

Orlando Sanford International Airport Master Plan Update

Chapter 5 - Development Alternatives

August 2021



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This document has 61 pages including the cover.

Document history

Document title: Chapter 5 - Development Alternatives

Document reference: 100063290

Revision	Purpose description	Originated	Checked	Reviewed	Authorized	Date
Rev 1.0	Chapter 5	CH	JH	AM	GF	

Client signoff

Client	Sanford Airport Authority
Project	Orlando Sanford International Airport Master Plan Update
Job number	100063290
Client signature/date	

Contents

Chapter Page

Development Alternatives	5
5. Development Alternatives	6
5.1. Airfield Enhancement	7
5.2. Airside and Landside Facility Enhancement	7
5.3. Airport Development Alternatives and Concepts	7
5.4. Airport Development Alternative Financial Cost	50
5.5. Alternatives Evaluation Criteria	51
5.6. Alternatives Evaluation Summary	52
5.7. Preferred Development Alternative	54

Tables

Table 5-1 - Evaluation Criteria for Preferred Development Alternative	6
Table 5-2 - Runway Modifications Summary	15
Table 5-3 - Existing & Proposed Runway 9R-27L Declared Distances	16
Table 5-4 - FAA's Parallel Runway Design Separation Requirements	17
Table 5-5 - Taxiway Modifications Summary	23
Table 5-6 - Apron Modifications Summary	27
Table 5-7 - Development Alternative 1: Gate Alternatives Summary	29
Table 5-8 - Development Alternative 2: Gate Alternatives Summary	30
Table 5-9 - Development Alternative 3: Gate Alternatives Summary	30
Table 5-10 - General Aviation Modifications Summary	37
Table 5-11 - Support Facility Modifications Summary	44
Table 5-12 - Ancillary Modifications Summary	46
Table 5-13 - Preferred Runway Modifications Summary	54
Table 5-14 - Preferred Taxiway Modifications Summary	57
Table 5-15 - Proposed Apron Modifications Summary	57
Table 5-16 – Preferred Commercial Terminal Gate Modifications	58
Table 5-17 - Preferred General Aviation Modifications Summary	59
Table 5-18 - Preferred Support Facility Modifications Summary	60
Table 5-19 - Preferred Ancillary Modifications Summary	60

Figures

Figure 5-1 - Development Alternative 1	9
Figure 5-2 - Development Alternative 2	10
Figure 5-3 - Development Alternative 3	11
Figure 5-4 - Landside Development Alternative 1	12
Figure 5-5 - Landside Development Alternative 2	13
Figure 5-6 - Landside Development Alternative 3	14
Figure 5-7 - Runway 9R/27L Development Alternative 1a – Declared Distances	16
Figure 5-8 - Runway 9R/27L Development Alternative 1b – Declared Distances	18
Figure 5-9 - Runway 9R/27L Development Alternative 2 – Declared Distances	19
Figure 5-10 - All Terminal Services Alternatives - Provide Second Floor Expansion	31
Figure 5-11 - International Arrivals Swap Alternative	32
Figure 5-12 - Terminal Services Development Alternatives Summary	32
Figure 5-13 - Terminal Services Development Alternative 1: First Floor	34
Figure 5-14 - Terminal Services Development Alternative 1: Second Floor	34
Figure 5-15 - Terminal Services Development Alternative 2: First Floor	35
Figure 5-16 - Terminal Services Development Alternative 2: Second Floor	35
Figure 5-17 - Terminal Services Development Alternative 3: First Floor	36
Figure 5-18 - Terminal Services Development Alternative 3: Second Floor	36
Figure 5-19 - Landside Facility Walkability Measurement	40
Figure 5-20 - Landside Development Alternative 1	41
Figure 5-21 - Landside Development Alternative 2	42
Figure 5-22 - Landside Development Alternative 3	43
Figure 5-23 - Alternatives Evaluation Summary	53
Figure 5-24 - Preferred Development Alternative	55
Figure 5-25 - Preferred Landside Development Alternative	56
Figure 5-26 - Preferred Terminal Services Modifications - First Floor	58
Figure 5-27 - Preferred Terminal Services Modifications - Second Floor	59

Development Alternatives

5. Development Alternatives

The primary objective of the Development Alternatives chapter is to outline a logical development alternative for the Orlando Sanford International Airport which meets the aviation needs throughout the planning period as well as satisfying the established development goals previously identified in Chapter 1, *Introduction*, Section 1.2, *Goals and Visioning*. Airport development alternatives were established based on the information presented in the previous chapters of this Airport Master Plan (AMP) in conjunction with reasonable foresight into industry trends.

This chapter will present the development alternatives that were produced for evaluation. A preferred development alternative will be created following the evaluation of the three preliminary development alternatives. The alternatives and preferred development alternatives are based on the general criteria outlined in **Table 5-1**.

Table 5-1 - Evaluation Criteria for Preferred Development Alternative

Criteria	Description
Operational Performance	Any selected development alternative should be capable of meeting the airport's facility needs as have been identified for the planning period. An airport's preferred alternative should achieve its operational performance with regards to safety, capacity, and efficiency.
Best Planning Tenets and Other Factors	The preferred development alternative should be feasible and justified based on a technical analysis of the airport's needs. Development should not exceed the identified demand; however, areas should be identified in which future development is feasible to ensure flexibility as demands change. These additional development areas will provide future growth beyond the planning period that can be integrated into the airport's overall strategic plan without impacting the potential for future airport design standard changes, to the best extent possible.
Environmental Factors	Airport growth and expansion has the potential to impact the surrounding environment. The preferred development alternative should seek to minimize environmental impacts in the areas within and outside the airport's boundaries, to the best extent possible. The preferred development alternative should also recognize sensitive environmental features that it may impact to ensure compliance with all applicable local and federal laws.
Fiscal Factors	Identification of cost efficient and effective development is paramount during the planning process. Costs should be considered during the alternatives analysis process to meet the identified demand in a reasonable and responsible financial matter. Development alternatives should consider the advantages and disadvantages of any option with respect to construction costs and future maintenance.
Sustainability	The four pillars of sustainability (human, social, economic, and environmental) should be referenced throughout all planning processes to ensure future airport development is completed in a method that promotes economic viability, operational efficiency, natural resource conservation, and social responsibility. Opportunities for integration of sustainable climate resilient development is crucial to minimizing the airport's impact on the environment and surrounding community, as well as ensuring the airport's long-term use.

Source: Atkins

5.1. Airfield Enhancement

Airfield facilities are, by nature, the focal point of an airport. Because of their role, and the fact that the majority of airport property is allocated to such infrastructure, airfield facility needs are often the most critical factor in the determination of viable airport development alternatives. The runway system requires the greatest commitment of land area and often has the greatest impact on development of other airport facilities both airside and landside.

The potential for physical expansion of an airport to accommodate airfield development is the primary factor that determines an airport's future capabilities. The runway and taxiway systems directly affect the efficiency of aircraft movements both on the ground and in the surrounding terminal and regional airspace. These systems also dictate the types of aircraft that can be accommodated, which can directly affect the types of air service an airport can accommodate. In addition, the efficiency of aircraft movements is affected by local approach and departure procedures, which can be influenced by local restrictions due to noise, airspace congestion, natural and man-made obstructions, or other operational congestions. Necessary airfield modifications are directly correlated with forecasted aviation operations and fleet mix. These necessary modifications have been analyzed with the Demand Capacity and Facility Requirements chapter of this AMP. The Airport's existing capacity was found to be in excess of 60 percent threshold of the Airport's Annual Service Volume (ASV) at which planning for capacity improvements should commence. Necessary capacity enhancing modifications will be presented to ensure the mitigation of future operational delays. The following sections further analyze how the necessary modifications have been implemented in various alternatives, and ultimately, the preferred alternative.

5.2. Airside and Landside Facility Enhancement

Airside and landside facilities form a critical backbone to an airport's safe, efficient, and effective operations. While airside infrastructure typically drives the location and availability of developable land, landside facilities form the crucial interface between an airport and its surrounding community that it serves. Ensuring that landside facilities compliment airside infrastructure without interfering with planned future development is paramount, as it has the potential to limit an airport's future expansion opportunities if necessary.

Airside development incorporates those items required by capacity constraints identified in the Demand Capacity and Facility Requirements, as well as those items necessary to meet the current and future design standards as outlined by the FAA.

5.3. Airport Development Alternatives and Concepts

Airport development alternatives for airside and landside facility modifications were produced for evaluation. The following sections provide details on the three preliminary airport development alternatives. **Figure 5-1**, **Figure 5-2**, and **Figure 5-3** graphically depict the three preliminary airport development alternatives, including airfield and airside development. **Figure 5-4**, **Figure 5-5**, and **Figure 5-6** graphically depict the three preliminary airport landside development alternatives.



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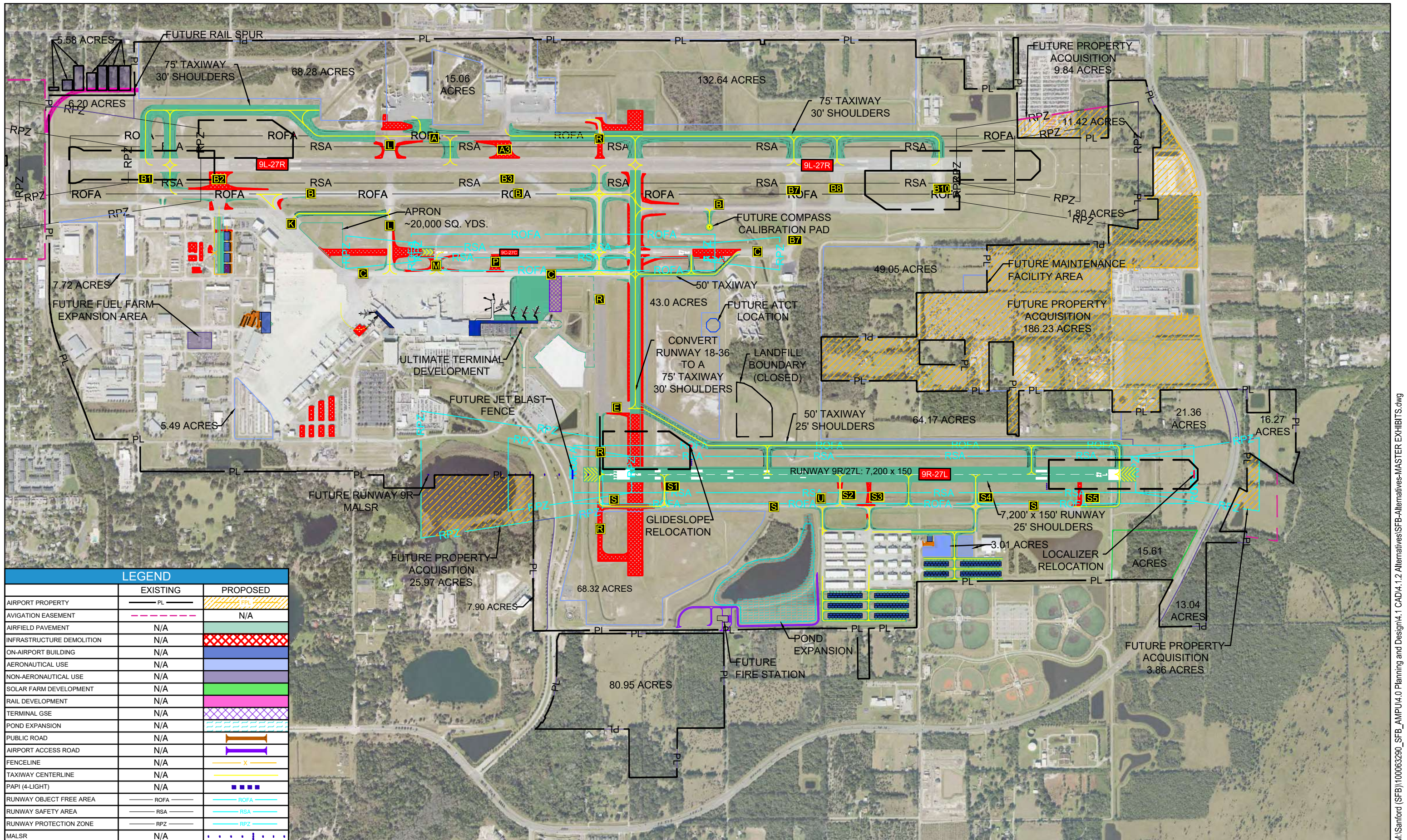


