is expanded, even if not depicted on the figures. The fuel farm expansion may include sustainable aviation fuel (SAF) infrastructure.

Signature Aviation Alternative 1

Alternative 1, depicted on **Figure 6-11**, proposes a relocation of Signature Aviation’s terminal and apron to the east side of the Airport on a parcel of airport-owned land near the intersection of East Tachevah Drive and Gene Autry Trail. This site is adjacent to the existing airport surveillance radar (ASR). Since the existing fuel farm will remain in its current location, this alternative requires the construction of a small fuel farm at this site to support the GA aircraft. Other than the ASR and the perimeter service road, this site remains undeveloped. Its location provides excellent airfield and landside access.

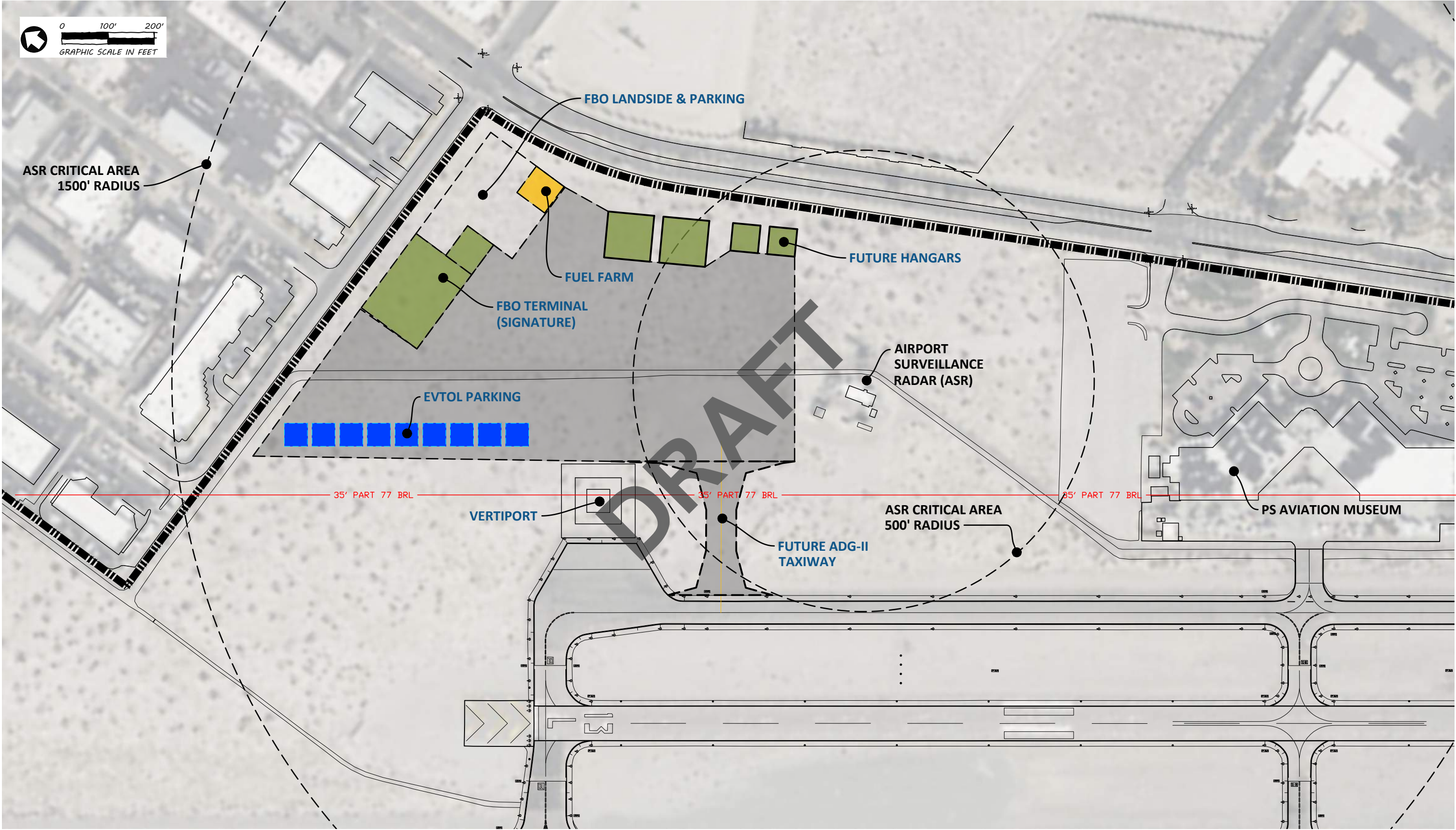
Potential Advantages of Alternative 1

- The alternative allows Signature Aviation to relocate sooner compared to other alternatives because the site is mostly undeveloped.
- The alternative provides good aircraft circulation because it allows for a large apron and provides two taxiway connectors to the apron.
- Landside wayfinding should be easy for users because Gene Autry Trail is a major arterial roadway.

Potential Disadvantages of Alternative 1

- The alternative represents higher costs and infrastructure requirements as the site is mostly undeveloped.
- The alternative requires a runway crossing for medium and large business jets to access the parcel from the airfield.

Figure 6-11: Signature Aviation Relocation Alternative 1 - Adjacent to ASR



Signature Aviation Alternative 2

Alternative 2, depicted on **Figure 6-12**, considers relocating Signature Aviation’s terminal and aircraft parking apron north of its existing location, north of Alejo Road on the west side of the Airport. This site is currently used for rental car overflow parking, which generates revenue for the Airport and allows the Airport to accommodate rental car storage requirements on property. During PSP’s peak season, this lot is filled with rental cars; therefore, a new rental car overflow lot would need to be identified or rental car overflow would need to be accommodated in the future consolidated rental car facility (CONRAC). The Fire Department Training Area is located just east of this lot, so a portion of this site is used by ARFF personnel for aircraft firefighting training purposes. Because of this training, this site could be contaminated with per- and polyfluoroalkyl substances (PFAS); however, an assessment has not yet been conducted. PFAS clean up could be required before Signature Aviation could relocate to this site. Also, a new aircraft firefighting training site would need to be identified. This site provides excellent airfield access.

