Alternatives

A primary focus of the Master Plan is to identify and evaluate airport development alternatives that satisfy future aviation-related demand, are responsive to the needs of the communities served by the Airport, and maximize revenue-generating opportunities while optimizing compatible land-uses. To satisfy these needs at AVP numerous development alternatives were identified and evaluated.

In this chapter, the previously determined development needs will be applied to a series of airport development alternatives and recommendations. The possible combinations of alternatives can be endless, so some intuitive judgment must be applied to identify those choices that have the greatest potential for implementation, and provide the underlying rationale for the final master plan recommendations. Further, the alternatives must consider the goals and overall vision for future development at the Airport, as outlined previously in this report. In some instances, specifically airfield improvements, there is a set development plan without alternatives. This is often a result of the project having already been designed but not yet implemented, or when only a single logical improvement is conceptualized as variations of such improvement are substantially similar without differing levels of benefit or cost.

The organization of this chapter reflects the process that was followed for the preparation and evaluation of alternative facility development strategies. The evaluation of the airfield facility was initiated first, due to the critical importance of the airfield on overall airport operations and the dominate impact that airfield expansions or improvements have on other airport facilities. After the determination of the preferred airside development alternative, alternatives for landside facilities are explored in detail before a review of currently undeveloped airport lands presents market-focused alternatives for further property development.

It is important to note that not all the alternatives presented herein are mutually exclusive. In fact, the final recommended plan could consist of several of the alternatives combined and refined to address the demands of the Airport within the constraints identified. Subsequent chapters will define how the selected development plan is to be implemented.

5.1. AIRSIDE ALTERNATIVES

In this section, various options to meet the airside needs of AVP were developed and evaluated. As noted in Chapter 4, *Facility Requirements*, airside facility alternatives include potential improvements to the runway, taxiways, and instrumentation. Several alternatives were developed around these areas of interest and are presented in the following sections.

5.1.1. Airside Alternative Evaluation Criteria

To provide for consistent assessments of each alterative throughout the review process, a set of evaluation criteria has been developed. The review criteria are specific to AVP airside alternatives and are defined as follows:





- Facility Requirements: Does the alternative meet the existing and future needs of the Airport and is the alternative feasible for implementation?
- Environmental Impact: What are the potential environmental impacts associated with implementation of the alternative? To what extent does the alternative further achievements of the Airport's environmental goals?
- FAA Design Standards: Does the alternative meet the design standards of Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5300-13A, Airport Design, and Code of Federal Regulations (CFR) Part 77, Objects Affecting Navigable Airspace, to the maximum extent feasible?
- **Development Costs:** Does the alternative have reasonable development costs in comparison to other alternatives that achieve the same goal?
- **Development Flexibility:** To what extent does this alternative leave flexibility for change and future surrounding development? Does this alternative allow flexibility from an operational standpoint?

Each of the evaluation factors above was given a scoring value as follows:

Facility Requirements:

Environmental Impact:

FAA Standards:

Development Costs:

Development Flexibility:

0 = Poor performance

3 = Excellent performance

Alternatives were compared using both a qualitative and quantitative assessment and given a value based on the alternative's ability to meet the requirements of the evaluation factor. Selection of a recommended alternative is based on the alternative meeting demand, enhancing operations and safety, minimizing negative environmental and community impacts and providing for future flexibility. The no-build alternative will be evaluated with respect to each project independently.

Further, it should be noted that while the assessment is created based on available information and design criteria, the completion of required environmental documentation, as well as preliminary and final design results, could require modifications to the alternatives as depicted and result in additional impacts beyond those considered and contemplated as part of this Master Plan Update.

5.1.2. Summary of Airport Facility Requirements

The preceding chapter identified and quantified the facility improvements required to adequately accommodate future demand through 2035. The following is a summary of the key airport facility requirements presented in Chapter 4, Facility Requirements.

Airside Requirements:

- Ultimate Runway 10-28 width of 75-feet (due to funding eligibility)
- Extend Taxiway B to Runway 4 and 22 ends
- Resolve direct apron-to-runway access issues on Taxiway A, B3, C, and E







- Acquire positive control of runway protection zones (RPZ) not currently under airport control or owned by a public entity
- Install PAPI-4 systems on Runway 22, Runway 10, and Runway 28 ends

5.1.3. Runway 10-28 Width

As identified in Section 4.2.2, the existing width of Runway 10-28 exceeds the required minimum design standard by 75 feet, and while in good condition currently, future pavement rehabilitation work may not be fully eligible for FAA grants made available through the airport improvement program (AIP). As such, plans should be made to either reduce the width of Runway 10-28 in the future so that the pavement available supports the runway use and the runway remains fully eligible for support through AIP, or identify alternate funding sources to provide the additional funding necessary to rehabilitate the existing runway width. It should also be noted that since the runway will require rehabilitation in the short-planning period, a new evaluation of FAA design standards, critical aircraft and the airport's overall fleet mix and operating conditions should be completed in the future when further rehabilitation is required to ensure that no changes to the runway's funding eligibility have occurred.