FIGURE 5-1: DEVELOPMENT ALTERNATIVE 1



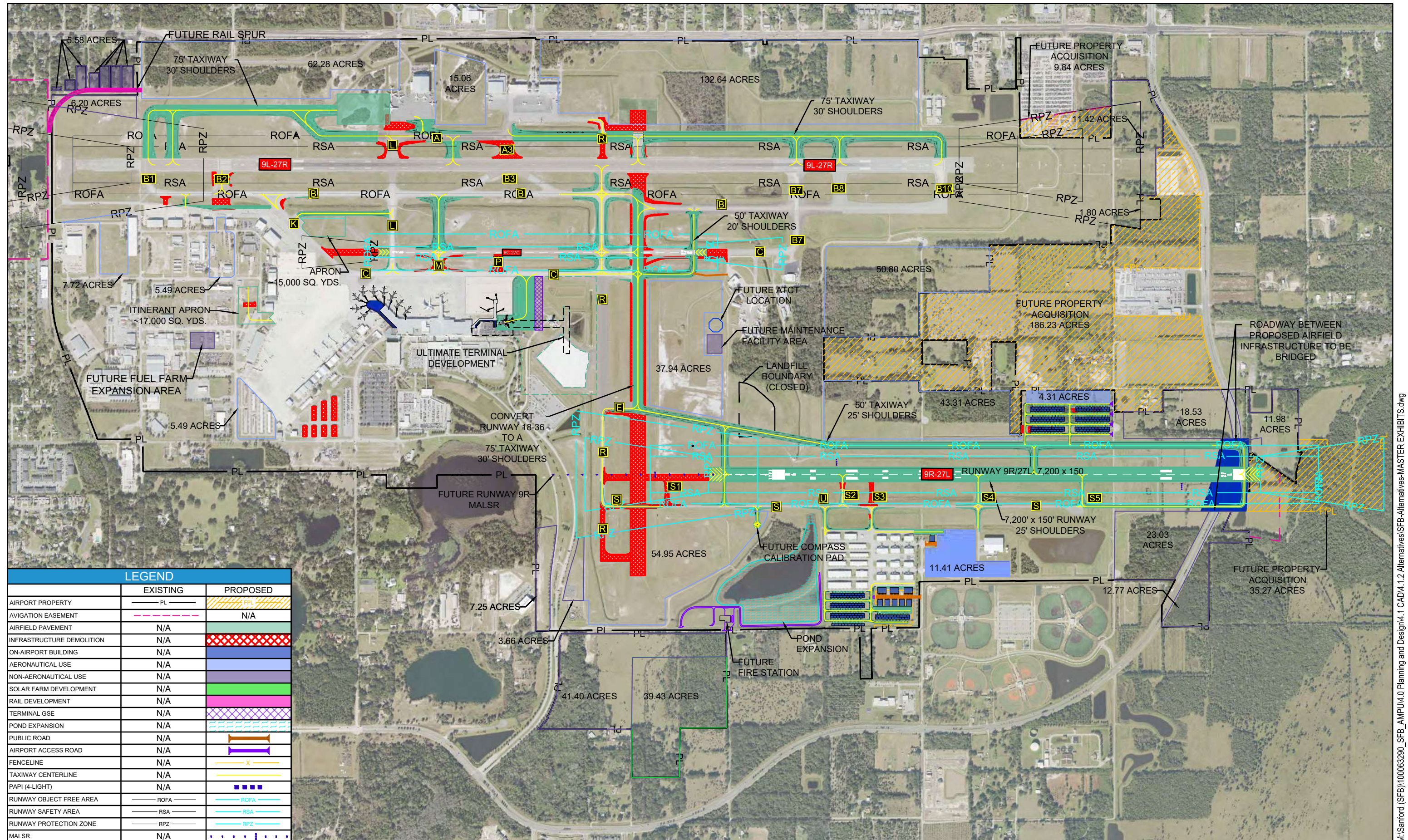


FIGURE 5-2: DEVELOPMENT ALTERNATIVE 2



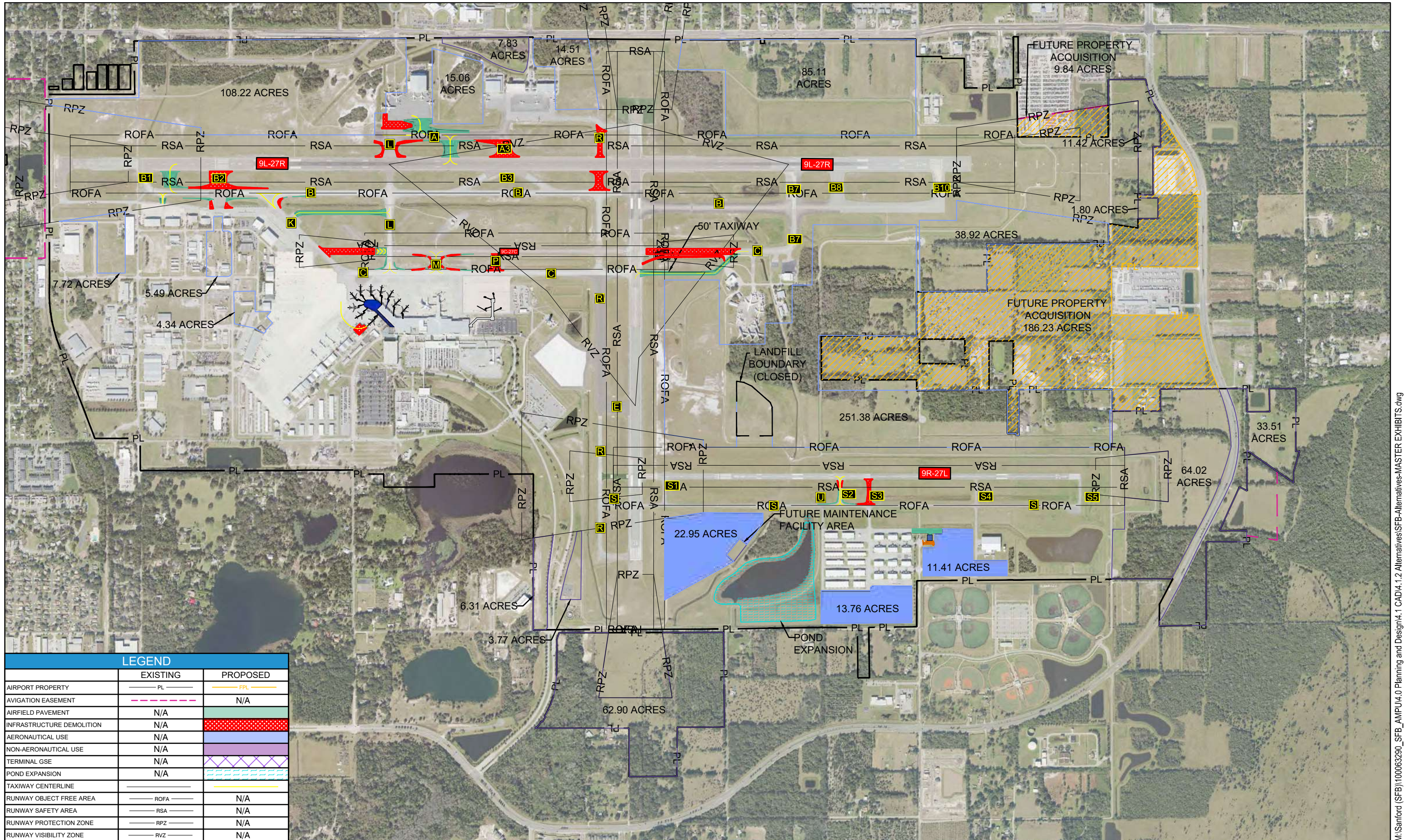


FIGURE 5-3: DEVELOPMENT ALTERNATIVE 3



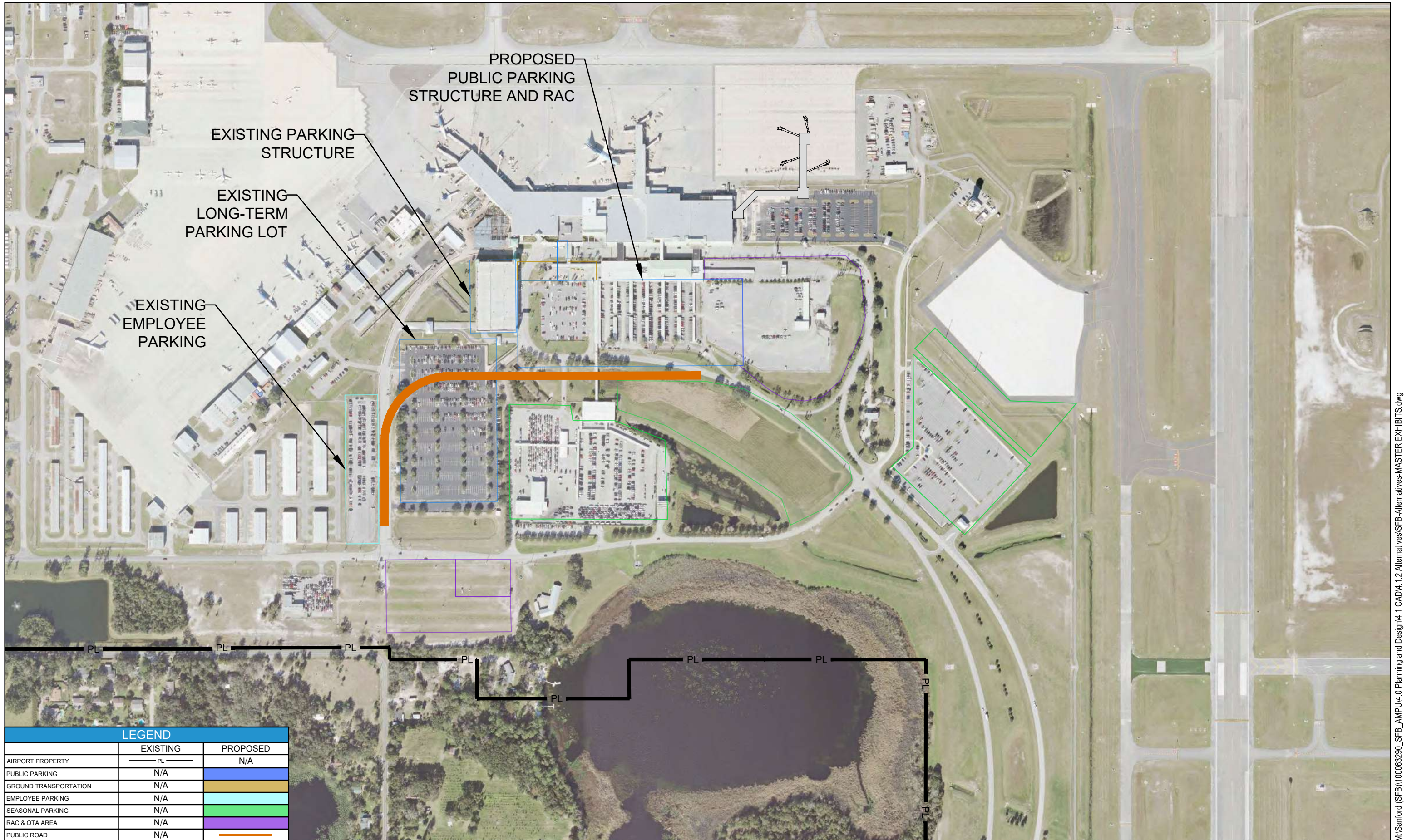


FIGURE 5-4: DEVELOPMENT ALTERNATIVE 1 - LANDSIDE ROADWAY AND PARKING

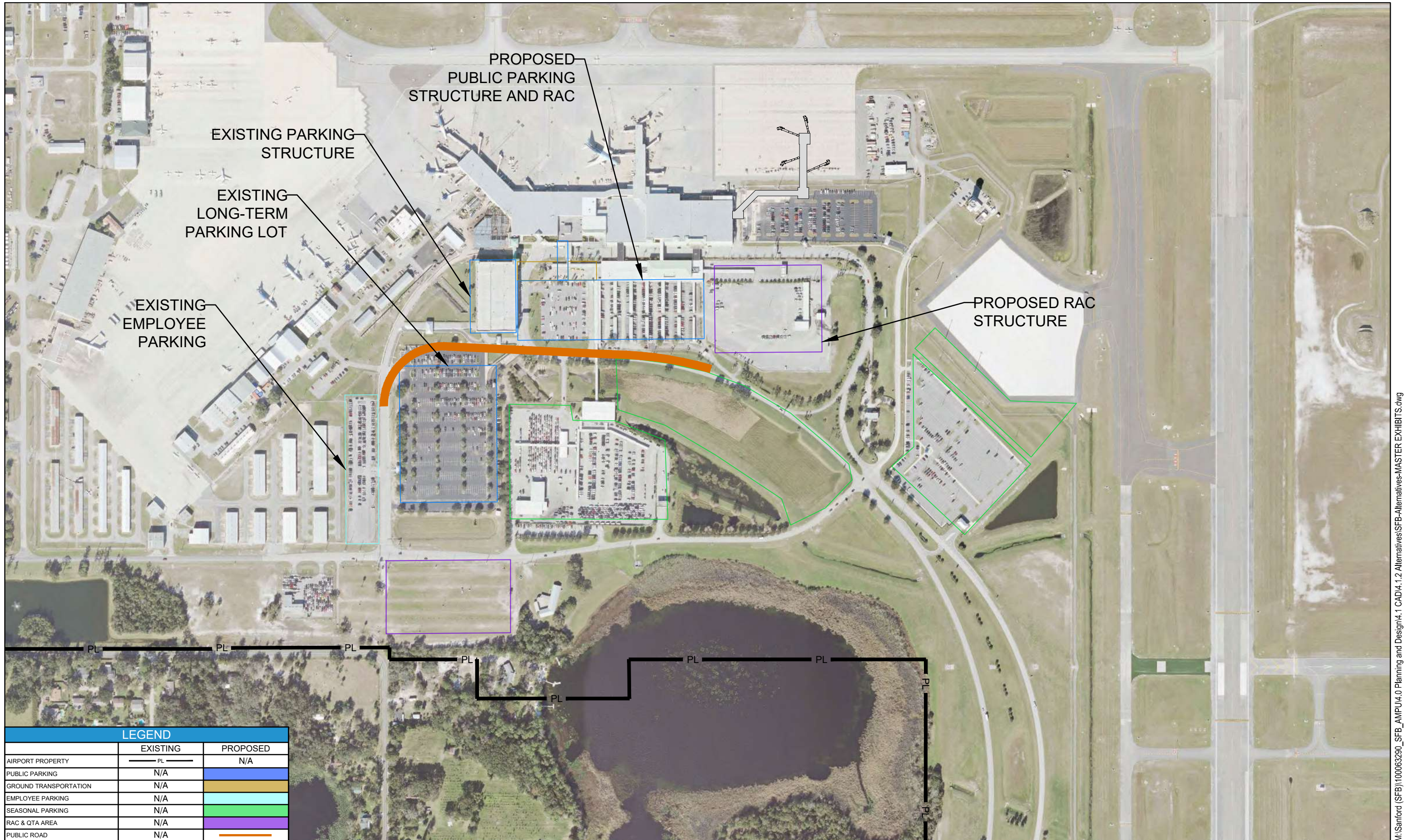


FIGURE 5-5: DEVELOPMENT ALTERNATIVE 2 - LANDSIDE ROADWAY AND PARKING

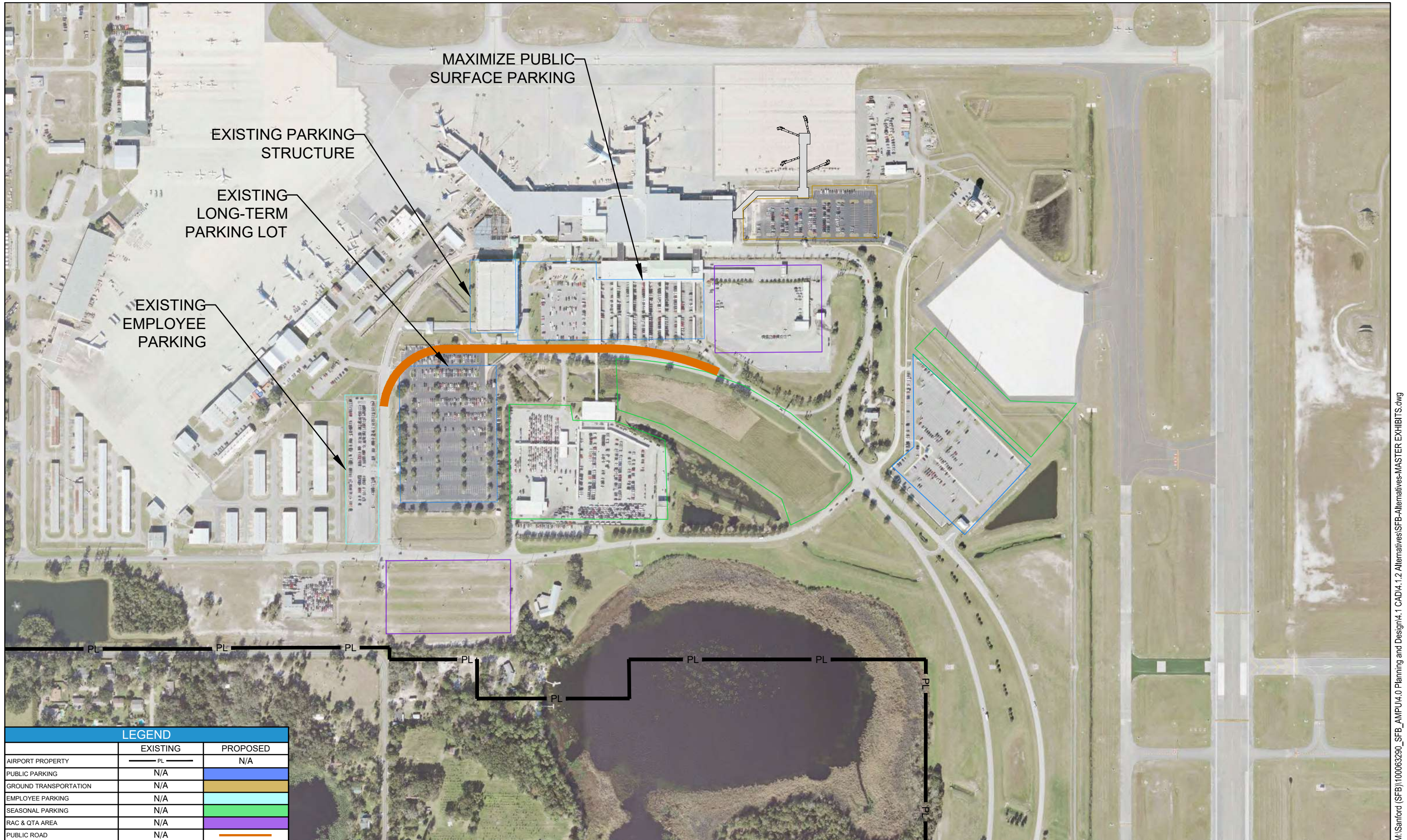


FIGURE 5-6: DEVELOPMENT ALTERNATIVE 3 - LANDSIDE ROADWAY AND PARKING

5.3.1. Runway Modifications

The following sections will discuss recommended runway modifications to both mitigate identified safety hazards, enhance capacity and accommodate growth at the Airport. **Table 5-2** summarizes the proposed runway modifications for each runway for each development alternative.

Table 5-2 - Runway Modifications Summary

Runway	Development Alternatives 1a & 1b		Development Alternative 2	Development Alternative 3
Runway 9R/27L	1a. Split extension for total length of 8,361 feet and Declared Distances	1b. Split extension for total length of 7,200 feet	Eastward runway shift and extension for a total length of 7,200 feet	No Action
Runway 18/36	Conversion to TDG 5, ADG V taxiway, partial removal		Conversion to TDG 5, ADG V taxiway, partial removal	No Action
Runway 9C/27C	Eastward runway shift of 643 feet (both runway ends)		Runway 27C end eastward relocation of 643 feet	No Action
Runway 9L/27R	No action		No Action	No Action

Source: Atkins Analysis

Runway 9R/27L

The Demand Capacity and Facility Requirements analysis established the future critical aircraft for Runway 9R/27L will be upgraded from the existing King Air 200 (AAC B, ADG II) to the Airbus A320 family (AAC C, ADG III). This upgrade of future critical aircraft is primarily due to a forecasted increase in demand for commercial service operations and their induced capacity constraints should the Airport not provide a way for simultaneous commercial service operations to occur. Runway 18/36 is currently the Airport's secondary commercial service runway. However, due to several reasons such as prevailing winds and air traffic conflicts, it serves less than two percent of the Airport's total operations and could never be used simultaneously with the Airport's other runways. Therefore, enhancing Runway 9R/27L to ensure that two parallel runways at the Airport can meet the needs of forecast demands is vital. As such, it is recommended that Runway 9R/27L is extended to a total length of 7,200 feet and widened to a total width of 150 feet with additional 25-foot shoulders on each side of the runway. The existing runway location is constrained primarily within the landside roads of Red Cleveland Boulevard to the west and East Lake Mary Boulevard to the east, these constraints do provide challenges to future runway development.

Development Alternative 1a – Runway Extension to 8,361' and Declared Distances

Development Alternative 1a has been proposed to explore the feasibility of achieving Runway Protection Zones (RPZs) clear of roads or parking lots, which prior to the Fall of 2012 were accepted by the FAA as compatible land uses within an RPZ. The FAA issued their *'Interim Guidance on Land Uses Within a Runway Protection Zone'* Memorandum (RPZ Memo) in the Fall of 2012. This guidance states that the desirable condition is to clear the entire RPZ area of all above ground objects, and any project which introduces transportation facilities such as public roads, highways, and vehicular parking facilities into the RPZ requires coordination with the FAA in order to execute that project.

The intent of the RPZ Memo was to establish policy that addresses new or modified land uses to an RPZ or proposed changes to the size or location of an RPZ. Therefore, elements such as public roads or parking lots which were permissible by FAA standards prior to the RPZ Memo guidelines are considered as temporarily permissible due to the existing condition, or 'grandfathered' situations. Proposed changes to an RPZ resulting from shifts to a runway threshold or upgrades to approach procedure minima for example may allow for undesired elements such as public roads to enter or remain in an RPZ but require further FAA evaluation to ensure that there are no other viable alternatives to avoid introducing the compatible land use. Hence the exploration of this first alternative which is to clear public roads, Red Cleveland, and Lake Mary Boulevards, as well as parking lots from Runway 9R/27L's approach and departure RPZs by applying declared distances.

Figure 5-7 depicts this declared distances alternative which entails extending the runway 1,716 feet to the east, widening it to 150 feet, and recapturing its original western end, in line with Taxiway Romeo. This alternative also includes displaced thresholds of 2,363 feet and 1,837 feet to the approach ends of Runway 9R and 27L, respectively. Those adjustments would result in an 8,361 feet long by 150 feet wide runway.

Figure 5-7 - Runway 9R/27L Development Alternative 1a – Declared Distances



Source: Atkins

The FAA requires declared distances to be published for all runways specified for commercial use, as well as those with certain operational conditions. In order to maintain proper dimensions of proposed runway protective surfaces, such as ROFAs, RSAs, and RPZs, declared distances could be implemented to mitigate issues such as the airport perimeter fence and public roads. **Table 5-3** lists the existing and proposed Runway 9R-27L declared distances for Alternatives 1a and 1b. The required distances needed to provide unrestricted takeoffs and landings by the critical aircraft are 7,200 and 6,520 feet, respectively. Alternative 1a would provide a maximum of 6,800 and 5,863 feet of runway for takeoffs and landings, respectively. As such, Alternative 1a would be deficient by 400 for takeoffs and 657 feet for landings. These deficiencies could require operators to accept load penalties and stage length reductions to utilize Runway 9R/27L.

Table 5-3 - Existing & Proposed Runway 9R-27L Declared Distances

Runway	TORA ¹	TODA ²	ASDA ³	LDA ⁴
Existing 9R	5,839'	5,839'	5,839'	5,000'
Alt 1a 9R	6,525'	6,525'	7,422'	5,059'
Alt 1b 9R	7,200'	7,200'	7,200'	6,937'
Existing 27L	5,839'	5,839'	6,264'	5,839'
Alt 1a 27L	6,800'	6,800'	7,700'	5,863'
Alt 1b 27L	6,537'	6,537'	6,537'	6,537'

Source: Atkins analysis, 2021

Notes:

1. TORA = Takeoff Run Available; the runway length declared available and suitable for the ground run of an aircraft taking off.
2. TODA = Takeoff Distance Available; the TORA plus the length of any remaining runway or clearway beyond the far end of the TORA.
3. ASDA = Accelerate Stop Distance Available; the runway plus stopway length declared available and suitable for the acceleration and deceleration of an aircraft aborting takeoff.
4. LDA = Landing Distance Available; the runway length declared available and suitable for an aircraft to land.

Development Alternative 1b - Split extension for a total length of 7,200 feet

This alternative proposes to relocate the Runway 9R end approximately 808 feet west, and the Runway 27L end approximately 553 feet east to achieve a 1,361-foot runway extension for a total runway length of 7,200 feet. This split extension would allow for no proposed relocation to either landside road. However, due to the precision approach on the Runway 9R end, a displaced threshold of 263 feet is proposed to mitigate approach impacts to existing infrastructure. The runway centerline is proposed to be shifted 40 feet to the north which allows for each landside roadways to be further from the proposed runway ends.

FAA safety and design criteria provide the standards necessary to operate simultaneous landings and/or takeoffs on two or more parallel runways. Parallel runway centerline separation standards vary based on the type of simultaneous operations that are planned to occur. **Table 5-4** provides various required separation standards. As indicated in that table, the FAA recommends 5,000 feet separation between parallel runway centerlines to achieve unfettered simultaneous approaches and/or departures when it is practical to do so. Runways 9R-27L and 9L/27R are currently separated by 4,300 feet, which is the minimum separation that the FAA normally approves to conduct dual simultaneous precision approach operations. However, the FAA will consider proposals utilizing separations down to a minimum of 3,000 feet for dual precision instrument approaches on parallel runways on a case-by-case basis. Such a reduction would require the Airport's ATC to be equipped with a Precision Runway Monitor (PRM) which is comprised of high-update radar, high-resolution ATC displays, and PRM-certified controllers.

Table 5-4 - FAA's Parallel Runway Design Separation Requirements

Simultaneous Operation(s) Type	Governing Flight Rule	Details	FAA Runway Centerline Separation (Ft.) Standard
Dual or Triple Approaches	IFR	Precision Approaches	5,000 ¹
Dual Approaches	IFR	Precision Approaches	4,300 ²
Departures	Non-Radar Controlled		3,500
Departures	Radar Controlled		2,500
Approach/Departure	Radar Controlled	Runway Thresholds are not staggered	2,500
Approach/Departure	Radar Controlled	Runway Thresholds are staggered	1,000 – 2,400 ³
Dual Approaches	VFR	Visual Approaches	1,200 ⁴
Dual Approaches	VFR	Visual Approaches	700 ⁵

Source: FAA AC 150/5300-13A - Change 1, *Airport Design*

Notes:

1. For airports at or below 1,000 feet elevation the FAA Recommends at least 5,000 feet where this is practical.
2. Dual simultaneous precision instrument approaches are normally approved on parallel runway centerline separation of 4,300 feet. On a case-by-case basis, the FAA will consider proposals utilizing separations down to a minimum of 3,000 feet where a 4,300-foot separation is impractical. Such a reduction of separation requires special high radar, monitoring equipment, etc.
3. When the approach is to the 'near end' (meaning approaching aircraft cross the landing runway threshold before passing by the parallel runway's end), the minimum centerline separation can be reduced by 100 feet for every 500 feet of threshold stagger. However, ADG V and VI runways require a separation of at least 1,200 feet.
4. For ADG V – VI aircraft operations. ATC typically treat runways with spacing less than 2,500 feet as single runways when wake turbulence is a factor. ATC practices, such as holding aircraft between the runways, frequently justify greater separation distances.
5. For ADG I – IV aircraft operations.

Proposed declared distances are essential for maintaining FAA compliant Runway Safety Area (RSA) or Runway Object Free Area (ROFA); see **Figure 5-8** and Table 5-3. Unlike Alternative 1a, Red Cleveland Boulevard would remain in Runway 9R/27L's western RPZ surfaces, which is their current disposition and a 'grandfathered' condition by the FAA; depicted in Figure 5-3. However, the western shift removes the Airport's Economy Parking lot

from the 9R approach RPZ, which would be an improvement from the current condition, as approximately a quarter of that lot is currently inside the RPZ.

Figure 5-8 - Runway 9R/27L Development Alternative 1b – Declared Distances



Source: Atkins

To provide jet blast erosion protection beyond each runway end, it is proposed to have a 200-foot by 200-foot blast pad directly beyond each proposed runway end. These blast pads will be paved and are dimensionally standard per the future Runway 9R/27L's design aircraft. Due to the proximity of Red Cleveland Boulevard to the Runway 9R end, it is proposed that a jet blast fence is placed directly beyond the runway's RSA and ROFA. This will ensure that jet blast does not negatively impact vehicles traveling north bound on Red Cleveland Boulevard.

The approach lighting systems (ALS) on both runway ends will be relocated as appropriate with the Runway 9R/27L split extension and centerline shift. The Runway 9R medium approach light system (MALSR) will be shifted as appropriate, with sections of the MALSR requiring installation within Golden lake. These sections of the lighting system can be supported with necessary equipment and infrastructure to be placed within the lake. The Runway 27L PAPI will be shifted east as appropriate to continue to support non-precision approaches to the Runway 27L end.