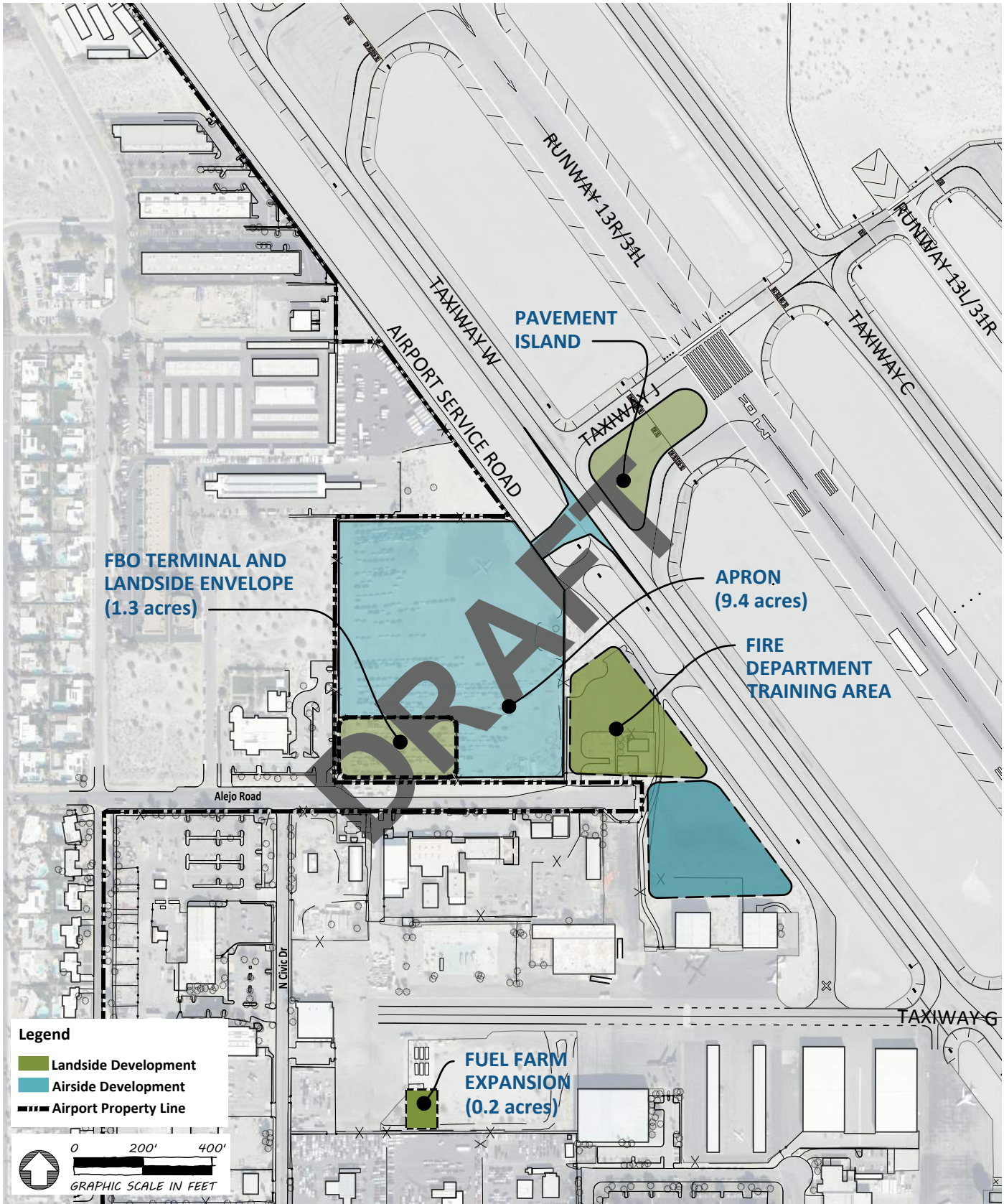
Potential Advantages of Alternative 2

- The FBO remains closer to all of its existing facilities including hangars and the fuel farm, which would help maintain operational efficiency.
- The site is relatively undeveloped, minimizing demolition costs.
- The site has good airfield access and therefore aeronautical use would be the highest and best use of this site.

Potential Disadvantages of Alternative 2

- Part of the lot is used for a Fire Department Training Area, which requires PFAS cleanup and a relocated ARFF training location. The scope and scale of the cleanup has not yet been determined.
- The alternative requires relocation of rental car storage.
- The alternative requires the relocation of the fire training facilities on a portion of the parcel.

Figure 6-12: Signature Aviation Relocation Alternative 2 - Rental Car Overflow Location



Signature Aviation Alternative 3

Alternative 3, depicted on **Figure 6-13**, considers the potential relocation of Signature Aviation’s terminal and apron north and west of its existing location. The terminal in this alternative would be constructed over a portion of the eastmost existing rental car maintenance facility. A new 30,000-square-foot transient aircraft storage hangar is shown over a portion of the westmost existing rental car maintenance facility. The remaining portions of the existing rental car maintenance facilities following their relocation to the CONRAC are converted to an aircraft parking apron. This alternative also relocates and reserves space for fuel farm expansion and also relocates fuel truck parking. Both are relocated to just west of the existing fuel farm location. Although not necessary, relocating the fuel farm allows for better aircraft circulation with the new location of the FBO. Additionally, this alternative provides various sized hangars and a GA customs facility that are located south of Alejo Road as well as in the parcel between Alejo Road and Taxiway W. These hangars could be leased to the FBO or could be built by a private developer. The hangars shown south of Alejo Road require several existing facilities to be demolished and relocated including airport maintenance facilities. Airport maintenance is relocated to the corner of Alejo Road and N Civic Drive. Finally, this alternative shows a future flight kitchen located along N Civic Drive.

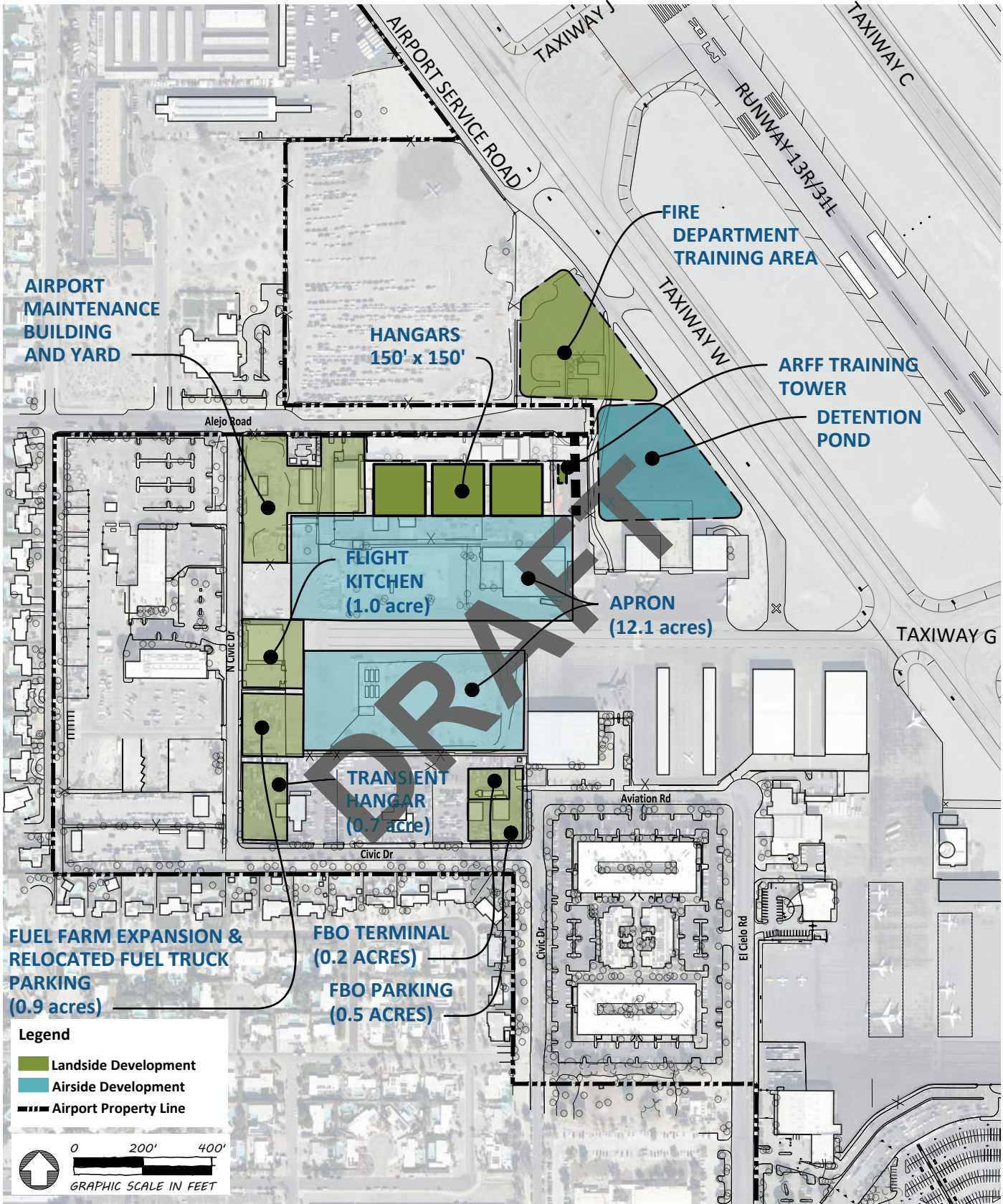
Potential Advantages of Alternative 3

- The FBO remains closer to all of its existing facilities including hangars and the fuel farm, which would help maintain operational efficiency.
- The terminal would be accessed via Civic Drive instead of El Cielo Road but still have convenient access to Tahquitz Canyon Way and downtown Palm Springs.
- Existing Taxilane G provides efficient airfield access.
- The alternative provides more aircraft parking apron than the existing condition does.
- Although this alternative is constructed over the existing rental car maintenance facilities, the space for these facilities is accounted for with the new CONRAC.
- The alternative provides a variety of hangar sizes.
- The alternative does not require relocation of the electrical substation.

Potential Disadvantages of Alternative 3

- The alternative requires relocation of the existing fuel truck and spill protection facilities to improve aircraft circulation.
- The alternative requires facility demolition before a new FBO terminal can be constructed.
- Hangar development in this area requires demolition and relocation of several existing facilities.
- The alternative creates congestions along Taxilane G, which can impact Signature Aviation’s operation.