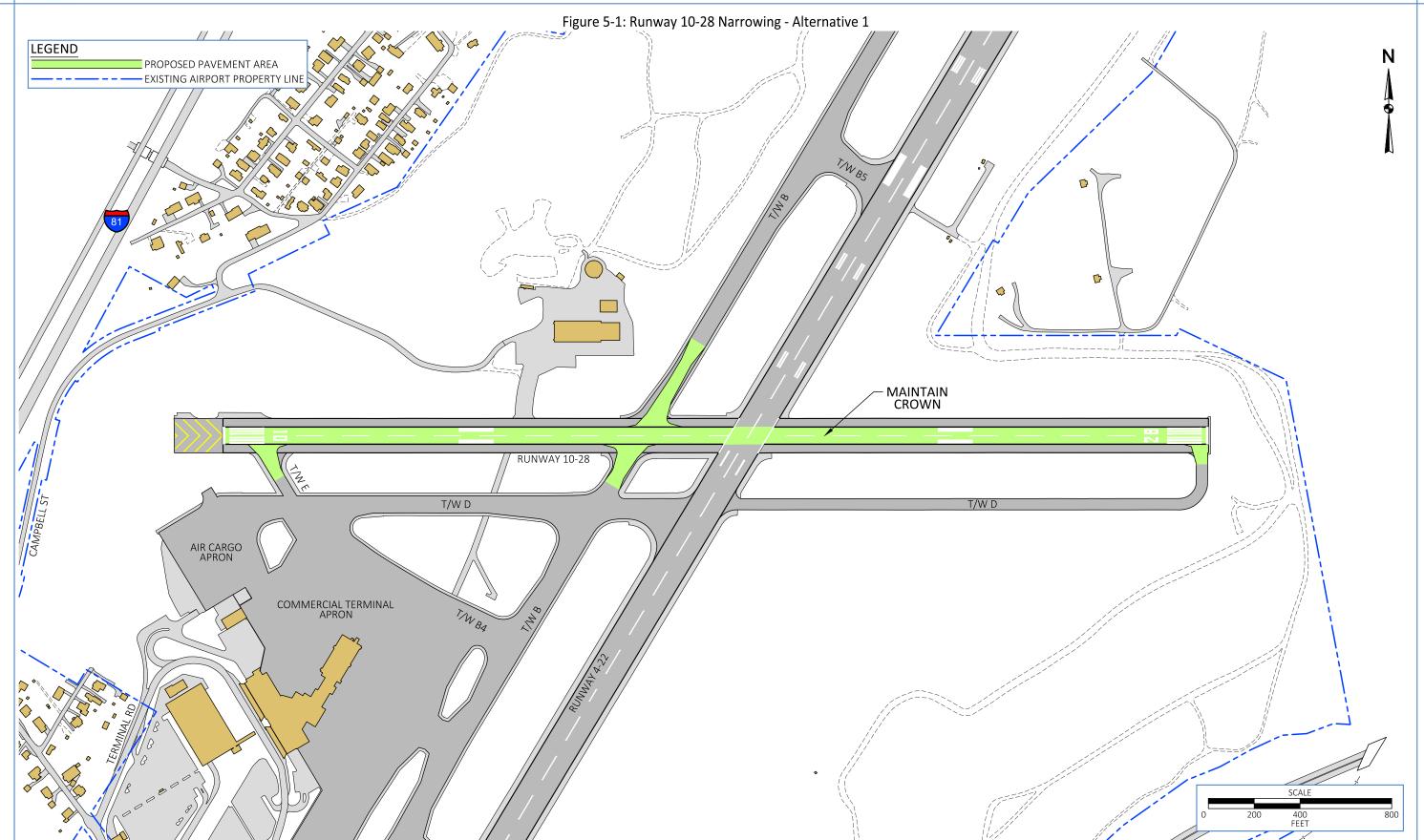
To accomplish the future runway improvement, the width of the existing runway could be reduced by removing pavement on the south side of the runway and relocating the runway centerline, or pavement be removed on both the north and south sides of the runway and maintaining the current runway centerline. Being the existing separation from the runway centerline to taxiway Delta is 300 feet, pavement removal from the north side of the runway would put the relocated runway centerline too near Taxiway Delta so this alternative was not considered. The primary difference between the two remaining alternatives is overall construction cost. Removal of one side of the runway pavement would preserve electrical conduit and runway light locations for one side of the runway, but would likely require relocating crown of the runway pavement to the new centerline location. Conversely, removal of pavement from both sides of the runway would preserve the runway pavement crown but require the relocation of electrical conduit and runway lights on both side of the runway. These proposed improvements are depicted in Figure 5-1 and Figure 5-2. The no build alternative would maintain the existing width of the runway and assumes the pavement continues to undergo regular preventative maintenance. As shown in Table 5-1, the no build alternative received the highest scoring, and will represent the preferred approach to managing Runway 10-28.







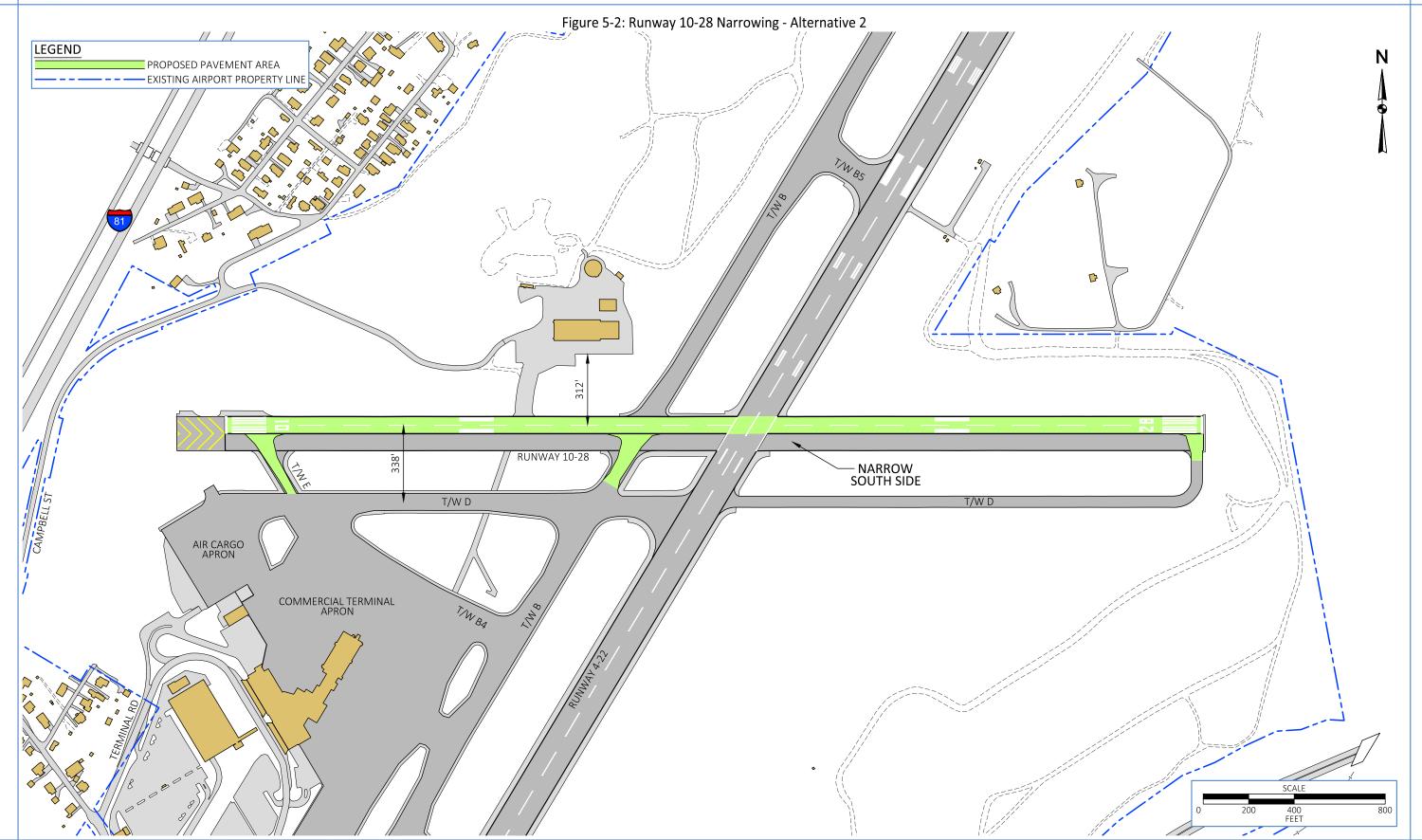














Runway 10-28 Width Alternatives Evaluation

Table 5-1: Runway-Taxiway Separation Alternatives Evaluation

Alternatives	Runway 10-28 Narrowing – Alt 1	Runway 10-28 Narrowing – Alt 2	No Build	
Facility Requirements	3	3	3	
Environmental Impact	2	2	3	
FAA Standards	ndards 3 3		3	
Development Costs	1	1	3	
Development Flexibility	3	3	3	
Total	12	12	15	

Source: McFarland Johnson, 2017.