Property acquisition is along the inner approach corridor for both runway ends to ensure that all shifted RPZ surfaces are kept within airport property. This property acquisition of 25.97 acres primarily consists of Golden lake and the direct lake frontage. The Runway 27L proposed RPZ property acquisition of 3.86 acres consists of unimproved areas adjacent to the existing right of way for E. Lake Mary Blvd.

Development Alternative 2 – Runway extension and eastern shift creating Lake Mary Boulevard Tunnel

To analyze the extension of Runway 9R/27L to accommodate the anticipated future critical aircraft, it has been proposed on Development Alternative 2 to expand and shift the runway eastward. A proposed eastward shift and subsequent extension over Lake Mary Boulevard could provide a total runway length of 7,200 feet. Similar to Development Alternative 1b, it is proposed to shift the runway centerline 40 feet to the north and widen the runway to a total width of 150 feet with additional 25-foot paved shoulders on each side of the runway. It is then proposed to relocate the Runway 9R end approximately 876 feet east, with a 678-foot displaced threshold. This threshold configuration could accommodate the determined critical aircraft landing distance of 6,520 feet when landing on Runway 9R; the only proposed declared distance as depicted in **Figure 5-9**. These adjustments to the Runway 9R end could ensure that both the approach and departure RPZs do not impact Red Cleveland Boulevard.

Relocating the Runway 27L approach end 2,236 feet to the west would require the entire runway to be graded and properly raised to allow for the bridging of the necessary portions of Lake Mary Boulevard that are impacted by the proposed runway extension and associated taxiway extensions. This grading and raising of the runway would be required to be compliant with the FAA's *Airport Design* Advisory Circular 150/5300-13A to align with required runway grading to accommodate a minimum 17-foot roadway clearance. The approximate impacted length of Lake Mary Boulevard is 1,256 feet of roadway, with two pairs of combined lanes (four lanes total) requiring the overhead bridges for the airfield infrastructure. To provide jet blast erosion protection beyond each runway end, it is proposed

to equip each runway end with a 200 by 200-foot blast pad. Those blast pads would be paved and are dimensionally standard per the future Runway 9R/27L's design aircraft. It is proposed to remove the existing runway pavement from the existing Runway 9R end to the proposed Runway 9R blast pad.

Figure 5-9 - Runway 9R/27L Development Alternative 2 – Declared Distances



Source: Atkins

The Runway's approach lighting systems (MALSR, PAPI, etc.) and instrument landing system (ILS) equipment (glideslope and localizer) would need to be relocated as appropriate with this proposed Runway 9R/27L shift and extension. The Runway 9R MALSR will be shifted as appropriate, with all pieces of the ALS system being retained on land.

Necessary property acquisition is proposed beyond the Runway 27L end to accommodate relocated airfield infrastructure and to ensure that the RSA, ROFA and RPZ surfaces are kept within airport property. This property acquisition of approximately 35 acres primarily consists of vacant and unimproved land owned by the St. Johns Water Management District.

Development Alternative 3 – No Action

Development Alternative 3 has been proposed as a no-action alternative, preserving Runway 9R/27L's existing infrastructure. This alternative does not achieve airport goals of operational capability as it is not capable of meeting the Airport's facility needs as have been identified for the planning period. This no-action alternative is presented for the evaluation of the financial costs and potential environmental impacts that could be associated with the proposed enhancement of Runway 9R/27L.

Runway 18/36

Development Alternative 1 - Conversion to TDG 5, ADG V taxiway and partial pavement removal

The existing airport capacity is becoming constrained with increased annual demand. This trend is anticipated to continue throughout the planning period, with forecasted annual demand reaching 85 percent of existing capacity by 2037 as was reported previously in Table 4-14. Additionally, it was previously identified that the existing east-west runways (Runway 9L/27R, Runway 9R/27L, and Runway 9C/27C) have over 95 percent wind coverage for existing and projected operations. This wind coverage percent threshold identifies that the Airport does not require the support of a crosswind runway, therefore classifying Runway 18/36 as a secondary runway.

When Runway 18/36 is in operation, the Airport's capacity drops from a three-parallel runway to a single runway airport. As Table 4-13 previously depicted, the Airport's hourly capacity drops from 353 to 121 operations per hour during VFR conditions from Scenario 1 (three parallel runways) to Scenario 3 (single runway), respectively and from 118 to 60 operations per hour during IFR conditions from Scenario 2 to Scenario 4, respectively. As such, the Airport's Annual Service Volume (ASV) would increase if Runway 18/36 was decommissioned. As such, to increase capacity, Development Alternative 1 proposes that Runway 18/36 be decommissioned and converted into a TDG 5, ADG V taxiway. That taxiway would be 75 feet wide and be equipped with the required 30-foot-wide paved shoulders on each side. The existing Runway 18/36 pavement, including shoulders, is 200 feet wide,

therefore it is required to remove 32.5 feet of pavement from each side to achieve the standard taxiway and shoulder pavement width.

This proposed runway to taxiway conversion would allow for the removal of all instances of intersecting runways at the Airport, therefore enhancing safety and capacity. In addition, decommissioning Runway 18/36 and converting it to a taxiway would substantially regain developmental airport property currently confined by the runway's multiple RPZ and Runway Visibility Zone (RVZ) surfaces. Developable areas to the north, south, and east of existing Runway 18/36 could be opened to aeronautical and non-aeronautical development. This change would also be necessary to ultimately extend the Airport's passenger terminal facilities linearly to the east.

The portion of Runway 18/36 pavement south of the proposed Runway 9R/27L extension is proposed to be removed, except for necessary pavement for Taxiway S. This pavement removal would allow for proposed aeronautical development south of Taxiway S.

The proposed TDG 5, ADG V taxiway would begin at the northern edge of the Runway 9R/27L extension where the runway extension intersects with the existing Runway 18/36 pavement. This taxiway will then continue north along the existing runway pavement, crossing Runway 9C/27C and Runway 9L/27R, connecting into the proposed Taxiway A extension. The remaining existing Runway 18/36 pavement north of the proposed Taxiway A extension is planned for removal to reclaim this portion of property.

Development Alternative 2 - Conversion to TDG 5, ADG V taxiway and partial pavement removal

Development Alternative 2 is similar to what is proposed and described within Development Alternative 1. However, it is proposed on Development Alternative 2 that the Runway 18/36 taxiway conversion does not provide a southern runway entrance onto Runway 9L/27R to avoid introducing a runway crossing within the middle one-third of the runway. The existing Runway 18/36 pavement would be utilized to provide necessary taxiway fillet geometry between the Taxiway B crossing the existing runway pavement. A northern runway entrance would be retained off of the proposed Taxiway A extension utilizing the existing Runway 18/36 pavement. Additionally, the southern portion of the existing Runway 18/36 taxiway conversion would cease at the proposed Runway 9R/27L north parallel End Around Taxiway (EAT), aligned with existing Taxiway E. All existing Runway 18/36 pavement south of this point is proposed to be removed excluding what will be necessary for the continuation of Taxiway S.

Development Alternative 3 – No Action

Development Alternative 3 has been proposed as a no-action alternative, preserving Runway 18/36 as existing infrastructure. This alternative does not achieve airport goals of operational capability as it is not capable of meeting the Airport's facility needs as have been identified for the planning period.

Runway 9C/27C

Development Alternative 1 – Runway 'Shift'

Development Alternative 1 proposes a shift to the Runway 9C and Runway 27C ends approximately 643 feet to the east, maintaining the runway's existing length. That shift would allow for the future Runway 9C RPZ to be situated outside of the GA apron area and Taxiway K. The eastern portion of this proposed shift is currently in-line Taxiway C which maintains the runway's width and would not require improvements other than marking and signage to be converted to runway pavement. To analyze the configuration of Runway 9C/27C where the Runway 9C RPZ does not encompass a portion of GA apron, it is proposed within Development Alternative 1 to shift the Runway 9C and Runway 27C ends approximately 643 feet to the east. This will allow for the future Runway 9C RPZ to be shifted east and outside of Taxiway K and the portion of the GA apron area. The existing runway pavement from the relocated Runway 9C end to the eastern edge of existing Taxiway L is proposed to be removed eliminating the existing in-line Taxiway K1. Taxiway L would be preserved, but ATC would need to hold aircraft with tails higher than 19 feet from crossing through the 9C approach RPZ when aircraft have been cleared to land on 9C.

Development Alternative 2 – Runway Extension

The existing Runway 9C/27C is 3,578 feet long with a King Air 200 design aircraft. According to the aircraft performance manual for the King Air 200, the design aircraft requires 4,200 feet of available takeoff length at maximum takeoff weight (MTOW). In order to accommodate the takeoff requirements for the runway design aircraft a minimum extension of 622 feet to enhance is required. Alternative 2 proposes a 643 feet eastern 'shift', like

Alternative 1, to the Runway 27C approach end, with the Runway 9C approach end staying in its existing location. That runway end 'shift' would effectively extend Runway 9C/27C to a total of 4,221 feet. This alternative also includes 150 feet long by 95 feet wide blast pads be implemented at both ends of the runway.

Development Alternative 3 – No Action

Development Alternative 3 has been proposed as a no-action alternative, preserving Runway 9C/27C as existing infrastructure. This alternative does not achieve airport goals of operational capability as it is not capable of meeting the Airport's facility needs as have been identified for the planning period.

Runway 9L/27R

Development Alternatives 1, 2, and 3

Due to the adequate length and width of the Runway 9L/27R existing pavement in accordance with the identified runway design aircraft, there are no recommended modifications to the runway proposed for the planning period.

5.3.2. Taxiway Modifications

The following sections discuss both required taxiway modifications to mitigate high risk or non-standard taxiways, or recommended modifications to enhance the Airport's taxiway infrastructure to promote aeronautical growth. These presented modifications will be discussed in further detail between the three preliminary alternatives.

Required Taxiway Improvements

The following are existing taxiway configurations requiring modifications. If feasible, various methods of mitigation will be evaluated throughout the three development alternatives:

- Taxiway A3: Direct access provided from the existing north FBO apron to Runway 9L/27R
- Taxiway B2: Direct access provided from the GA apron south of Taxiway B to Runway 9L/27R
- Taxiway C (Western Portion): Aligned taxiway configuration to Runway 9C/27C, leading into the Runway 27C end
- Taxiway K1: Aligned taxiway configuration to Runway 9C/27C, leading into the Runway 9C end
- Taxiway P: Non-standard compass calibration pad location and fillet geometry
- Taxiway R: Portion of taxiway crossing Runway 9L/27R creates a middle-third configuration
- Taxiway S3: Direct access provided from the southeast general aviation area to Runway 9R/27L
- Avocet Taxiway Connector: Direct access provided from the existing Avocet apron to Runway 9L/27R via Taxiway L

Taxiway A

Development Alternatives 1 and 2 (Figures 5-1 and 5-2)

Taxiway A, a north partial parallel taxiway to Runway 9L/27R, currently extends approximately 1,600 feet between Taxiways A3 and L. To increase aircraft operational ground maneuvering flow and to promote aeronautical growth on the northern portion of the Airport, it is recommended in both Development Alternative 1 and Development Alternative 2 to extend Taxiway A along Runway 9L/27R creating a full north parallel taxiway. Taxiway A should be sized to accommodate the critical design aircraft Boeing 787-8 (ADG V, TDG 5) with a 75-foot taxiway width and 30 feet wide shoulders.

To eliminate direct access from Constant Aviation's aircraft parking apron onto Runway 9L/27R via Taxiway A3, it is proposed to relocate the A3 connector approximately 755 feet west. To eliminate direct access from the Avocet apron to Runway 9L/27R via Taxiway L, it is proposed to relocate this apron taxiway connector by approximately 422 feet to the east. Proposed Taxiway A connectors to Runway 9L/27R offer access to each end respectively, and runway crossings mirroring Taxiway B7 and Taxiway B8. A bypass connector is proposed on the Runway 9L end to allow for reduction in aircraft queuing delay by providing multiple runway entry points.

The proposed Taxiway A extension is separated from Runway 9L/27R's centerline by 400 feet in accordance with required design standards. However, this separation increases to 753 feet for the remaining 1,935 feet of the

proposed Taxiway A pavement due to the proposed relocation and future enhancement of the glideslope antenna and associated shelter (located between Runway 9L/27R and proposed Taxiway A).

Development Alternative 3 (Figure 5-3)

Development Alternative 3 proposes only the necessary direct access mitigation of Taxiway A3 and the Avocet apron taxiway connector as described for the Development Alternatives 1 and 2. No additional changes for Taxiway A are proposed within this alternative.

Taxiway B

Development Alternatives 1 and 3 (Figures 5-1 and 5-3)

The existing location of Taxiway B2 creates a direct access configuration from the GA apron located south of Taxiway B to the Runway 9L threshold. To mitigate the direct access configuration, it is proposed to shift the Taxiway B2 connector west to create a bypass taxiway configuration parallel with existing Taxiway B1. This will allow for an additional runway crossing on Development Alternative 1 with the proposed extension of Taxiway A and the proposed bypass connector on the northern side of the runway. Additionally, this bypass would allow for the decrease of aircraft queuing times. The fillet geometry and shoulders are proposed to be enhanced per design standards on the connector from Taxiway B onto the GA apron, as well as at the intersection of Taxiway R.

Table 5-5 summarizes the taxiway modifications for each development alternative.

Required Taxiway Improvements

The following are existing taxiway configurations requiring modifications. If feasible, various methods of mitigation will be evaluated throughout the three development alternatives:

- Taxiway A3: Direct access provided from the existing north FBO apron to Runway 9L/27R
- Taxiway B2: Direct access provided from the GA apron south of Taxiway B to Runway 9L/27R
- Taxiway C (Western Portion): Aligned taxiway configuration to Runway 9C/27C, leading into the Runway 27C end
- Taxiway K1: Aligned taxiway configuration to Runway 9C/27C, leading into the Runway 9C end
- Taxiway P: Non-standard compass calibration pad location and fillet geometry
- Taxiway R: Portion of taxiway crossing Runway 9L/27R creates a middle-third configuration
- Taxiway S3: Direct access provided from the southeast general aviation area to Runway 9R/27L
- Avocet Taxiway Connector: Direct access provided from the existing Avocet apron to Runway 9L/27R via Taxiway L

Taxiway A

Development Alternatives 1 and 2 (Figures 5-1 and 5-2)

Taxiway A, a north partial parallel taxiway to Runway 9L/27R, currently extends approximately 1,600 feet between Taxiways A3 and L. To increase aircraft operational ground maneuvering flow and to promote aeronautical growth on the northern portion of the Airport, it is recommended in both Development Alternative 1 and Development Alternative 2 to extend Taxiway A along Runway 9L/27R creating a full north parallel taxiway. Taxiway A should be sized to accommodate the critical design aircraft Boeing 787-8 (ADG V, TDG 5) with a 75-foot taxiway width and 30 feet wide shoulders.

To eliminate direct access from Constant Aviation's aircraft parking apron onto Runway 9L/27R via Taxiway A3, it is proposed to relocate the A3 connector approximately 755 feet west. To eliminate direct access from the Avocet apron to Runway 9L/27R via Taxiway L, it is proposed to relocate this apron taxiway connector by approximately 422 feet to the east. Proposed Taxiway A connectors to Runway 9L/27R offer access to each end respectively, and runway crossings mirroring Taxiway B7 and Taxiway B8. A bypass connector is proposed on the Runway 9L end to allow for reduction in aircraft queuing delay by providing multiple runway entry points.

The proposed Taxiway A extension is separated from Runway 9L/27R's centerline by 400 feet in accordance with required design standards. However, this separation increases to 753 feet for the remaining 1,935 feet of the proposed Taxiway A pavement due to the proposed relocation and future enhancement of the glideslope antenna and associated shelter (located between Runway 9L/27R and proposed Taxiway A).

Development Alternative 3 (Figure 5-3)

Development Alternative 3 proposes only the necessary direct access mitigation of Taxiway A3 and the Avocet apron taxiway connector as described for the Development Alternatives 1 and 2. No additional changes for Taxiway A are proposed within this alternative.

Taxiway B

Development Alternatives 1 and 3 (Figures 5-1 and 5-3)

The existing location of Taxiway B2 creates a direct access configuration from the GA apron located south of Taxiway B to the Runway 9L threshold. To mitigate the direct access configuration, it is proposed to shift the Taxiway B2 connector west to create a bypass taxiway configuration parallel with existing Taxiway B1. This will allow for an additional runway crossing on Development Alternative 1 with the proposed extension of Taxiway A and the proposed bypass connector on the northern side of the runway. Additionally, this bypass would allow for the decrease of aircraft queuing times. The fillet geometry and shoulders are proposed to be enhanced per design standards on the connector from Taxiway B onto the GA apron, as well as at the intersection of Taxiway R.

Table 5-5 - Taxiway Modifications Summary

Taxiway	Development Alternative 1	Development Alternative 2	Development Alternative 3
Taxiway A	<ul style="list-style-type: none"> Taxiway A3 relocation Full north parallel taxiway to Runway 9L/27R Entrance taxiway bypass connector – 9L end 	<ul style="list-style-type: none"> Taxiway A3 relocation Full north parallel taxiway to Runway 9L/27R Entrance taxiway bypass connector – 9L end 	<ul style="list-style-type: none"> Taxiway A3 relocation
Taxiway B	<ul style="list-style-type: none"> Taxiway B2 relocation Taxiway B apron connector enhancement 	<ul style="list-style-type: none"> Taxiway B2 enhancement Taxiway B apron connector relocation 	<ul style="list-style-type: none"> Taxiway B2 relocation Taxiway B apron connector enhancement
Taxiway C	<ul style="list-style-type: none"> East taxiway jog & taxiway removal up to Runway 27C end 	<ul style="list-style-type: none"> East taxiway jog & taxiway removal up to Runway 27C end 	<ul style="list-style-type: none"> East taxiway jog & taxiway removal up to Runway 27C end
Taxiway E	<ul style="list-style-type: none"> No action 	<ul style="list-style-type: none"> No action 	<ul style="list-style-type: none"> No action
Taxiway K	<ul style="list-style-type: none"> Taxiway K1 relocation 	<ul style="list-style-type: none"> Taxiway K1 relocation 	<ul style="list-style-type: none"> Taxiway K1 relocation
Taxiway L	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> N/A
Taxiway M	<ul style="list-style-type: none"> Modification to accommodate Runway 9C end relocation – Runway end entrance taxiway 	<ul style="list-style-type: none"> Extension across Runway 9C/27C up to Taxiway B Fillet enhancement 	<ul style="list-style-type: none"> Fillet enhancement
Taxiway P	<ul style="list-style-type: none"> Taxiway removal 	<ul style="list-style-type: none"> Taxiway removal 	<ul style="list-style-type: none"> Taxiway removal
Taxiway R	<ul style="list-style-type: none"> Removal south of Taxiway S intersection 	<ul style="list-style-type: none"> Removal south of Taxiway S intersection 	<ul style="list-style-type: none"> Removal north of Runway 9L/27R

	<ul style="list-style-type: none"> Removal north of Runway 9L/27R 	<ul style="list-style-type: none"> Removal north of Runway 9L/27R 	
Taxiway S	<ul style="list-style-type: none"> Taxiway S1, S2, and S4 fillet enhancement Taxiways S3, and S5 relocation 	<ul style="list-style-type: none"> Taxiway S2, and S4 fillet enhancement Taxiways S1, S3, and S5 relocation 	<ul style="list-style-type: none"> Taxiway S2 fillet enhancement Taxiway S3 removal
Taxiway U	<ul style="list-style-type: none"> Fillet enhancement 	<ul style="list-style-type: none"> Fillet enhancement 	<ul style="list-style-type: none"> No action
Proposed Runway 9R/27L North Partial Parallel	<ul style="list-style-type: none"> North partial parallel taxiway 	<ul style="list-style-type: none"> North partial parallel taxiway with EAT configuration 	<ul style="list-style-type: none"> No Action

Source: Atkins Analysis

Development Alternative 2 (Figure 5-2)

To mitigate the identified direct access created by Taxiway B2, Development Alternative 2 proposes to retain the existing location of Taxiway B2 and enhance the connector fillet geometry per design standards while removing the Taxiway B to GA apron connector. An enhancement of existing pavement west of the removed taxiway to apron connector will allow for a standard taxiway connector between Taxiway B and the GA apron.

Taxiway C

Development Alternatives 1 and 2 (Figures 5-1 and 5-2)

The eastern portion of Taxiway C leading into Runway 9C/27C is considered an 'aligned taxiway' (also known as an 'inline taxiway') which no longer meets FAA design standards and poses a safety hazard. This aligned taxiway creates an operational hazard where aircraft can inadvertently taxi into the approach or departure paths of aircraft landing on or taking off from Runways 27C or 9C, respectively. Additionally, this configuration can create situational awareness issues for both pilots operating on Taxiway C and Runway 9C/27C. Two development alternatives were planned to mitigate this aligned taxiway condition. Both Development Alternatives 1 and 2 propose the western portion of Taxiway C be extended eastward across existing Runway 18/36.