Figure 6-13: Signature Aviation Relocation Alternative 3 - South of Taxiway G Location



Signature Aviation Alternative 4

Alternative 4 is depicted on **Figure 6-14**. Similar to Alternative 3, this alternative relocates Signature Aviation’s terminal and apron north and west of its existing location. The terminal in this alternative is planned to be relocated to the space where the former Quonset Hut was located. The space in front of the terminal that currently stores trailers is converted to aircraft parking apron. The existing fuel truck parking location and existing building north of Taxilane G are also converted to aircraft parking apron. This alternative expands and relocates the fuel farm to the Desert Aero Maintenance Center. A flight kitchen is shown over the westmost existing rental car maintenance facility. A new 30,000-square-foot transient hangar is shown over a portion of the two remaining existing rental car maintenance facilities and a GA customs facility adjacent to the transient hangar. The remaining portions of the existing rental car maintenance facilities is converted to aircraft parking apron. Finally, this alternative provides four large hangars south of Alejo Road. These hangars require several existing facilities to be demolished and relocated including airport maintenance facilities. Airport maintenance is relocated to the parcel between Alejo Road and Taxiway W.

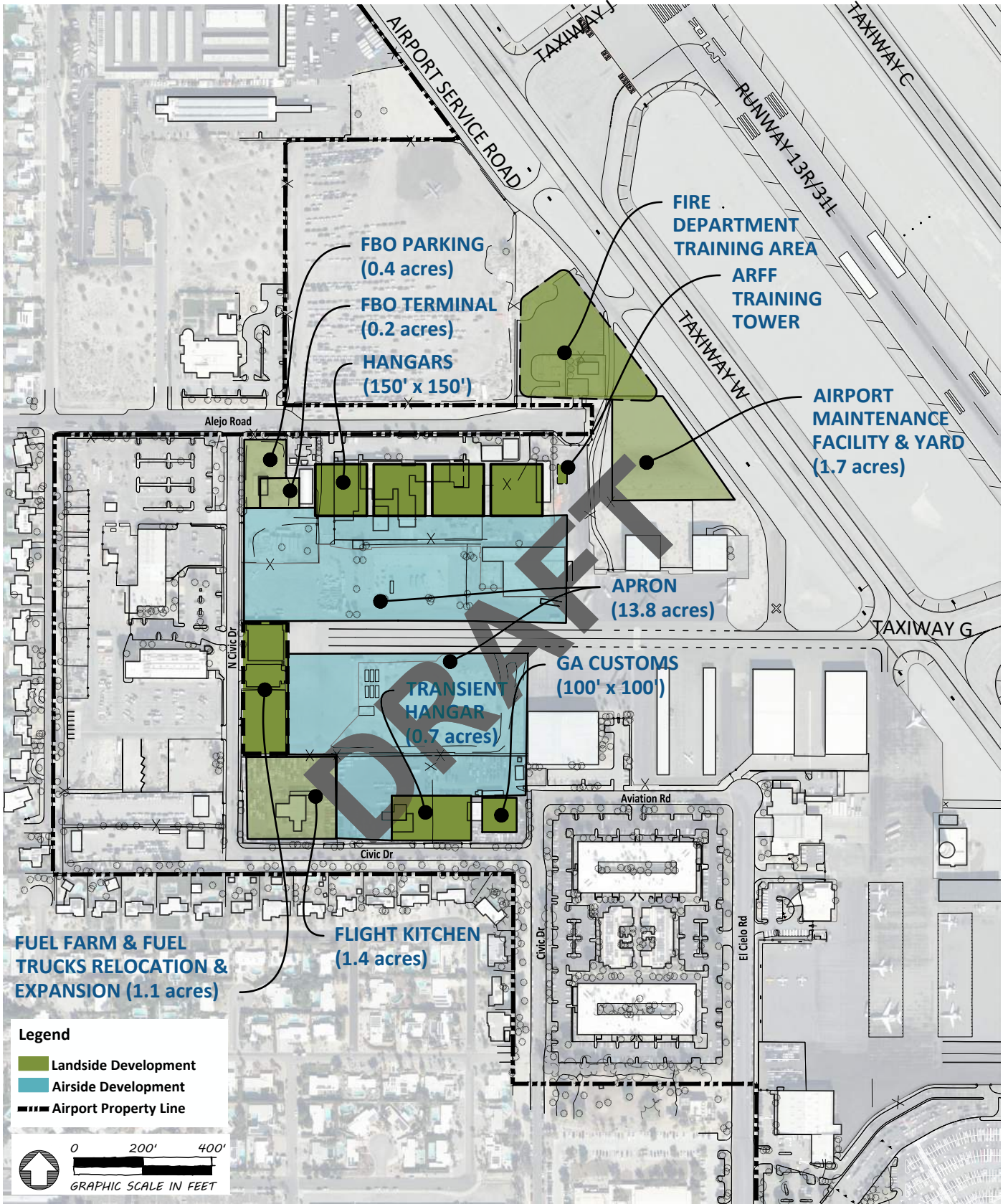
Potential Advantages of Alternative 4

- The FBO remains close to all of its existing facilities allowing them to operate efficiently.
- Terminal access is via N Civic Drive, close to the existing FBO terminal, making wayfinding simple.
- The alternative maximizes aircraft parking apron.
- Existing Taxilane G provides efficient airfield access.
- The electrical substation does not need to be relocated.

Potential Disadvantages of Alternative 4

- The alternative requires the relocation of existing fuel truck and spill protection facilities.
- The alternative requires facility demolition before FBO terminal and hangars can be constructed.
- The alternative creates congestion along Taxilane G, which can impact Signature Aviation’s operation.

Figure 6-14: Signature Aviation Relocation Alternative 4 - North of Taxilane G Location



Signature Aviation Alternatives Summary

Each alternative is summarized below. **Table 6-4** provides a comparison of the alternatives presented above.

- **Alternative 1** – relocates FBO terminal and apron to east side adjacent to ASR’s current location.
- **Alternative 2** – relocates FBO terminal and apron to existing rental car overflow parking lot.
- **Alternative 3** – relocates FBO terminal and apron south of Taxilane G.
- **Alternative 4** – relocates FBO terminal and apron north of Taxilane G.

Table 6-4: Signature Aviation Alternatives Comparison

Item	Alt 1	Alt 2	Alt 3	Alt 4
New aircraft parking apron (acres)	8	9	12	14
New hangar/landside (acres)	2	1	4	3
New development (acres)	10	10	16	17

Source: Mead & Hunt, 2023.

Note: Acreage is approximate.

Signature Aviation Recommendation

Relocating Signature Aviation to the east side of the airfield (Alternative 1) is the preferred alternative because the new site is mostly undeveloped, provides excellent airfield and landside access, and provides easy access to the new GA customs facility.

