

5.0 Airport Alternatives

5.1 Alternatives Objectives

This Airport Alternatives Chapter describes potential improvements to DVT's airfield, landside, and support facilities to meet the forecast facility requirements presented in Chapter 3, Facility Requirements.

5.1.1 Identified Needs

Chapter 3, Facility Requirements identified the future infrastructure needed to accommodate forecast demand for those facilities. The condition of the existing airport infrastructure and its capability to accommodate this need is also taken into account. Based on the recommendations of the facility requirements and input from project stakeholders, the following improvements were studied within this Airport Alternatives Chapter:

Airside Development Alternatives

- Mitigation of FAA-recognized hot spots
- Mitigation of non-standard airfield geometry
- Extension of Runway 7L-25R
- Mitigation of Runway 7R-25L holdbars south of the runway
- Improvements to meet current FAA design standards for the future critical aircraft (Gulfstream IV)
- Improvements to the visual navigation aids for both runways

Support Facility Alternatives

- Compass calibration pad
- Options for an IFR hold bay
- Relocation options for the Police Air Support Unit
- U.S. Customs and Border Protection (CBP) Alternatives

On-Airport Land Use Alternatives (includes general aviation and landside)

- Expansion of general aviation hangar facilities
- North side terminal or pilot's lounge
- Helicopter training area
- Access improvements to the north side facilities
- New vehicle parking associated with new/relocated facilities

The development alternatives presented in this chapter are separated into the three families as indicated above. Each family of alternatives addresses its specific functional areas without consideration of other alternative families. In addition, the individual support facility alternatives each address a specific component without inclusion of the other components. The alternatives will be considered comprehensively in relation to each other during the evaluation and selection of the Recommended Alternative.

5.1.2 Alternatives Objectives

The following objectives were considered in order to guide the development of the various alternatives:

- **Meet the Forecast Facility Requirements:** The facility requirements qualitatively and quantitatively describe DVT's needs for the next 20 years based on the Forecast as well as tenant/user-specific requirements.
- **Right-size the Airport for Future Growth:** This Master Plan is not intended to overbuild facilities nor preclude the ability to further expand facilities in the future, but to provide a plan for future growth.
- **Meet Current FAA Design Standards:** A significant number of the airside facilities do not currently meet current FAA design standards and the Master Plan strives to bring them into compliance with current standards.
- **Balance the Utilization of the Airfield (North and South):** The existing utilization of the runways heavily favors the south runway, Runway 7R-25L, due to the proximity of DVT's most frequent users. The plan aims to better balance this demand between the north and south runways.
- **Improve the Safety and Operational Efficiency of the Airfield:** Continue to look for opportunities to reduce the risk of airfield incursions while maximizing the efficiency of DVT.
- **Continue to Serve the General Aviation Community:** DVT's role as a general aviation reliever airport will not change as part of this Master Plan
- **Provide a High Level of Service to Tenants and Users:** Ensure that planned infrastructure provides DVT's tenants and users with a high level of service and customer satisfaction.

5.1.3 System Considerations

There are several considerations specific to DVT factored into the development of the alternatives families. A principal physical consideration is DVT's existing property boundary. As discussed in the previous section, one of the main goals of this Master Plan is to right-size DVT, and as such, the vast amount of developable land that already exists on airport will be sufficient to meet DVT's needs for the next 20 years. Another consideration is the desire to minimize additional impacts to off-airport property either by physical development or by associated airspace surfaces (e.g. RPZs, RSAs, ROFAs, Part 77 surfaces, etc...). Based on this Master Plan's goal to continue serving the general aviation community, DVT will not serve commercial airline operations other than air taxi service or purposefully attract additional military traffic. Development opportunities will be sized to meet the needs of DVT's future critical aircraft – the Gulfstream IV.

5.2 Non-Development Alternatives

Non-development alternatives are used to compare and assess impacts of development alternatives. Three non-development alternatives were identified.

5.2.1 No Build Alternative

Under the No Build (or No Action) Alternative, no additional airside and landside facilities would be constructed. The No Build Alternative is included for comparison to Build Alternatives and will be carried through any subsequent environmental analysis. The No Build Alternative does not address existing or forecast airside, landside, or support facility deficiencies. Under this alternative, the existing facilities and infrastructure remain in place and no physical alterations would be made with the exception of necessary regular maintenance activities. It is expected that periodic runway and taxiway overlay projects will be needed to maintain airport operations. As demand continues to grow, DVT will not be able to accommodate much more activity in many of its facilities than it accommodates today and deficiencies projected in the Chapter 3, Facility Requirements, will be realized. The No-Action Alternative is presented in **Figure 5-1**.

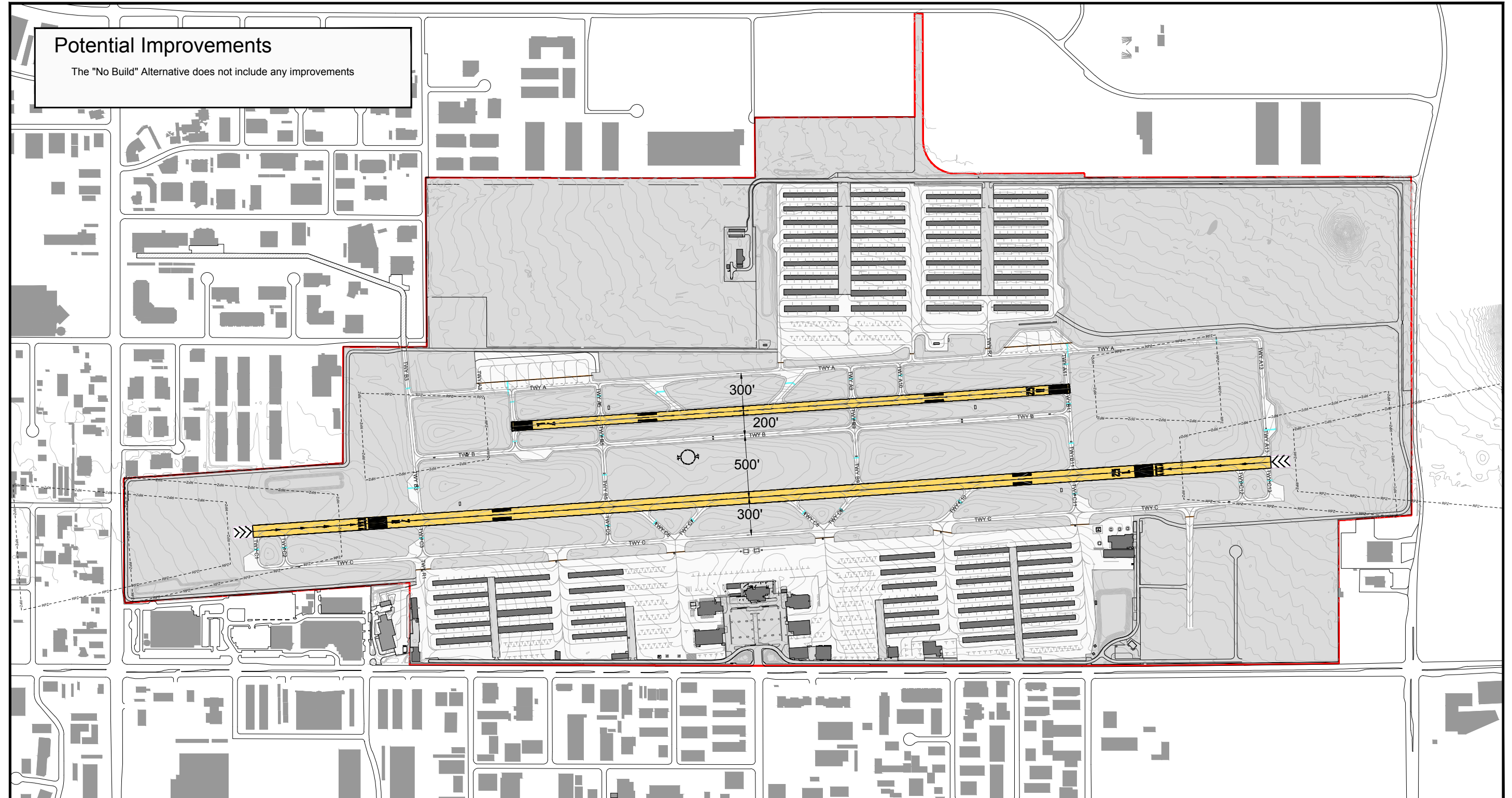
5.2.2 Transfer Aviation Services

Another non-development alternative is the transfer of all or partial existing aviation services to another airport in the Phoenix Metropolitan Area. Transferring all aviation services and activities to another airport, which would result in the closure of DVT, is not a viable alternative as the City has identified DVT as its primary general aviation reliever airport for PHX. Transferring specific or partial aviation services to another airport would change the mission of DVT. In addition, DVT is an economic driver creating employment opportunities and supporting businesses in the area. It is not recommended to transfer any aviation services or activities to another airport.

5.2.3 Construction of a new Airport Site

In some exceptional situations, replacement airports are constructed when an existing airport cannot sufficiently be expanded or face significant external challenges due to the community, environment, or terrain. Constructing a new airport in today's environment can take more than a decade and cost billions of dollars. DVT's existing facilities and available developable parcels are sufficient to support projected aviation demand through the planning horizon and the surrounding industrial land use and DVAO District make DVT compatible with its surroundings. It is not recommended that the City explore the construction of a new airport site.

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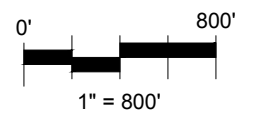
No Build Alternative

Figure 5-1



LEGEND

- Airport Property Boundary
- Airfield Ramp, Taxiway & shoulders
- Existing Runway Pavement
- Existing on-Airport Building
- Holding Position
- Runway Protection Zone



5.3 Airfield Development Alternatives

The airfield development build alternatives were created with the overall development goals presented in Section 5.1.2 in mind and specifically address the need to right-size DVT based on the Forecast, meet current FAA design standards, and further improve safety. Five build alternatives are presented accommodating a range of potential needs. The alternatives are intended to be interchangeable and all of the alternatives build off of each other.

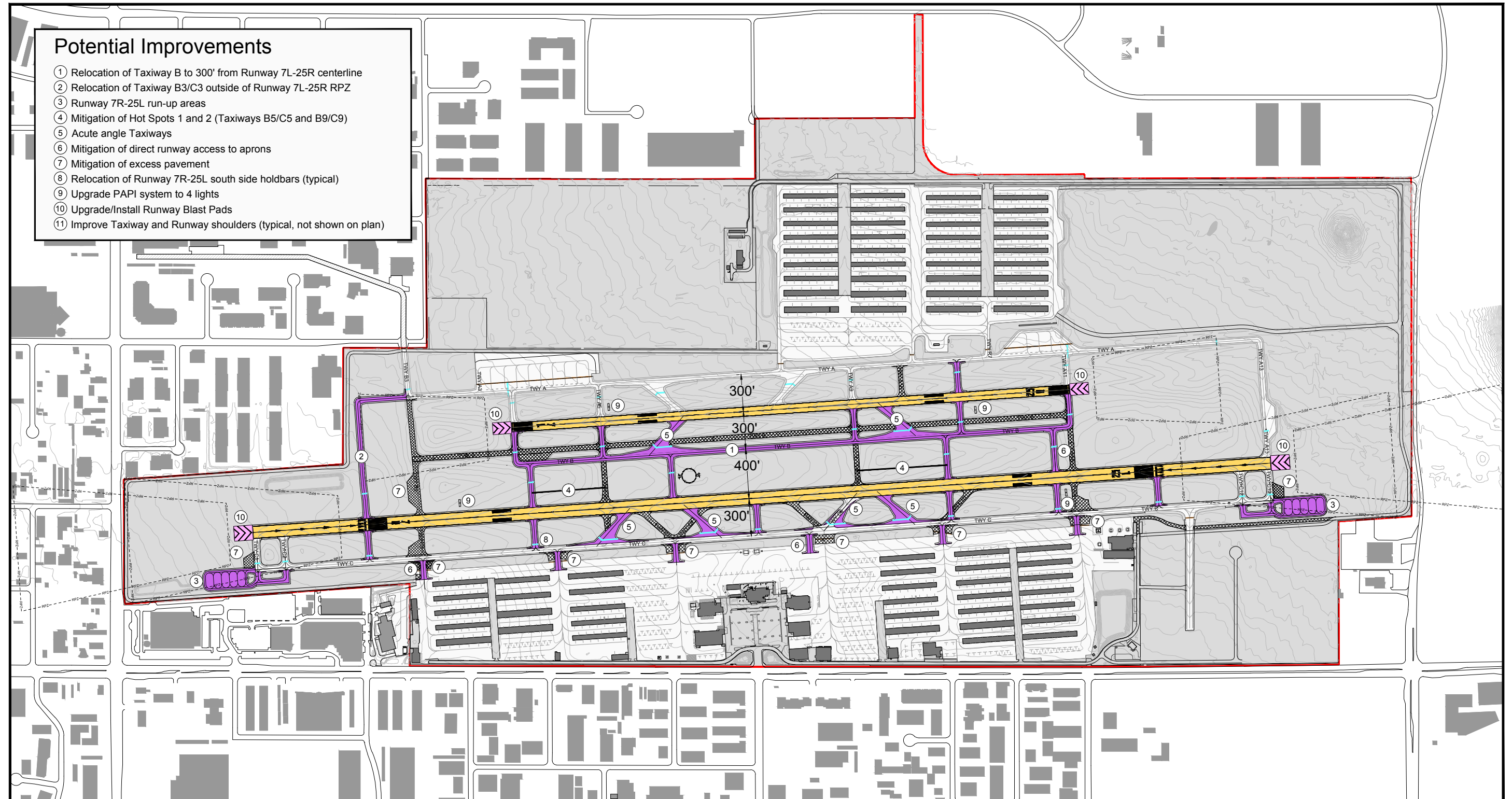
5.3.1 Airfield Alternative 1 – Taxiway Geometry Enhancements