The Development Alternative 1 plans that the Taxiway C extension make a 'dog leg' turn to tie into the eastern remaining portion of Taxiway C. That new taxiway alignment is planned to ensure that no Taxiway Object Free Area (TOFA) impacts are created to the existing ARFF station. The eastern portion of Taxiway C pavement is planned to be removed from the proposed taxiway 'dog leg' alignment west to the proposed relocated Runway 27C approach end. Even though not directly connected to Runway 9C/27C, this would leave approximately 760 linear feet of Taxiway C 'inline' with Runway 9C/27C and would require ATC to hold aircraft with tails higher than 12.5 feet from entering the Runway 27C approach RPZ when aircraft are cleared to land or depart to Runway 27C or 9C, respectively. A visual screen to eliminate false perceptions of runway incursions would be required between the 'dog leg' portion of the taxiway and the ROFA. A new taxiway connector is proposed south of the relocated Runway 27C approach end.

Development Alternative 2 proposes that the extension of Taxiway C end at the 90-degree runway-end connector, and includes an additional northern runway end connector to tie the Runway 27C approach end to Taxiway B. A portion of existing Taxiway C, approximately 275 linear feet long, would be removed between the proposed 27C blast pad and existing ARFF road connection, and a new portion of ARFF road would connect the ARFF's main facilities to the proposed new Taxiway C. The remaining portions of existing Taxiway C would only service the Seminole County Sheriff's operations and the occasional tugs of aircraft to the Avocet aircraft 'bone-yard' located southwest of the ARFF building. ATC would need to hold arrivals to 27C or departures from 9C while aircraft with tails higher than 31 feet being ferried to the 'bone-yard'. Development Alternative 2 also plans to include 20-foot shoulders along the extended Taxiway C due to the ADG III design aircraft. Per FAA AC 150/5300-13A, taxiways serving a design aircraft of ADG III are 'recommended', not 'required', to have supporting taxiway shoulders.

Development Alternative 3 (Figure 5-3)

In Development Alternative 3, Runway 9C/27C is preserved as its existing condition. To mitigate the aligned taxiway on the western portion of Taxiway C, it is proposed to extend the western portion of Taxiway C across Runway 18/36 and tie into the eastern portion of Taxiway C similar to Development Alternatives 1 and 2. However, the pavement removal on the western portion of Taxiway C will include all pavement from the extended Taxiway C jog up to the existing Runway 27C end.

Taxiway E

Development Alternatives 1, 2 and 3 (Figures 5-1, 5-2, and 5-3)

Taxiway E was found to be compliant of all current design standards in accordance with the established design aircraft. Therefore, there are no proposed modifications for Taxiway E on all three development alternatives.

Taxiway K

Development Alternatives 1, 2 and 3 (Figures 5-1, 5-2, and 5-3)

Existing Taxiway K1 is proposed to be relocated north approximately 530 feet. The purpose of that relocation is to eliminate the existing aligned taxiway configuration with Runway 9C/27C and FAA identified 'Hot Spot'. The relocated Taxiway K1 would be parallel to Taxiway B and their centerlines would be separated by 267 feet. Relocated Taxiway K1 would connect Taxiways K and L. The proposed Taxiway K1 relocation has a design aircraft of TDG 3, ADG III.

Taxiway L

Development Alternatives 1, 2 and 3 (Figures 5-1, 5-2, and 5-3)

Fillet enhancements and adjustments were just completed in 2020 for Taxiway L at its Taxiways A and C intersections. Those fillet enhancements meet the required taxiway fillet geometry standards, therefore no other modifications to Taxiway L are proposed.

Taxiway M

Development Alternative 1 (Figure 5-1)

Due to the proposed shift of Runway 9C/27C in Development Alternative 1, Taxiway M is proposed to be converted to a taxiway connector onto the Runway 9C approach end with fillet modification. Taxiway M will retain TDG 5, ADG V design standards, as it is planned to be used by the Airport's largest aircraft traversing between the terminal apron and Runway 9L/27R.

Development Alternative 2 (Figure 5-2)

An extension of Taxiway M is proposed across Runway 9C/27C north to existing Taxiway B. This would allow for additional available taxi routes between the north side of the Airport to the commercial terminal area. This Taxiway M extension will accommodate a design aircraft up to TDG 5, ADG V which will require taxiway fillet enhancement for existing Taxiway M and Taxiway C intersection.

Development Alternative 3 (Figure 5-3)

Development Alternative 3 proposes taxiway fillet enhancement to serve TDG 5, ADG V design standards. However, no other extension or modifications for Taxiway M is proposed on this development alternative.

Taxiway P

Development Alternatives 1, 2, and 3 (Figures 5-1, 5-2, and 5-3)

Due to the existing non-standard pavement geometry of Taxiway P and the redundant taxiway connector along Runway 9C/27C, Taxiway P is proposed to be removed from all three development alternatives. Relocation alternatives of the compass calibration pad currently located on Taxiway P are presented in section 5.3.7.3.

Taxiway R

Development Alternatives 1 and 2 (Figures 5-1 and 5-2)

To mitigate the existing non-standard middle-third crossing on Runway 9L/27R, it is proposed to remove the portion of Taxiway R pavement north of the runway. Portions of this pavement will be retained and utilized as part of the proposed Taxiway A extension.

Taxiway R currently has insufficient shoulders to serve TDG 5, ADG V aircraft from Runway 9L/27R to the terminal environment. To correct this deficiency, 30-foot-wide compliant shoulders are proposed to be added on Taxiway R between Runway 9L/27R and Taxiway C. Additional 20-foot pavement shoulders are proposed for Taxiway R between Taxiway E and the proposed Runway 9R end. This portion of Taxiway R is anticipated to accommodate TDG 3, ADG III aircraft to support the future anticipated Runway 9R/27L commercial service operations.

The section of Taxiway R from the proposed Runway 9R approach end relocation on Development Alternative 1 and the proposed runway removal on Development Alternative 2 down to Taxiway S will be enhanced for TDG 2, ADG II design standards. Regarding the proposed Runway 18/36 taxiway conversion and partial Runway 18/36 pavement removal, it is proposed to remove the portion of Taxiway R south of Taxiway S. This area will then be reclaimed for future aeronautical or non-aeronautical development.

Development Alternative 3 (Figure 5-3)

To mitigate the existing non-standard middle-third crossing on Runway 9R/27L, it is proposed to remove the portion of Taxiway R north of the runway.

Taxiway S

Development Alternative 1 (Figure 5-1)

Taxiway Connectors S1, S2, and S4 are proposed to have fillet enhancements to ensure compliance with design standards for TDG 2, ADG II aircraft. Due to the existing non-standard direct access configuration provided by Taxiway S3, it is proposed to relocate Taxiway S3 approximately 545 feet east along Runway 9R/27L. This placement will allow for increased exit factor along the south parallel runway due to the increased separation between Taxiway S2.

Due to the proposed Runway 27L eastward relocation, it is proposed to relocate Taxiway S5 in to accommodate the proposed runway end relocation.

Development Alternative 2 (Figure 5-2)

Similar to Development Alternative 1, Taxiways S2 and S4 are proposed to have fillet enhancements. Additionally, Taxiway S5's fillet geometry is planned to be enhanced and Taxiway S3 be removed to mitigate its direct access configuration. Due to the proposed Runway 9R/27L eastward shift, Taxiway S1 is planned move to the relocated Runway 9R approach end and extend Taxiway S by 2,208 feet east providing access to the relocated Runway 27L approach end.

An EAT configuration is proposed on the Runway 9R/27L parallel taxiway to ensure that no impacts are caused to the approach surface for Runway 9R. The feasibility of an EAT configuration was analyzed for Taxiway S and was found that the configuration would not be practical due to existing environmental features. Therefore, it is proposed that Taxiway S is kept within the current location.

Development Alternative 3 (Figure 5-3)

On Development Alternative 3, Taxiway S3 is proposed to be removed to mitigate its direct access configuration.

Taxiway U

Development Alternatives 1 and 2 (Figures 5-1 and 5-2)

In Development Alternatives 1 and 2, taxiway fillet enhancement is proposed for existing Taxiway U to comply with fillet design standards for the design aircraft.

Development Alternative 3 (Figure 5-3)

Development Alternative 3 proposes no modifications for Taxiway U.

Proposed Runway 9R/27L North Partial Parallel Taxiway

Development Alternative 1 (Figure 5-1)

To support the proposed enhancement of Runway 9R/27L to commercial service capability, it is proposed to develop a north partial parallel taxiway to increase capacity for this runway and to provide aeronautical development opportunities north of Runway 9R/27L. The proposed partial parallel taxiway is designed to accommodate the Runway 9R/27L critical aircraft with TDG 3 and ADG III design requirements. The parallel taxiway would provide access to the relocated Runway 27L approach end and would then extend west to the proposed Runway 18/36 taxiway conversion. The parallel taxiway provides two connector taxiways along Runway 9R/27L to enhance the runway's exit factor and decrease operation's runway occupancy time.

Development Alternative 2 (Figure 5-2)

Like Development Alternative 1, it is proposed to develop a north partial parallel taxiway supporting Runway 9R/27L. However, with Development Alternative 2 proposing the eastward shift of Runway 9R/27L, the western portion of the proposed north taxiway will need to be configured as an EAT, which ensures that the taxiing aircraft do not impact the approach surface. The proposed taxiway is planned to run parallel to Runway 9R/27L until required to be angled to the northwest, connecting directly into Taxiway E and the proposed Runway 18/36 taxiway conversion. This proposed EAT taxiway alignment would impact the closed historical landfill area which is located north of Runway 9R/27L. The proposed taxiway development through this closed landfill would require an extensive environmental analysis and rigorous environmental mitigation. A proposed taxiway connector would provide north access to the relocated Runway 9R approach end via the proposed EAT.

Development Alternative 3 (Figure 5-3)

Development Alternative 3 was utilized as a no-action alternative to further evaluate the costs and other potential impacts from the discussed taxiway development. No Runway 9R/27L north partial parallel taxiway is proposed on this development alternative.

5.3.3. Apron Modifications

The following subsections and **Table 5-6** outline the proposed apron modifications as presented on each development alternative. As discussed in the Demand Capacity and Facility Requirements chapter, both based and itinerant aircraft apron areas are recommended to be expanded throughout the planning period to accommodate anticipated forecasted operational growth. The recommended apron expansions are only slated for general aviation aircraft, it was found that existing commercial jet-based aircraft apron was sufficient throughout the planning period.

Table 5-6 - Apron Modifications Summary

Development Alternative 1 (Figure 5-1)	Development Alternative 2 (Figure 5-2)	Development Alternative 3 (Figure 5-3)
<ul style="list-style-type: none"> ~20,000 square yard apron area south of Taxiway K1 relocation Increased itinerant apron area associated with proposed conventional hangar development south of Million Air facilities 	<ul style="list-style-type: none"> ~15,000 square yard apron area connected to the south of Taxiway K1 relocation ~17,000 square yard apron area connected to existing apron area south of Million Air facilities and expanding west then north 	No Action

Source: Atkins Analysis

Development Alternative 1 (Figure 5-1)

Primary apron pavement expansion is proposed on the northeast side of Taxiway K, and south of the proposed Taxiway K1 relocation. This proposed apron area is approximately 20,000 square yards of pavement total. To allow

for safe aircraft maneuvering around the apron area, taxilanes with appropriate separation will be required. These taxilanes with associated clearances will account for approximately 6,000 square yards of the proposed 20,000 square yard area.

Itinerant aircraft apron is assumed to be associated with the proposed hangar expansion south of the existing Million Air hangar row. Itinerant aircraft apron requirements, as analyzed in the Demand Capacity and Facility Requirements chapter, took into consideration the apron area frontage associated with the existing Million Air hangars. With the expansion of the additional hangar, it is assumed that the apron frontage with this hangar will accommodate the associated itinerant apron requirements throughout the planning period.

Development Alternative 2 (Figure 5-2)

Similar to Development Alternative 1 for proposed based aircraft apron, an apron expansion is proposed northeast along Taxiway K and connected to the south of the relocated Taxiway K1. This apron expansion will account for the based aircraft requirements throughout the planning period. The 15,000 square yard pavement area will have approximately 11,000 square yards of storage space available, with the remaining 4,000 square yards associated with necessary taxilanes and clearance areas.

The existing apron area associated with the Million Air hangars is proposed to be expanded westward, running directly south of the southernmost existing Million Air hangar. This westward apron expansion will then turn north to fill in the existing landside area west of the Million Air facilities. The 17,000 square yard expansion will account for all required itinerant apron area throughout the planning period.

Development Alternative 3 (Figure 5-3)

Development Alternative 3 was utilized as a no-action alternative to further evaluate the costs and other potential impacts from the discussed apron expansions. No apron modifications or enhancements are proposed on this development alternative.

5.3.4. Proposed Commercial Service Terminal Modifications

As identified in the Demand Capacity and Facility Requirements chapter, the existing commercial terminal infrastructure is anticipated to be deficient through the planning period compared to forecasted growth. The measurement of maximum forecasted growth, also known as Planning Activity Level (PAL) 4, identifies that both aircraft gate infrastructure and commercial terminal square footage will be required to be expanded to accommodate the increased commercial operations. Following are the objectives related to the commercial service terminal modification alternatives:

1. Provide additional hold room, concessions, TSA queue, ticketing, and restrooms spaces with gate and/or terminal expansion alternatives.
2. Improve efficiency of overall space.
3. Provide additional ticketing on west side of terminal to access checkpoint and baggage handling facilities.
4. Consider consolidation of baggage claim on east side to allow ticketing expansion on west side.
5. Consider more reliance on self-service and self-baggage tagging options.
6. Consider the potential to expand beyond the planning horizon (PAL 4+, 2037+).
7. Minimize impact to apron facilities to the west.

The following subsections outlines the proposed airside gate expansions along with associated terminal expansions and the terminal services modifications.

5.3.4.1. Airside Gate and Associated Terminal Modifications

The Facility Requirements analysis determined that to accommodate PAL 4 service levels, the Airport would require three additional gates within the planning period if existing Gate 16 is modified or replaced to accommodate the A320 family or similar aircraft. However, if existing Gate 16 is not upgraded to accommodate this larger aircraft family, the total required additional gates throughout the planning period would be four. The proposed gate expansions have been evaluated through three varying alternatives to accommodate the required expansion.

Associated hold room, concessions, and rest room areas with each proposed gate expansion have been analyzed to ensure the adequate interior commercial terminal space is accounted for.

Development Alternative 1 (Figure 5-1)

To accommodate the anticipated gate requirements through PAL 4, Development Alternative 1 proposes for an east gate expansion and enhancement of existing Gate 16 to support the A320 family or similar aircraft. The east terminal expansion would add approximately 61,400 square feet of terminal area and would provide three additional gates. This terminal expansion would accommodate the increased space requirements for the proposed three gates, which are capable to accommodate ADG III to ADG V aircraft. This expansion would include additional concessions, hold rooms, and restrooms. A Ground Support Equipment (GSE) storage area of 8,722 square yards is proposed on the eastern edge of the proposed apron pavement expansion. Associated apron pavement expansion of 37,447 square yards is required to accommodate the east terminal expansion and associated gates.

The enhancement of existing Gate 16 to support ADG III aircraft would require the relocation of the existing flight kitchen facility, currently located directly west of the terminal. Additionally, the west terminal would require an expansion of 12,600 square feet to accommodate expanded hold rooms. **Table 5-7** summarizes the gate alternative as presented on Development Alternative 1.

Table 5-7 - Development Alternative 1: Gate Alternatives Summary

Criteria	Development Alternative 1 (Figure 5-1)	Outlook
Flexibility for various aircraft sizes	<ul style="list-style-type: none"> New east concourse allows larger aircraft positions to be implemented 	<ul style="list-style-type: none"> Positive
Impact to other facilities	<ul style="list-style-type: none"> Flight kitchen relocation Relocation of GSE storage 	<ul style="list-style-type: none"> Neutral Neutral
Walking Distance	<ul style="list-style-type: none"> Highest additional walking distance 	<ul style="list-style-type: none"> Negative
Capital costs	<ul style="list-style-type: none"> Most expensive with apron expansion and flight kitchen relocation Large building expansion 	<ul style="list-style-type: none"> Negative Negative
Constructability	<ul style="list-style-type: none"> No impact to existing gates 	<ul style="list-style-type: none"> Positive
Balances flight line (gates) with terminal facilities	<ul style="list-style-type: none"> Balances gates by adding to the east where the larger hold room and call to gate operations can be leveraged 	<ul style="list-style-type: none"> Positive
Supports ultimate expansion to east	<ul style="list-style-type: none"> A logical first step toward all ultimate expansion options 	<ul style="list-style-type: none"> Positive

Source: Jacobsen | Daniels Analysis

Development Alternative 2 (Figure 5-2)

To accommodate the anticipated gate requirements through PAL 4, Development Alternative 2 proposes for a west terminal expansion and minor east terminal expansion. The west terminal expansion would provide three additional gates capable for ADG III aircraft, and the west terminal expansion would be approximately 39,400 square feet. This terminal expansion would accommodate the increased space requirements for the proposed three gates, including as previously mentioned associated concessions, hold rooms, and restrooms.

The additional proposed east terminal expansion would provide one additional gate capable for ADG III to ADG V aircraft. The additional minor east terminal expansion of 9,100 square feet will allow for required increase of circulation and restroom expansions associated with the additional east gate. Approximately 30,012 square yards of associated apron pavement will be required to accommodate the east terminal expansion. A GSE storage area of 8,722 square yards is proposed on the eastern edge of the proposed apron pavement expansion. **Table 5-8** summarizes the gate alternative as presented on Development Alternative 2.

Table 5-8 - Development Alternative 2: Gate Alternatives Summary

Criteria	Development Alternative 2 (Figure 5-2)	Outlook
Flexibility for various aircraft sizes	<ul style="list-style-type: none"> New east concourse allows larger aircraft positions to be implemented 	<ul style="list-style-type: none"> Positive
Impact to other facilities	<ul style="list-style-type: none"> Flight kitchen relocation Push backs increase activity on taxilanes to/from GA areas to the west Relocation of GSE storage 	<ul style="list-style-type: none"> Neutral Negative Neutral
Walking Distance	<ul style="list-style-type: none"> More additional walking distances 	<ul style="list-style-type: none"> Neutral
Capital costs	<ul style="list-style-type: none"> More expensive with apron and building expansion 	<ul style="list-style-type: none"> Neutral
Constructability	<ul style="list-style-type: none"> Some impact to existing gates 	<ul style="list-style-type: none"> Neutral
Balances flight line (gates) with terminal facilities	<ul style="list-style-type: none"> Adds most of the new gates to west end where hold room area per gate ratios are smallest 	<ul style="list-style-type: none"> Negative
Supports ultimate expansion to east	<ul style="list-style-type: none"> A logical first step toward all ultimate expansion options 	<ul style="list-style-type: none"> Positive

Source: Jacobsen | Daniels Analysis

Development Alternative 3

To accommodate the anticipated gate requirements through PAL 4, Development Alternative 3 proposes for a primarily west terminal expansion with the enhancement of existing Gate 16 to support ADG III or similar aircraft. The west terminal expansion would provide three additional gates capable for ADG III aircraft, along with the enhancement of existing Gate 16. Similar to Development Alternative 1, the existing flight kitchen facility will be required to be relocated due to the enhancement. The total proposed west terminal expansion would be approximately 39,400 square feet.

Table 5-9 summarizes the gate alternative as presented on Development Alternative 3.