Atlantic Aviation Alternative Concepts

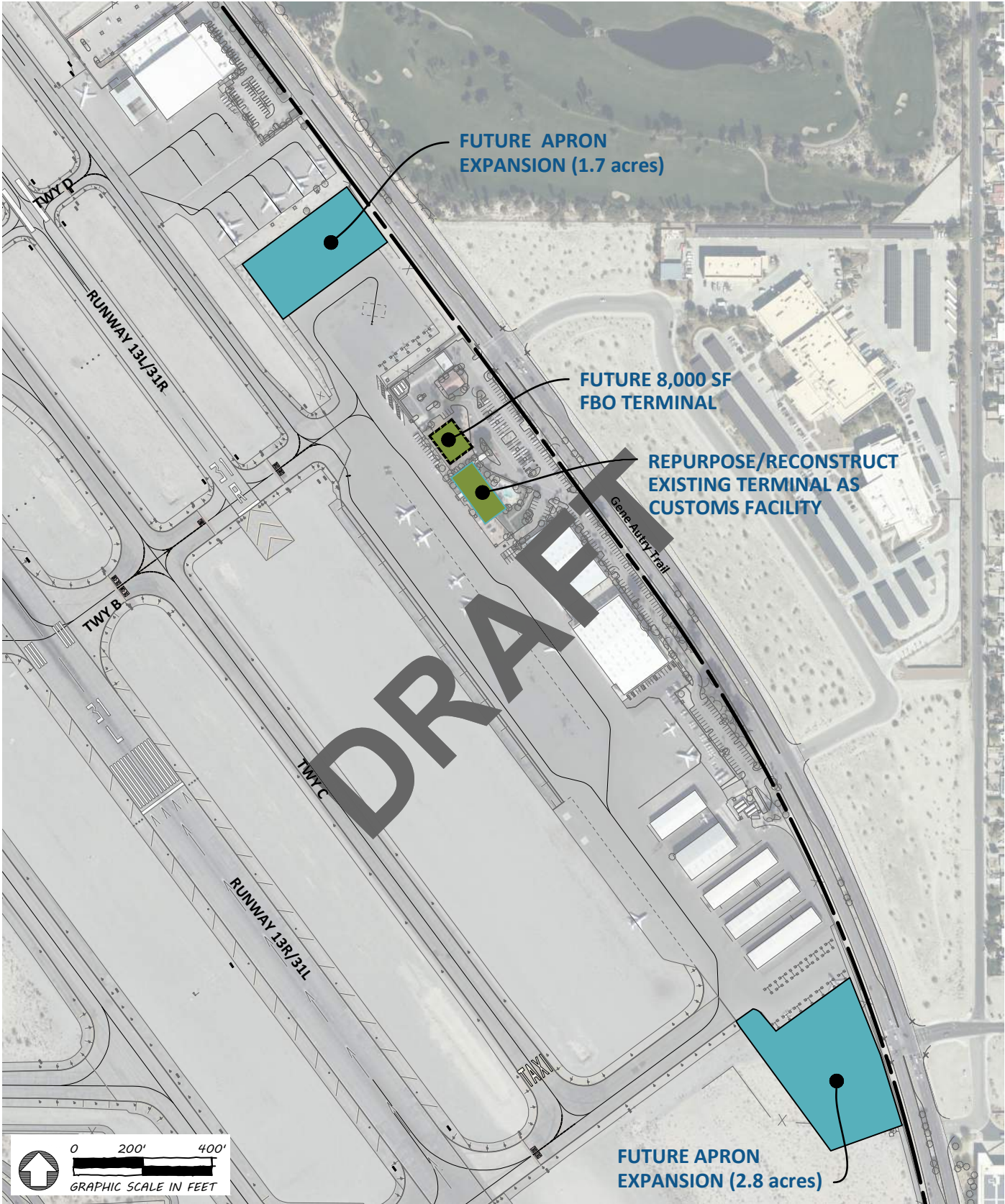
Atlantic Aviation’s goals from this master plan are listed below:

- New 8,000-square-foot terminal.
- Customs facility.
- Maximize aircraft parking apron.
- Maximize current lease hold.

Atlantic Aviation Development Concept

Figure 6-15 depicts Atlantic Aviation’s development concept. An 8,000-square-foot terminal is shown adjacent to the existing FBO terminal. This terminal could be a new facility or an expansion to the existing building. An apron expansion is provided on the north and south ends of the leasehold to maximize parking positions for aircraft.

Figure 6-15: Atlantic Aviation Expansion



Electric Aircraft Alternatives

The purpose of these electric aircraft development alternative concepts is to explore alternative layouts and configurations for aircraft charging stations, aircraft parking, takeoff and landing requirements, and safety regulations and requirements at PSP. The goal of these concepts is to plan for the potential fleet of electric aircraft within the planning period – 2022 to 2042. The alternative concepts delineate targeted areas for electric aircraft charging infrastructure and electric aircraft parking.

It is important to note that various components of these concepts can be mixed and matched to develop the preferred electric aircraft development concept.

Electric Aircraft Alternative 1

Alternative 1, depicted on **Figure 6-16**, provides two separate vertiports on each of the FBO's aprons. The vertiport allows the electric aircraft to operate without disrupting operations on either of the runways. The vertiport provides six electric vertical takeoff and landing (eVTOL) aircraft parking positions. Located on the FBO aprons, both vertiports provide terminals to process passengers. Both locations provide good landside and airfield access.

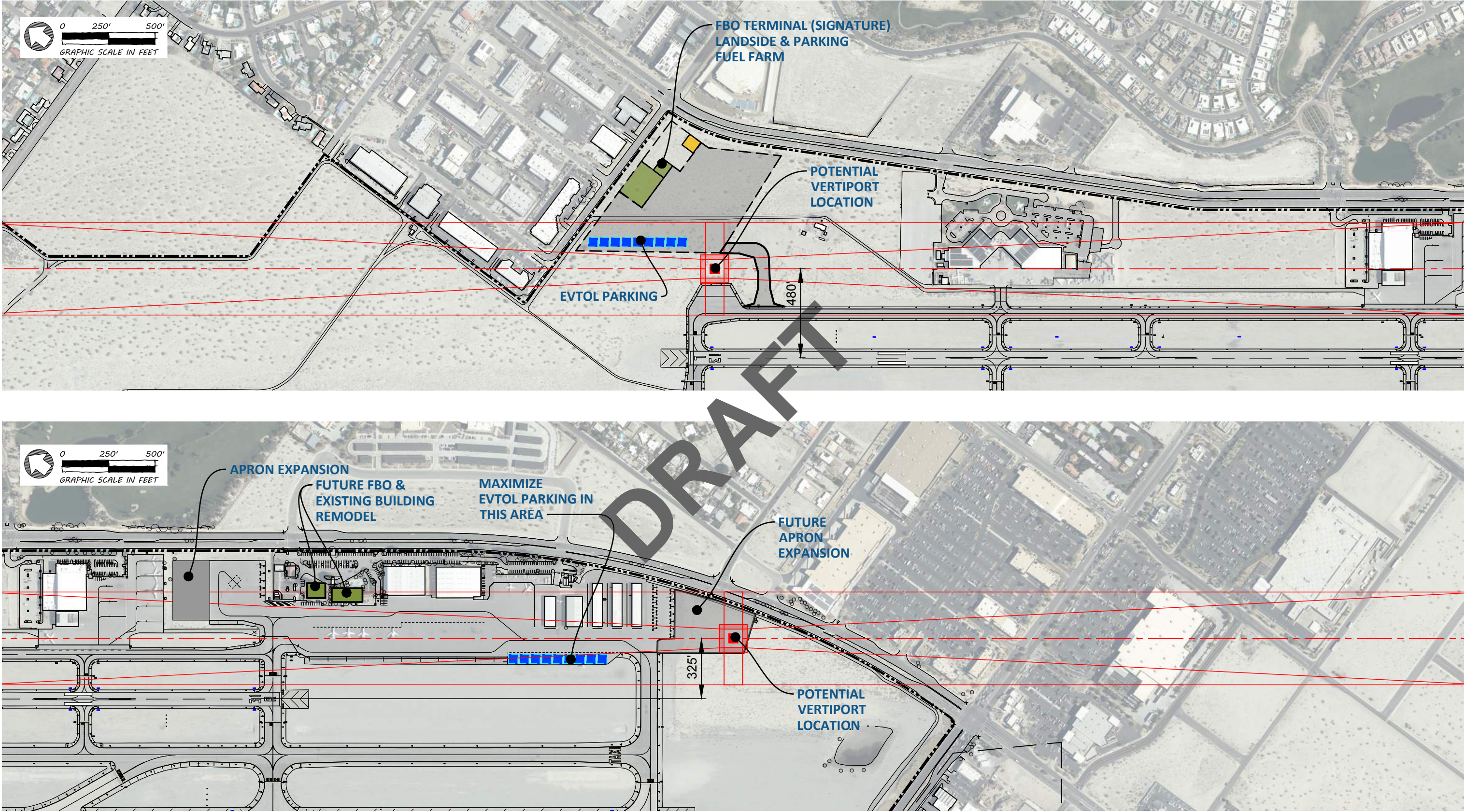
Potential Advantages of Alternative 1

- The alternative is located adjacent to the FBO, which is beneficial for eVTOL users.
- The alternative would not interfere with operations conducted on runways.
- The alternative utilizes existing/planned terminals, so it does not require construction of an additional terminal.
- The alternative utilizes planned apron space, which can be used for fixed-wing aircraft and helicopter parking until the demand of eVTOL parking and vertiports are needed.
- The alternative allows the Airport to gauge interest in the electric infrastructure before a complete build-out of a future facility with multiple charging stations.