Airfield Alternative 1 – Taxiway Geometry Enhancements, presented in **Figure 5-2**, proposes the reconfiguration, realignment, and reconstruction of many of DVT's taxiways with the goal of meeting current FAA design standards and eliminating hot spots and non-standard geometry intersections. The most significant improvement included within this alternative is the relocation of parallel Taxiway B to increase its existing centerline to centerline separation with Runway 7L-25R from 200 feet to 300 feet. Similar to the Taxiway A reconstruction and relocation, which relocated Taxiway A from 200 feet to 300 feet north of Runway 7L-25R's centerline, the relocation and reconstruction of Taxiway B is needed for Runway 7L-25R to meet ARC B-II design standards. While the future RDC for Runway 7L-25R is B-II, and the required runway to taxiway design standard separation is a minimum of 240 feet, relocating Taxiway B to the RDC D-II standard of 300 feet from the runway centerline allows full redundancy in case of an incident on Runway 7R-25L. This would allow D-II aircraft to have functional use of the airfield during periods of Runway 7R-25L closure. The additional separation gained by the 100 foot relocation allows most of the small general aviation fleet to hold between the Runway 7L-25R holdbars and the Taxiway B OFA, reducing congestion on Taxiway B and enhancing the capacity of the taxiway system. The relocation of Taxiway B 100 feet south still maintains sufficient separation of 400 feet from Runway 7R-25L as well.

The relocation of Taxiway B also provides an opportunity to address the FAA hot spots and non-standard geometry intersections that were identified in Chapter 3, Facility Requirements. An important and successful method to improve airfield safety and reduce the occurrence of incursions is the enhancement of pilot situational awareness by eliminating runway crossings straight through to the ramp, maximizing 90 degree intersections to improve pilot visibility, as well as implementation of other visual cues.

To address the FAA-identified hot spots, this alternative proposes to eliminate the straight through taxi paths that currently exist on Taxiways B5 and B9 and require aircraft to make a turn onto Taxiway B in order to cross to the north or south. Requiring an aircraft to make a turn onto Taxiway B enhances pilot and controller situational awareness as it provides more visual cues for pilots to understand their location on the airfield. This reduces the risk of a pilot missing runway holdbars and causing an incursion in these two hot spot locations.

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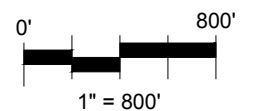


Airfield Alternative 1 - Taxiway Geometry Enhancements

Figure 5-2

LEGEND

- Airport Property Boundary
- Airfield Ramp, Taxiway & shoulders
- Existing Runway Pavement
- Existing on-Airport Building
- Holding Position
- RPZ Runway Protection Zone
- Proposed Removal
- Proposed Airfield Enhancement
- Proposed Runway Pavement



Another improvement proposed within this alternative is the addition of two acute angle taxiway connectors connecting Runway 7L-25R with the relocated Taxiway B, one accommodating east flow, and the other accommodating west flow. The acute angle taxiway connector in the west flow direction aligns with acute angle taxiway connector A6. The east flow taxiway connector would not align with acute angle Taxiway A8 as a greater percentage of the fleet would be able to exit the runway further east. The eastbound acute angle taxiway connector would be located approximately 3,000 feet east of the Runway 7L threshold. At that distance, approximately 90% of the propellor-driven fleet would be able to slow down sufficiently to exit the runway.

Existing Taxiway B3 serves as a north-south taxi route connecting the Northwest Industrial Airpark with Runway 7R-25L. Taxiway B3, while not officially recognized as an FAA hot spot, has geometry similar to Taxiways B5 and B9 such that aircraft have the potential to miss runway holdbars due to an extended straight through taxi route. Airfield Alternative 1 proposes to relocate Taxiway B3 to the west outside of the Runway 7L arrival RPZ. The relocation improves pilot situational awareness as aircraft originating from the Northwest Industrial Airpark would have to make a turn onto Taxiway A, prior to turning south on the relocated Taxiway B3.

Existing Taxiway A10 is proposed to be relocated to the east and provide a complete north-south connection between Taxiway A and Taxiway B. This new set of connector taxiways also replaces Taxiway B9's crossing, which is currently located in the "high-energy" middle third of the runway.

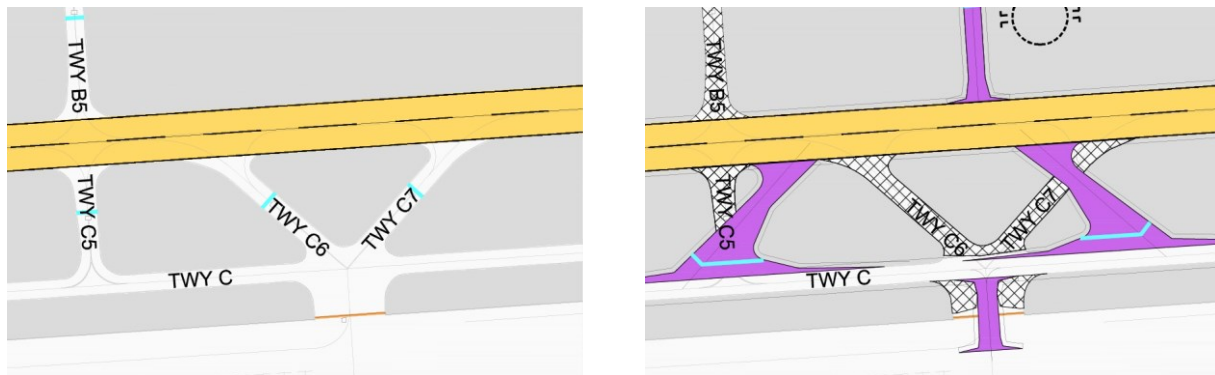
This alternative also proposes several taxiway geometry modifications south of Runway 7R-25L. This alternative carries forward the run-up areas that were studied and proposed in a separate DVT Airport Layout Plan update. Each run-up area accommodates six ADG-I aircraft positions allowing pilots to complete their pre-flight checklists and perform engine run-ups. The new run-up areas are needed because the existing run-up areas south of Runway 7R-25L are located within the RSA. The configuration of the run-up areas, as depicted, allow the enhanced sequencing of aircraft and remove the first-in, first-out restriction that currently exists. The high-volume of flight training aircraft residing on the south side of the airfield justifies the need for six positions on each end of the runway. Oftentimes, flight training aircraft will leave the ramp in groups of up to 10 aircraft. The proposed six positions better balances congestion on Taxiway C. A small portion of a taxiway parallel to Taxiway C would need to be constructed in order to provide a dedicated entrance into the run-up areas. The parallel taxiway would begin at Taxiway C2 on the west end and at Taxiway C12 on the east end. That entrance taxiway would be designed to meet ADG-II standards for taxiway separation.

As described in Chapter 3, Facility Requirements, there are several taxiway intersections that were identified to have non-standard geometries. The six (6) taxiway entrances to/from the southside aprons all have taxiway widths that exceed FAA design standards and can cause signs to be located outside of a pilot's peripheral vision resulting in a loss of pilot situational awareness. Instead of

demolishing the extra pavement width and its associated fillets, the extra pavement could be painted to identify it as shoulder pavement.

The intersection of Taxiways C6, C7, C, and R3 was also identified as a non-standard geometry intersection. This five spoke decision point can cause the loss of pilot and controller situational awareness. A 90 degree four spoke intersection, also known as a "t" intersection provides more clarity to pilots and controllers. Acute angle taxiway connectors C6 and C7 also both directly feed into the ramp entrance. In order to remedy this non-standard geometry, Airfield Alternative 1 proposes to relocate both acute angle taxiway connectors to the east and west. Acute angle taxiways are needed in order to minimize runway occupancy time so that minimum in-trail arrival separations can be maintained which optimizes the capacity of the airfield. **Figure 5-3** provides a larger scale view of this existing five node intersection and the potential geometry improvements to meet current design standards. The relocation of Taxiway B5 provides the opportunity to locate a replacement westbound acute angle Taxiway C7 connector in its former location. The location further west accommodates a greater percentage of the jet fleet, approximately 75%. The eastbound acute angle Taxiway C6 would be relocated approximately 500 feet to the east and would also capture a greater percentage of the fleet, both jet and propeller-driven aircraft. The relocation of both acute angle taxiways resolves the complex, non-standard geometry of that intersection and better locates the acute angle taxiways to serve a larger percentage of the expected fleet.

Figure 5-3: Taxiway Geometry Comparison



Source: HNTB

The intersection of Taxiways C8, C9, C, and R4 is another complex intersection with five spokes. Similar to the improvements described above for C6, C7, C, and R3, this alternative proposes to reconfigure the acute angle taxiway connectors C8 and C9 to better accommodate a larger share of the fleet mix. Westbound acute angle Taxiway C9 would remain in its current location, however, its fillet would be widened to meet current design standards. Taxiway C9 will continue to accommodate the majority of the propeller-driven fleet. The eastbound acute angle taxiway would be relocated approximately 800 feet east of its existing location. This new location will accommodate approximately 70% of the jet fleet. To eliminate the exit taxiway leading directly to a ramp, this alternative proposes to relocate the entrance to R4 to the west requiring aircraft turn onto Taxiway C prior

to entering the ramp. This also prevents aircraft coming from the ramp errantly continuing onto the acute angle taxiway and entering Runway 7R-25L.

Existing acute angle Taxiway C10 would be reconfigured into a 90 degree taxiway connector. Taxiway C10 is currently located approximately 1,500 feet west of the Runway 25L arrival threshold. This location is too close to the arrival threshold to justify an acute angle taxiway connector. Furthermore, existing Taxiway C10 leads directly into the ramp. The proposed relocation of Taxiway C10 allows for a north-south crossing that replaces hot spot Taxiway B9 and is located within the first third of Runway 7R-25L.

Existing Taxiway B11 has similar geometry to the existing hot spots, Taxiways B5 and B9. In order to enhance situational awareness and reduce the potential risk of incursion, Alternative 1 proposes to relocate Taxiway B11 to the west to prohibit aircraft from crossing two runways without a turning movement. Further to the east, a new taxiway connector would connect Taxiway C with the arrival threshold of Runway 25L. This taxiway is needed to reduce the runway occupancy time for aircraft that roll long and have no exit between Taxiways C11 and C12. It is also useful as another intersection departure location for smaller aircraft.

There are several other improvements included within Alternative 1 unrelated to taxiway geometry. As identified in Chapter 3, Facility Requirements, many of the taxiways on the south side of the airfield lack taxiway shoulders. Additionally, Runway 7R-25L does not have paved runway shoulders. This alternative proposes to add those missing shoulders. The facility requirements identified that the existing runway blast pads for Runway 7R-25L do not meet existing design standards. This alternative proposes to widen the blast pad to meet standards and add blast pads to Runway 7L-25R, which currently does not have them. Airfield Alternative 1 also proposes the upgrade of all existing 2-light PAPIs to 4-light PAPIs as recommended in the facility requirements.

The final feature of this alternative is the relocation of the runway holdbars south of Runway 7R-25L to their standard location 250 feet from runway centerline. Many of the problems caused by moving these holdbars, as discussed in Chapter 3, Facility Requirements, are not mitigated by this alternative. Aircraft arriving on Runway 7R-25L would no longer have the room to hold between the Runway 7R-25L holdbars and the Taxiway C OFA and will immediately have to taxi directly onto Taxiway C.