Table 5-9 - Development Alternative 3: Gate Alternatives Summary

Criteria	Development Alternative 3 (Figure 5-3)	Outlook
Flexibility for various aircraft sizes	<ul style="list-style-type: none"> Least flexibility Limited to ADG III aircraft 	<ul style="list-style-type: none"> Negative Negative
Impact to other facilities	<ul style="list-style-type: none"> Flight kitchen relocation Push backs increase activity on taxilanes to/from GA areas to the west 	<ul style="list-style-type: none"> Neutral Negative
Walking Distance	<ul style="list-style-type: none"> Least additional walking distances 	<ul style="list-style-type: none"> Positive
Capital costs	<ul style="list-style-type: none"> Least expensive (no major apron expansion but flight kitchen relocation to consider) 	<ul style="list-style-type: none"> Positive
Constructability	<ul style="list-style-type: none"> Impacts to existing gates 	<ul style="list-style-type: none"> Negative
Balances flight line (gates) with terminal facilities	<ul style="list-style-type: none"> Adds all new gates to west end where hold room area per gate ratios are smallest 	<ul style="list-style-type: none"> Negative
Supports ultimate expansion to east	<ul style="list-style-type: none"> Does not preclude nor support ultimate expansion to east 	<ul style="list-style-type: none"> Neutral

Source: Jacobsen | Daniels Analysis

5.3.4.2. Terminal Services Modifications

The previously completed facility requirements analysis determined that to accommodate PAL 4 operational levels, the Airport would require additional core terminal services. The proposed expansion and redevelopment of the interior core terminal services are presented on the three development alternatives to accommodate the projected growth of operations through forecasted PAL 4. The terminal services alternatives include:

- Ticketing & Check-In
- Security Screening Checkpoints (SSCP)
- Circulation
- Baggage Handling & Baggage Claim
- Restrooms
- Concessions
- Office Space

All Terminal Services Alternatives – Provide 2nd Story Expansion

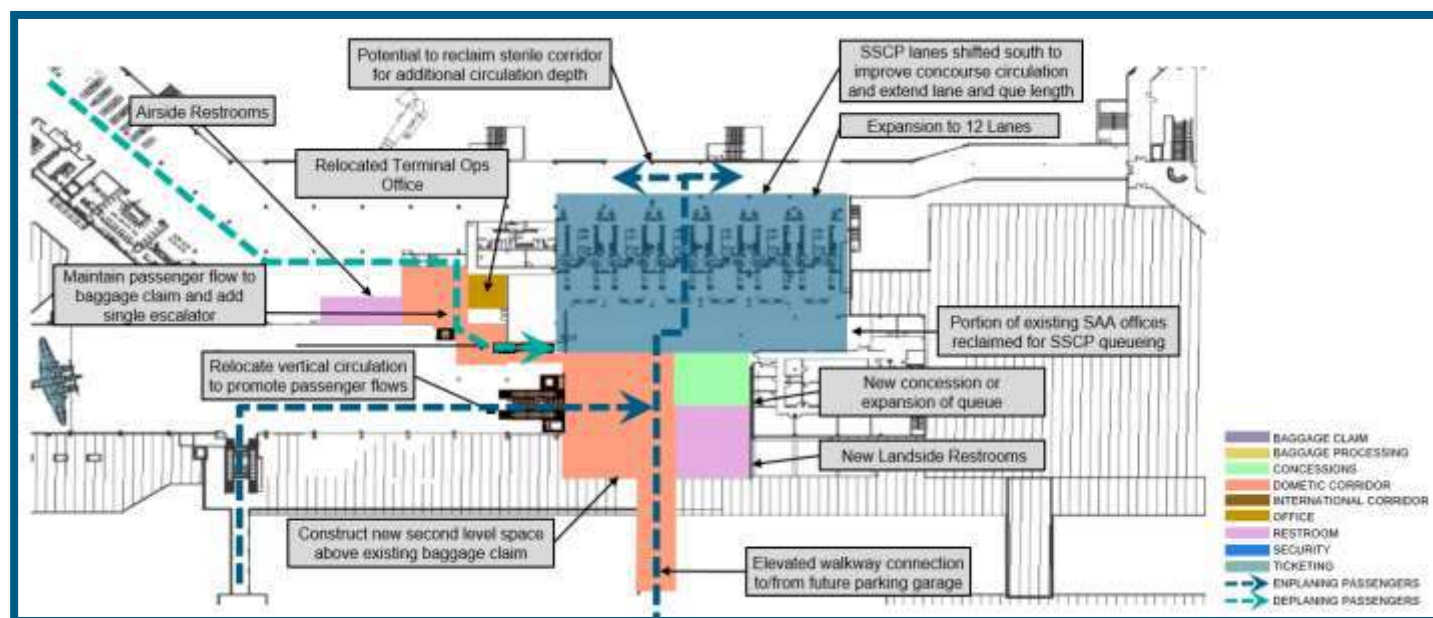
Consistent throughout all three development alternatives is the proposed second story expansion to accommodate the additional terminal services requirements. As depicted in **Figure 5-10**, the expansion of the 2nd story terminal would relocate the existing Sanford Airport Authority (SAA) administration space to expand the SSCP area with increased queue area, lane length, a wider domestic corridor, and overall SSCP depth increase to 30 feet.

Additionally, landside restrooms and concessions will be expanded on the second story along with an elevated walkway to a proposed landside parking garage. To accomplish this expansion, the SAA administration space will be relocated, and the existing escalator and elevator would require relocation.

The 2nd story expansion would provide the following:

- 17,000 square feet of total additional terminal floor space
- 10,000 square feet of total additional SSCP space
- 5,000 square feet of total additional landside restroom and concession areas

Figure 5-10 - All Terminal Services Alternatives - Provide Second Floor Expansion

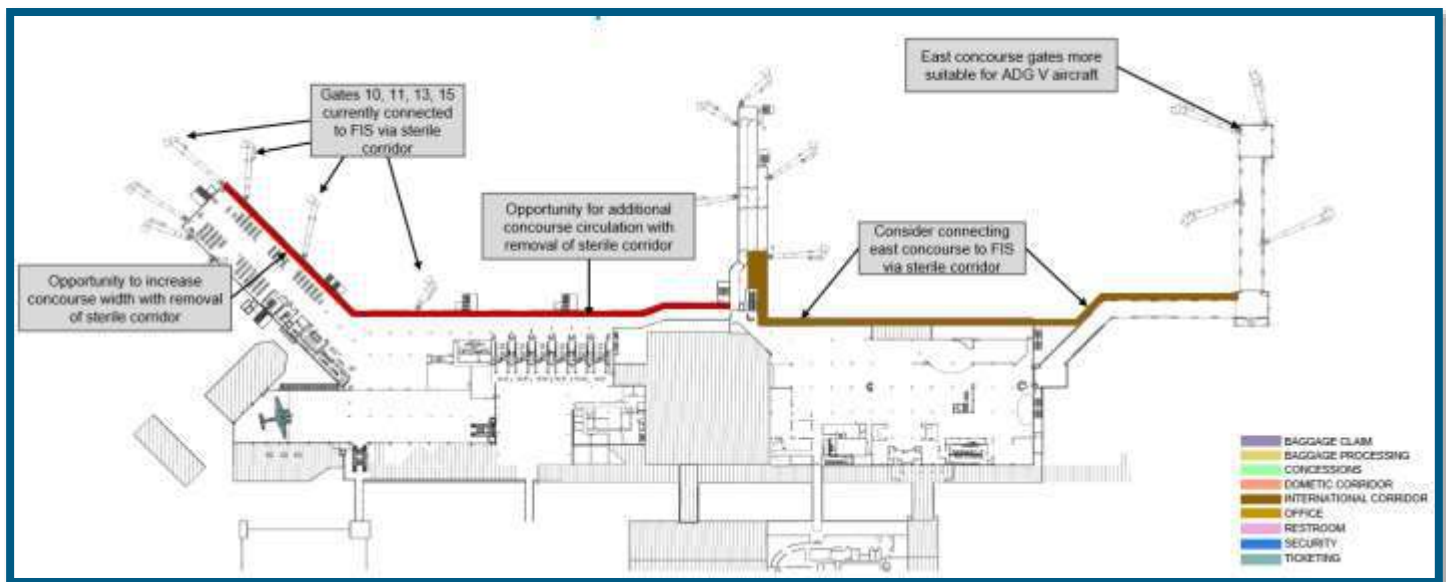


Source: Jacobsen | Daniels Analysis

All Terminal Services Alternatives - International Arrivals Swap Alternative

An additional analysis was conducted to analyze the benefits and drawbacks from transitioning the international arrivals to the east side of the terminal to capitalize on the existing east concourse capability. **Figure 5-11** depicts the proposed transition. The east concourse currently has additional gate infrastructure that is capable to accommodate ADG V aircraft compared to the west concourse. This transition would primarily be completed through connecting the east concourse to the existing Federal Inspection Services (FIS) via the sterile corridor. With the removal of the west sterile corridor, this presents an opportunity to increase the overall width of the west concourse providing additional circulation area. To accomplish this relocation, elimination of international arrival gates on the west concourse for existing users would be required and a new sterile corridor be added to connect Gates 1 – 4 to the FIS.

Figure 5-11 - International Arrivals Swap Alternative



Source: Jacobsen | Daniels Analysis

Terminal Services Development Alternatives

Figure 5-12 depicts a summary of the three terminal services development alternatives and their respective expansions. The following subsections will detail the three development alternatives variations to accommodate the forecasted PAL 4 service demand.

Figure 5-12 - Terminal Services Development Alternatives Summary



Source: Jacobsen | Daniels Analysis

Development Alternative 1

For the terminal services presented on Development Alternative 1, it is proposed on the terminal's first floor to upgrade the existing check-in areas with additional kiosk and bag drop facilities. A proposed two-level expansion for check-in and circulation south of the existing check-in area will allow for accommodation of increased service levels. It is proposed on the terminal's second floor to integrate the proposed two-level expansion for increased ticketing and circulation, which will connect into the proposed elevated parking garage walkway connection. A shift of the existing SSCP area south will allow for expanded queuing areas and other SSCP support areas required. Additional second floor restrooms and concessions will allow for passenger ease of access to these facilities after entering the terminal from the proposed elevated walkway and prior to entering the SSCP area.

Primary benefits of the terminal services presented on Development Alternative 1 is the connection of both parking garages to the second level via an elevated walkway, expanding first and second floor ticketing and kiosks, and not increasing passenger walk distances. However, drawbacks for the proposed terminal services include reduced curb width and entrance canopy, temporary construction impacts to the terminal entrance, and a complex bag belt placement from remote ticketing areas. **Figure 5-13** depicts the first-floor terminal services and **Figure 5-14** depicts the second-floor terminal services as presented on Development Alternative 1.

Development Alternative 2

For the terminal services presented on Development Alternative 2, it is proposed on the terminal's first floor to upgrade the existing check-in areas with additional kiosk and bag drop facilities. The existing elevator is proposed to be maintained but it is proposed to rotate the existing down escalator to improve passenger flow and access to the baggage claim area. On the second floor, a proposed mezzanine-level infill check-in and circulation space would be constructed to support additional terminal services required. Like Development Alternative 1, this area would be connected to the future parking garage via an elevated walkway. A shift in the SSCP south and expansion of queuing area will allow to satisfy the forecasted demand.

Primary benefits of the terminal services presented on Development Alternative 2 is the connection of both parking garages to the second level terminal, expanding the second floor ticketing capability, not increasing passenger walking distance, and no change to the overall terminal building footprint will be necessary. However, drawbacks for the proposed terminals services include temporary construction impacts to the main ticketing hall, split ticket counter operation, and does not meet the recommended ticketing area requirements as outlined at PAL 4 service levels. **Figure 5-15** depicts the first-floor terminal services and **Figure 5-16** depicts the second-floor terminal services as presented on Development Alternative 2.

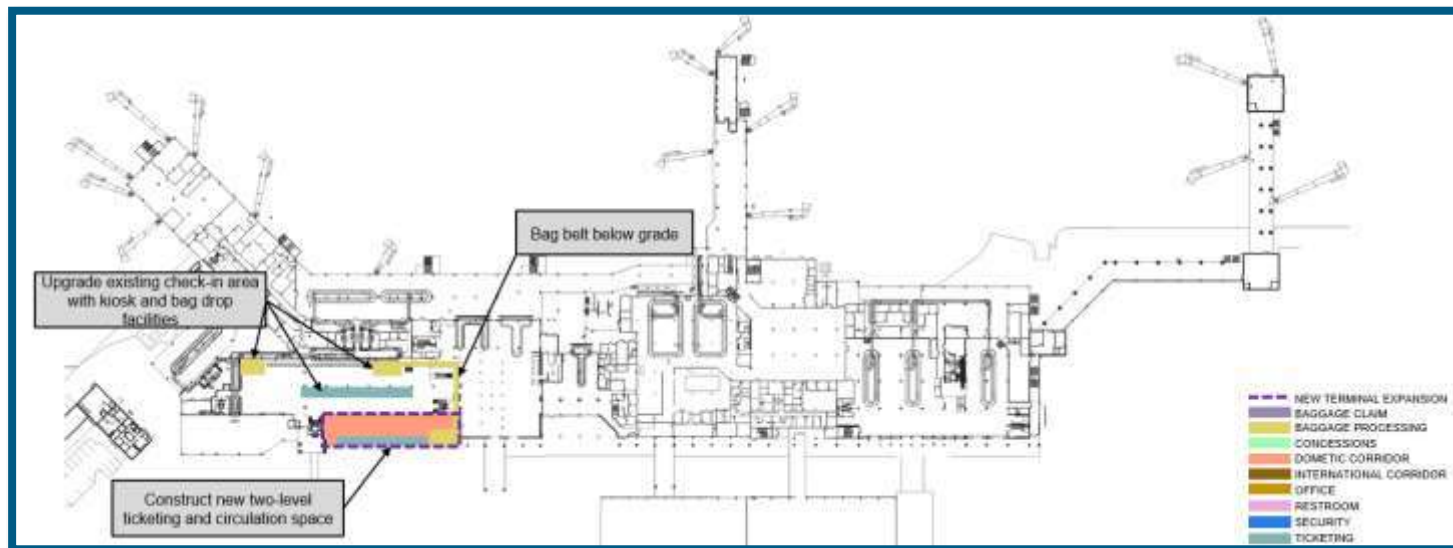
Development Alternative 3

For the terminal services presented on Alternative 3, it is proposed on the terminal's first floor to consolidate the baggage claim on the east side of the terminal replacing the existing baggage claim area with check-in, circulation, and office spaces. The consolidation of the baggage claim on the east would provide two new baggage claim carousels to replace the capacity lost in the central location. A new vertical circulation core and lower-level entry point for west and center concourse deplaning passengers is proposed into the future east baggage claim area. This new vertical circulation will allow for the ease of access to the proposed baggage claim consolidation on the east side of the terminal. On the west side of the terminal's first floor, it is proposed to upgrade the existing check-in area with additional kiosk and bag drop facilities. Additional landside restrooms are proposed both on the west and east sides of the terminal's first floor.

On the second floor, similar to previous development alternatives, it is proposed to have an elevated walkway connection to and from the future parking garage. Additional concessions and restroom areas are proposed upon immediately existing the proposed elevated walkway into the terminal's second floor. The SSCP is proposed to be shifted south and expanded to allow for additional queuing area. A proposed two-level expansion on the east end of the terminal will allow for the addition of hold rooms, concessions, and restrooms on the second floor. Additional airside restrooms are proposed on the northeast side of the main terminal area, towards the east concourse.

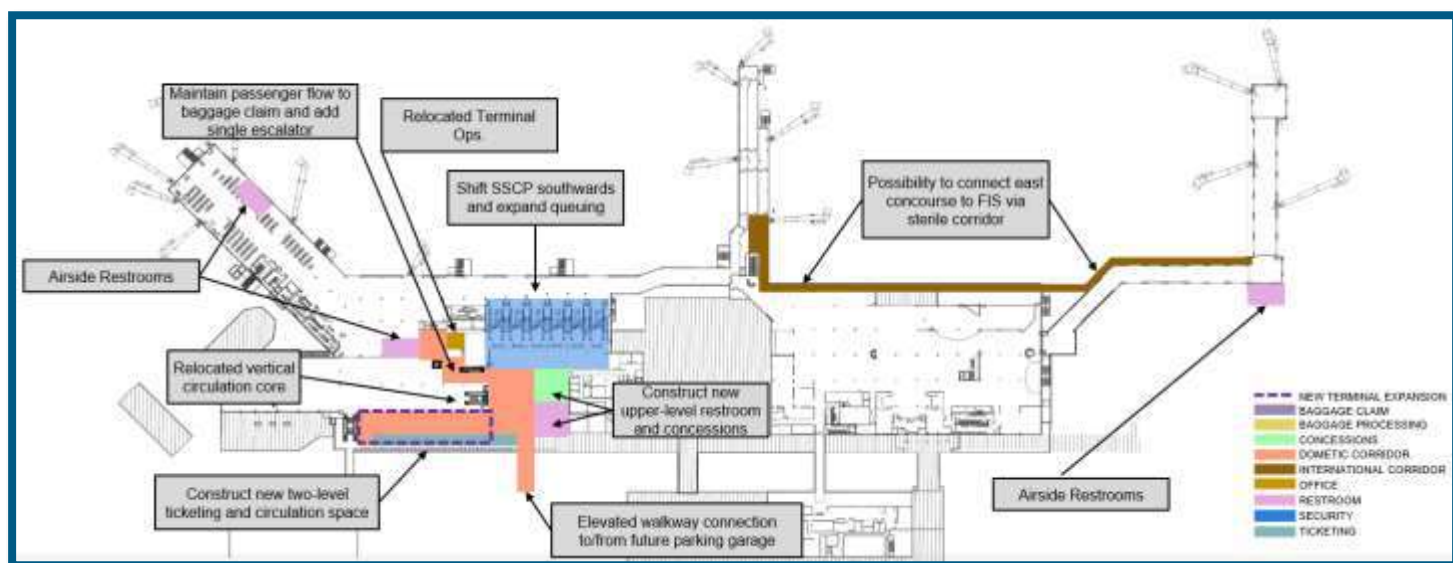
Primary benefits of the terminal services presented on Development Alternative 3 is the expansion of the ticketing hall, consolidation of all ticketing operations on the terminal's first floor, separating the ticketing and baggage claim areas, minimal impact to airline operations during construction, and supports a proposed east gate expansion. However, drawbacks for the proposed terminal services include increased walking distances to baggage claim from the west gates, requires significant east terminal expansion, requires two new baggage carousels, and does not meet the recommended ticketing area requirement.