Potential Disadvantages of Alternative 1

- The alternative is furthest from the Airport Terminal for passengers needing to access commercial flights.
- The alternative has limited expansion potential due to proximity to other lease holds and the property line.
- Charging infrastructure would be dependent on electric supply access in this location.

Figure 6-16: Electric Aircraft Alternative 1



Electric Aircraft Alternative 2

Alternative 2, shown in **Figure 6-17**, provides a vertiport in the open parcel between Taxiway W and Alejo Road. The vertiport would potentially allow electric aircraft to operate without disrupting operations on either of the runways. The vertiport provides four eVTOL parking positions and an independent terminal to process its users. This parcel provides good landside access to Alejo Road and good airfield access for eVTOL or helicopters flying runway approaches and hover taxiing.

Potential Advantages of Alternative 2

- The alternative would not interfere with operations conducted on runways.
- The alternative provides a separate terminal, which would be beneficial for eVTOL users.
- The alternative provides good landside access and airfield access.

Potential Disadvantages of Alternative 2

- Charging infrastructure would be dependent on electric supply access in this location.
- The parcel does not have direct access to either FBO.
- This site may have existing drainage issues.

Electric Aircraft Alternative 3

Alternative 3, shown in **Figure 6-18**, provides a conceptual layout of vertiport and eVTOL aircraft parking in the open parcel between PS Air Museum and SkyWest Maintenance. The vertiport allows the electric aircraft to operate without disrupting operations on either of the runways. The concept provides six eVTOL parking positions and has the capacity to grow in both directions. A terminal is provided to process its users. This parcel provides good landside and airfield access.

Potential Advantages of Alternative 3

- The alternative would not interfere with operations conducted on runways.
- The alternative provides an independent terminal, which is beneficial for eVTOL users.
- The alternative provides good airfield and landside access.
- The alternative allows for eVTOL aircraft parking expansion.

Potential disadvantages of Alternative 3 include:

- Charging infrastructure would be dependent on electric supply access in this location.
- This location is not adjacent to either FBO and would likely require a separate terminal to process users and passengers.

Figure 6-17: Electric Aircraft Alternative 2

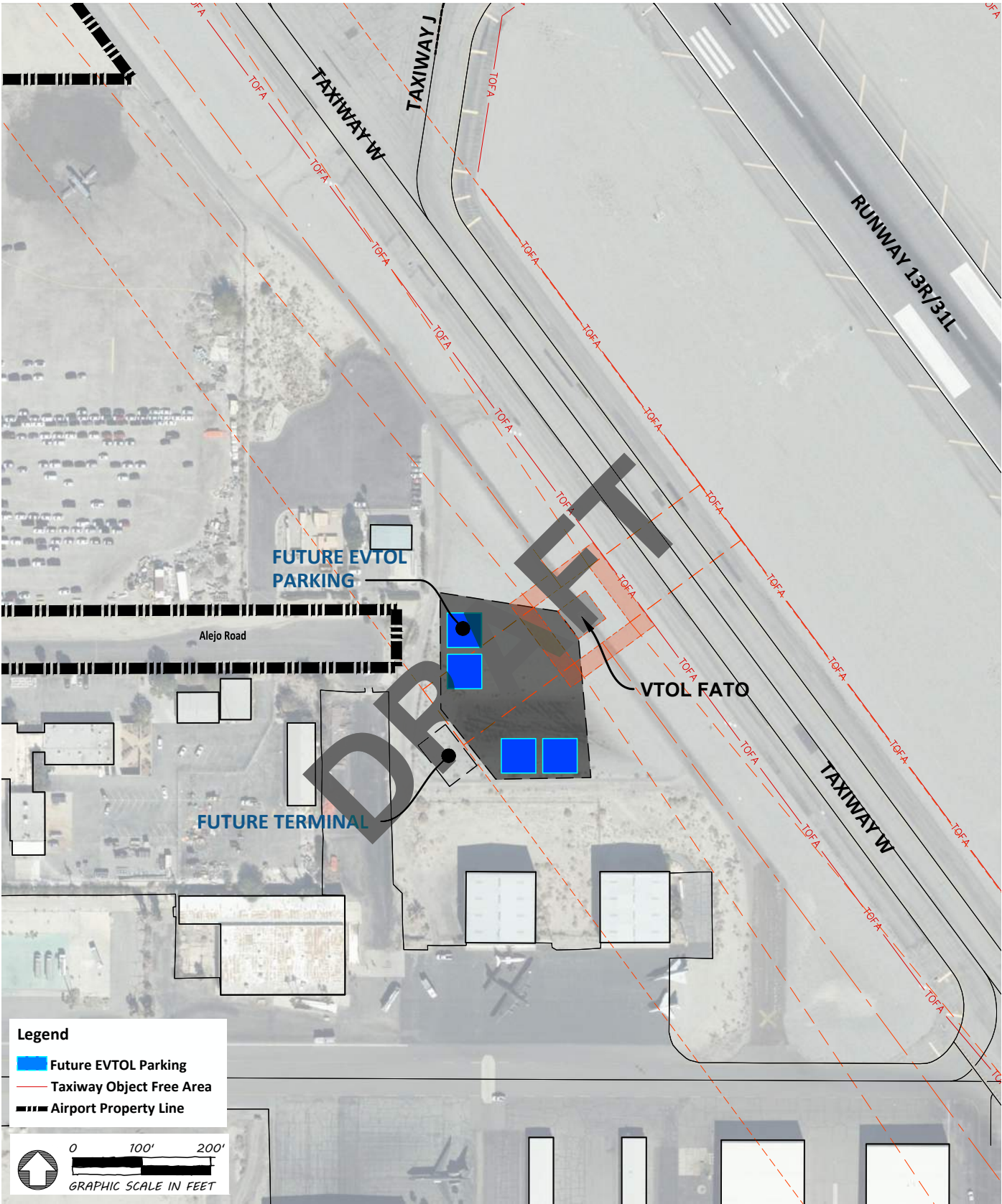
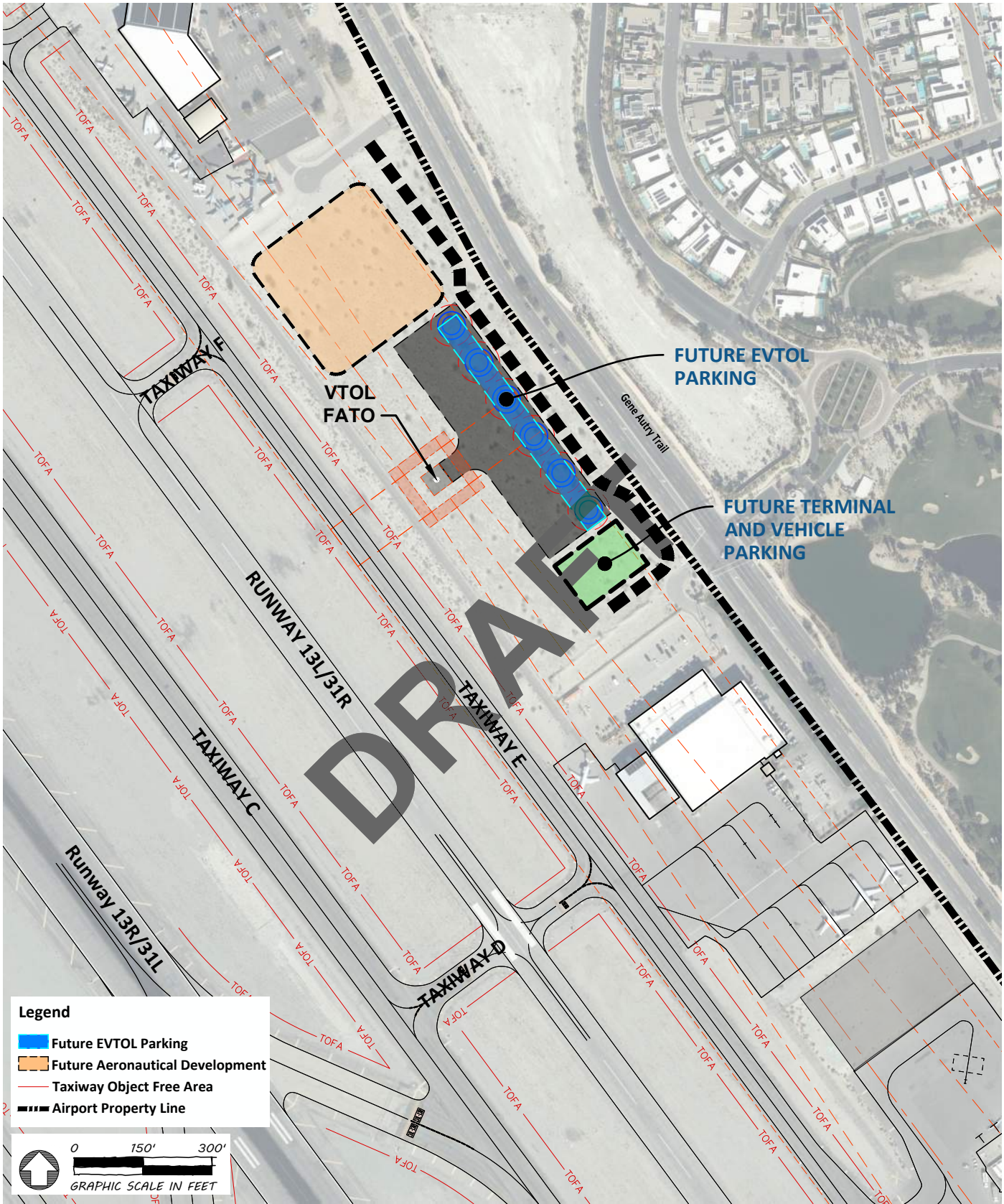