The following is a summary of the advantages of this alternative:

- Meets current FAA design standards
- Mitigates the FAA-identified hot spots
- Mitigates the non-standard geometry south of Runway 7R-25L
- Minimizes the risk of runway incursions
- Eliminates runway crossings in the "high energy" middle third of each runway
- Re-uses existing airfield pavement to the extent possible
- Improves operational efficiency and reduces runway occupancy times by relocating acute angle taxiway connectors on both runways

- Adds needed run-up positions outside of the RSA
- Provides a slight increase in capacity by reducing the runway occupancy time of landing aircraft

The following is a summary of the disadvantages of this alternative:

- Solution for runway holdbars south of Runway 7R-25L does not address Safety Risk Management concerns
- Requires an expansive reconstruction of the airfield

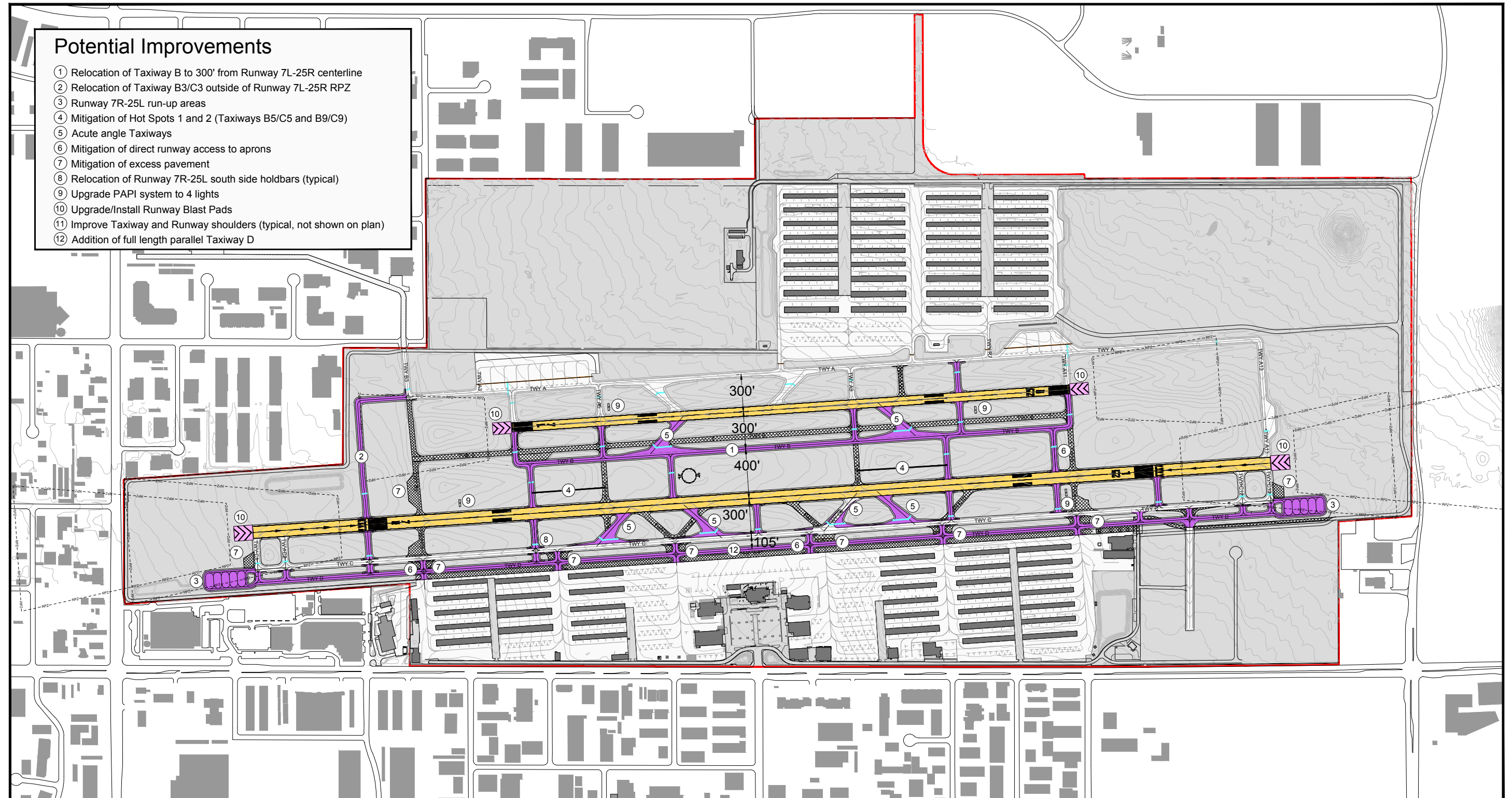
5.3.2 Airfield Alternative 2 – Full Length Parallel Taxiway D

Airfield Alternative 2 – Full Length Parallel Taxiway D, presented in **Figure 5-4**, incorporates all of the improvements described in Alternative 1 and supplements them with a new full length parallel taxiway, denoted as Taxiway D, south of existing Taxiway C. Taxiway D's centerline would be located 105 feet south of Taxiway C's centerline and meet the ADG-II design standards. Taxiway D provides a comprehensive solution for relocating the holdbars south of Runway 7R-25L to their standard location because a second parallel taxiway enables the segregation of modes allowing departing and arriving aircraft to operate on separate taxiways. Arriving aircraft could taxi directly onto Taxiway C without risk of a head-to-head conflict with an aircraft taxiing to departure and aircraft would no longer need to hold short of Taxiway C upon arrival to avoid other taxiing aircraft. This will reduce ATC's workload and improve pilot and controller situational awareness.

The full length taxiway enables enhanced flexibility for the sequencing of aircraft, especially IFR aircraft that are assigned a specific departure time. It is not uncommon for IFR aircraft to be given a departure time 10 to 30 minutes after taxiing out from the ramp. Today these aircraft sometimes block Taxiway C when waiting for their call for release, but a new parallel taxiway would allow aircraft to bypass each other and meet the dynamic needs of ATC. A large portion of Taxiway D, between ramp entrances R1 and R6, are already paved, however, detailed pavement analyses are needed to determine whether or not that pavement could support the demands of a taxiway. The portions of Taxiway D west of R1 and east of R6 will require full-depth pavement sections.

The proposed alignment of Taxiway D causes a number of impacts to existing facilities. The first row of north facing t-hangar and shade hangar buildings west of the Terminal and south of Taxiway D would have to be operationally closed due to the impact from aircraft exiting the hangars encroaching Taxiway D's OFA. The three t-hangar buildings could be repurposed to serve alternative uses. The north facing hangars could be used for airport related storage and maintenance or the north and south sides of the buildings could be converted to larger hangars that only open to the south. Further to the east, Taxiway D impacts the Police Air Support Unit leasehold. The extents of Taxiway D's OFA requires the extensive reconfigurations the Police Air Support Unit's apron and hangars, as their hangars open to the north. The combined operational restrictions and existing poor condition of the building provide the opportunity to relocate this facility to a more advantageous location. Potential relocation concepts are presented in Section 5.4.

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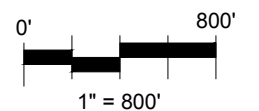
- Potential Improvements**
- ① Relocation of Taxiway B to 300' from Runway 7L-25R centerline
 - ② Relocation of Taxiway B3/C3 outside of Runway 7L-25R RPZ
 - ③ Runway 7R-25L run-up areas
 - ④ Mitigation of Hot Spots 1 and 2 (Taxiways B5/C5 and B9/C9)
 - ⑤ Acute angle Taxiways
 - ⑥ Mitigation of direct runway access to aprons
 - ⑦ Mitigation of excess pavement
 - ⑧ Relocation of Runway 7R-25L south side holdbars (typical)
 - ⑨ Upgrade PAPI system to 4 lights
 - ⑩ Upgrade/Install Runway Blast Pads
 - ⑪ Improve Taxiway and Runway shoulders (typical, not shown on plan)
 - ⑫ Addition of full length parallel Taxiway D

Airfield Alternative 2 - Full Length Parallel Taxiway D

Figure 5-4

LEGEND

- | | |
|------------------------------------|-------------------------------|
| Airport Property Boundary | Proposed Removal |
| Airfield Ramp, Taxiway & shoulders | Proposed Airfield Enhancement |
| Existing Runway Pavement | Proposed Runway Pavement |
| Existing on-Airport Building | |
| Holding Position | |
| Runway Protection Zone | |



The following is a summary of the advantages of this alternative:

- Meets current FAA design standards
- Mitigates the FAA-identified hot spots
- Mitigates the non-standard geometry south of Runway 7R-25L
- Minimizes the risk of runway incursions
- Eliminates runway crossings in the “high energy” middle third of each runway
- Re-uses existing airfield pavement to the extent possible
- Improves operational efficiency and reduces runway occupancy times by relocating acute angle taxiway connectors on both runways
- Adds needed run-up positions outside of the RSA
- Minimizes runway occupancy time by providing a dedicated arrival taxiway
- Reduces the risk of head-to-head taxi conflicts
- Enables the relocation of the Runway 7R-25L holdbars to their standard location while minimizing impacts to airfield operations
- Improves ATC flexibility for sequencing departures, especially for IFR aircraft

The following is a summary of the disadvantages of this alternative:

- Requires an expansive reconstruction of the airfield
- Requires the costly construction of a full length taxiway
- Requires the relocation of some hangars and leaseholds, including the Police Air Support Unit, as a result of the taxiway development

5.3.3 Airfield Alternative 3 – Partial Length Parallel Taxiway D

Airfield Alternative 3 – Partial Length Parallel Taxiway D, presented in **Figure 5-5**, incorporates all of the improvements described in Alternative 1 and supplements them with a new partial length parallel taxiway, denoted as Taxiway D, south of existing Taxiway C. Alternative 3 is similar in design to Alternative 2; however, Taxiway D is limited to a span between existing Taxiways C3 and C11. Partial length parallel Taxiway D still meets ADG-II design standards and provides many of the same benefits that the full length alternative does. The partial length taxiway allows for the segregation of arriving and departing aircraft in the central portion of the airfield, where nearly 100% of the fleet are expected to land and exit the runway. This allows the Runway 7R-25L holdbars to be relocated to their standard location without a significant impact on operations.

Taxiway D still impacts the first row of the north facing t-hangar and shade hangar buildings west of the Terminal and south of Taxiway D. The existing tenants would need to be relocated to another hangar. The partial length Taxiway D terminates at ramp entrance R6 on the east end, and therefore, the Police Air Support Unit leasehold would not be impacted. The construction of a partial length taxiway does not preclude the ability to expand to a full length taxiway in the future and is a reasonable first phase of development if funds are not initially available to construct the full length taxiway and a replacement Police Air Support Unit facility.

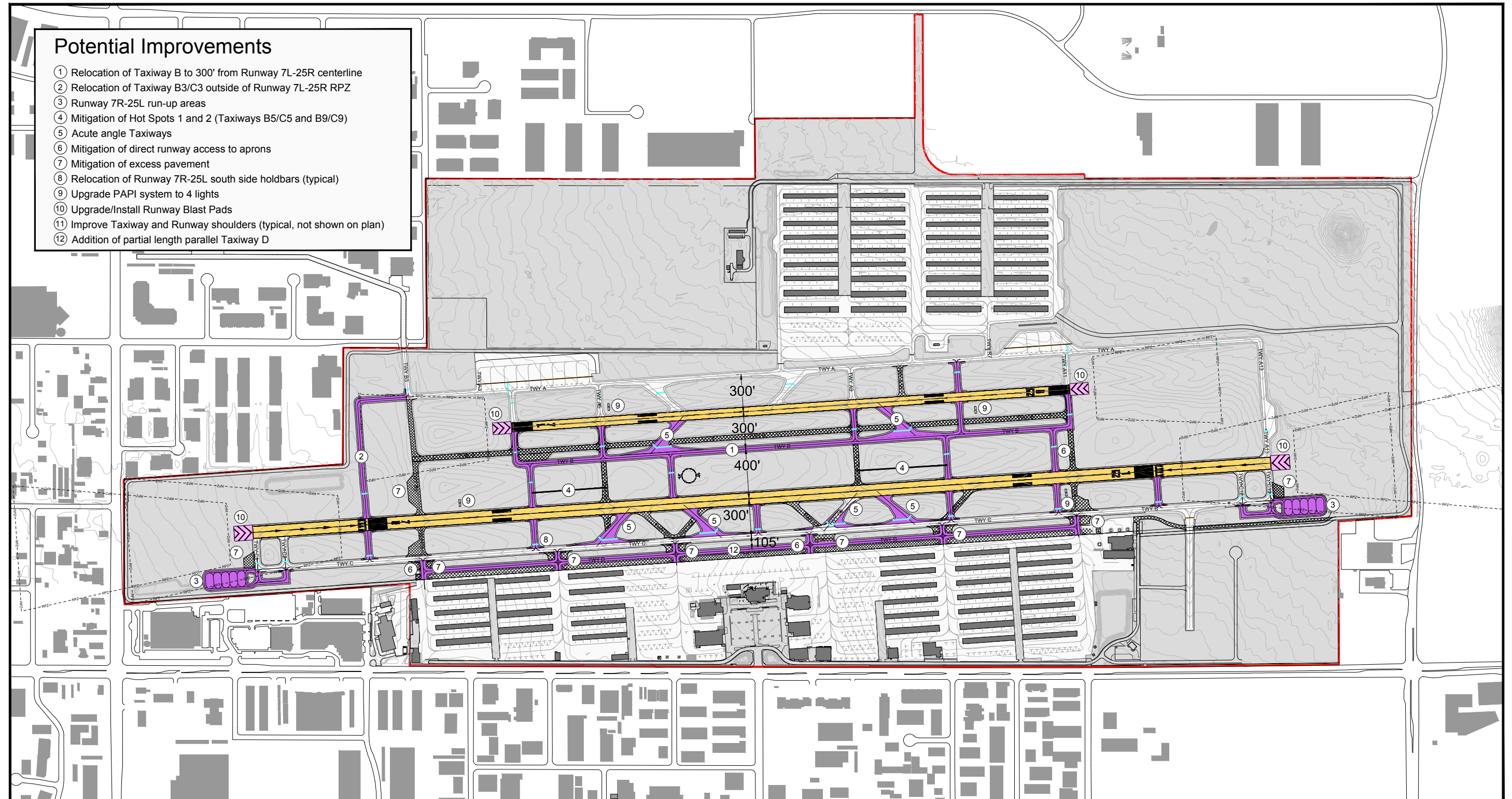
The following is a summary of the advantages of this alternative:

- Meets current FAA design standards
- Mitigates the FAA-identified hot spots
- Mitigates the non-standard geometry south of Runway 7R-25L
- Minimizes the risk of runway incursions
- Eliminates runway crossings in the “high energy” middle third of each runway
- Re-uses existing airfield pavement to the extent possible
- Improves operational efficiency and reduces runway occupancy times by relocating acute angle taxiway connectors on both runways
- Adds needed run-up positions outside of the RSA
- Minimizes runway occupancy time by providing a dedicated arrival taxiway
- Reduces the risk of head-to-head taxi conflicts
- Enables the relocation of the Runway 7R-25L holdbars to their standard location
- Does not require relocation of the Police Air Support Unit

The following is a summary of the disadvantages of this alternative:

- Requires an expansive reconstruction of the airfield
- Requires the costly construction of a partial length taxiway
- Requires the relocation of some hangars and leaseholds as a result of the taxiway development
- Does not provide enhanced flexibility for ATC sequencing of aircraft

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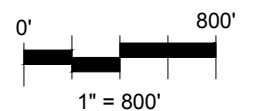
- Potential Improvements**
- ① Relocation of Taxiway B to 300' from Runway 7L-25R centerline
 - ② Relocation of Taxiway B3/C3 outside of Runway 7L-25R RPZ
 - ③ Runway 7R-25L run-up areas
 - ④ Mitigation of Hot Spots 1 and 2 (Taxiways B5/C5 and B9/C9)
 - ⑤ Acute angle Taxiways
 - ⑥ Mitigation of direct runway access to aprons
 - ⑦ Mitigation of excess pavement
 - ⑧ Relocation of Runway 7R-25L south side holdbars (typical)
 - ⑨ Upgrade PAPI system to 4 lights
 - ⑩ Upgrade/Install Runway Blast Pads
 - ⑪ Improve Taxiway and Runway shoulders (typical, not shown on plan)
 - ⑫ Addition of partial length parallel Taxiway D

Airfield Alternative 3 - Partial Length Parallel Taxiway D

Figure 5-5

LEGEND

- Airport Property Boundary
- Airfield Ramp, Taxiway & shoulders
- Existing Runway Pavement
- Existing on-Airport Building
- Holding Position
- RPZ Runway Protection Zone
- Proposed Removal
- Proposed Airfield Enhancement
- Proposed Runway Pavement



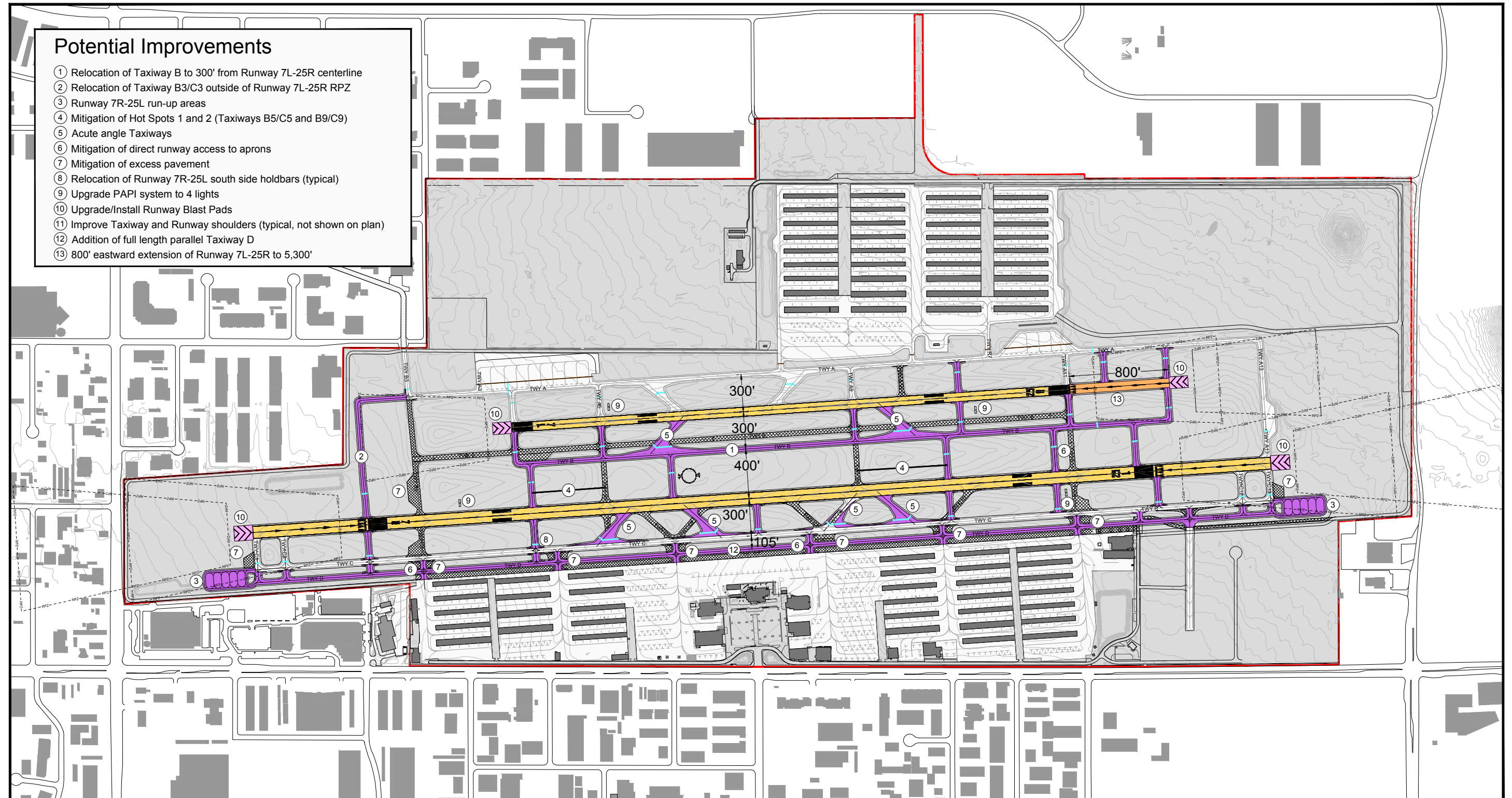
5.3.4 Airfield Alternative 4 – 800 Foot Extension of Runway 7L-25R

Airfield Alternative 4 – 800 Foot Extension of Runway 7L-25R, presented in **Figure 5-6**, incorporates all of the improvements presented in Alternative 2, Full Length Parallel Taxiway D, and supplements it with an extension of Runway 7L-25R 800 feet to the east for a total length of 5,300 feet. Chapter 3, Facility Requirements, reviewed DVT's runway length requirements for the next 20 years based on the projected fleet mix and concluded that Runway 7L-25R could benefit from additional runway length to bring the total length over 5,000 feet. Exceeding 5,000 feet of runway length will allow corporate aircraft to use the runway and could better balance the utilization of the two runways.

During development of this alternative, it was concluded that the only feasible direction that Runway 7L-25R could be extended is to the east due to off-airport property impacts associated with the RPZ on the west. Several iterations of a modest runway length increase were studied and presented to the Technical and Public Advisory Committees, ranging from 500 feet to 1,000 feet. New obstruction data prepared for an FAA AC 150/5300-18B aeronautical survey provided detailed information about the objects and terrain east of DVT. One of the primary goals with the runway extension is to provide runway pavement that is usable in both east and west flow. In discussions with DVT's tenants and users it was stated that the users prefer not to move the Runway 25R arrival threshold closer to the Runway 25L arrival threshold because of the high number of student pilots making converging approaches. By not aligning the arrival thresholds, aircraft entering the pattern for Runway 25R will be at a higher altitude than the aircraft entering the Runway 25L pattern, reducing the risk of inflight incident should one or both aircraft overshoot their final approach course.

Of the various runway extension opportunities, an 800 foot extension of Runway 7L-25R maximizes the ability to use the additional runway length bi-directionally. Due to tenant and user's request to maintain the existing arrival threshold as a safety measure, Alternative 4 proposes that the runway extension is added with a displaced arrivals threshold on the 25R end. The additional runway length would be used for departures and arrivals in east flow and departures in west flow. Arrivals in west flow would not benefit from the added runway length because of the displaced threshold. For departures to the east, the 800 foot extension is the maximum distance that does not cause the departure climb to exceed a 500 foot per nautical mile climb gradient over obstacles to the east of the runway. A summary of the available runway lengths is included in **Table 5-1**. Anything greater than a 500 foot per nautical mile climb gradient must be approved by FAA's Flight Standards Division.

PHOENIX DEER VALLEY AIRPORT MASTER PLAN UPDATE



- Potential Improvements**
- ① Relocation of Taxiway B to 300' from Runway 7L-25R centerline
 - ② Relocation of Taxiway B3/C3 outside of Runway 7L-25R RPZ
 - ③ Runway 7R-25L run-up areas
 - ④ Mitigation of Hot Spots 1 and 2 (Taxiways B5/C5 and B9/C9)
 - ⑤ Acute angle Taxiways
 - ⑥ Mitigation of direct runway access to aprons
 - ⑦ Mitigation of excess pavement
 - ⑧ Relocation of Runway 7R-25L south side holdbars (typical)
 - ⑨ Upgrade PAPI system to 4 lights
 - ⑩ Upgrade/Install Runway Blast Pads
 - ⑪ Improve Taxiway and Runway shoulders (typical, not shown on plan)
 - ⑫ Addition of full length parallel Taxiway D
 - ⑬ 800' eastward extension of Runway 7L-25R to 5,300'

Airfield Alternative 4 - 800' Extension of Runway 7L-25R

Figure 5-6

LEGEND

- Airport Property Boundary
- Airfield Ramp, Taxiway & shoulders
- Existing Runway Pavement
- Existing on-Airport Building
- Holding Position
- Runway Protection Zone
- Proposed Removal
- Proposed Airfield Enhancement
- Proposed Runway Pavement

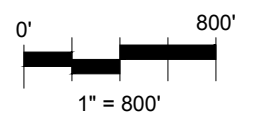


Table 5-1: Airfield Alternative 4 Runway Lengths

Operation	Available Length
Westbound Departures	5,300'
Westbound Arrivals	4,500'
Eastbound Departures	5,300'
Eastbound Arrivals	5,300'

Source: HNTB Analysis

To adequately serve the 800 foot runway extension, Taxiway B is extended east to align with the physical end of Runway 7L-25R. An additional taxiway connector leading to the runway from Taxiway A is included approximately 500 feet down the runway for intersection departures or to allow aircraft that abort a departure to exit the runway quickly. The new departure RPZ is contained within airport property and there are no other impacts to airport safety surfaces.

The following is a summary of the advantages of this alternative:

- Meets current FAA design standards
- Mitigates the FAA-identified hot spots
- Mitigates the non-standard geometry south of Runway 7R-25L
- Minimizes the risk of runway incursions
- Eliminates runway crossings in the "high energy" middle third of each runway
- Re-uses existing airfield pavement to the extent possible
- Improves operational efficiency and reduces runway occupancy times by relocating acute angle taxiway connectors on both runways
- Adds needed run-up positions outside of the RSA
- Minimizes runway occupancy time by providing a dedicated arrival taxiway
- Reduces the risk of head-to-head taxi conflicts
- Enables the relocation of the Runway 7R-25L holdbars to their standard location
- Improves ATC flexibility for sequencing departures, especially for IFR aircraft
- Provides redundancy of operations should Runway 7R-25L be temporarily closed
- Provides a more balanced utilization of the runways

The following is a summary of the disadvantages of this alternative:

- Requires an expansive reconstruction of the airfield
- Requires the costly construction of full length taxiway
- Requires the relocation of some hangars and leaseholds as a result of the taxiway development
- Requires the development of new airspace departure procedures
- May require the lighting/marketing of new obstructions

5.3.5 Airfield Alternative 5 – 1,526 Foot Extension of Runway 7L-25R

Airfield Alternative 5 – 1,526 Foot Extension of Runway 7L-25R, presented in **Figure 5-7**, incorporates all of the improvements presented in Alternative 2, Full Length Parallel Taxiway D, and supplements it with an extension of Runway 7L-25R 1,526 feet to the east for a total length of 6,026 feet. This runway extension maximizes the distance the runway can be extended while still maintaining associated safety areas on airport which avoids the need for property acquisition and easements. The proposed runway length accommodates a significant portion of the jet fleet at a high payload percentage.

The full runway length would be available for westbound departures and eastbound arrivals only. As in Alternative 4, Runway 25R would have a displaced arrivals threshold and westbound arrivals would be limited to the existing runway length. Eastbound departures would be limited to 5,300 feet until critical obstructions limiting climb gradients above 500 feet per nautical mile are mitigated. A summary of the available runway lengths is included in **Table 5-2** below.