5.1.4. Taxiway Improvements

Designed Taxiway Improvements

Some taxiway improvements identified in the preceding chapter have already been designed and are either currently being implemented or are awaiting implementation. Specifically, the northerly extension of Taxiway B to the Runway 22 end and the reconfiguration of identified runway incursion hotspots on Taxiway Bravo 3 and Charlie have all been designed and most were under construction at the time of this writing. These improvements are depicted in **Figure 5-3** and will be depicted as an existing condition in subsequent graphics including the ALP document.

Proposed Taxiway Improvements

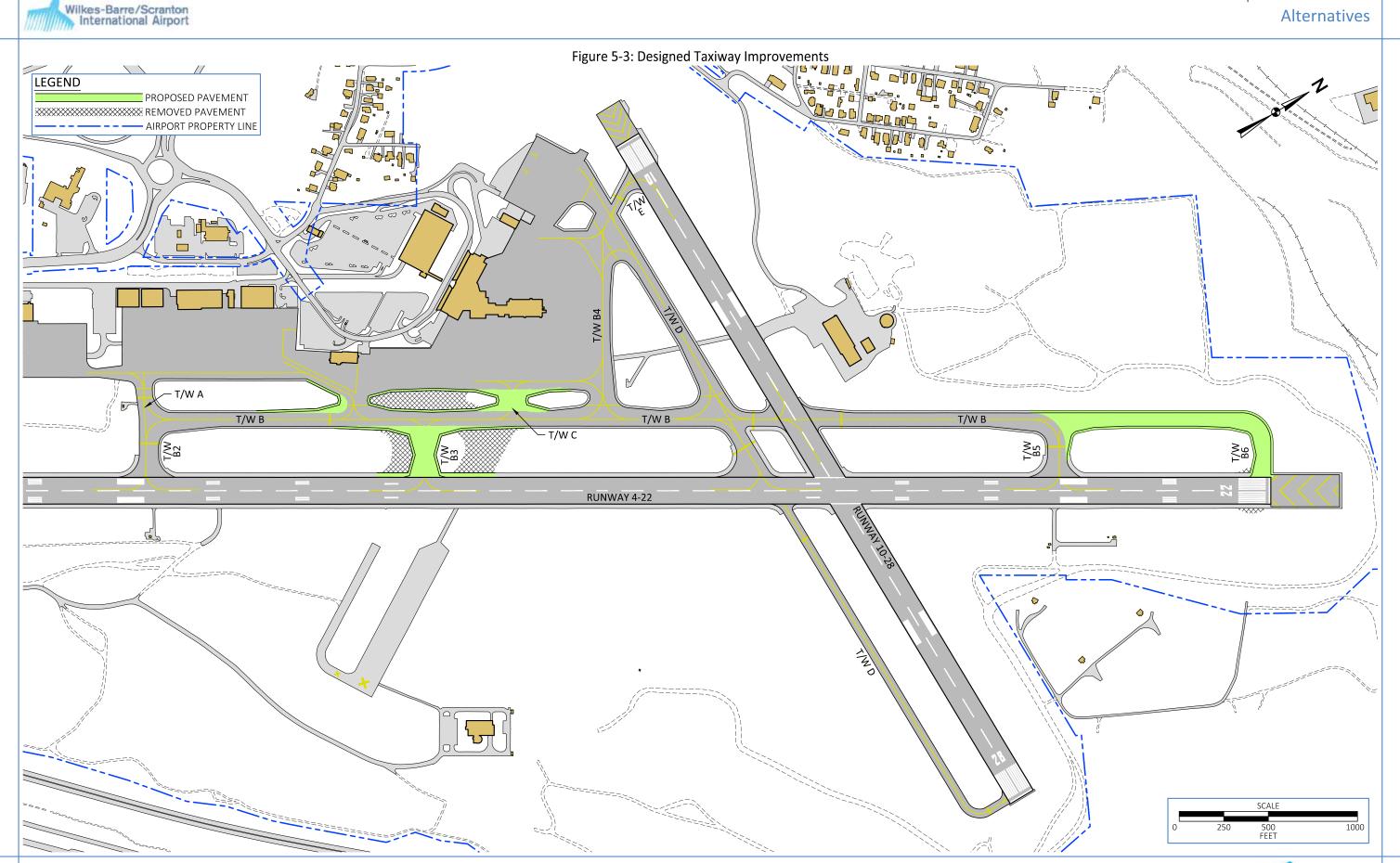
Required taxiway improvements not already designed include a future southerly extension of Taxiway B to provide access to the Runway 4 end, a partial parallel taxiway on the east side of Runway 4-22 to provide airside access to developable land on that side of the airfield, and the reconfiguration of Taxiways Alpha and Echo to mitigate identified hotspots. These alternatives are presented in **Figure 5-4** through **Figure 5-11**. **Table 5-2** and **Table 5-3** evaluate these alternatives and indicate both parallel taxiway improvements, as well as Taxiway Alpha - Alternative 3 and Taxiway Echo - Alternative 2, as the preferred future taxiway development initiatives for the Airport.











Rising Above.