Figure 6-18: Electric Aircraft Alternative 3



Electric Aircraft Alternative 4

Alternative 4, shown in **Figure 6-19**, provides a potential future vertiport and up to 12 eVTOL parking positions on top of the planned CONRAC. Also illustrated are approach and departure paths parallel to the runway and the prevailing winds at PSP. The alternative includes a landside area for passenger pickup and drop off. The vertiport and parking positions would potentially allow electric aircraft to operate in close proximity to the terminal and transfer passengers to and from the terminal without disrupting operations on the runways. A potential future use for this facility could be for shuttling passengers to and from down valley resorts and increase airport connectivity for Palm Springs Visitors.

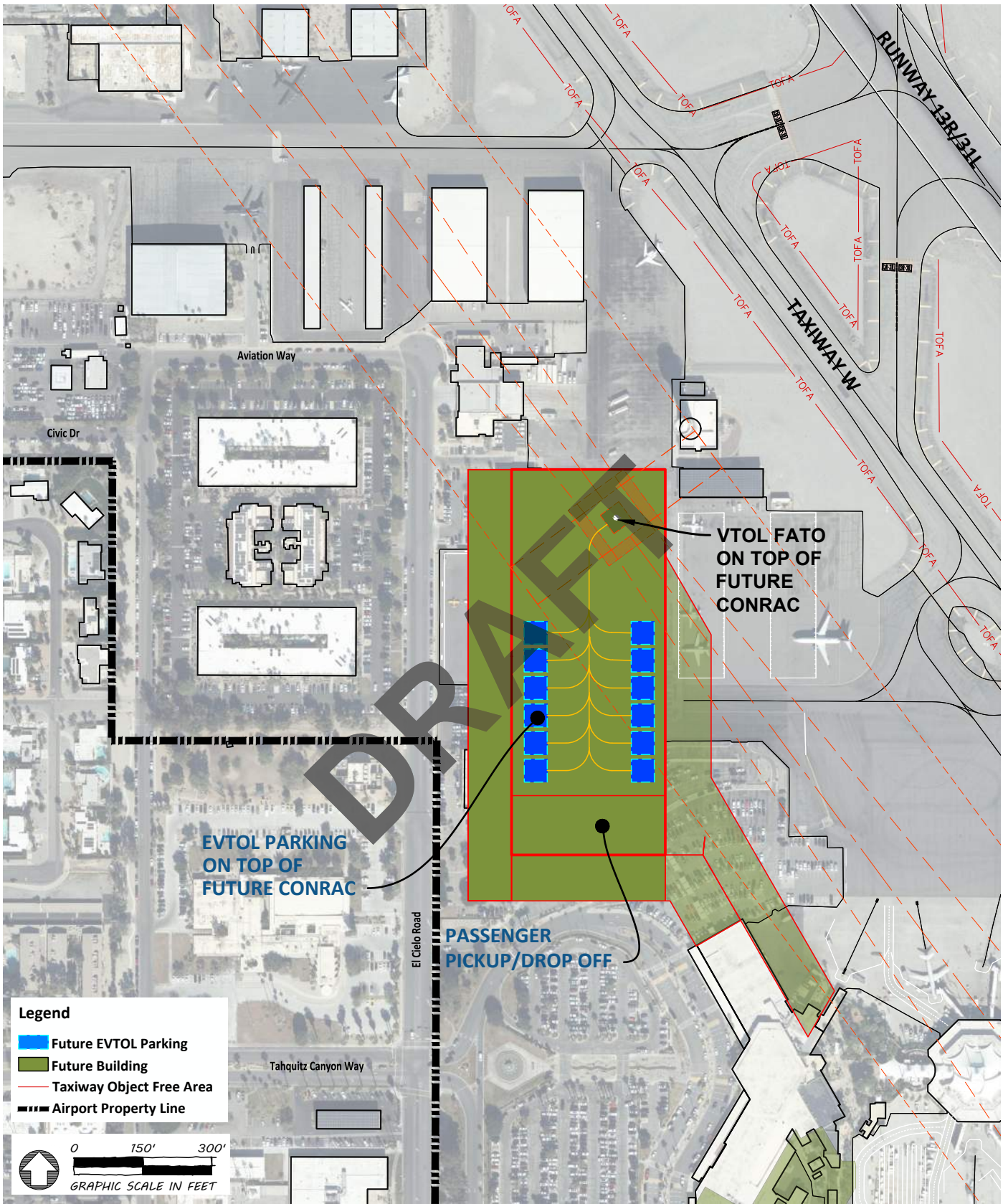
Potential Advantages of Alternative 4

- The alternative would not interfere with operations conducted on runways.
- The site is located in close proximity to the commercial terminal.
- The alternative utilizes eVTOL parking space on the future CONRAC.
- Since developable space on-airport property is limited and vertiport surfaces require a significant amount of space, the vertiport in this alternative does not impact developable space because it is built on top of a structure rather than the ground.

Potential Disadvantages of Alternative 4

- Charging infrastructure would be dependent on electric supply access in this location.
- The alternative does not have direct access to either FBO.
- The alternative reduces the number of vehicle parking spaces provided in the CONRAC.

Figure 6-19: Electric Aircraft Alternative 4



Electric Aircraft Alternatives Summary

Each alternative is summarized below.

- **Alternative 1** – vertiport on both FBO aprons.
- **Alternative 2** – vertiport in parcel between Taxiway W and Alejo Road.
- **Alternative 3** – vertiport in the parcel between the PS Air Museum and SkyWest Maintenance.
- **Alternative 4** – vertiport on top of planned CONRAC.

Electric Aircraft Recommendation

The recommended electric aircraft alternative is to provide a vertiport on both FBO aprons (Alternative 1) because it utilizes existing/planned terminals and apron space, does not interfere with operations conducted on the runways, and provides good airfield and landside access.

Aircraft Rescue and Fire Fighting Alternative Concepts

The existing ARFF facility is shared with the city fire station. The building has reached the end of its useful life. Therefore, the facility needs to be reconstructed. This section explores three alternatives for new potential sites. As discussed in the **Airside and Landside Facility Requirements** chapter, the ARFF must fall within a three-minute response range to the midpoint of the commercial service runway (Runway 13R/31L). It is also recommended to maintain truck access to both ends of the primary runway in less than 3 minutes. It is assumed that the ARFF and City of Palm Springs fire station will continue to share a facility. The Airport is in the process of planning and designing a new ARFF training tower. The proposed location of this facility is shown on each alternative.