Table 5-2: Airfield Alternative 5 Runway Lengths

Operation	Available Length
Westbound Departures	6,026'
Westbound Arrivals	4,500'
Eastbound Departures	5,300'
Eastbound Arrivals	6,026'

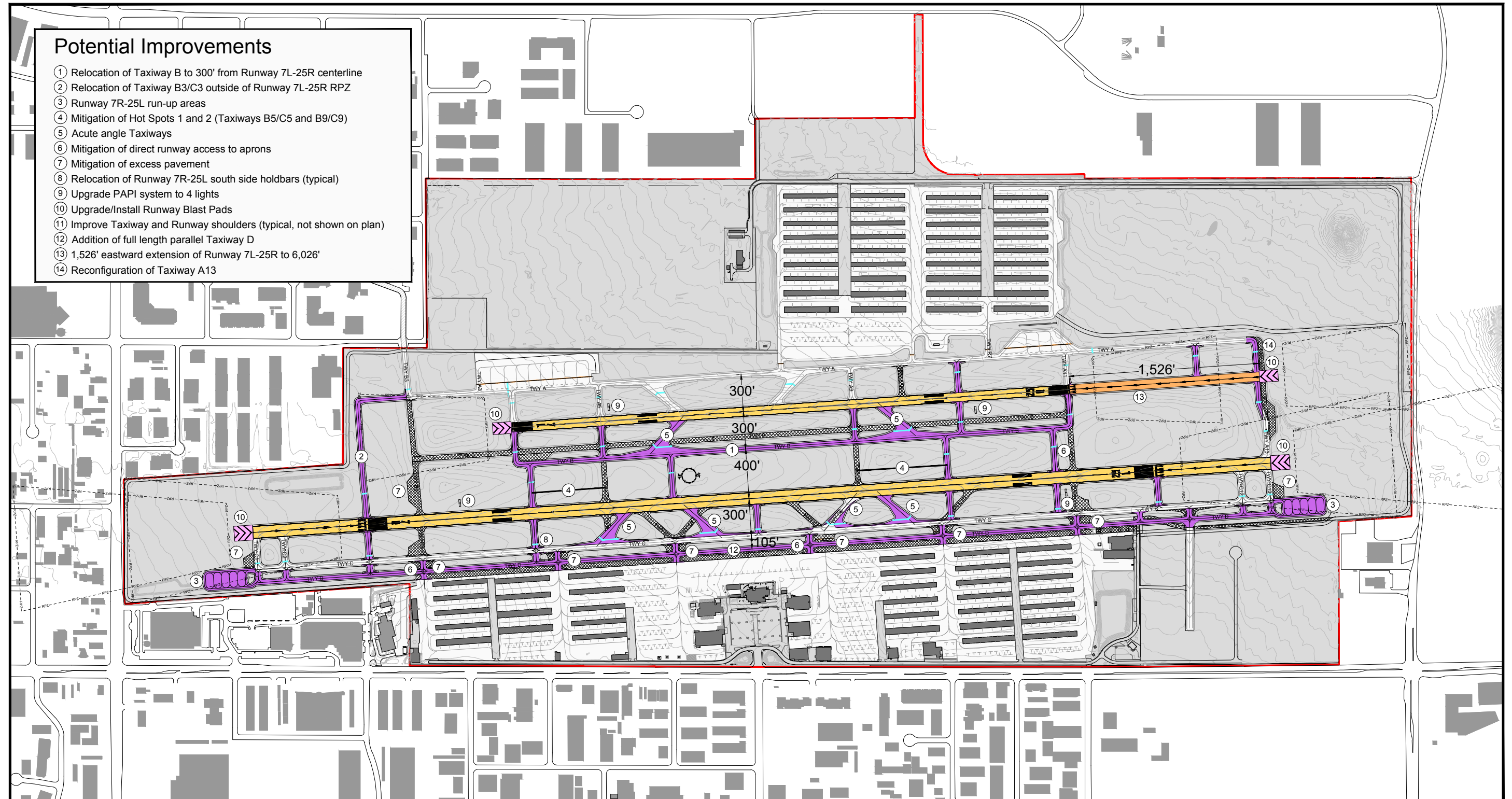
Source: HNTB Analysis

The physical end of Runway 7L-25R does not align with Runway 7R-25L to minimize off-airport RPZ impacts. The alignment of Taxiway A13 requires a jog and partial reconstruction to serve the extended runway threshold because the FAA no longer allows aligned taxiways to serve runways. An additional taxiway connector leading to the runway from Taxiway A is included approximately 500 feet down the runway for intersection departures or to allow aircraft that abort a departure a way to exit the runway quickly. In this alternative, Taxiway B is not extended further to the east in order to prevent the potential misidentification of the taxiway as a runway.

The following is a summary of the advantages of this alternative:

- Meets current FAA design standards
- Mitigates the FAA-identified hot spots
- Mitigates the non-standard geometry south of Runway 7R-25L
- Minimizes the risk of runway incursions
- Eliminates runway crossings in the “high energy” middle third of each runway
- Re-uses existing airfield pavement to the extent possible
- Improves operational efficiency and reduces runway occupancy times by relocating acute angle taxiway connectors on both runways
- Adds needed run-up positions outside of the RSA

PHOENIX DEER VALLEY AIRPORT MASTER PLAN UPDATE



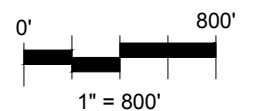
Airfield Alternative 5 - 1,526' Extension of Runway 7L-25R

Figure 5-7



LEGEND

- Airport Property Boundary
- Airfield Ramp, Taxiway & shoulders
- Existing Runway Pavement
- Existing on-Airport Building
- Holding Position
- Runway Protection Zone
- Proposed Removal
- Proposed Airfield Enhancement
- Proposed Runway Pavement



- Minimizes runway occupancy time by providing a dedicated arrival taxiway
- Reduces the risk of head-to-head taxi conflicts
- Enables the relocation of the Runway 7R-25L holdbars to their standard location
- Improves ATC flexibility for sequencing departures, especially for IFR aircraft
- Provides redundancy should Runway 7R-25L be temporarily closed
- Provides a more balanced utilization of the runways
- Enables a large percentage of the jet fleet to use Runway 7L-25R

The following is a summary of the disadvantages of this alternative:

- Requires an expansive reconstruction of the airfield
- Requires the costly construction of full length taxiway
- Requires the relocation of some hangars and leaseholds as a result of the taxiway development
- Requires the development of new airspace departure procedures
- May require the lighting/marketing of new obstructions
- Additional runway length is not fully usable in both directions

5.3.6 Summary of Airfield Development Alternatives

Table 5-3 below summarizes the principal improvements associated with the alternatives described above.

Table 5-3: Airfield Alternatives Summary

Component	No Build	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Runway 7L-25R Length	4,500'	4,500'	4,500'	4,500'	5,300'	6,026'
Runway 7R-25L Length	8,196'	8,196'	8,196'	8,196'	8,196'	8,196'
Meets AC Design Standards	No	Yes	Yes	Yes	Yes	Yes
Addresses Runway 7R-25L Holdbar Location	Yes	Not Adequately	Yes	Yes	Yes	Yes
Improves Operational Efficiency	No	No	Yes	Yes	Yes	Yes
Mitigates Hot Spots	No	Yes	Yes	Yes	Yes	Yes
Mitigates Non-Standard Geometry	No	Yes	Yes	Yes	Yes	Yes
Impacts Existing Tenants/Leaseholds	No	No	Yes	Yes	Yes	Yes
Balances the Airfield	No	No	No	No	Yes	Yes
Improves FAA Sequencing Flexibility	No	No	Yes	No	Yes	Yes

Source: HNTB Analysis

5.4 Support Facility Alternatives

5.4.1 Compass Calibration Pads

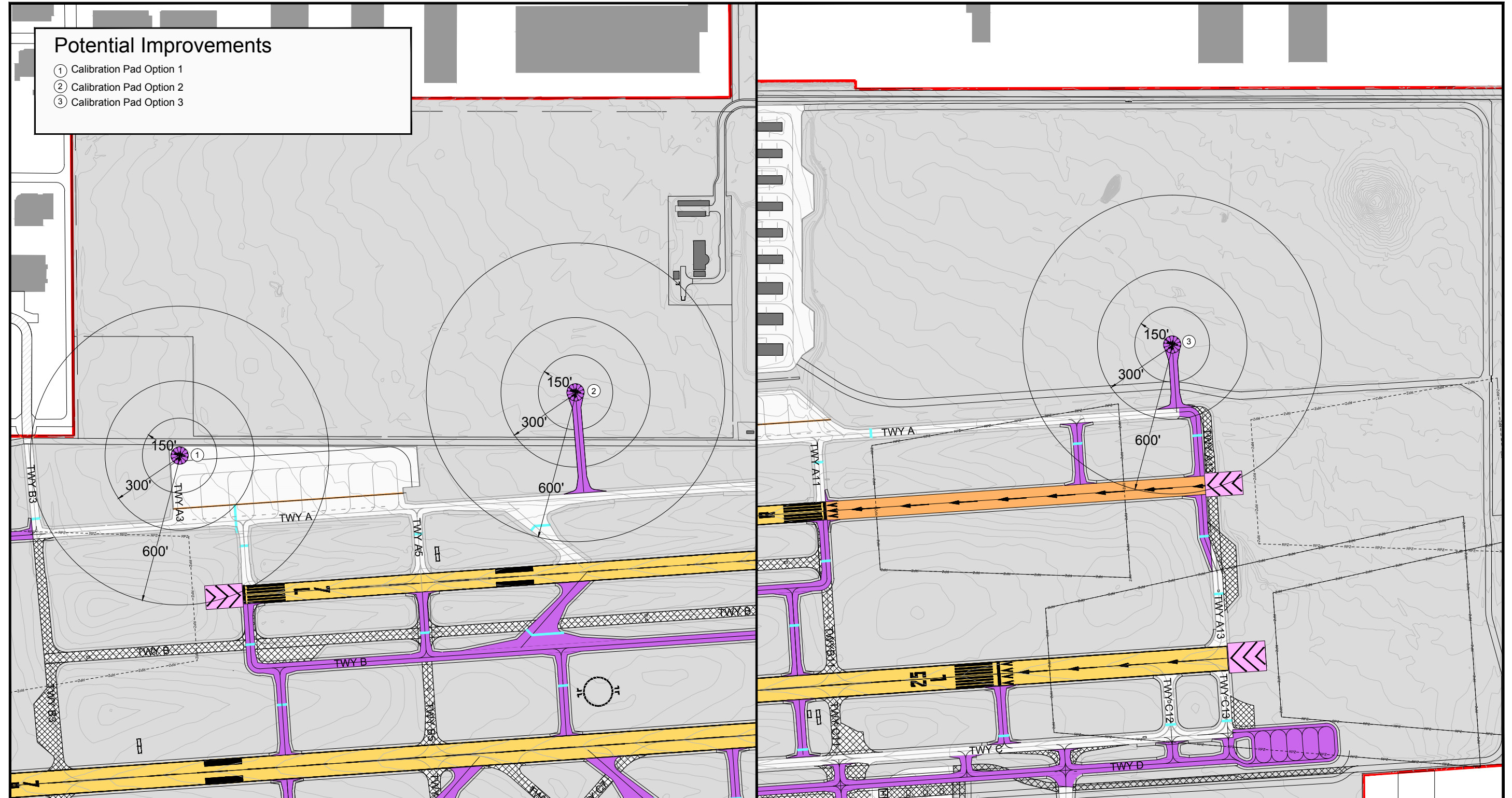
Prior to its reconstruction, DVT maintained a compass calibration pad located on the northwest run-up apron. A compass calibration pad enables pilots to calibrate their on-board magnetic compass by aligning their aircraft on known magnetic headings and making adjustments to the compass and/or placard markings to indicate the required corrections. Since the decommissioning of the former compass calibration pad, tenants and users have requested that this important air navigation function be restored at DVT and it was the most requested facility in the survey of DVT based pilots. FAA AC 150/5300-13A, Appendix 6, specifies detailed requirements for the siting of a compass calibration pad.

The FAA recommends the following design criteria when siting a compass calibration pad at an airport:

- Locate the center of the pad at least 600 feet (183 meters) from magnetic objects such as large parking lots, busy roads, railroad tracks, high voltage electrical transmission lines or cables carrying direct current (either above or below ground)
- Locate the center of the pad at least 300 feet (91 meters) from buildings, aircraft arresting gear, fuel lines, electrical or communication cable conduits when they contain magnetic (iron, steel, or ferrous) materials and from other aircraft
- Locate the center of the pad at least 150 feet (46 m) from runway and taxiway light bases, airfield signs, ducts, and grates for drainage that contain iron, steel, or ferrous materials
- Avoid NAVAID interference in accordance with other NAVAID siting criterion
- The compass calibration pad must be located outside airport design surfaces to satisfy the runway and taxiway clearances applicable to the airport on which it is located
- Conduct a comprehensive magnetic survey of the area to ensure compliance with magnetic interference requirements

The three alternatives for accommodating a compass calibration pad are presented in **Figure 5-8**. For the purposes of ensuring the maximum development of the airfield can be accommodated in the future, the compass calibration pad options are paired with Airfield Alternative 5. This is not intended to indicate a preference toward Airfield Alternative 5.

Compass Calibration Pad Alternative 1 is located within the northwest run-up apron, which is close to where it was previously located. This alternative, unlike the other two alternatives, does not propose a remote location for the compass calibration pad. It relies on existing pavement in an area of the run-up apron that does not accommodate frequent traffic. Alternative 1 may be inoperable during periods where the run-up area is occupied by aircraft due to magnetic interference.