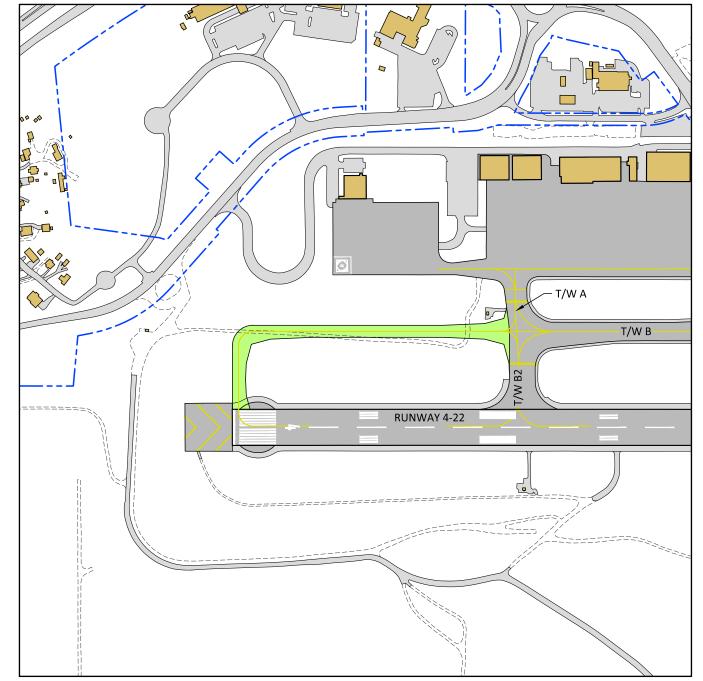




Runway 4-22 Parallel Taxiway Alternatives







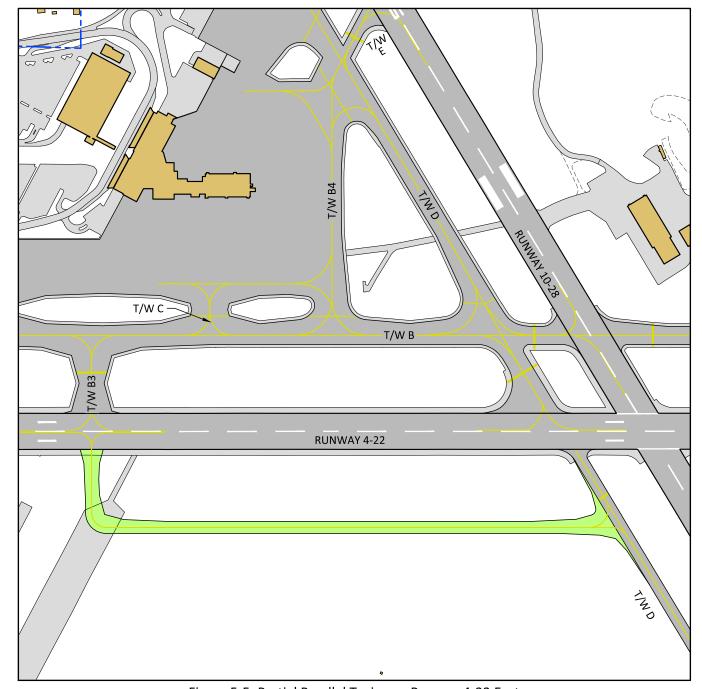
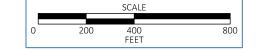


Figure 5-4: Taxiway B Southerly Extension

Figure 5-5: Partial Parallel Taxiway - Runway 4-22 East



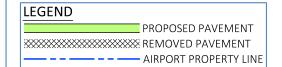




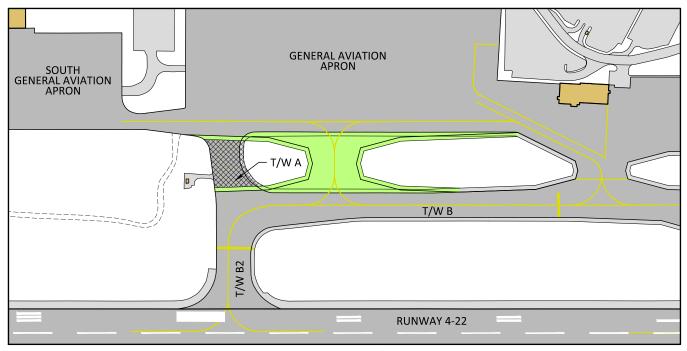




Taxiway A Alternatives







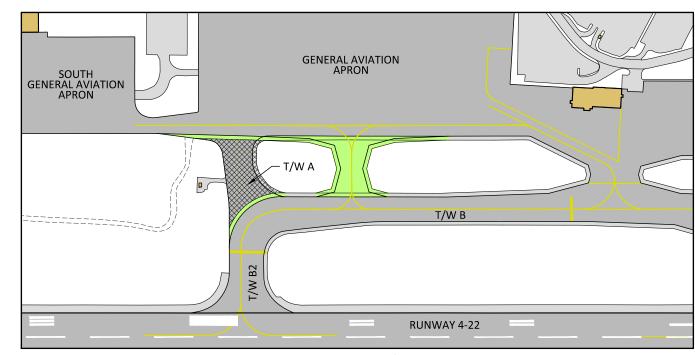


Figure 5-6: Taxiway A Alternative 1

Figure 5-7: Taxiway A Alternative 2

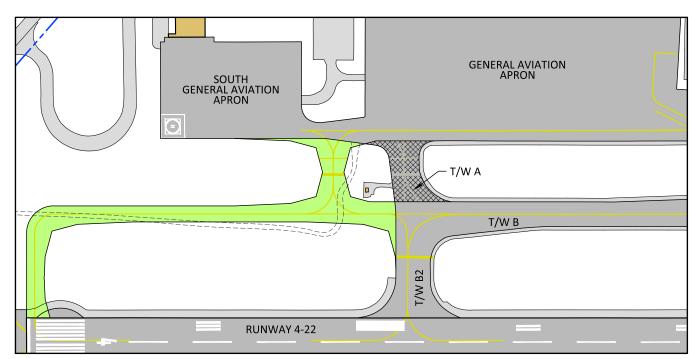
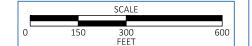


Figure 5-8: Taxiway A Alternative 3







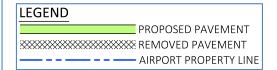


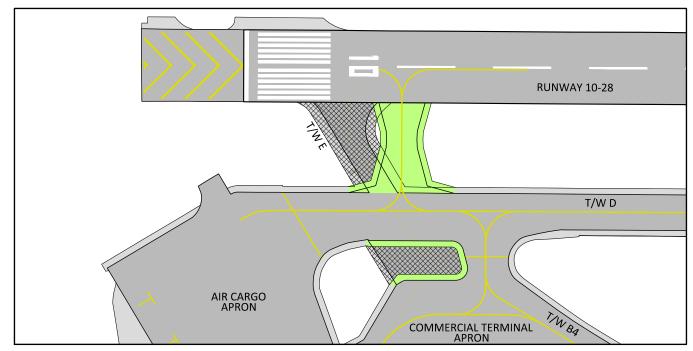




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Taxiway E Alternatives





T/W D

AIR CARGO APRON

COMMERCIAL TERMINAL APRON

Figure 5-9: Taxiway E Alternative 1

Figure 5-10: Taxiway E Alternative 2

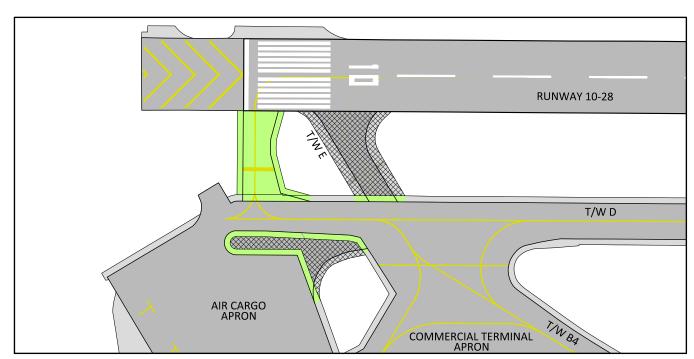
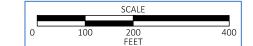


Figure 5-11: Taxiway E Alternative 3











Taxiway Improvement Alternatives Evaluation

Table 5-2: Parallel Taxiway Improvements Alternatives Evaluation

Alternatives	TW B Southerly Extension	No Build	Partial Parallel TW	No Build
Facility Requirements	3	1	2	1
Environmental Impact	2	3	2	3
FAA Standards	3	1	2	1
Development Costs	2	3	1	3
Development Flexibility	3	1	3	1
Total	13	1	10	9

Source: McFarland Johnson, 2017.

Table 5-3: Taxiway Alpha and Echo Alternatives Evaluation

Alternatives	TW A Alt 1	TW A Alt 2	TW A Alt 3	No Build	TW E Alt 1	TW E Alt 2	TW E Alt 3	No Build
Facility Requirements	3	3	3	1	3	3	3	1
Environmental Impact	2	2	2	3	2	2	2	3
FAA Standards	3	3	3	1	3	3	3	1
Development Costs	2	2	2	3	2	3	2	3
Development Flexibility	2	2	3	3	3	3	3	3
Total	12	12	13	11	13	14	13	11

Source: McFarland Johnson, 2017.