ARFF Alternative 1

Alternative 1, depicted on **Figure 6-20**, reconstructs the facility at its existing location. This site not only falls within the required three-minute range, but it is also the most central site of the three alternatives. Since this alternative rebuilds the facility in its existing location, this site meets the city fire station's required response times. This site provides good landside access on El Cielo Road, which has a cul-de-sac that can make it easier for the fire trucks to enter and exit the fire station. As this facility is reconstructed, a temporary facility would need to be identified to allow both the city fire station and ARFF to remain active.

Figure 6-20: ARFF Alternative 1



Potential Advantages of Alternative 1

- This alternative is the most central site.
- The site provides good landside access and a cul-de-sac that makes it easy for firetrucks to enter and exit the fire station.

Potential Disadvantages of Alternative

- The airport will need a temporary facility during reconstruction.

ARFF Alternative 2

Alternative 2, shown on **Figure 6-21**, relocates the facility to the vacant parcel of land just off of Alejo Road. This site is adjacent to the Fire Department Training Area, which makes it easier for ARFF personnel to get to and from both facilities. This site provides great airfield access for ARFF trucks with direct access to Taxiway W. The site also provides good landside access, and Alejo Road provides a cul-de-sac that would facilitate the firetrucks entering and exiting the fire station.

Potential Advantages of Alternative 2

- The alternative consolidates the ARFF facility with the Fire Department Training Area.
- The site is adjacent to Taxiway W making it easier for ARFF trucks to respond.
- The site provides good landside access and a cul-de-sac that makes it easy for fire trucks to get in and out of fire station.

Potential Disadvantages of Alternative 2

- This site, unlike the others, could be used for other aeronautical activity, for example, a new hangar.

Figure 6-21: ARFF Alternative 2



ARFF Alternative 3

Alternative 3, depicted on **Figure 6-22**, relocates the facility north of the existing Fire Department Training Area. This site provides direct access to Taxiway W, making it easier for ARFF trucks to respond. The site also provides good landside access, which comes off of Alejo Road. However, this site is smaller than the other two alternatives.

Potential Advantages of Alternative 3

- This alternative consolidates the ARFF facility with the Fire Department Training Area.
- The site is adjacent to Taxiway W making it easier for ARFF trucks to respond.

Potential Disadvantages of Alternative 3

- This site is smaller than the other two alternatives.
- This site may have existing drainage issues.

DRAFT

Figure 6-22: ARFF Alternative 3



ARFF Alternatives Summary

Each alternative is summarized below.

- **Alternative 1** – reconstructs the ARFF facility in its current location.
- **Alternative 2** – relocates ARFF facility in the parcel east of the Fire Department Training Area.
- **Alternative 3** – relocates ARFF facility in the area north of the Fire Department Training Area.

ARFF Recommendation

The recommended ARFF alternative is to reconstruct the ARFF in its current location (Alternative 1).

AVIATION-RELATED DEVELOPMENT ALTERNATIVES

This section considers additional aviation-related development alternatives at PSP. Developable on-airport space is limited so both alternatives in this section focus on the off-airport parcel northeast of the airfield. Ultimately, the development of this parcel will be determined by business decisions. The two alternatives below explore how the parcel could be utilized rather than how it should be utilized.

Aviation-Related Development Alternative 1

Alternative 1, depicted on **Figure 6-23**, shows a potential future air cargo facility, which includes an aircraft parking apron that allows for up to three narrowbody parking positions. The air cargo facility also includes space for a loading dock behind the building. This alternative also shows a potential future maintenance, repair, and overhaul MRO facility that can accommodate up to three narrowbody aircraft inside the hangar as well as three narrowbody aircraft on the apron in front of the hangar. Additionally, the alternative shows four large aviation-related business hangars. Each hangar could accommodate a large jet, provides enough apron space to park an aircraft in front of the hangar, and provides space for vehicle parking. The alternative preserves space for further aviation-related and potential future solar panel development. The alternative provides excellent landside access to and from Vista Chino and provides excellent airfield access to Taxiway C and both runways.

Potential Advantages of Alternative 1

- The alternative provides excellent airfield and landside access.
- Aircraft tails clear the Part 77 transitional surface and therefore can be parked on the apron in front of their facilities.
- Minimal aircraft taxi distance to both runways.
- The parcel is undeveloped; therefore, no demolition of existing facilities is required.

Potential Disadvantages of Alternative 1

- The alternative requires Tribal Land acquisition.
- The alternative requires development infrastructure including roads and utilities.

Legend

- Future Hangars
- Future Pavement
- Taxiway Object Free Area
- Airport Property Line

Map Labels:

- Vista Chino
- MRO
- AIR CARGO FACILITY
- RUNWAY 13L APPROACH SURFACES & RUNWAY PROTECTION ZONE (FUTURE EXTENSION 825')
- AVIATION BUSINESS HANGARS
- ULTIMATE AVIATION BUSINESS DEVELOPMENT
- SOLAR PANEL DEVELOPMENT AREA (4.2 ACRES)
- FUTURE AIRPORT PERIMETER ROAD ALIGNMENT
- NOISE BUFFER
- TAXIWAY C
- RPZ
- 35' PART 77 BRL
- TOFA
- P77 AS
- P77
- 35'
- 77'
- RPZ

GRAPHIC SCALE IN FEET

0 150' 300'

Aviation-Related Development Alternative 2

Alternative 2, depicted on **Figure 6-24**, shows a potential future air cargo facility that includes an aircraft parking apron that allows for four narrowbody parking positions. The air cargo facility includes a loading dock behind the building. This alternative also shows a potential MRO that can accommodate up to three narrowbody aircraft inside the hangar as well as three narrowbody aircraft on the apron in front of the hangar. Additionally, the alternative shows four large and three medium aviation-related business hangars. Each large hangar could potentially accommodate a large jet, provides enough apron space to park an aircraft in front of the hangar, and provides vehicle parking space for the tenants. Each medium hangar can accommodate up to a mid-size jet and provides vehicle parking space for the tenants. The alternative preserves space for future solar panel development. The alternative provides excellent landside access to and from Vista Chino and provides excellent airfield access to Taxiway C and both runways.