Compass Calibration Pad Alternatives

Figure 5-8



Compass Calibration Pad Alternative 2 sites the compass calibration pad in a more remote location served by a connector taxiway linking Taxiway A with the pad just to the east of the northwest run-up apron. This alternative requires an extensive amount of taxiway pavement to locate the pad at a distance that meets clearance requirements. The location also interferes with potential development options in the northwest portion of the airfield.

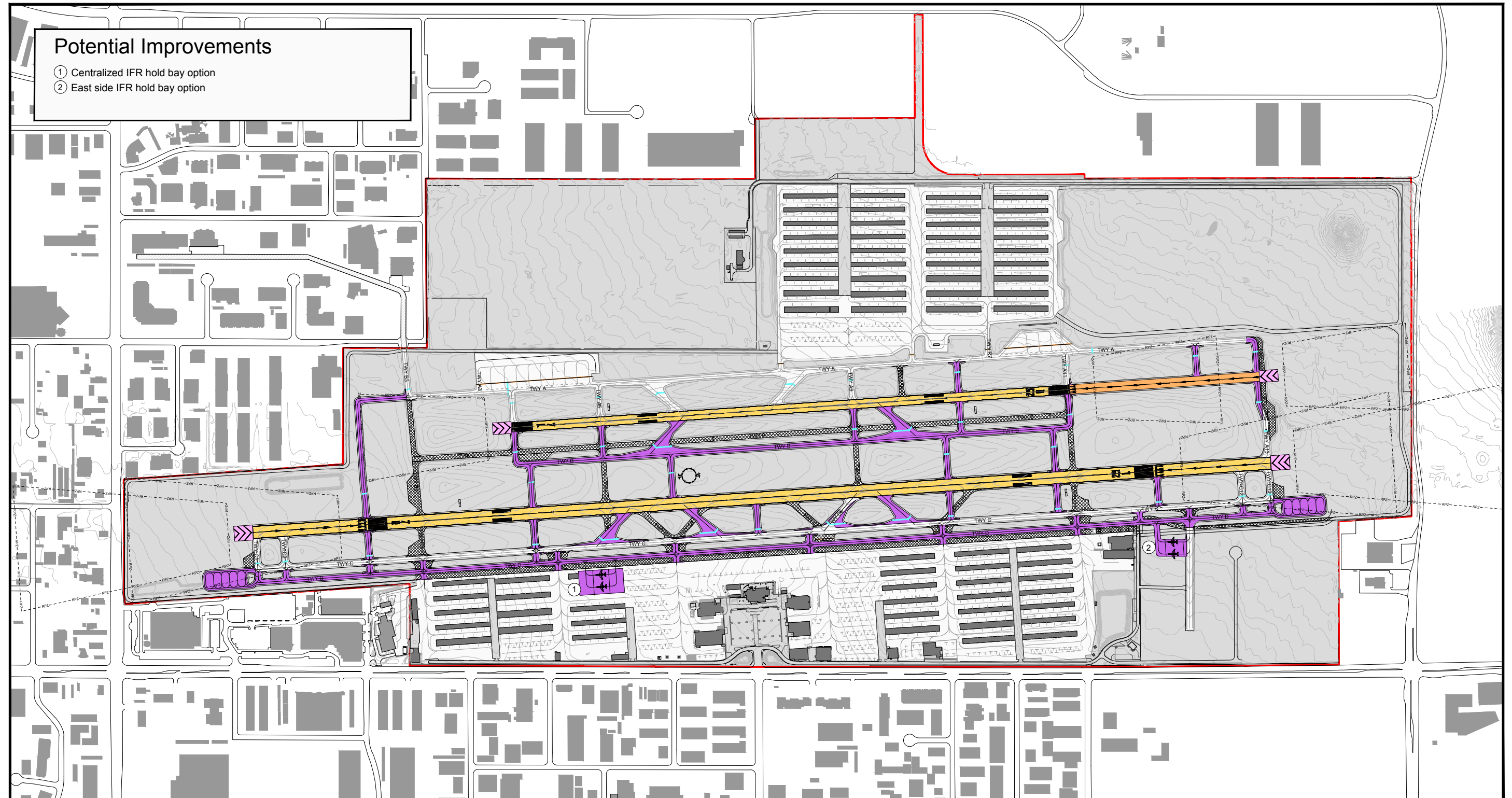
Compass Calibration Pad Alternative 3 sites the compass calibration pad in a remote location in the northeast corner of the airfield. The connector taxiway would be located near the intersection of Taxiways A and A13. Similar to Alternative 2, this alternative requires an extensive amount of taxiway pavement to locate the pad at a distance that meets clearance requirements. The location also interferes with potential development options in the northeast portion of the airfield.

5.4.2 IFR Hold Bays

As discussed in Airfield Alternative 2, aircraft departing under IFR are often given very narrow windows to depart by FAA ATC. Upon notification of a wheels-up time, aircraft are usually given less than five minutes to reach the end of the runway and depart. Given the larger share of small propeller-driven aircraft at DVT, it is clear why the proposed south run-up areas are planned for ADG-I aircraft. However, when IFR traffic taxi down to the end of the runways and await clearance, they often block other aircraft trying to taxi to the end of the runway since no bypass route is currently available. Construction of Taxiway D, as described in Airfield Alternative 2, would allow IFR aircraft to hold without blocking other aircraft, providing one potential solution. Another potential solution is the development of IFR hold bays that are specifically designed for corporate aircraft and located where they do not block other aircraft but when released they can access the departure end of the runway within their narrow departure window. Two potential IFR hold bay alternatives are presented in **Figure 5-9**.

IFR hold bay Alternative 1 sites a two position ADG-II capable hold bay west of the Atlantic Aviation FBO ramp where two shade hangars are currently located. The design would allow aircraft to power-in and power-out of their holding positions avoiding long tow times. This alternative is compatible with all of the potential airfield alternatives. The location of the hold bay would make it difficult for aircraft to access the end of Runway 25L within a timely manner and is preferable for aircraft departing from Runway 7R.

IFR hold bay Alternative 2 sites a two position ADG-II capable hold bay east of the Police Air Support Unit and connects to the existing southbound taxilane. The design of Alternative 2 would also allow aircraft to power-in and power-out of their holding positions. The location of the hold bay would make it even more difficult for aircraft to access the end Runway 7R within a timely manner and is preferable for aircraft departing from Runway 25L. Furthermore it is located in an area that has long been planned for corporate aviation development.

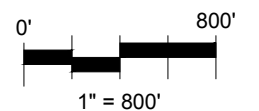


IFR Hold Bay Alternatives

Figure 5-9

LEGEND

- Airport Property Boundary
- Proposed Removal
- Airfield Ramp, Taxiway & shoulders
- Proposed Airfield Enhancement
- Existing Runway Pavement
- Proposed Runway Pavement
- Existing on-Airport Building
- Holding Position
- Runway Protection Zone



5.4.3 Public Safety Building

As discussed in Airfield Alternative 2 – Full Length Parallel Taxiway D, the existing City of Phoenix Police Air Support Unit has surpassed its service life and the building and adjoining apron is in poor condition. Additionally, several of the airfield alternatives recommend improvements that directly impact the ability of the Police Air Support Unit to operate from their existing facility. It is prudent to identify a potential replacement location for the facility that could meet other City needs as well including providing a replacement home for City of Phoenix Fire Station 36. Existing City Fire Station 36, which is located at the intersection of West Melinda Lane and North 9th Avenue, is the station assigned to respond to on-airport emergencies and is nearing the end of its expected service life. As strongly indicated in feedback from DVT's tenant and user surveys, it would be a major benefit to co-locate the fire department and Police Air Support Unit in a single joint-use Public Safety Building on DVT's property. An on property fire department could respond to aircraft emergencies much more quickly than their existing route allows.

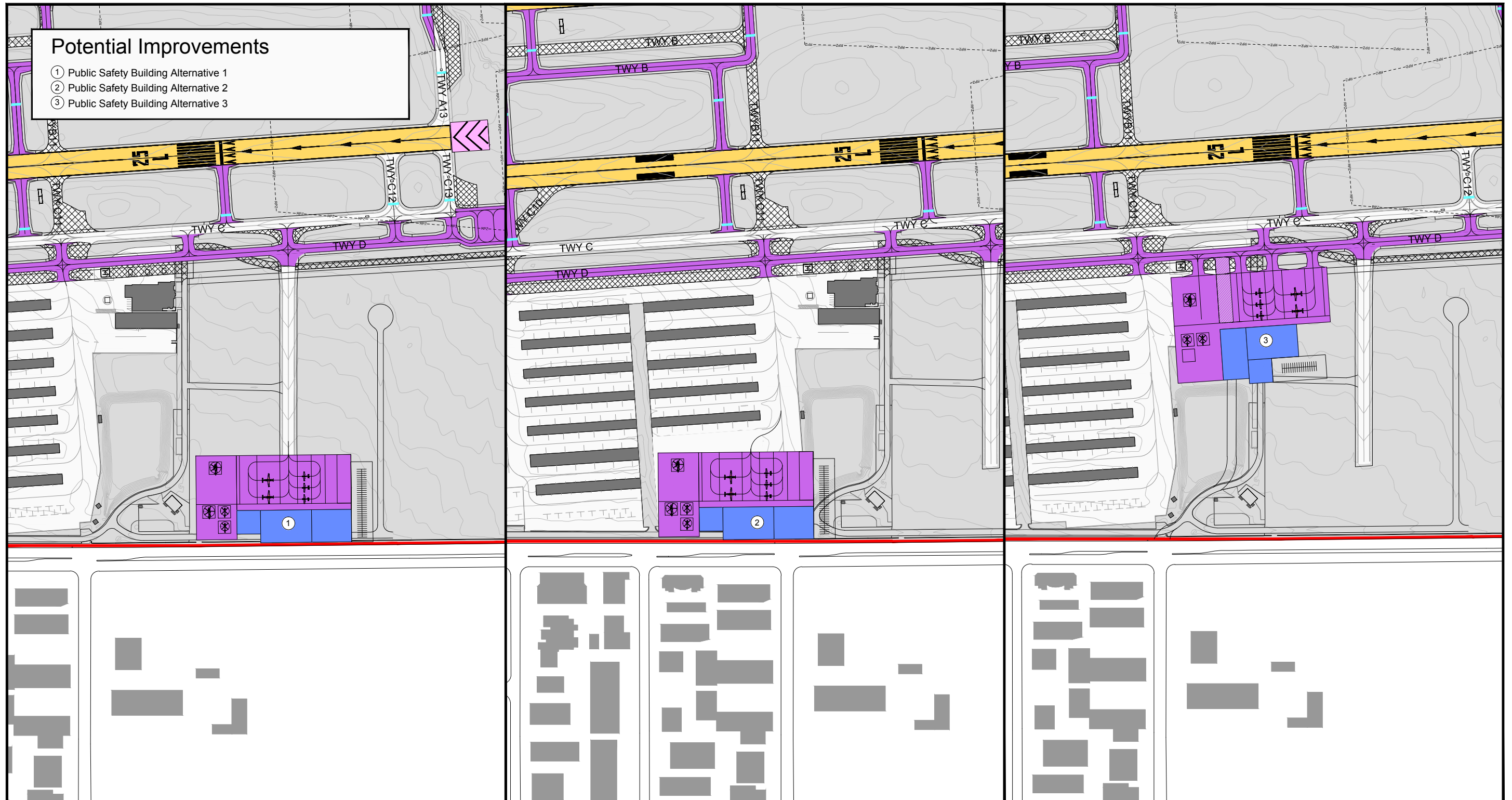
Three alternatives, depicted in **Figure 5-10**, were developed to accommodate the consolidated Public Safety Building. The common criteria across all three options is that they are all located on the south side of DVT which is necessary to maintain Police Air Support Unit response times to Downtown Phoenix.

Public Safety Building Alternative 1 locates the Public Safety Building at the south terminus of the corporate aviation taxiway in the southeast corner of airport property. The Public Safety Building would include administrative offices, hangars, a fire station, apron, and landside parking. Being located close to the fence line facilitates ease of access for the fire station to respond to community and on-airport emergencies. The proposed location for Alternative 1 has long been reserved for corporate aviation development.

Public Safety Building Alternative 2 locates the Public Safety Building at the south end of Taxiway R6 just to the west of the Alternative 1 location. The Public Safety Building would include administrative offices, hangars, a fire station, apron, and landside parking. Being located close to the fence line facilitates ease of access for the fire station to respond to both community and on-airport emergencies. The proposed location for Alternative 2 impacts one existing shade hangar structure, one t-hangar building, and 18 aircraft tie-down parking positions.

Public Safety Building Alternative 3 reconstructs the Public Safety Building in its current location. The Public Safety Building would include administrative offices, hangars, a fire station, apron, and landside parking. Being located further away from the fence line increases fire department response times to the community as the fire department would have to traverse internal DVT roads in order to get outside of airport property. Additionally, the facility could not be easily phased if it is reconstructed on its current leasehold unlike the other two alternatives.