5.1.5. Runway Protection Zone Control

Runway protection zone (RPZ) land use compatibility is a significant concern for airport sponsors and the FAA, and is often complicated by ownership and right-of-way considerations. Airport ownership of RPZ land is emphasized to achieve the desired positive control of development within the RPZ and ultimately the protection of people and property on the ground. As identified in Section 4.2.2, the Airport does not currently own or control the activity within the entire limits of any of the four RPZs associated with its runway system. Further, several incompatible land uses currently exist within RPZ areas. Two alternative options exist which would allow for more positive control by the Airport over the uses of land within the RPZs. These include; fee simple acquisition of properties within the limits of the RPZs, and development of an avigation easement focused on land use and airspace height and hazard concerns for lands within the limits of the RPZs. Each of these options are expressed in Figure 5-12 and Figure 5-13. Table 5-4 provides the evaluation of these options which shows both fee simple acquisition of all RPZ land and a combination approach to managing RPZ land score equally higher than the no build alternative. Based on the existing utilization of properties within the RPZ, the combination of these alternatives was identified to be the most appropriate for AVP and only as properties become available for sale or first right of refusal.

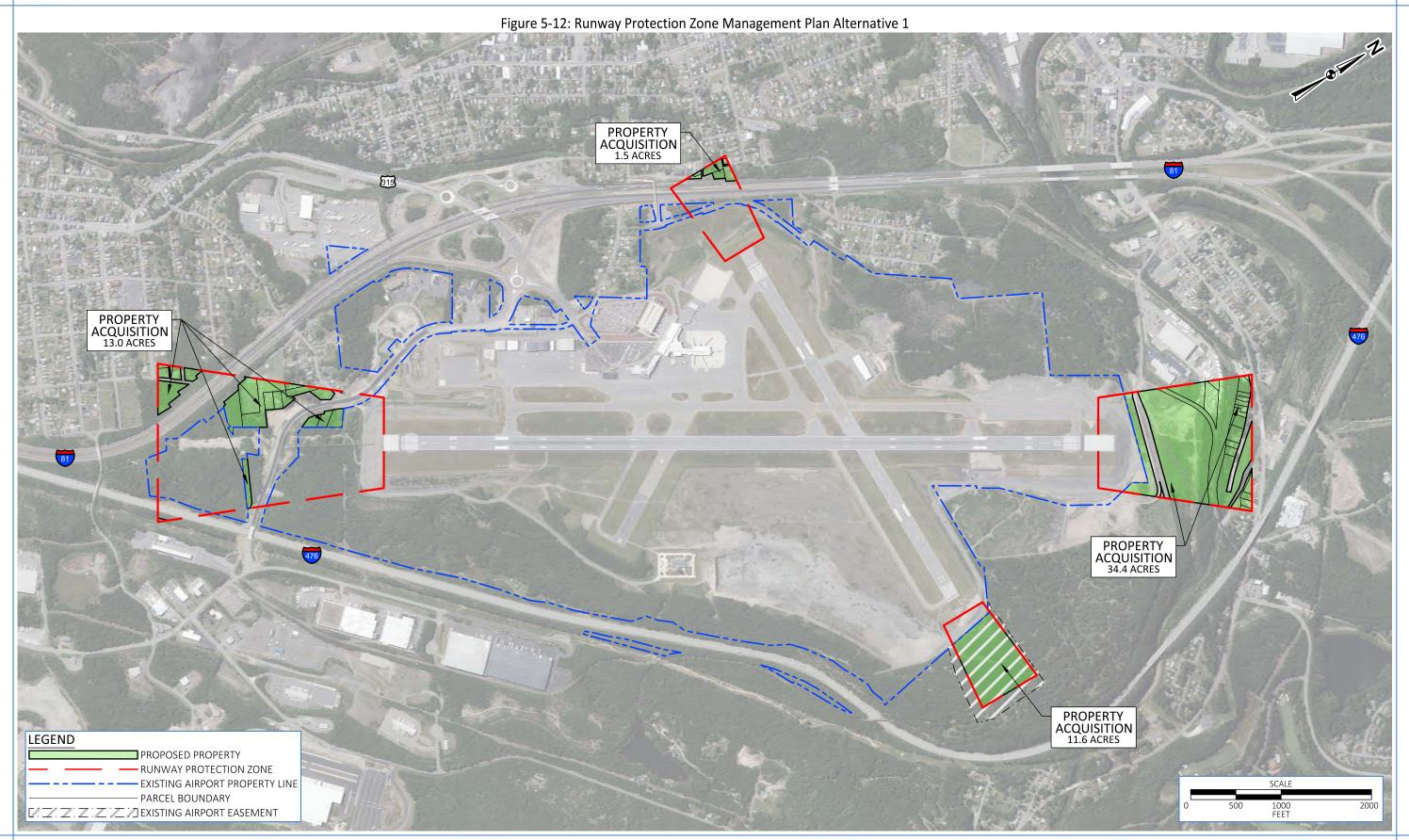








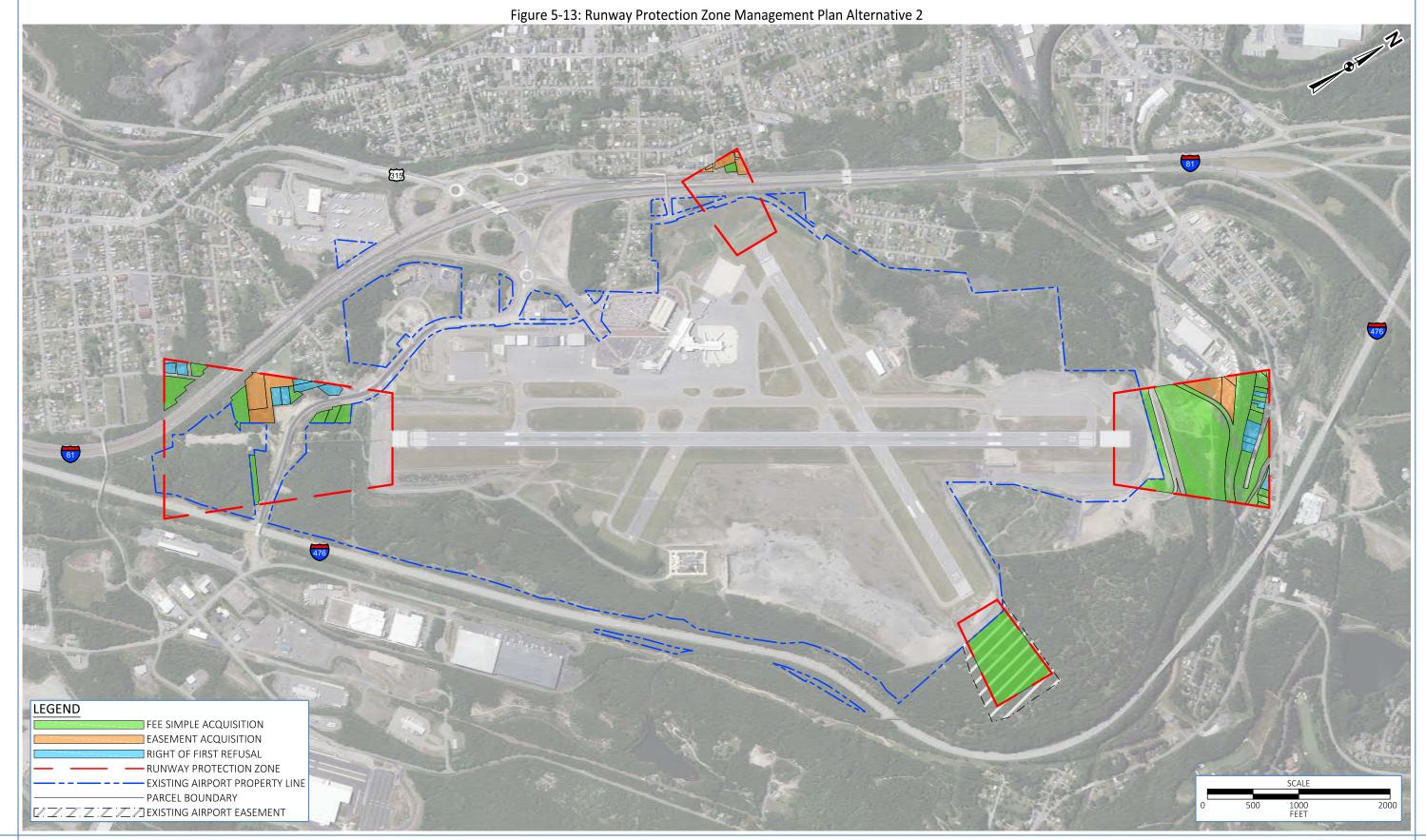


















Runway Protection Zone Control Alternatives Evaluation

Table 5-4: Runway Protection Zone Control Alternatives Evaluation

Alternatives	RPZ Acquisition	RPZ Combination Acquisition / Easements / First-Right-of Refusal	No Build
Facility Requirements	3	3	1
Environmental Impact	3	3	2
FAA Standards	3	2	1
Development Costs	2	3	3
Development Flexibility	3	3	1
Total	14	14	8

Source: McFarland Johnson, 2017.

5.1.6. Precision Approach Path Indicator Installation

As expressed in Section 4.2.4, 4-box Precision Approach Path Indicators (PAPI) could be installed on Runway 22, Runway 10 and Runway 28 to better standardize airfield equipment and provide improved visual glide slope reference to pilots on approach. **Table 5-5** provides the evaluation indicating PAPI systems should be pursued for Runway 22 and Runway 10 but not Runway 28. This is primarily due to terrain obstructions within the Runway 28 approach and the inability to meet a standard 3.00° glide slope to that runway end.

Precision Approach Path Indicator Alternatives Evaluation

Table 5-5: Precision Approach Path Indicator Alternatives Evaluation

Alternatives	PAPI on RW 22	No Build	PAPI on RW 10	No Build	PAPI on RW 28	No Build
Facility Requirements	3	2	3	2	3	2
Environmental Impact	3	3	3	3	3	3
FAA Standards	3	2	3	2	1	2
Development Costs	2	3	2	3	2	3
Development Flexibility	3	3	3	3	3	3
Total	14	13	14	13	12	13

Source: McFarland Johnson, 2017.

5.2. LANDSIDE ALTERNATIVES

5.2.1. Landside Area Alternative Evaluation Criteria

A set of evaluation criteria was developed to provide consistent assessments of each alternative throughout the review process. The criteria are defined as follows:

• Land Use Compatibility: Is the alternative compatible with on-Airport and off-Airport patterns of land use? This criterion will evaluate such things as access to the airside





Alternatives



movement areas and the local road network, as well as the degree to which the alternative is compatible with activities occurring in surrounding on and off-Airport lands.

- **Environmental Impact:** What are the potential environmental impacts associated with implementation of the alternative? To what extent does the alternative further achievements of the Airport's environmental goals?
- Potential for Expansion: Does this alternative have the ability to accommodate future unanticipated expansion? This criterion recognizes the fact that site decisions made today will influence future Airport development for many years to come. Planning shall consider future development needs beyond the Facility Requirements of the current planning period.