Figure 5-13 - Terminal Services Development Alternative 1: First Floor



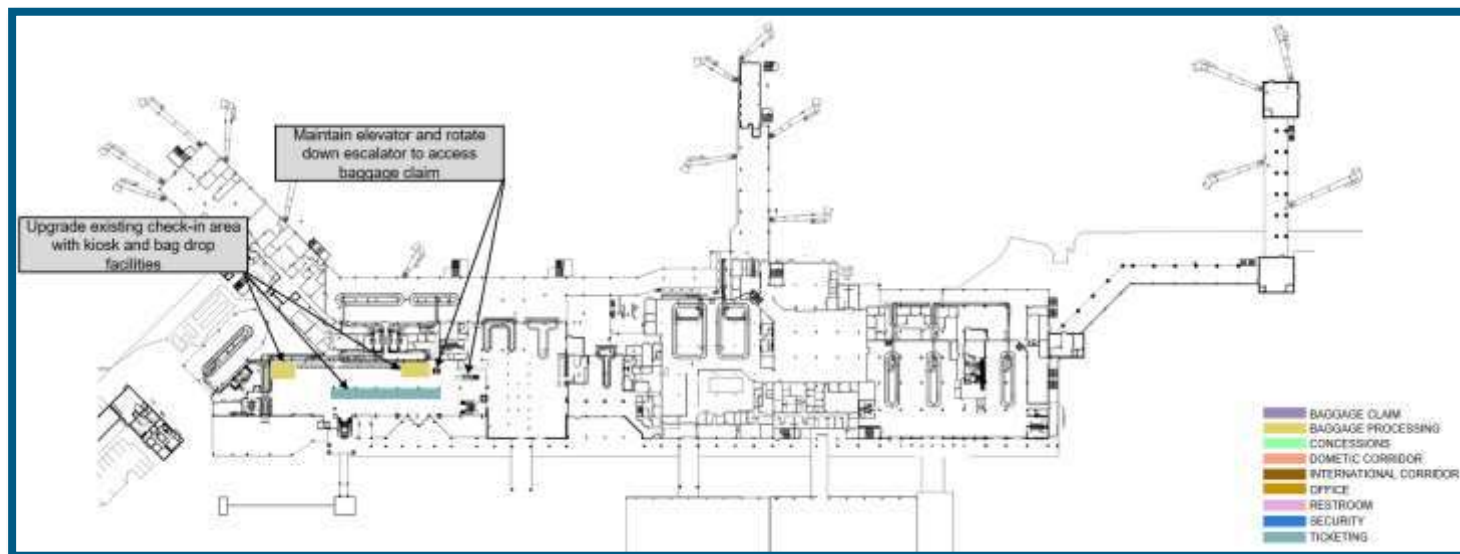
Source: Jacobsen | Daniels Analysis

Figure 5-14 - Terminal Services Development Alternative 1: Second Floor



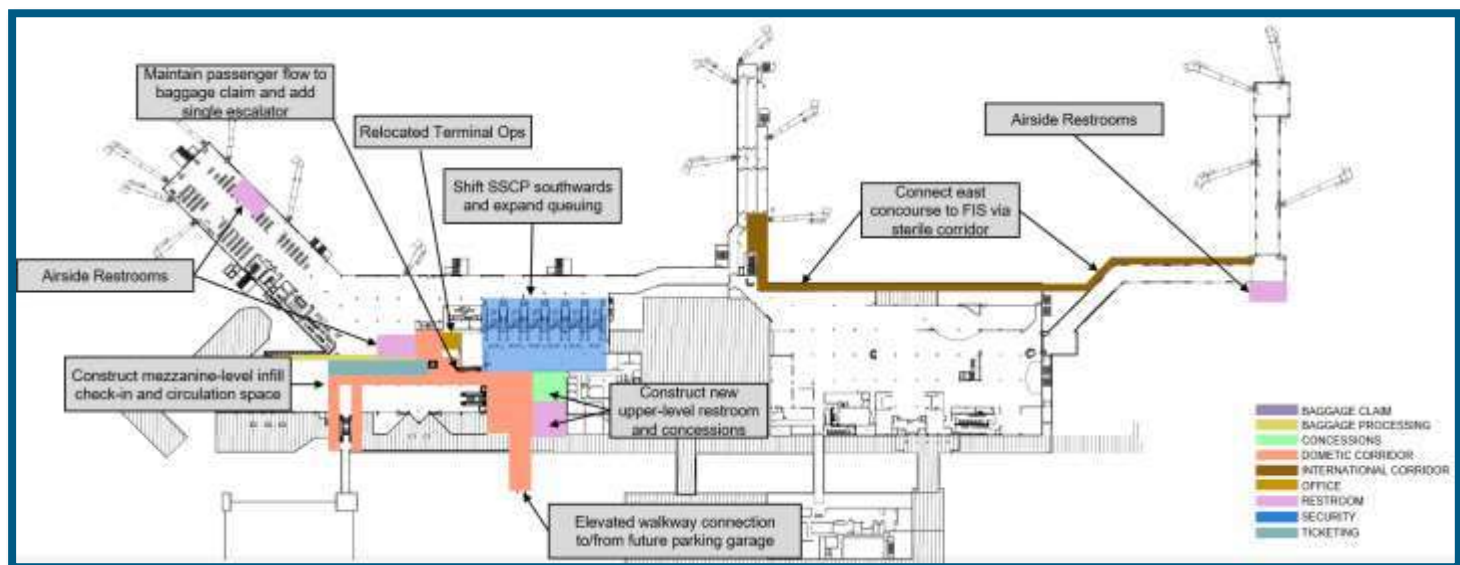
Source: Jacobsen | Daniels Analysis

Figure 5-15 - Terminal Services Development Alternative 2: First Floor



Source: Jacobsen | Daniels Analysis

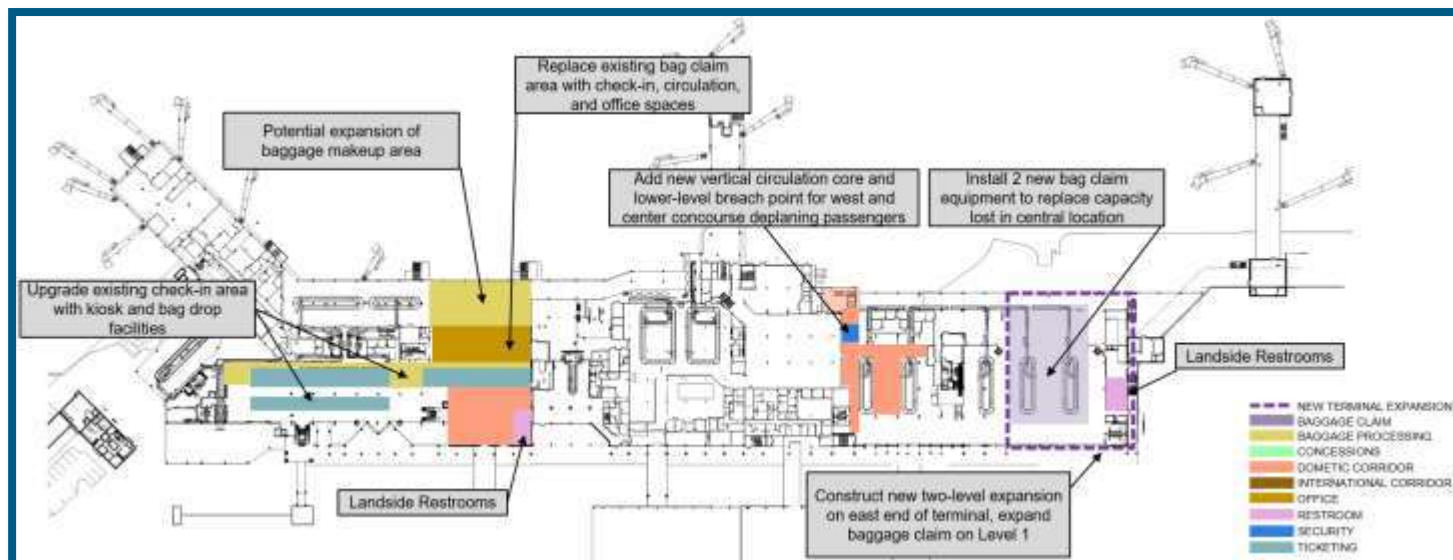
Figure 5-16 - Terminal Services Development Alternative 2: Second Floor



Source: Jacobsen | Daniels Analysis

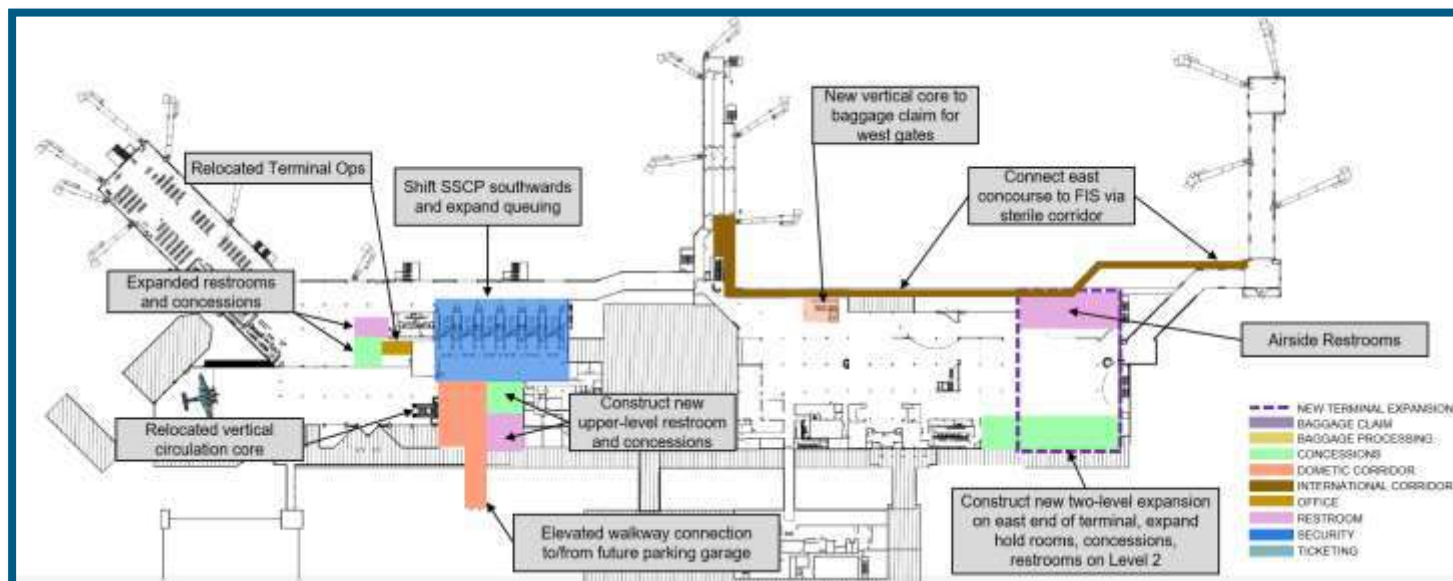
Figure 5-17 depicts the first-floor terminal services and **Figure 5-18** depicts the second-floor terminal services as presented on Development Alternative 3.

Figure 5-17 - Terminal Services Development Alternative 3: First Floor



Source: Jacobsen | Daniels Analysis

Figure 5-18 - Terminal Services Development Alternative 3: Second Floor



Source: Jacobsen | Daniels Analysis

5.3.5. Proposed General Aviation Modifications

The following subsections will outline the proposed general aviation (GA) facility expansions as presented on each development alternative. As discussed in the Demand Capacity and Facility Requirements chapter, aircraft storage hangars are recommended to be expanded throughout the planning period to accommodate anticipated increase of demand. The proposed expansions primarily focus on both conventional hangar and T-hangar development. It was found that the existing general aviation terminal is adequate to serve the projected demand throughout the planning period, therefore no proposed expansion was presented for this facility. Expansion of aircraft storage facilities were primarily consolidated in the direct vicinity of existing aircraft storage facilities. **Table 5-10** summarizes the proposed general aviation development within the three proposed development alternatives.

Table 5-10 - General Aviation Modifications Summary

Hangar Type	Development Alternative 1 (Figure 5-1)	Development Alternative 2 (Figure 5-2)	Development Alternative 3 (Figure 5-3)
Conventional Hangar	<ul style="list-style-type: none"> • (4) 9,600 Square Foot Facilities • (1) 35,000 Square Foot Facility • (1) 5,500 Square Foot Facility 	<ul style="list-style-type: none"> • (5) 6,300 Square Foot Facilities • (3) 9,600 Square Foot Facilities • (1) 5,500 Square Foot Facility 	<ul style="list-style-type: none"> • No Action
T-Hangar	<ul style="list-style-type: none"> • (4) 20-Unit Facilities • (1) 8-Unit Facility 	<ul style="list-style-type: none"> • (4) 20-Unit Facilities • (1) 10-Unit Facility 	<ul style="list-style-type: none"> • No Action

Source: Atkins Analysis

5.3.5.1. Conventional Hangar Development

As outlined in the previous chapter, the conventional hangar requirements result in a deficiency through PAL GA 4. Varying conventional hangar development configurations have been proposed to mitigate the forecasted deficiency. The three development alternatives have proposed differing expansions to allow for flexibility of aspects related to conventional hangar development such as site selection, hangar size, accessibility, and more.

Development Alternative 1 (Figure 5-1)

In Development Alternative 1, the primary concentration of proposed conventional hangar expansion is on the western portion of the Airport in the vicinity of existing aircraft storage facilities. Additionally, a conventional hangar is proposed in the direct vicinity of the South East Ramp.

A large conventional hangar is proposed directly south and aligned with the existing Million Air hangar to expand the FBO's capabilities. This conventional hangar is sized to approximately 35,000 square feet and includes increased landside parking. A minimal apron expansion will be required to connect the existing apron to the full airside length of the conventional hangar.

An expansive existing area of property west of the airside facilities on the apron area along Taxiway K and south of the apron area along Taxiway B is solely utilized for landside use. This is primarily due to existing airside infrastructure outlining this area, effectively hampering any further airside expansion into the specified landside area. To convert a portion of this landside property into airside accessible property, it is proposed to develop a north-south TDG 2 taxilane situated between two existing conventional hangars on the apron south of Taxiway B. This taxilane is proposed to be aligned with the existing taxiway to apron connector onto Taxiway B and cross existing E 26th Place, disconnecting the roadway. With airside access established south of existing E 26th Place, it is proposed to develop four 9,600 square-foot conventional hangars along Carrier Avenue. These four conventional hangars would be supported by adequate landside access and parking off of Carrier Avenue for each proposed facility.

A 5,500 square-foot conventional hangar is proposed directly east of the existing South East Ramp, aligned with the existing northeast row of conventional hangars in the specified GA complex. This conventional hangar is provided with an apron expansion and adequate landside access and parking.

In total, proposed conventional hangar development as proposed in Development Alternative 1 equals approximately 78,900 square feet. This total exceeds the projected PAL GA 4 hangar requirement square footage by approximately 24,100 square feet.

Development Alternative 2 (Figure 5-2)

In Development Alternative 2, the primary concentration of proposed conventional hangar expansion is in the direct vicinity of the existing South East Ramp complex.

Similar to Development Alternative 1, it is proposed to construct a standalone 5,500 square-foot conventional hangar directly aligned with the existing three conventional hangars on the northeast portion of the GA complex. Conserving the layout of the existing complex, it is proposed to expand conventional hangar development into the vacant area located directly south of the existing hangar infrastructure. The vacant land, cornered with Skyway Drive and Marquette Avenue, allows for readily developable property to accommodate the future conventional hangar requirements. It is proposed to mirror three 9,600 square-foot conventional hangars directly south of the existing three conventional hangars on the southern portion of the South East Ramp. These three proposed 9,600 square-foot hangars are proposed to be connected to the existing apron area with a partial southward expansion of the existing pavement area. To allow for diversification of aircraft types stored in conventional hangars, and to provide a lower financial barrier for conventional hangar storage, it is proposed to develop five 6,300 square-foot conventional hangars south of the proposed three 9,600 square-foot conventional hangars. These hangars will have landside access provided via Skyway Drive and an east-west roadway expansion. Landside parking will be accommodated at each proposed hangar individually. The east-west roadway expansion is proposed to be extended past the AOA fence into the proposed taxilane system expansion.

In total, proposed conventional hangar development as proposed in Development Alternative 2 equals approximately 65,800 square feet. This total exceeds the projected PAL GA 4 hangar requirement square footage by approximately 11,000 square feet.

Development Alternative 3 (Figure 5-3)

Development Alternative 3 was utilized as a no-action alternative to further evaluate the costs and other potential impacts from the discussed conventional hangar expansions. No conventional hangar development is proposed on this development alternative.

5.3.5.2. T-Hangar Development

As outlined in the previous chapter, the analyzed T-hangar requirements result in a deficiency through PAL GA 4. Varying T-hangar development configurations have been proposed to mitigate such deficiency. The three development alternatives have proposed differing expansions to allow for flexibility of aspects related to T-hangar development such as site selection, unit per facility, accessibility, and more.

Development Alternative 1 (Figure 5-1)

T-hangar development proposed in Development Alternative 1 is entirely concentrated within the existing South East Ramp complex. The vacant land south of the complex, situated along Skyway Drive and Marquette Avenue, is considered as prime developable land for aeronautical expansion. It is proposed to expand the T-hangar facilities into this vacant land, with four 20-unit T-hangar facilities and one 8-unit T-hangar facility. These facilities will be airside accessible via the existing taxilane system with necessary taxilane development being proposed around the five proposed T-hangar facilities. Landside access will be provided via the proposed east-west roadway expansion off of Skyway Drive.

In total, proposed T-hangar development as proposed in Development Alternative 1 equals 88 units. This total exceeds the projected PAL GA 4 T-hangar unit requirement by 1 unit.

Development Alternative 2 (Figure 5-2)

Similar to Development Alternative 1, Development Alternative 2 has the entirety of proposed T-hangar development concentrated on the vacant land directly south of the existing South East Ramp complex. It is proposed to expand the T-hangar facilities into this vacant land, with four 20-unit T-hangar facilities and one 10-unit box configuration hangar. Three 20-unit facilities are aligned with the existing T-hangars located in the South East Ramp, while the fourth 20-unit facility is proposed to be south of the proposed five 6,300 square-foot conventional hangars. The 10-unit box hangar facility is proposed to be directly north of Marquette Avenue and south of the three 20-unit T-hangars.

In total, proposed T-hangar development as proposed in Development Alternative 2 equals 80 T-hangar units with 10 box hangar units. Totaling the T-hangar units with the proposed box hangar units, this total exceeds the projected PAL GA 4 T-hangar unit requirement by 3 units.

Development Alternative 3 (Figure 5-3)

Development Alternative 3 was utilized as a no-action alternative to further evaluate the costs and other potential impacts from the discussed T-hangar expansions. No T-hangar development is proposed on this development alternative.

5.3.6. Proposed Ground Transportation and Landside Parking Modifications

As discussed in the Demand Capacity and Facility Requirements chapter, the existing landside roadway requirements and automobile parking infrastructure is anticipated to be deficient through the planning period. The measurement of maximum forecasted growth, also known as PAL 4, identifies that both Red Cleveland Boulevard and the landside parking facilities will be required to be expanded to accommodate the increased forecasted demand.

The following are objectives related to the landside ground transportation and parking alternatives:

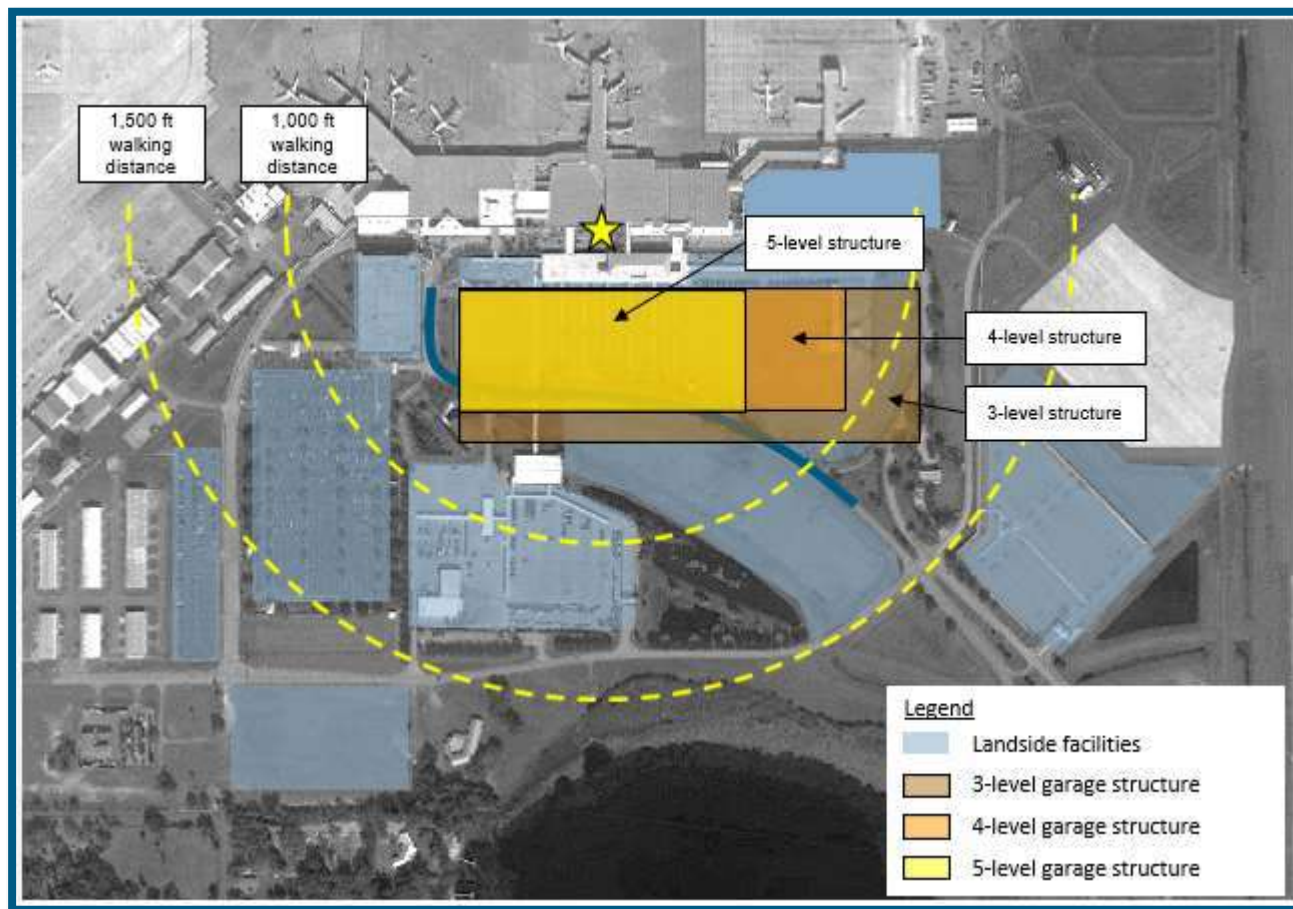
1. Focus development within walkable distance of passenger terminal.
2. Improve customer service by repurposing remote facilities, which require costly shuttle bus operations, where possible.
3. Consolidate similar facilities where possible for site efficiency.
4. Improve access and egress wayfinding in conjunction with roadway capacity improvements.
5. Balance capital investment in vertical structures with optimization of surface facilities on available landside parcels.

The proposed landside development has several considerations regarding both opportunities and constraints towards meeting the forecasted demand. Environmental factors such as wetland mitigation and floodplain mitigation were analyzed to ensure the least impact possible. It has been preliminarily determined that throughout the three development alternatives, no delineated wetlands would be impacted and minimal floodplain mitigation will be necessary. Customer service enhancements and parameters have been taken into consideration to optimize the passenger's overall experience while at the Airport. This is primarily accomplished through consolidation of parking operations into close proximity of the terminal, and reduce rental car traffic and consolidate Quick Turnaround (QTA) facilities related to rental car operations.

A proposed roadway reconfiguration within the terminal area could reshape the terminal core itself. Reducing traffic volume on the curbside roadway would improve loading and unloading operations. Creating a roadway access to the rental car facilities and other landside parking facilities could improve overall wayfinding.

Through the development alternatives analysis, it has been determined that at least one vertical structure is required to meet the forecasted demand. Potential vertical structures shown would maximize development within walkable distance of the passenger terminal building. Typical walking measurements of 1,000 to 1,500 feet are typically used to gauge walkability of airport landside facilities. Facilities further than 1,500 feet from the terminal building may require shuttle busing or should be used primarily as seasonal overflow areas. **Figure 5-19** depicts the landside walkability measurement as discussed.

Figure 5-19 - Landside Facility Walkability Measurement



Source: Jacobsen | Daniels Analysis

The following subsections outlines the proposed landside group transportation and parking facilities enhancements.