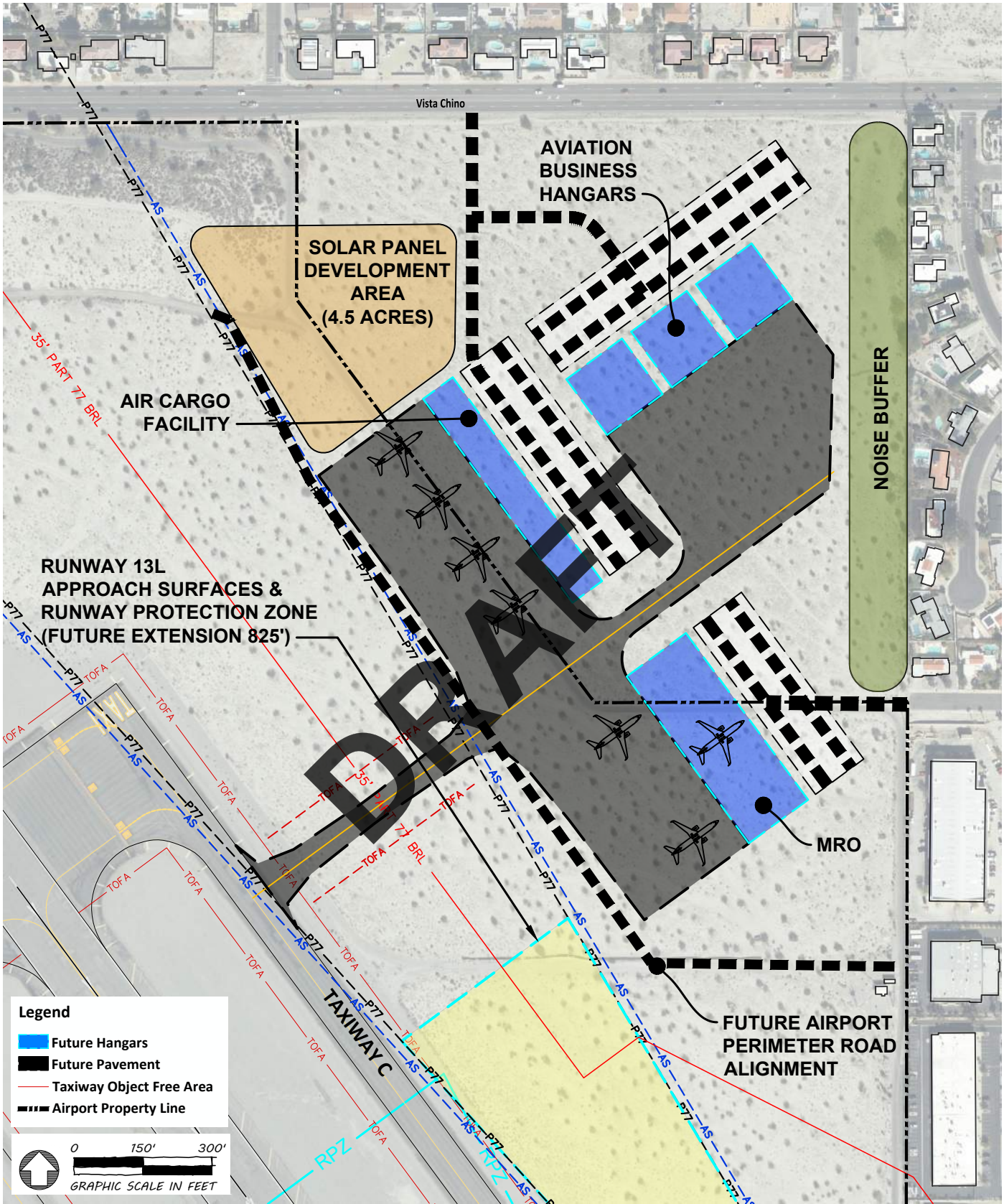
Potential Advantages of Alternative 2

- The alternative provides excellent airfield and landside access.
- Aircraft tails clear the Part 77 transitional surface and therefore can be parked on the apron in front of their facilities.
- The aircraft taxi distance is minimal to both runways.
- The parcel is undeveloped; therefore, no demolition of existing facilities is required.

Potential Disadvantages of Alternative 2

- This alternative requires Tribal Land acquisition.
- This alternative requires development infrastructure including roads and utilities.

Figure 6-24: Aviation-Related Development Alternative 2



Aviation-Related Development Recommendation

Because developable on-airport space is limited, it is recommended to acquire and reserve the land northeast of the airfield for aviation-related development. The type of aviation development will come down to business decisions made by the Airport.

NOISE CONSIDERATIONS

The runway extension alternatives for Runway 13R/31L (the commercial service runway) and Runway 13L/31R (the general aviation runway) presented in previous sections of this chapter consider the potential relocation of runway thresholds both north and south of the Airport. For the commercial service runway, additional runway length is not needed within the 20-year planning period so commercial aircraft will arrive and depart at the exact same altitudes they do today and follow the same flight paths that they do today.

For the GA runway, the recommended alternative is an 825-foot extension to the north. This extension could potentially result in GA aircraft approaching PSP from the north at lower altitudes than they do today. This change in approach altitude could potentially increase noise over existing noise sensitive land uses north of the Airport. The Master Plan process includes a California Environmental Quality Act (CEQA) analysis that will develop noise contours and a land use compatibility assessment in accordance with FAA and California guidance on aircraft noise. While typical thresholds of significance are not expected to be exceeded with the GA runway extension, the CEQA analysis will confirm that assumption. Should the noise contour analysis show any potential for significant noise impacts, changes to the proposed extension will be considered or recommended.

EQUITY AND SUSTAINABILITY CONSIDERATIONS

The primary goals of the airfield and landside alternatives are to meet FAA design standards, maintain a safe and efficient airfield system, align with tenant goals, and determine the best-use scenarios for PSP's limited on-airport developable property. In support of these goals, equity and sustainability factors were incorporated into the planning and development of the airfield and landside alternatives. Using this sustainable development lens within the planning process allows the Airport to consider meeting the needs of today, while minimizing environmental and social impacts in the future.

The airfield and landside alternatives serve different purposes; therefore, equity and sustainability factors are separated in the following sections. A number of these factors will be considered in the CEQA analysis as part of this Comprehensive Airport Master Plan.

Airfield Considerations

Equity Factors

- **Community Engagement:** Continues to gather input from stakeholders including tenants and local communities to minimize potential negative impacts to these groups.
- **Employment Opportunities:** Considers how airfield development and construction can impact commercial or GA activity and potentially create local job opportunities.
- **Environmental Justice:** Assesses the potential for environmental impacts, such as noise, on surrounding communities, particularly in marginalized neighborhoods. Airfield development should aim to minimize or mitigate negative impacts to ensure that benefits of the projects are distributed equitably.

Sustainability Factors

- **Materials Selection:** Chooses sustainable and locally sourced materials whenever possible.
- **Waste Management:** Considers reuse or recycling of materials, whenever possible. For example, pavement proposed for removal in airfield alternatives can be recycled and re-used as sub-base for runway, taxiway, or apron expansions.
- **Lifecycle Assessment:** Considers the lifespan of airfield development projects. For example, to increase pavement longevity, airfield developments should consider the use of an environmentally friendly asphalt rejuvenator.

Landside Considerations

Equity Factors

- **Accessibility for All:** Ensures any landside development is accessible to individuals of all abilities by incorporating ramps, elevators, wayfinding, and other features.
- **Inclusive Design:** Creates spaces that are inclusive of diverse backgrounds and abilities. Considers cultural sensitivities, age, gender, language, and race and can integrate local history in designs.
- **Community Engagement:** Involves local communities and stakeholders in the design process. Seek input from residents, businesses, stakeholders, and community organization that would be affected by the landside development to ensure their needs and concerns are addressed.
- **Employment Opportunities:** Considers how landside development and construction can create job opportunities for the local community, especially in marginalized neighborhoods. Collaborate with community organizations to provide training and employment initiatives.
- **Environmental Justice:** Assesses the potential for environmental impacts on surrounding communities, particularly those that are historically disadvantaged. Landside development should aim to minimize negative effects and maximize benefits for surrounding communities.

Sustainability Factors

- **Energy Efficiency:** Prioritizes energy-efficient design, utilizing advanced lighting, heating, cooling, and ventilation systems in applicable landside developments. Sensors and automation to optimize energy use should be implemented, if appropriate.
- **Renewable Energy:** Integrates renewable energy sources like solar panels to power landside development. Utilizes clean energy technologies to reduce reliance on fossil fuels.
- **Water Management:** Implements water-efficient fixtures and systems to minimize water consumption in applicable landside developments. Incorporates rainwater harvesting and greywater recycling to further conserve water resources, if appropriate.
- **Materials Selection:** Chooses sustainable and locally sourced materials whenever possible.
- **Waste Management:** Designs should include waste disposal and recycling facilities that encourage proper waste segregation. Promotes waste reduction through initiatives like composting and recycling program.
- **Transportation Alternatives:** Considers on-site electric vehicle charging stations, if appropriate. Considers access for local transit options and ease of pick up/drop off.
- **Biodiversity:** Incorporates desert landscape and native vegetation into applicable landside developments to support local biodiversity. Use landscaping practices that require minimal water and maintenance.
- **Resilience to Climate Change:** Landside developments should be designed to withstand the impacts of climate change and extreme weather events. Consider materials selection and energy redundancy in the design of applicable landside developments.
- **Lifecycle Assessment:** Considers the entire lifecycle of landside development, from construction to operation and eventual decommissioning. Strives to minimize environmental impacts at every stage.
- **Certification of Standards:** Strives for sustainability certifications such as Leadership in Energy and Environmental Design (LEED) or Building Research Establishment Environmental Assessment Method (BREEAM), if applicable to the landside development.

Sustainable development at PSP requires thoughtful consideration of the above-mentioned equity and sustainability factors. These holistic considerations pave the way to meet the needs of today while minimizing environmental impacts and ensuring that future needs can be met in a sustainable, equitable fashion.

AIRFIELD AND LANDSIDE ALTERNATIVES SUMMARY

This chapter explored alternatives and proposed recommendations for the airfield and landside facilities at PSP. All recommendations from this Master Plan are shown on **Figure 6-25**. The Facilities Implementation Plan organizes the Master Plan recommendations and projects in the Airport's Capital Improvement Program in a project list that provides rough planning level cost estimates. The Facilities Implementation Plan also provides phasing diagrams for the Master Plan projects.

Figure 6-25: Conceptual Development Plan