- Operational Efficiency: Will the alternative contribute to the development of a smoothly functioning airport with efficient movement of aircraft? This criterion will consider whether the alternative makes the best and most efficient use of airport facilities and infrastructure.
- Revenue Generation Capability: Does the alternative afford opportunities for Airport Management to increase revenue generation from within the terminal area and terminal concourse as a means to improve financial sustainability

Each of the evaluation factors above was given a scoring value as follows:

Land Use Compatibility:

Environmental Impact:

Potential for Expansion: Operational Efficiency:

Revenue Generation:

0 = Poor performance

3 = Excellent performance

Alternatives were compared using both a qualitative and quantitative assessment and given a value based on the alternative's ability to meet the requirements of the evaluation factor. Selection of a recommended alternative is based on the alternative meeting demand needs, enhancing operations and safety, minimizing environmental and community effects, and providing future flexibility. While the assessment is created based on available information and design criteria, it should be noted that the completion of required environmental documentation, as well as preliminary and final design documents, could require modifications to the alternatives as depicted and result in additional impacts beyond those considered and contemplated as part of this Master Plan Update.

5.2.2. Summary of Airport Facility Requirements

The preceding chapter identified and quantified the facility improvements required to adequately facilitate future demand through 2035. The following is a summary of the key terminal area facility requirements presented in Chapter 4, Facility Requirements.

<u>Terminal Area Requirements:</u>

- Provide space for an additional 120 square feet of security queuing area
- Expand baggage claim belts by 70 linear feet to improve and expedite baggage pickup.
- Provide an expanded federal inspection services area (additional 200 square feet)





- Relocate restaurant post security
- Add an additional 675 garage parking positions, 500 surface lot parking positions, and 50 rental car parking positions.

General Aviation Requirements:

- 16,120 square feet of additional aircraft storage hangar capacity
- 1,356 square feet of additional GA terminal space
- 41 additional GA parking spaces

Support Facility Requirements:

- Provide space for an expanded airfield maintenance facility
- Provide an additional 40,000 gallon capacity for Jet-A fuel

5.2.3. Terminal Area Alternatives

In this section, various options to meet the terminal area requirements outlined in the preceding chapter, Chapter 4, Facility Requirements, were developed and evaluated. As such, terminal area alternatives include potential improvements to the terminal building, terminal access roadway system and terminal parking lots/structures. Several alternatives were developed and are presented in the following sections. Terminal Area Alternatives are presented in Figure 5-14 through Figure 5-19.

Terminal Area Alternative Identification

The following alternatives for terminal area development have been prepared to address the identified terminal facility requirements at AVP. Improvements to the interior of the terminal building are not evaluated here as these facility improvements are more related to space allocation as opposed to space availability. However, with the demolition of the old terminal building and the need to expand parking availability at the airport, a variety of options can be explored related to the ingress/egress of vehicles to the terminal area and its parking availability.

Terminal Area Alternative 1 (No-Build)

The existing commercial terminal building, parking facilities and access infrastructure would remain unchanged. The existing terminal area facilities would be maintained through the planning period and service demand as best able given existing spatial limitations and external constraints.