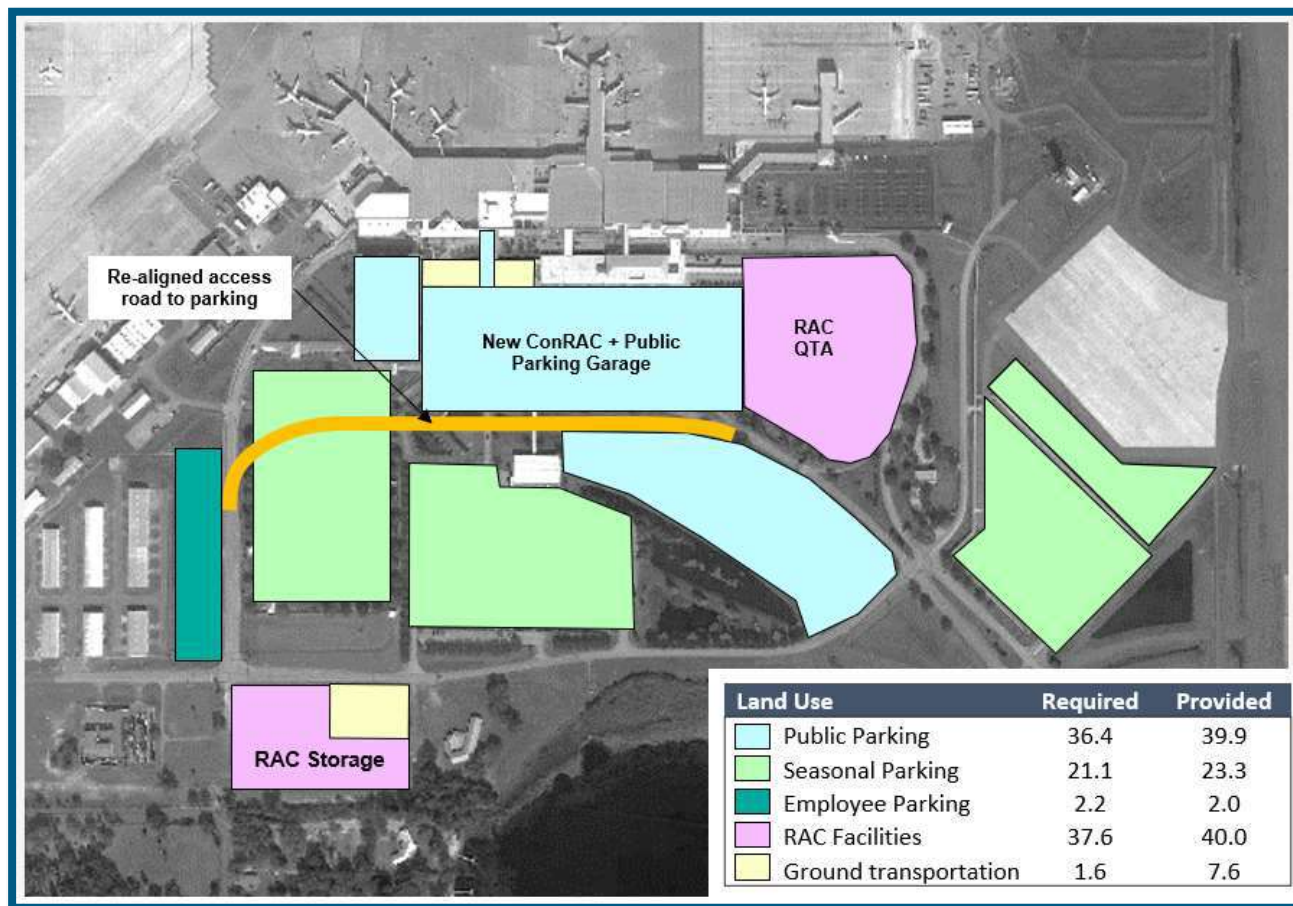
Development Alternative 1

Development Alternative 1 proposes to construct a new combined public parking and Rent-A-Car (RAC) ready/return garage to satisfy a portion of the public parking requirements along with a new RAC facility centralized near the terminal building. A RAC QTA area is proposed directly east of the proposed garage to ensure efficient operations for rental car companies. The repurposing of the southwestern landside terminal area as year-round RAC storage will ensure that rental car companies can continue to meet the forecasted demand. The repurposing of the existing economy parking, long-term parking, and Alamo rental car facilities as seasonal parking will ensure seasonal overflow capacity is accounted for. Additionally, the partial conversion of existing Seasonal Lot 1 to a commercial vehicle hold lot and supplemental cell phone lot allows for a centralized area for such storage. Employee parking is retained west of Airline Boulevard due to its determined optimal location.

As stated previously, a roadway reconfiguration would reduce traffic volume on the curbside roadway to the terminal. Therefore, it is proposed to adjust Red Cleveland Boulevard to provide a roadway bypass to the proposed parking facilities and back to Airline Boulevard.

Figure 5-20 depicts the proposed Development Alternative 1 landside roadway and parking facility modifications.

Figure 5-20 - Landside Development Alternative 1



Source: Jacobsen | Daniels Analysis

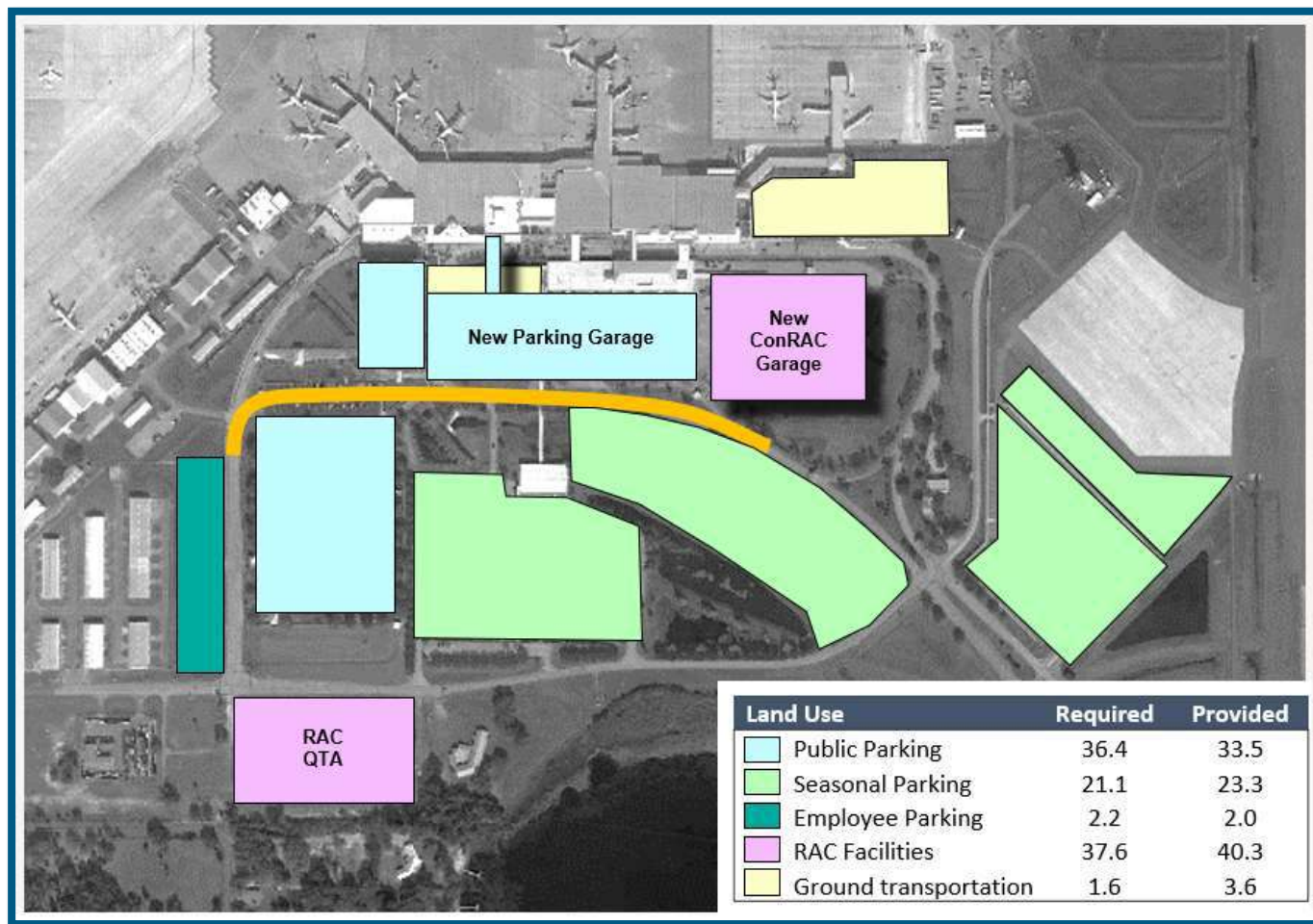
Development Alternative 2

Development Alternative 2 proposes to construct a new public parking garage and a new RAC QTA facility separately. This split of operation will allow for improved customer service through the clear delineation of use. Both proposed structures are optimized for favorable walkability to and from the terminal building. However, the overall capital costs of two separate structures can be considerable. The split garages allows for the proper phasing of such expansion, compared to Development Alternative 1 where the combined garage would be required to be constructed entirely at once. Additionally, the phasing of Development Alternative 2 can minimize the temporary construction impacts by constructing one facility at a time, in contrast to Development Alternative 1 where the proposed large facility footprint would require substantial temporary construction impacts. Existing public parking and employee parking is utilized to meet the forecasted demand. Additional seasonal parking areas are proposed at various locations around the terminal's landside area to accommodate forecasted peak operations. A RAC QTA area is proposed south of East Airport Boulevard.

Similar to Development Alternative 1, a proposed roadway enhancement of Red Cleveland Boulevard will allow for the diversion of traffic from the curbside roadway to minimize traffic. This roadway enhancement will connect with proposed and existing parking areas, then ultimately join into Airline Avenue.

Figure 5-21 depicts the proposed Development Alternative 2 landside roadway and parking facility modifications.

Figure 5-21 - Landside Development Alternative 2



Source: Jacobsen | Daniels Analysis

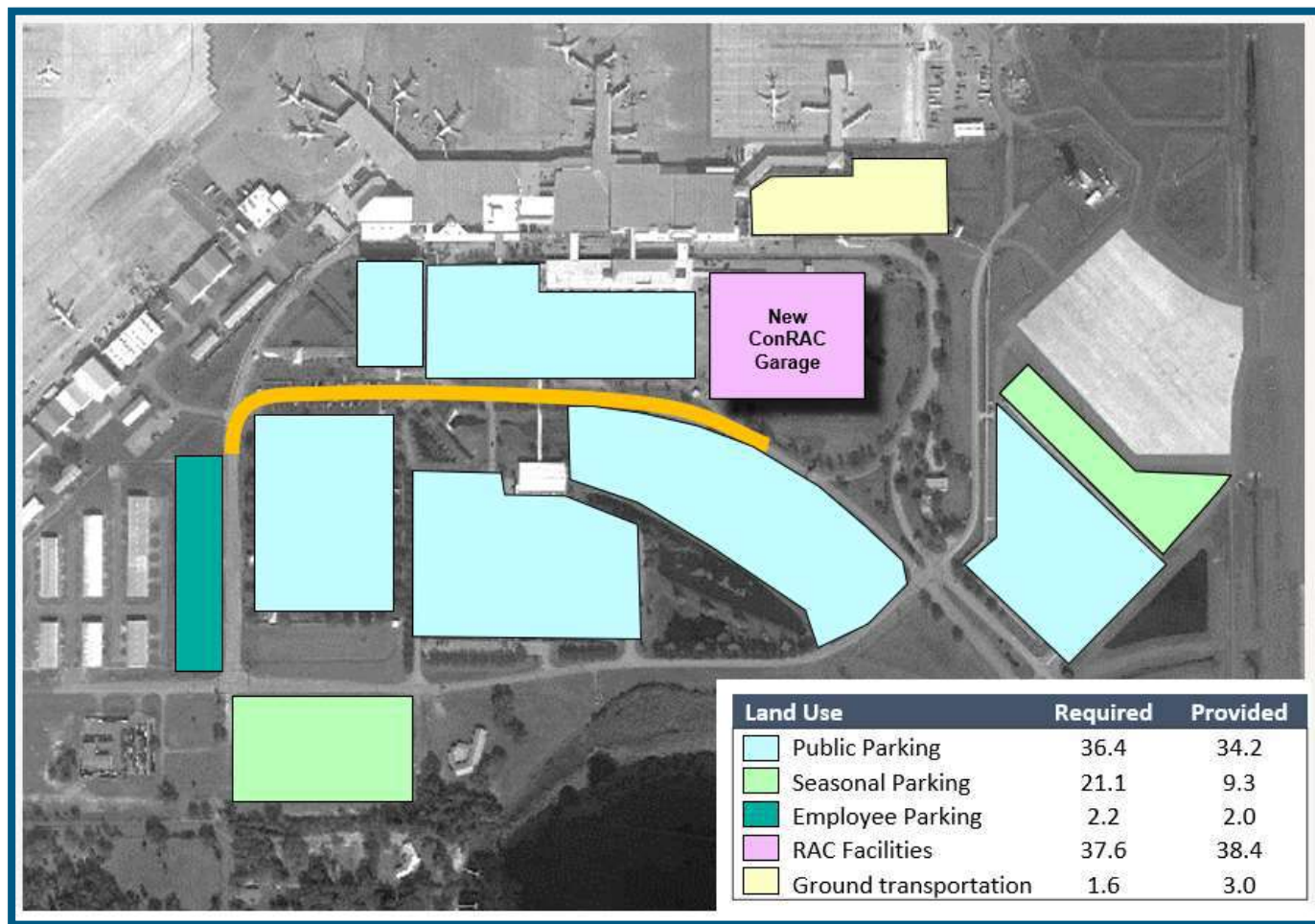
Development Alternative 3

Development Alternative 3 proposes the maximization of surface parking around the terminal landside area. This is realized through the conversion of all available landside parking facilities to year-round surface parking. A new RAC garage structure is proposed to facilitate the growing demand for rental car facilities through the planning period. A new RAC QTA is proposed on the site of the existing Seasonal Lot 1. However, with the optimization of the existing surface level parking, it can be seen that the walkability to and from the terminal is unfavorable due to the significant increase. Additionally, with the conversion of existing landside parking facilities into year-round public parking, the seasonal parking demand is partially met. This alternative would minimize capital costs, construction phasing, and construction impacts.

Similar to the previous two development alternatives, a proposed roadway enhancement of Red Cleveland Boulevard will allow for the diversion of traffic from the curbside roadway to minimize traffic. This roadway enhancement will connect with proposed and existing parking areas, then ultimately join into Airline Avenue.

Figure 5-22 depicts the proposed Development Alternative 3 landside roadway and parking facility modifications.

Figure 5-22 - Landside Development Alternative 3



Source: Jacobsen | Daniels Analysis

5.3.7. Proposed Support Facility Modifications

Support facilities ensure for the safe, efficient, and overall preservation of operations at the Airport. Due to proposed Airport modifications previously outlined and factors related to the specific support facilities in question, several facilities are proposed for relocation or expansion at the Airport. The following subsections outlines the proposed support facility modifications as presented on the three development alternatives. **Table 5-11** summarizes the support facility modifications presented on each development alternative.

Table 5-11 - Support Facility Modifications Summary

	Development Alternative 1	Development Alternative 2	Development Alternative 3
Air Traffic Control Tower ¹	<ul style="list-style-type: none"> East relocation 	<ul style="list-style-type: none"> East relocation 	<ul style="list-style-type: none"> No Action
Airport Maintenance Facility	<ul style="list-style-type: none"> Secondary maintenance complex: 1.75 acres 	<ul style="list-style-type: none"> Secondary maintenance complex: 1.20 acres 	<ul style="list-style-type: none"> Secondary maintenance complex: .85 acres
Compass Calibration Pad	<ul style="list-style-type: none"> Relocation off Taxiway B 	<ul style="list-style-type: none"> Relocation off Taxiway S 	<ul style="list-style-type: none"> No Action
Fuel Storage	<ul style="list-style-type: none"> Expand existing infrastructure site 	<ul style="list-style-type: none"> Expand existing infrastructure site 	<ul style="list-style-type: none"> No action

Notes: ¹Proposed in same location between development alternatives
Source: Atkins Analysis

5.3.7.1. Air Traffic Control Tower

As discussed in the Demand Capacity and Facility Requirements chapter, the existing air traffic control tower (ATCT), located directly east of the existing commercial terminal, does not meet all current FAA siting criteria. Therefore, the ATCT facility has been proposed to be relocated.

Development Alternatives 1 and 2 (Figures 5-1 and 5-2)

The proposed site for the relocated ATCT facility is retained from the previous Airport Layout Plan (ALP), which was originally approved in 2012. This proposed relocation site is located east of existing Runway 18/36, south of existing Taxiway C, and directly southwest of the existing ARFF station. Landside access would be available via East Lake Mary Boulevard, to Moores Station Road, to Beardall Avenue South, and then to Don Knight Lane. A minor roadway expansion off of Don Knight Lane would be required. Through preliminary analysis and revalidation of the site, it has been found that positive visual line of sight can be obtained to all existing and future airfield infrastructure along with other key areas on the Airport. Further detailed analysis is required for validation of the proposed relocation site and to properly design the facility for the needs of the airport environment.

Development Alternative 3 (Figure 5-3)

Development Alternative 3 was utilized as a no-action alternative to further evaluate the costs and other potential impacts from the discussed ATCT relocation. No ATCT relocation is proposed on this development alternative.

5.3.7.2. Airport Maintenance Facility

As discussed in the Demand Capacity and Facility Requirements chapter, the existing airport maintenance facility has exceeded its useful life. However, the existing facility is still functional and utilized by airport staff. While the existing facility is still utilized, the maintenance facility size has become insufficient. A secondary maintenance facility development area has been proposed on each development alternative. Each varying site is located east of existing Runway 18/36 to allow for a split maintenance operation and allow for the necessary staging of equipment on each half of the airport property.

Development Alternative 1 (Figure 5-1)

To mitigate the existing maintenance facility space deficiency, it is proposed to develop a secondary maintenance facility. This proposed development has been reserved on approximately 1.75 acres of airport property. This portion of property is located directly east of the northern portion of Beardall Avenue South. This development area is centralized to the eastern portion of the Airport and has been deemed feasible for non-aeronautical use.

Development Alternative 2 (Figure 5-2)

Development Alternative 2 proposes for a reserved area of approximately 1.20 acres of airport property. The proposed maintenance facility development area on Development Alternative 2 is located directly south of the

proposed ATCT relocation. This allows for a centralized siting and development of non-aeronautical facilities on the Airport to maximize viable aeronautical property use. Additionally, the centralized location allows for the quick deployment of maintenance equipment and the proper staging on the east side of the airport property.

Development Alternative 3 (Figure 5-3)

Development Alternative 3 proposed for a reserved area of approximately .85 acres of airport property, the least amount of space compared to the three development alternatives. This reserved development area is located east of the existing Runway 36 end and south of existing Taxiway S.

5.3.7.3. Airfield Compass Calibration Pad

As discussed in the Demand Capacity and Facility Requirements chapter, the existing compass calibration pad located on Taxiway P is non-standard and is recommended to be relocated to a standard location. This standard location, based on siting requirements within FAA AC 150/5300-13A, Appendix 6, ensures that the testing and calibration completed on the compass calibration pad is valid with no interference with surrounding electrical and/or other magnetic infrastructure.

Development Alternative 1 (Figure 5-1)

To ensure proper siting requirements are preserved while selecting property which otherwise would be not feasible for other aeronautical or non-aeronautical use, it was found that the area between existing Taxiway B and existing Taxiway C is viable to satisfy both requirements. The compass calibration pad has been designed to accommodate TDG 2 aircraft. This proposed location is centralized on the airfield and allows for ease of access from tenants around the Airport.

Development Alternative 2 (Figure 5-2)

Development Alternative 2 provides a proposed compass calibration pad south of existing Taxiway S, directly northwest of the existing storm pond west of the South East Ramp. The compass calibration pad has been designed to accommodate TDG 2 aircraft.

Development Alternative 3 (Figure 5-3)

Development Alternative 3 was utilized as a no-action alternative to further evaluate the costs and other potential impacts from the discussed compass calibration pad relocation. No compass calibration pad relocation is proposed on this development alternative.

5.3.7.4. Fuel Storage

As discussed in the Demand Capacity and Facility Requirements chapter, the existing fuel storage is anticipated to become deficient through the planning period. Specifically, the Jet A storage will be deficient between PAL 1 and PAL 2 service levels. Existing AvGas storage is anticipated to be sufficient through the planning period. PAL 4 service levels have found that the existing Jet A storage will be deficient by 142,536 gallons.

Development Alternatives 1 and 2 (Figures 5-1 and 5-2)

It is proposed to expand the existing fuel storage facilities to 150,000 gallons of additional capacity. The area between East 29th Street, East 30th Street, and Carrier Ave has been identified as primarily developable land for fuel storage expansion. Therefore, this area should remain reserved for non-aeronautical use to ensure proposed preservation for future fuel storage infrastructure.

Development Alternative 3 (Figure 5-3)

Development Alternative 3 was utilized as a no-action alternative to further evaluate the costs and other potential impacts related to proposed fuel storage expansions. No fuel storage expansion is proposed on this development alternative.

5.3.8. Proposed Ancillary Modifications

Ancillary modifications such as future property acquisition and storm pond expansion allows for the strategic future growth of the Airport through proper planning and the development of ancillary infrastructure. These items ensure that the Airport is planning for the future through land use analysis to reserve areas essential for this future growth. The following subsections outlines the proposed ancillary modifications presented in the three development alternatives. **Table 5-12** summarizes the ancillary modifications presented on each development alternative.