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Public Safety Building Alternatives

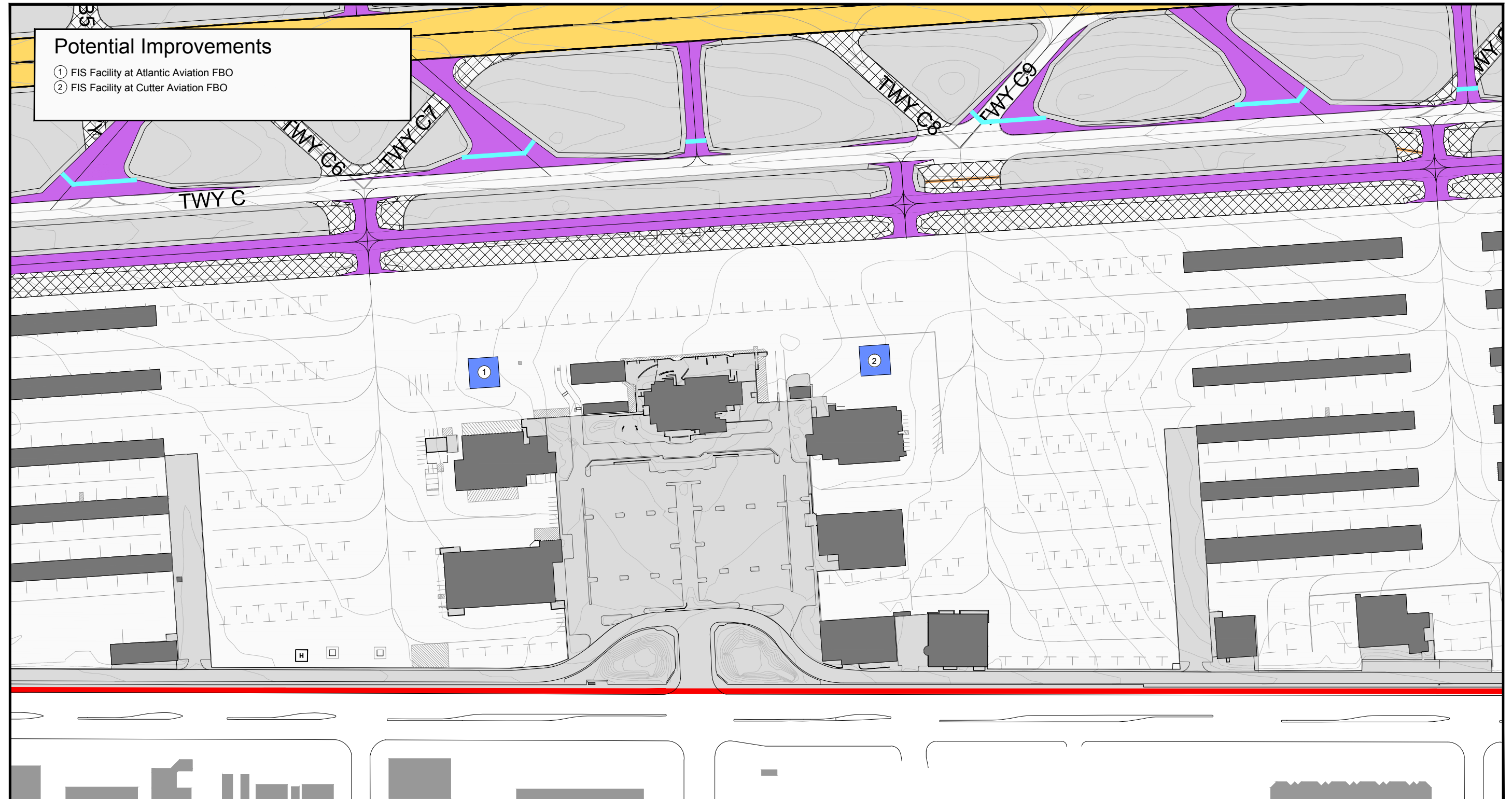
Figure 5-10



5.4.4 U.S. Customs and Border Protection Facility

A U.S. Customs and Border Protection international arrivals facility processes immigration and customs for international arriving passengers. A CBP facility at a general aviation airport is considered a premium amenity and can oftentimes attract additional high-end corporate aviation traffic. SDL and PHX currently have CBP services for general aviation international arrivals. DVT does not currently have a permanent CBP facility; however, CBP service can be made available with advanced notice. At most general aviation airports that have CBP service, FBOs burden the costs of capital construction of permanent processing facilities and the reimbursable CBP staffing costs. DVT's two FBOs have expressed interest in having CBP service at DVT to enhance their business offerings to the corporate aviation community.

CBP's Airport Technical Design Standards, published in June 2012, provides specific facility requirements and design guidelines for all CBP facilities. General aviation CBP facilities are able to process up to 20 passengers and associated baggage at one time. The typical dedicated area required for a CBP facility is approximately 5,000 square feet; however, that size is subject to change based on negotiations with the presiding local CBP Port Director. Two alternatives were developed to meet the CBP requirements, both of which are depicted in **Figure 5-11**. Alternative 1 locates the CBP facility on the Atlantic Aviation FBO leasehold. Alternative 2 locates the CBP facility on the Cutter Aviation leasehold. The locations depicted for the CBP facilities are intended to only represent that the cost of CBP services will be burdened by one of the two FBOs. The actual location of where the building would be constructed would likely be different than what is depicted in the two alternatives.



Potential Improvements

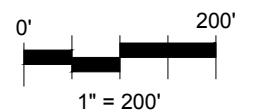
- ① FIS Facility at Atlantic Aviation FBO
- ② FIS Facility at Cutter Aviation FBO

Customs and Border Protection Alternatives

Figure 5-11

LEGEND

- Airport Property Boundary
- Proposed Removal
- Airfield Ramp, Taxiway & shoulders
- Proposed Airfield Enhancement
- Existing Runway Pavement
- Proposed Runway Pavement
- Existing on-Airport Building
- Proposed on-Airport Building
- Holding Position
- Runway Protection Zone



5.5 On-Airport Land Use Development Alternatives

The On-Airport Land Use Development Alternatives present three opportunities for defining the future land use for vacant on-airport land. The alternatives identify potential locations for accommodating general aviation, corporate aviation, aviation support services, and aviation business park uses. A separate market study, the *DVT Real Estate Development Strategy*, was conducted in December 2012 to review opportunities to cultivate additional sources of revenue through the strategic development of DVT's vacant parcels. The purpose of the market study was to identify potential revenue streams from the vacant parcels, while the Master Plan's objective is to comprehensively review all of DVT's needs and protect space for development in appropriate areas. The market study was reviewed as part of this task and some of the recommendations were carried through the land use development alternatives. The market study identified solar farm development as a non-permanent use for the northeast parcel. This use was not carried through the Land Use Alternatives, because it was not determined to be a long-term strategy. A solar farm could be developed as an interim use but would require a detailed cost-benefit review to confirm the short-term financial benefits versus the cost of interim development. The potential glare impacts would also need to be assessed to confirm the location proposed in the market study would not impact the ATCT or pilots' view of the airfield.

The On-Airport Land Use Development Alternatives identify four major functional areas of development. The specific layouts of facilities, including supporting landside and airside access infrastructure (e.g. roads and taxiways), within the areas will be determined as facilities are designed and constructed. Proposed roadway access for sites on the north side of the airfield is described within each On-Airport Land Use Development Alternative. The four functional development areas identified are as follows:

General Aviation: General aviation uses include aircraft parking hangars and tie-down areas, flight schools, helicopter areas, and pilot services such as a terminal or pilot's lounge.

Corporate Aviation: Corporate aviation uses include FBO facilities and corporate box hangar development.

Aviation Support: Aviation support services include facilities that would support general aviation pilots at DVT such as propeller or paint shops and avionics repair. These are facilities which were frequently requested in the DVT pilot's user survey.

Aviation Business Park: Aviation business park uses include development of aviation related business facilities and business or industrial airpark. Facilities may include aircraft hangar and ramp space with direct taxiway access. Development be undertaken by a large single-purpose user or a third-party developer accommodating multiple smaller scale businesses.

All alternatives maintain the southeast parcel for future corporate aviation development and depict the maximum airfield development to preserve the space although no preferred airfield development option has been selected. The previous Master Plan also reserved a 150-foot wide easement to protect taxiway access to property north of the airport property line adjacent to Pinnacle Peak Road, allowing for future through-the-fence access to DVT. This easement was carried through the alternatives but the need for the easement is lessened by current FAA guidelines discouraging through-the-fence agreements and the excess vacant airport parcels located on the north side of the airfield that provide opportunities for businesses who desire to maintain aircraft and have access to the airfield.

The On-Airport Land Use Development Alternatives were created with the overall development objectives presented in Section 5.1.2 in mind and specifically address the desire to balance the utilization of the airfield. The land use plans do not indicate immediate development or relocation of facilities, but designate the areas where facilities would be developed as the need arises. The recommended Land Use Development Plan may include a hybrid of the alternatives described below.

5.5.1 Land Use Alternative 1

Land Use Alternative 1 (**Figure 5-12**) maintains approximately 40 acres of aviation commercial and industrial business park land uses in the northwest parcel along with the 10.7 acre area north of Airport Boulevard, as proposed in the DVT market study. The south 30 acre portion of the northwest parcel is reserved for corporate aviation uses. The northeast 64.6 acre parcel would be dedicated to general aviation development including aircraft hangar and tie-down parking expansion and a pilot's lounge. The flight schools would be relocated to the northeast general aviation site allowing the existing FBOs to expand in place. North side non-secure access would be provided to the aviation business park development from Pinnacle Peak Road and 15th Avenue. This new access roadway would end past the development parcel and would not connect to airside facilities. Additional north side roadway access to the ATCT and north hangars would be provided by developing 3rd Avenue from Pinnacle Peak Road. Airside gates would be maintained at the ATCT and north hangar entrances. This alternative does not specify a specific area for aviation support or helicopter training.

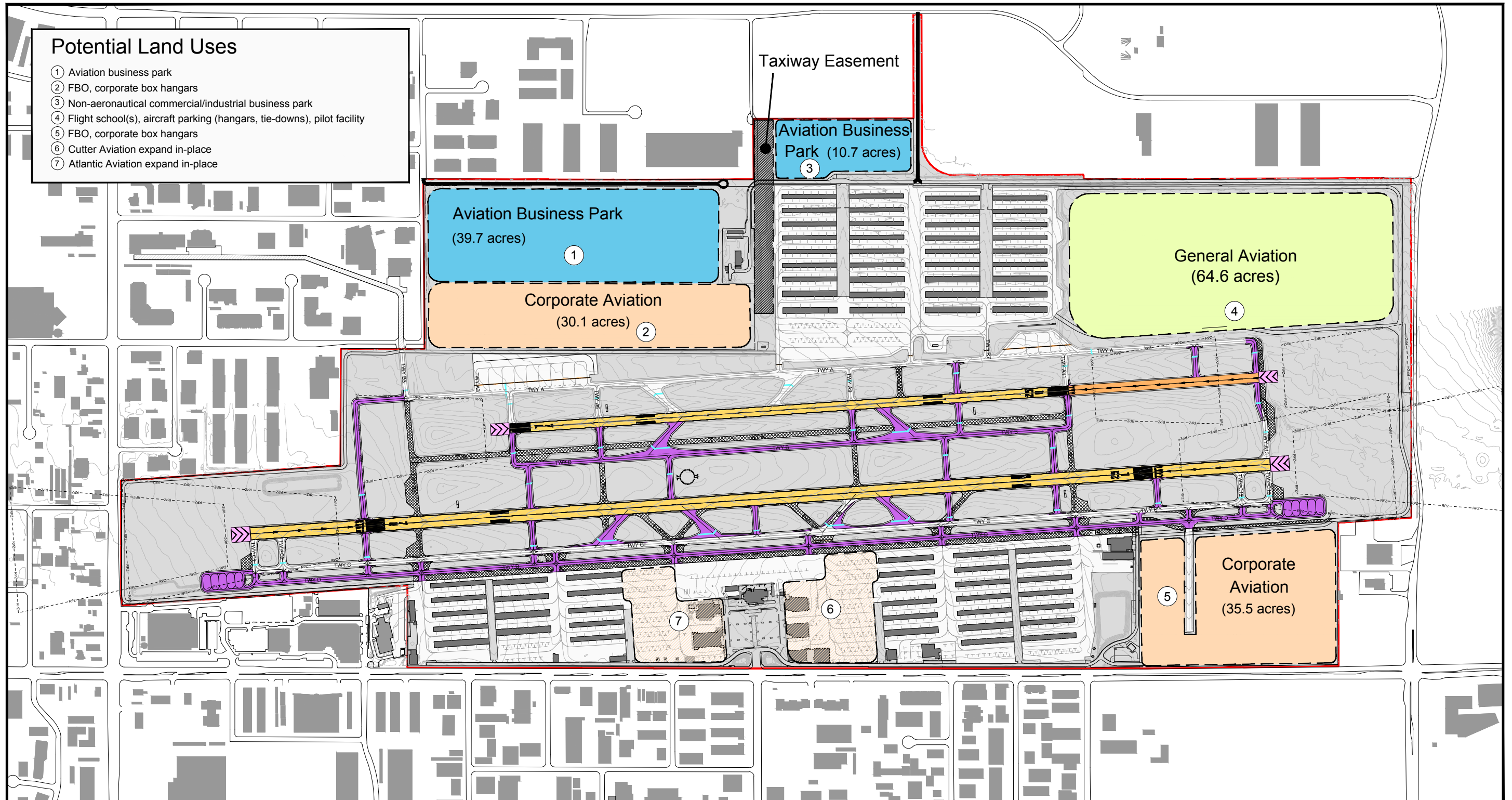
The following is a summary of the advantages of this alternative:

- Maintains aviation business park uses recommended in the DVT market study
- Moves flight schools to the north side of the airfield to better balance the use of the north and south runways
- Allows the existing FBOs to expand their facilities
- Provides a pilot's lounge on the north side of the airfield to serve pilots of aircraft housed in the north side facilities
- Provides north side roadway access from Pinnacle Peak Road

The following is a summary of the disadvantages of this alternative:

- Does not provide a designated space for aviation support uses
- Does not provide a designated space for helicopter training

PHOENIX DEER VALLEY AIRPORT MASTER PLAN UPDATE



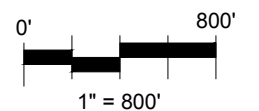
Land Use Alternative 1

Figure 5-12



LEGEND

- Airport Property Boundary
- Airfield Ramp, Taxiway & shoulders
- Existing Runway Pavement
- Existing on-Airport Building
- Holding Position
- Runway Protection Zone
- Proposed Removal
- Proposed Airfield Enhancement
- Proposed Runway Pavement



5.5.2 Land Use Alternative 2

Land Use Alternative 2 (**Figure 5-13**) retains the aviation business park and corporate aviation uses on the northwest parcel as presented in Land Use Alternative 1, while designating approximately 21 acres of space for aviation support uses, such as a propeller or paint shop, and approximately 42 acres for future general aviation hangar and tie-down expansion on the northeast parcel. A pilot's lounge would also be located in this general aviation development. The 10.7 acre parcel north of Airport Boulevard is identified for general aviation uses and would be designated for helicopter pattern work allowing it to be separated from other airfield operations increasing the safety of the airfield. Under this alternative flight schools would remain on the south side of the airfield and the existing FBO's would maintain their current configurations. North side non-secure access would be provided to the aviation business park development from Pinnacle Peak Road and 15th Avenue. This new access roadway would end past the development parcel and would not connect to airside facilities. Additional north side roadway access to the north hangars would be provided by developing 3rd Avenue from Pinnacle Peak Road. In addition, 7th Avenue would be extended to Airport Boulevard providing access to the ATCT and north hangar facilities. Airside gates would be maintained at the ATCT and north hangar entrances.

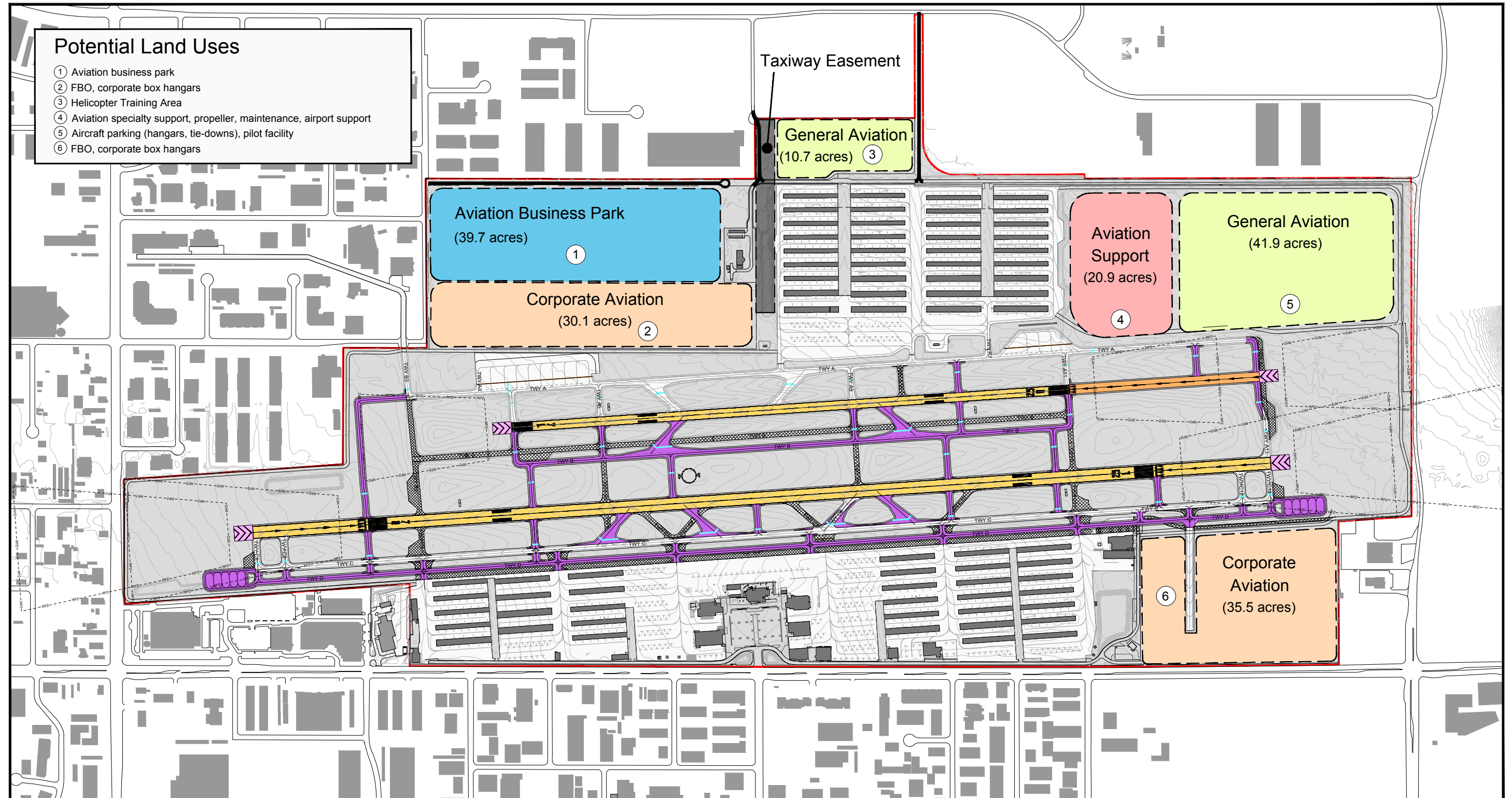
The following is a summary of the advantages of this alternative:

- Maintains aviation business park uses recommended in the DVT market study
- Provides a pilot's lounge on the north side of the airfield to serve pilots of aircraft housed in the north side facilities
- Provides a designated space for aviation support uses
- Provides a designated space for helicopter training
- Provides north side roadway access from Pinnacle Peak Road

The following is a summary of the disadvantages of this alternative:

- Does not move flight schools to the north side of the airfield maintaining the current imbalance of operations on the south runway
- Does not provide additional space for the existing FBO's to expand in place

PHOENIX DEER VALLEY AIRPORT MASTER PLAN UPDATE

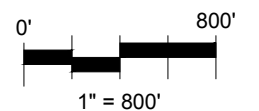


Land Use Alternative 2

Figure 5-13

LEGEND

- Airport Property Boundary
- Proposed Removal
- Airfield Ramp, Taxiway & shoulders
- Proposed Airfield Enhancement
- Existing Runway Pavement
- Proposed Runway Pavement
- Existing on-Airport Building
- Holding Position
- Runway Protection Zone



5.5.3 Land Use Alternative 3

Land Use Alternative 3 (**Figure 5-14**) expands general aviation uses to all parcels on the north. A 60 acre northwest parcel and a 64.6 acre parcel on the northeast would provide space for future general aviation hangar and tie-down expansion. The flight schools would be relocated to the northeast and / or northwest general aviation sites allowing the existing FBOs to expand in place. A pilot's lounge would be located within one of these general aviation development parcels. The 10.7 acre parcel north of Airport Boulevard is identified for general aviation uses and would be designated for helicopter pattern work allowing it to be separated from other airfield operations increasing the safety of the airfield. A 10.2 acre space would be carved out of the northwest general aviation and designated for aviation support uses, such as a propeller or paint shop. North side roadway access to the expanded northeast hangars and flight schools would be provided by developing 3rd Avenue from Pinnacle Peak Road. In addition, 7th Avenue would be extended to Airport Boulevard providing access to the ATCT and northwest hangar and flight school facilities. Airside gates would be maintained at the ATCT and north hangar entrances.

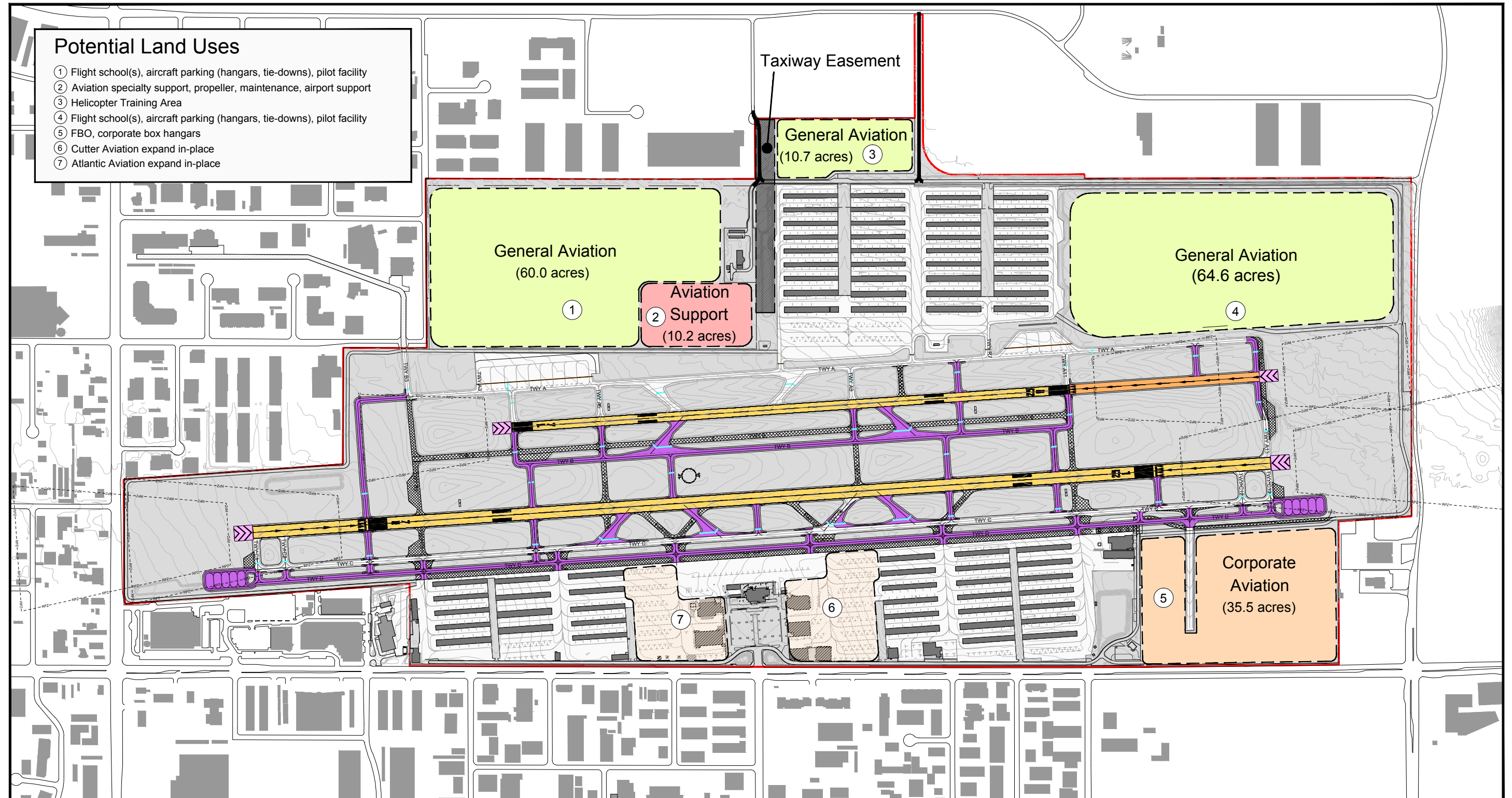
The following is a summary of the advantages of this alternative:

- Moves flight schools to the north side of the airfield to better balance the use of the north and south runways
- Allows the existing FBOs to expand their facilities
- Provides a pilot's lounge on the north side of the airfield to serve pilots of aircraft housed in the north side facilities
- Provides a designated space for aviation support uses
- Provides a designated space for helicopter training
- Provides north side roadway access from Pinnacle Peak Road

The following is a summary of the disadvantages of this alternative:

- Does not maintain aviation business park uses recommended in the DVT market study

PHOENIX DEER VALLEY AIRPORT MASTER PLAN UPDATE



- Potential Land Uses**
- ① Flight school(s), aircraft parking (hangars, tie-downs), pilot facility
 - ② Aviation specialty support, propeller, maintenance, airport support
 - ③ Helicopter Training Area
 - ④ Flight school(s), aircraft parking (hangars, tie-downs), pilot facility
 - ⑤ FBO, corporate box hangars
 - ⑥ Cutter Aviation expand in-place
 - ⑦ Atlantic Aviation expand in-place

Land Use Alternative 3

Figure 5-14

LEGEND

- Airport Property Boundary
- Airfield Ramp, Taxiway & shoulders
- Existing Runway Pavement
- Existing on-Airport Building
- Holding Position
- Runway Protection Zone
- Proposed Removal
- Proposed Airfield Enhancement
- Proposed Runway Pavement