Terminal Area Alternative 2

In terminal area alternative 2 the existing commercial terminal building footprint would remain unchanged, but significant improvements would be planned and implemented in the terminal parking garage and surface parking lots. Additionally, access improvements and a slightly expanded terminal curb are also provided in this alternative. Within the terminal building some spatial reallocations would take place in alternative 2, including the expansion of security screening queuing area.





Terminal Area Alternative 3

In terminal area alternative 3 the terminal footprint would expand slightly to provide additional circulation and holdroom space. Similar to Alternative 2, significant expansions to the terminal parking garage and surface parking lots are provided in this alternative, as is an expanded curb front. This alternative would also realign portions of the terminal loop road to expand parking lot availability. This roadway improvement would require an acquisition of 2.19 acres of residential land.

Terminal Area Alternative 4

Terminal area alternative 4 seeks to realign a portion of the ingress route on the terminal loop road to provide an expanded terminal curb front and allow for the construction of a sub-grade garage, similar to the existing terminal garage and one that shares the same vertical circulation access to the tunnel connected to the terminal building. This alternative would seek to preserve some of the existing surface lot at terminal grade and provide access to pedestrians from that lot to the terminal access tunnel via the garage structure.

Terminal Area Alternative 5

Similar to alternative 4, this alternative explores a new sub-grade garage connected to the existing tunnel access. In this alternative, no roadway realignment is proposed and no existing surface lots would be maintained at terminal grade. In this alternative the garage would be designed to utilize all available land within the existing roadways and maximize parking availability within the vertical limits of the existing garage.

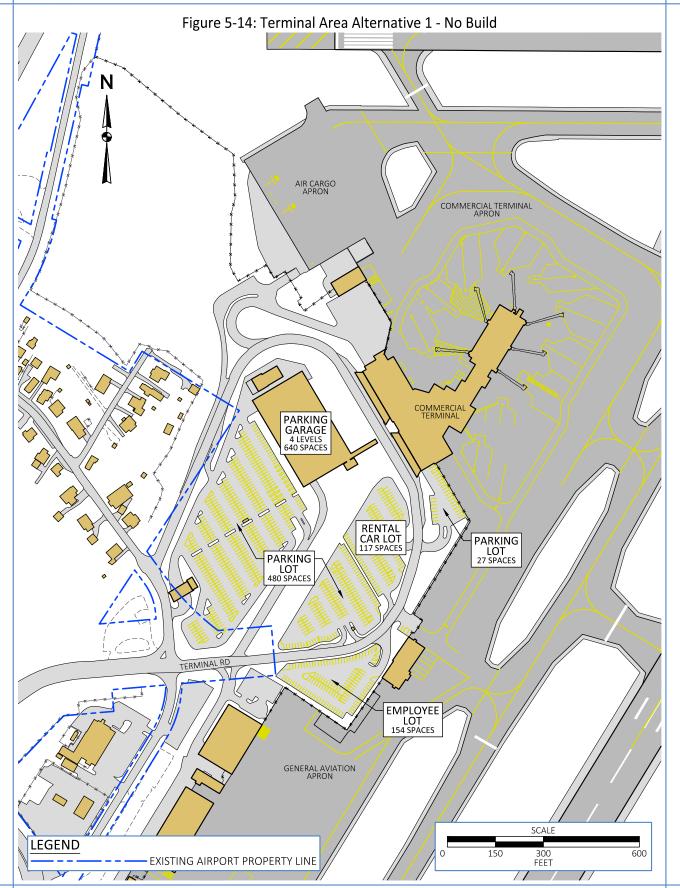
Terminal Area Alternative 6

Alternative 6 seeks to blend concepts from Alternative 4 and Alternative 5. This alternative includes a new sub-grade garage that is also connected to the existing tunnel access and which occupies all space within the roadways after a realignment to the terminal loop road. Also similar to Alternatives 4 and 5, in this alternative parking availability would be maximized within the vertical limits of the existing garage so as to maintain the existing visual aesthetic when approaching the terminal by car.









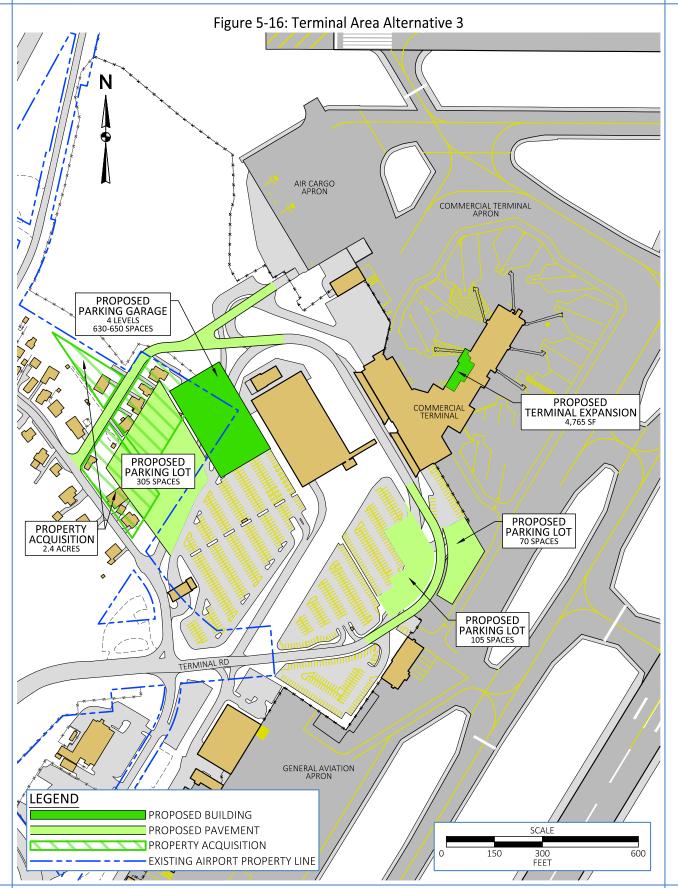




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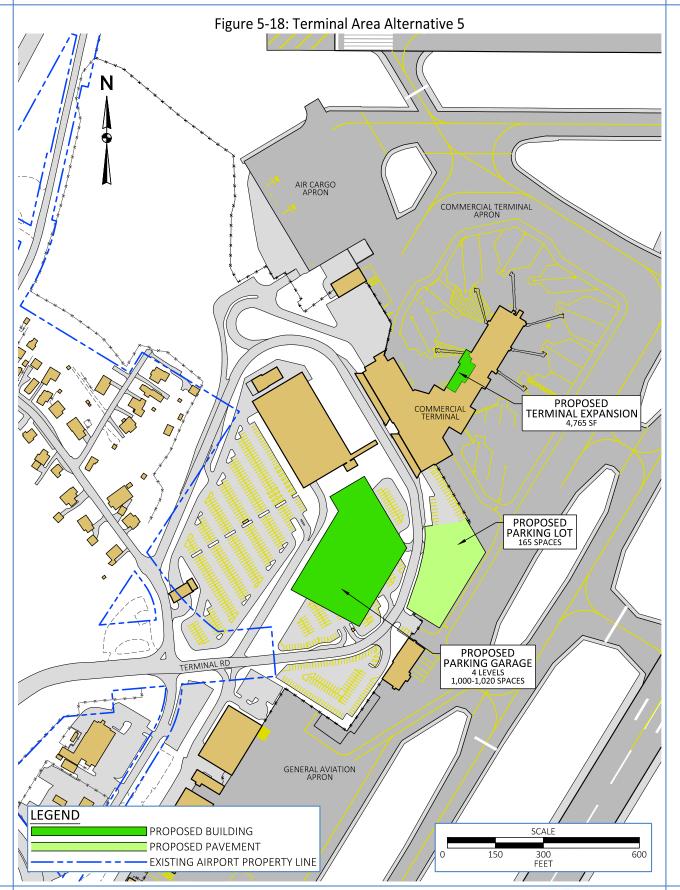
















5-34





Terminal Alternatives Evaluation

Table 5-6: Terminal Area Alternatives Evaluation

Alternatives	Terminal Area Alternative 1 – No Build	Terminal Area Alternative 2	Terminal Area Alternative 3	Terminal Area Alternative 4	Terminal Area Alternative 5	Terminal Area Alternative 6
Land Use Compatibility	3	3	3	3	3	3
Environmental Impact	3	3	2	3	3	3
Potential for Expansion	1	2	1	3	2	3
Operational Efficiency	1	3	3	3	3	3
Revenue Generation	1	2	2	2	2	3
Total	9	13	11	14	13	15

Source: McFarland Johnson, 2017.

5.2.4. General Aviation Alternatives

This section examines the future placement of, and relationship between, existing and future landside general aviation (GA) facilities at the Airport. The GA alternatives will be compatible with the preferred airside alternative identified in Section 5.1. AVP has several areas available for landside development. In planning for landside facilities, an important consideration is the relationship between the activity centers of an Airport. An activity center is an area in which a certain type of activity occurs, such as aircraft fueling or equipment maintenance. As an airport grows and activity increases, the smooth functioning of these activity centers and the relationships between them become increasingly important.

GA Hangar Development

Over 16,000 square feet of additional hangar space was identified as a need for AVP. Currently a 9,200-square-foot hangar is being developed by the Pennsylvania State Police on the south side of the South GA Apron. One additional high-tail hangar is being developed on the north side of the South GA Apron, leaving only one smaller airside accessible parcel for development on the west side of the Airport. In the future, land east of Runway 4-22 is likely to be required for GA expansion and is the next logical location for future GA facility development.

Figure 5-20 and **Figure 5-21** present the GA hangar development alternatives. **Table 5-7** details the evaluation.



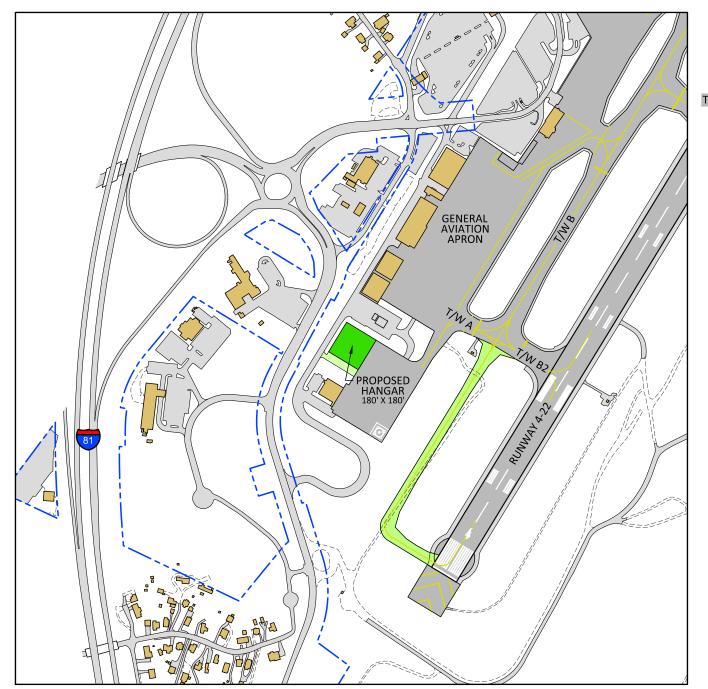








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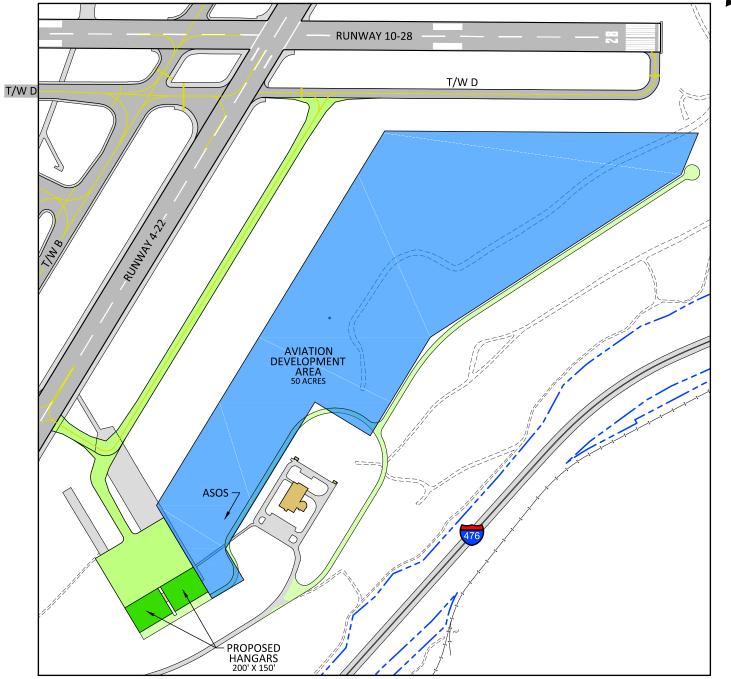
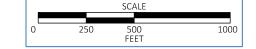


Figure 5-20: GA Hangar Development Alternative 1

Figure 5-21: GA Hangar Development Alternative 2









GA Terminal Area Facilities

The majority of identified facility requirements needed to support GA activities at AVP are related to the GA terminal building. Specifically, an expansion of 1,356 square feet is proposed to the GA facility itself. The accompanying parking lots are recommended to expand by at least 41 vehicle positions.

Figure 5-22 and Figure 5-23 present the GA terminal area alternatives. Table 5-7 details the evaluation.

GA Terminal Area Alternatives Evaluation

Table 5-7: GA Terminal Area Alternatives Evaluation

Alternatives	GA Term - No Build	GA Term Area Alternative 1	GA Terminal Area Alternative 2	GA Hangar - No Build	GA Hangar Development Alternative 1	GA Hangar Development Alternative 2
Land Use Compatibility	3	3	3	3	3	3
Environmental Impact	3	3	3	3	3	2
Potential for Expansion	0	1	1	1	2	3
Operational Efficiency	1	2	1	1	3	3
Revenue Generation	1	2	2	1	3	3
Total	8	11	10	9	13	14

Source: McFarland Johnson, 2017.