Table 5-12 - Ancillary Modifications Summary

	Development Alternative 1	Development Alternative 2	Development Alternative 3
Future Property Acquisition	<ul style="list-style-type: none"> Required (RPZ): 39.67 acres Airport expansion: 186.23 acres Total: 225.90 acres 	<ul style="list-style-type: none"> Required (Airfield Development, RSA, ROFA. RPZ): 45.11 acres Airport expansion: 186.23 acres Total: 225.90 acres 	<ul style="list-style-type: none"> Required (RPZ): 9.84 acres Airport expansion: 186.23 acres Total: 196.07 acres
Storm Pond Expansion	<ul style="list-style-type: none"> Approximate 13-acre expansion 	<ul style="list-style-type: none"> Approximate 13-acre expansion 	<ul style="list-style-type: none"> Approximate 13-acre expansion
Solar Farm Development	<ul style="list-style-type: none"> 15.61 acres 	<ul style="list-style-type: none"> 39.34 acres 	<ul style="list-style-type: none"> No action
Rail Access Expansion	<ul style="list-style-type: none"> Northwest expansion into airport property 	<ul style="list-style-type: none"> Northwest expansion into airport property 	<ul style="list-style-type: none"> No action
Future Aeronautical Development Area	<ul style="list-style-type: none"> 460.11 total acres 	<ul style="list-style-type: none"> 431.40 total acres 	<ul style="list-style-type: none"> 587.51 total acres
Future Non-Aeronautical Development Area	<ul style="list-style-type: none"> 165.87 total acres 	<ul style="list-style-type: none"> 130.85 total acres 	<ul style="list-style-type: none"> 189.53 total acres

Source: Atkins Analysis

5.3.8.1. Future Property Acquisition

Planning future property acquisition not only ensures that an airport analyzes the proposed purchase, but the intention for the further growth of airport property to solicit both additional aeronautical and non-aeronautical expansions. Planning for future property acquisition within the master planning effort is key to ensure the preservation of this intention and to begin the documenting phase towards acquisition. Additionally, some future property acquisition may be required to comply with FAA guidance regarding land use surrounding the airport environment. The following subsections outlines the areas and quantity of proposed future property acquisition as presented in the three development alternatives.

Development Alternative 1 (Figure 5-1)

It is required to show the intention of property acquisition for non-airport property that is encompassed by existing and future RPZs. There are currently three areas of proposed future property acquisition to ensure the Airport owns the full property encompassed by the RPZs. An existing portion of the north side of the Runway 27R Approach RPZ is depicted for future property acquisition. This area equates to 9.84 acres. With the proposed upgrades to Runway 9R/27L, the future RPZs associated with this runway encompass portions of non-airport property. The first area is 25.97 acres of non-airport property that falls with the majority of the southwest portion of the Runway 9R approach RPZ. The second area is 3.86 acres of future Runway 27L approach RPZ, on the east side of East Lake Mary Boulevard. This area is owned by the St. Johns Water Management District, and the Airport maintains an

existing aviation easement for the entire portion of this property. As such, permanent RPZ compliance and land use may be maintained by that easement.

Additional future property acquisition depicted on Development Alternative 1 is primarily to promote the growth of the Airport through expanding the available developable land for both aeronautical and non-aeronautical use, as well as preventing non-compatible land uses from being developed near the Airport. The primary area for this secondary future property acquisition is located on the east side of the airport, encompassing the existing non-airport property between the property line and running long the west side of East Lake Mary Boulevard excluding the existing industrial area between Cameron Avenue and East Lake Mary Boulevard. This area equates to 186.23 acres. In summary, Development Alternative 1's total future property acquisition equals to 225.90 acres.

Development Alternative 2 (Figure 5-2)

Similar to Development Alternative 1, future property acquisition is proposed for a portion of existing non-airport property that is encompassed within the existing approach RPZ for Runway 27R. This area equals 9.84 acres. Due to the proposed eastward shift and extension of Runway 9R/27L, a portion of property is proposed to be acquired totaling 35.27 acres. This proposed property acquisition may be substituted by an expansion of the Airport's aviation easement, and it is proposed to accommodate the relocated airfield infrastructure and its associated safety surfaces (RSA, ROFA, and RPZ). Additionally, the area previously described for airport expansion equaling 186.23 acres is presented on Development Alternative 2. In summary, Development Alternative 2's total future property acquisition equals 221.5 acres.

Development Alternative 3 (Figure 5-3)

Like Development Alternatives 1 and 2, future property acquisition is proposed for a portion of existing non-airport property that is encompassed within the existing approach RPZ for Runway 27R. This area equals 9.84 acres. Additionally, the area previously described for airport expansion equaling 186.23 acres is presented on Development Alternative 3. In summary, Development Alternative 3's total future property equals 196.07 acres.

5.3.8.2. Storm Pond Expansion

Proposed storm pond expansions are necessary for the enhancement of stormwater drainage capabilities. The following subsection outlines the proposed expansion of the existing stormwater pond location on the southeast portion of the Airport.

Development Alternatives 1, 2, and 3 (Figures 5-1, 5-2, and 5-3)

The proposed expansion of the existing storm pond west of the South East Ramp and north of Marquette Ave is necessary for the containment of stormwater and proper drainage capacity during rain-weather events. The proposed expansion totals approximately 13 acres of additional pond.

5.3.8.3. Solar Farm Development

To promote the growth of sustainability at the Airport and to offset energy dependence from local power grids, solar farm arrays are pinnacle to achieve both previously mentioned actions. Airport environments provide viable land available for solar farm infrastructure. This is primarily due to the typically clear and flat property that are located within airport properties. A specific siting analysis for the proposed solar farms at the Airport was completed to ensure that no glare impacts are caused to either aircraft operators or ATCT personnel. All proposed solar farm locations were validated to ensure that each site did not surpass the minimal impact threshold required for safe installation of a solar farm. Electrical yield and additional parameters associated with the proposed solar array infrastructure were not analyzed as part of this master plan process.

Development Alternative 1 (Figure 5-1)

In Development Alternative 1, the proposed location for the future solar farm is located on the southeast portion of the Airport west along East Lake Mary Boulevard and directly northeast of the Boombah Sports Complex. The proposed area equals 15.61 acres. Primary benefits of this location include the ease of landside access and the marketability of the solar array for community outreach.

Development Alternative 2 (Figure 5-2)

In Development Alternative 2, the proposed location for the future solar farm is located on the airport property south of Marquette Avenue and north of East Lake Mary Boulevard. The proposed area equals 39.34 acres. Primary benefits of this location include the ease of landside access via Sipes Avenue South and the primary land use restriction to non-aeronautical land use. This site is only viable with the proposed conversion of existing Runway 18/36 into a taxiway due to potential glare impacts to aircraft on approach to Runway 36.

Development Alternative 3 (Figure 5-3)

Development Alternative 3 was utilized as a no-action alternative to further evaluate the costs and other potential impacts from the discussed solar farm development. No solar farm development is proposed on this development alternative.

5.3.8.4. Rail Access Expansion

Rail access is essential to ensuring a multi-modal transportation environment. With access to the airport infrastructure, roadway infrastructure and railway infrastructure, cargo and other goods can be transferred from one mode of transportation to another with ease, cutting down on operational costs and overall increasing logistical efficiency. The following subsections outlines the proposed rail spur expansion at the Airport.

Development Alternatives 1 and 2 (Figures 5-1 and 5-2)

An existing rail spur runs along the west boundary of the existing airport property, with one piece of the rail spur turning into an industrial park located directly west of Mellonville Avenue. A similar rail spur expansion turning further into the airport property is proposed on the northwest portion of the Airport in the vicinity of Orange Avenue and Willow Avenue. This rail spur expansion would be supported with proposed future non-aeronautical development areas around the rail spur, with proposed future aeronautical development directly to the east.

Development Alternative 3 (Figure 5-3)

Development Alternative 3 was utilized as a no-action alternative to further evaluate the costs and other potential impacts from the discussed rail access expansion. No rail access expansion is proposed on this development alternative.

5.3.8.5. Future Aeronautical Development Areas

Future aeronautical development areas provide the land use planning of airport property that is not yet justified for aeronautical development per the Demand Capacity and Facility Requirements chapter. Additionally, it provides the Airport flexibility for development within the identified areas. Aeronautical development areas are typically located where there is airside access, providing the highest and best use of finite airside adjacent parcels. Several areas have been identified for future aeronautical development presented within the three development alternatives. The following subsections discuss the areas and their total acreage.

Development Alternative 1 (Figure 5-1)

Development Alternative 1 identifies 463.12 acres total for future aeronautical development. Primary areas include property between the proposed Taxiway A extension and East 25th Street, central/east portion of the airport property adjacent to the proposed 186.23 acres of future property acquisition, and south of Taxiway S where reclaimed land from the removal/conversion of Runway 18/36 could be developable. Other identified areas include expansions of existing aeronautical facilities onto adjacent land.

Development Alternative 2 (Figure 5-2)

Development Alternative 2 identifies 431.40 acres total for future aeronautical development areas. These identified areas are similar to Development Alternative 1 with adjustments regarding factors such as the proposed Runway 9R/27L eastward shift and extension, maintenance facility location and size, specific Avocet apron facility expansion, and Development Alternative 1 proposed conventional hangar complexes shown as future aeronautical development on Development Alternative 2.

Development Alternative 3 (Figure 5-3)

Development Alternative 3 identifies 587.51 acres total for future aeronautical development areas. In contrast to the first two development alternatives, Development Alternative 3 has been primarily utilized as a no-action alternative. The primary promotion of additional aeronautical developable land was gained with the proposed conversion of Runway 18/36 to a taxiway, effectively allowing for development off each runway end. Aeronautical development areas are still centralized south along East 25th Street, the central/east portion of the airport property around the proposed 186.23 acres of future property acquisition, and south of Taxiway S.

5.3.8.6. Future Non-Aeronautical Development Areas

Future non-aeronautical development areas provide the land use planning preservation of airport property for development not directly associated with aeronautical use. These properties typically do not need airside access and development can include industrial, commercial, and other infrastructure facilities. Several areas have been identified for future non-aeronautical development as presented on the three development alternatives. The following subsections discuss the areas and their total acreage.

Development Alternative 1 (Figure 5-1)

Development Alternative 1 identifies 167.90 acres total for future non-aeronautical development areas. Primary identified areas include existing airport property that has been deemed least viable for aeronautical associated development and more feasible for the types of development associated with non-aeronautical uses in airport environs. These non-aeronautical development areas include portions of airport property that are along or in direct vicinity major landside roadway infrastructure.

Development Alternative 2 (Figure 5-2)

Development Alternative 2 identifies 130.85 acres total for future non-aeronautical development areas. These identified areas are similar to Development Alternative 1 with adjustments regarding factors such as the proposed Runway 9R/27L eastward shift and extension, proposed solar farm location and size, and the reduction of some future aeronautical development areas.

Development Alternative 3 (Figure 5-3)

Development Alternative 3 identifies 189.53 acres total for future non-aeronautical development areas. These identified areas are similar to the first two development alternatives with minor adjustments. These minor adjustments are associated with the no-action alternative for Runway 18/36 and the land that is not reclaimed for future development. Additionally, with the no-action alternative for Runway 9R/27L, the land beyond Runway 27L is left open for development due to the preservation of the smaller existing RPZ.

5.4. Airport Development Alternative Financial Cost

PLACEHOLDER FOR ROM COSTS (AVCON) – IN PRODUCTION

5.5. Alternatives Evaluation Criteria

Alternatives' evaluation followed the criteria provided in the FAA's AC 150/5070-6B, *Airport Master Plan* which include the following:

- Operational Performance.
- Best planning Tenets and Other Factors.
- Environmental Factors; and
- Fiscal Factors.

In addition, sustainability was included as an evaluation factor given the global focus on sustainable development in aviation. Sustainability initiatives include a focus on reducing environmental impacts, achieving economic benefits, and increasing integration with local communities.

5.5.1. Operational Performance

An airport's ability to function as a system can be evaluated based on several factors:

- **Capacity** – The ability to accommodate future demand as determined in the facility requirements.
- **Capability** – The ability to meet airport design standards and ensure a safe operating environment.
- **Operational Efficiency** – How well the alternatives work as a system to avoid delays, inefficiencies, airspace conditions, etc. This also considers the coexistence of existing and future users.

5.5.2. Best Planning Tenets and Other Factors

Several best planning tenets were selected to determine the most responsible and viable alternative within this AMP. These include:

- **Flexibility** to accommodate unforeseen change (e.g., increases or decreases in activity levels, changes to fleet mix, new users, etc.)
- **Technically feasible** (e.g., considers site constraints and other limitations)
- **Conformance** to the Airport's goals, industry best practices, applicable state and federal laws, guidelines, and standards, local, regional, and state transportation plans.

5.5.3. Environmental Factors

As discussed in the Environmental Overview Chapter, there are several environmental resources that may be impacted by proposed airport development. Please refer to the Environmental Overview chapter of this AMP which details the National Environmental Policy Act (NEPA) environmental categories associated with the Airport.

Following are the Airport's identified environmental criteria:

- Air Quality
- Biological Resources (Including Fish, Wildlife, and Plants)
- Hazardous Materials, Solid Waste, and Pollution Prevention
- Land Use
- Noise and Noise-Compatible Land Use
- Climate
- Department of Transportation Act, Section 4(f)
- Historical, Architectural, Archaeological, and Cultural Resources
- Visual Effects (Including Light Emissions)
- Water Resources (Including Wetlands, Floodplains, Surface Waters, Groundwater, and Wild and Scenic Rivers)

5.5.4. Fiscal Factors

This analysis considers impacts of an alternative in relation to the Airport's economic viability as well as surrounding community's. Furthermore, the analysis provides consideration of the estimated development costs associated with the various alternatives, along with prospective funding sources. Development cost estimates for the preferred alternative are provided in Chapter 7, Capital Improvement Plan. The following were assessed as a part of this analysis:

- **Development Costs** – Includes anticipated costs of development and potential alternative funding sources. Alternative funding sources include those other than the City, State, or FAA, such as private business owners and/or developers.
- **Job Creation** – The potential of each alternative to create employment and other economic development benefits for the Airport and immediate surrounding areas.
- **Financial Sustainability** – Anticipated opportunities for revenue generation through increased activity, new businesses, etc. to increase the Airport's ability to become more financially self-sufficient

5.5.5. Sustainability

The FAA is committed to making airports environmentally responsible with initiatives that affect facility operations, the aviation industry, and customers. Airports commonly follow the approach to sustainability codified by Airports Council International-North America (ACI-NA), known as 'EONS', which consider four key components when sustainability programs are designed and implemented:

- **Economic Viability**
- **Operational Efficiency**
- **Natural Resource Conservation**
- **Social Responsibility**

5.6. Alternatives Evaluation Summary

The evaluation criteria described above were applied to each alternative based on initial input from the Airport. Based on the overall assessment, each criterion was assigned a rating for comparison. The rating system is based on the Consumer Reports method.

Each alternative was evaluated independently. As a result of the evaluations summary, depicted in **Figure 5-23**, both Development Alternative 1 and Development Alternative 2 tied for the first ranking at nine total points, while Development Alternative 3 held the second ranking with negative two points. Both Development Alternatives 1 and 2 are similar with proposed airfield, airside, and landside development items, therefore they are scored similarly. Minor adjustments between taxiway configurations and landside modifications did not constitute a substantial enough change to dictate varying total points. Development Alternative 3, mainly seen as the no-action alternative for majority of the proposed airfield and airside development, was ranked the lowest due to the shortsighted outlook and planning to meet forecasted demand thought the planning period.

Figure 5-23 - Alternatives Evaluation Summary

Alternatives Evaluation Criteria Orlando Sanford International Airport			
● = +1 ◐ = 0 ○ = -1	Alt.1	Alt.2.	Alt.3.
Operational Performance			
Capacity	●	●	○
Capability	●	●	●
Operational Efficiency	●	●	○
Best Planning Tenets			
Flexibility	●	●	◐
Technically Feasible	●	●	●
Conforms to County's Goals	●	●	○
Environmental Factors			
Air Quality	○	○	◐
Biological Resources	◐	◐	◐
HazMat/Waste	◐	◐	◐
Land Use	●	●	○
Noise	●	●	◐
Climate	◐	◐	◐
DOT Section 4(f)	◐	◐	◐
Visual/Lighting Effects	○	○	◐
Water Resources	●	●	●
Fiscal Factors			
Development Costs	○	○	●
Job Creation	●	●	○
Financial Sustainability	●	●	◐
Sustainability			
Overall Support of Sustainability	●	●	○
Evaluation			
Score	9	9	-2
Summary			
Ranking	1 (Tie)	1 (Tie)	2
Key ● = +1 This symbol represents a positive impact, an improvement or benefit, a lower anticipated cost, a higher level of flexibility, or a lower impact to the environment. ◐ = 0 This symbol represents maintaining a similar level or benefit, an average cost, an average level of flexibility, or average potential environmental impact. ○ = -1 This symbol represents an improvement that is not anticipated to meet the need, a higher cost, limited flexibility, and higher than normal environmental impacts.			

5.7. Preferred Development Alternative

The following section summarizes the preferred development alternatives based on the alternatives' evaluation presented in previous sections of this chapter. **Figure 5-24** presents the preferred development alternative and is based on the alternative with the highest evaluation score, while elements from the other alternatives may have been integrated into the preferred alternative to achieve the Airport's vision. **Figure 5-25** presents the preferred landside development alternative. Due to both Development Alternative 1 and Development Alternative 2 scoring similar within the alternatives evaluation matrix, elements from both alternatives have been integrated into the preferred alternative to optimize the airfield, airside, and landside development.

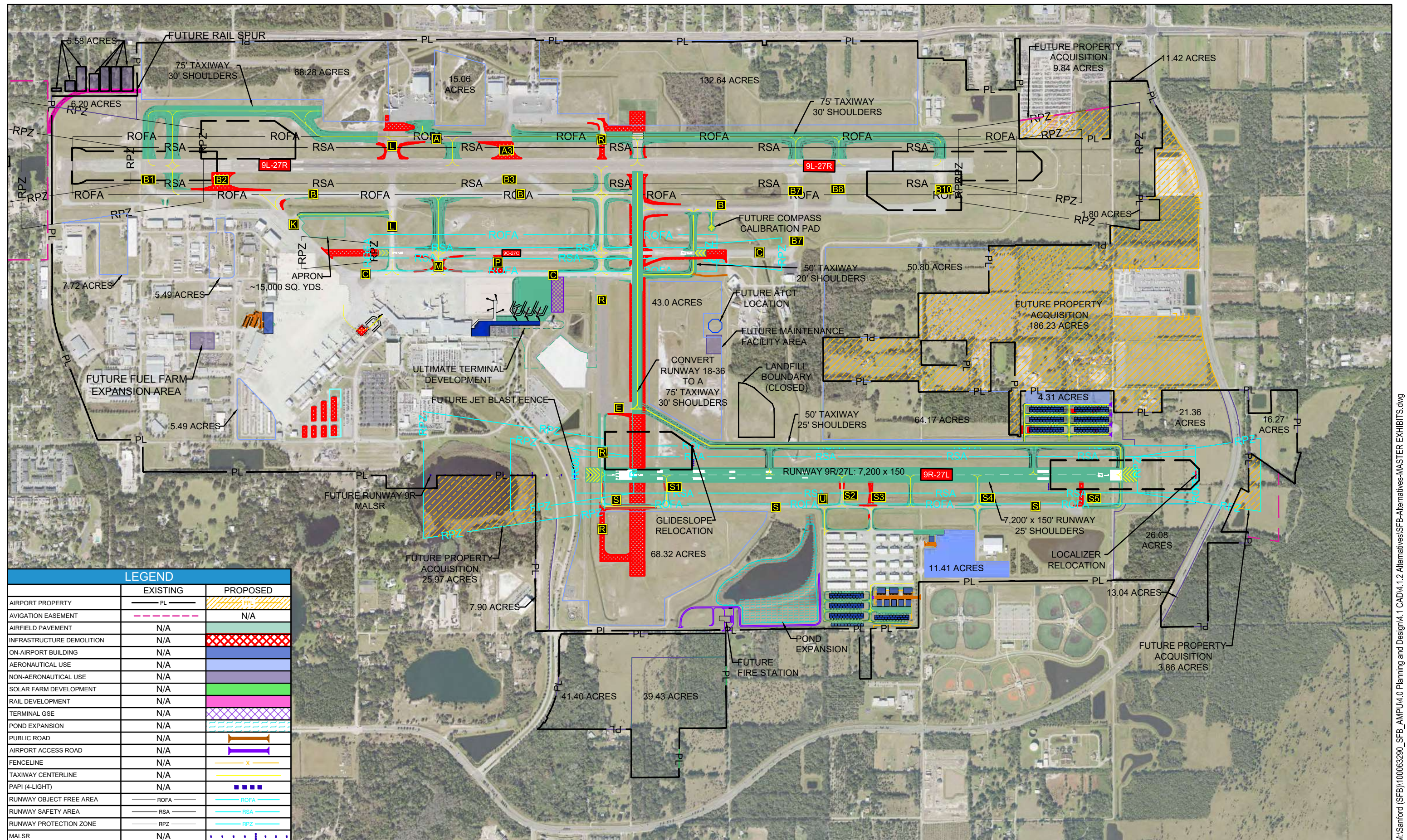
5.7.1. Preferred Runway Modifications

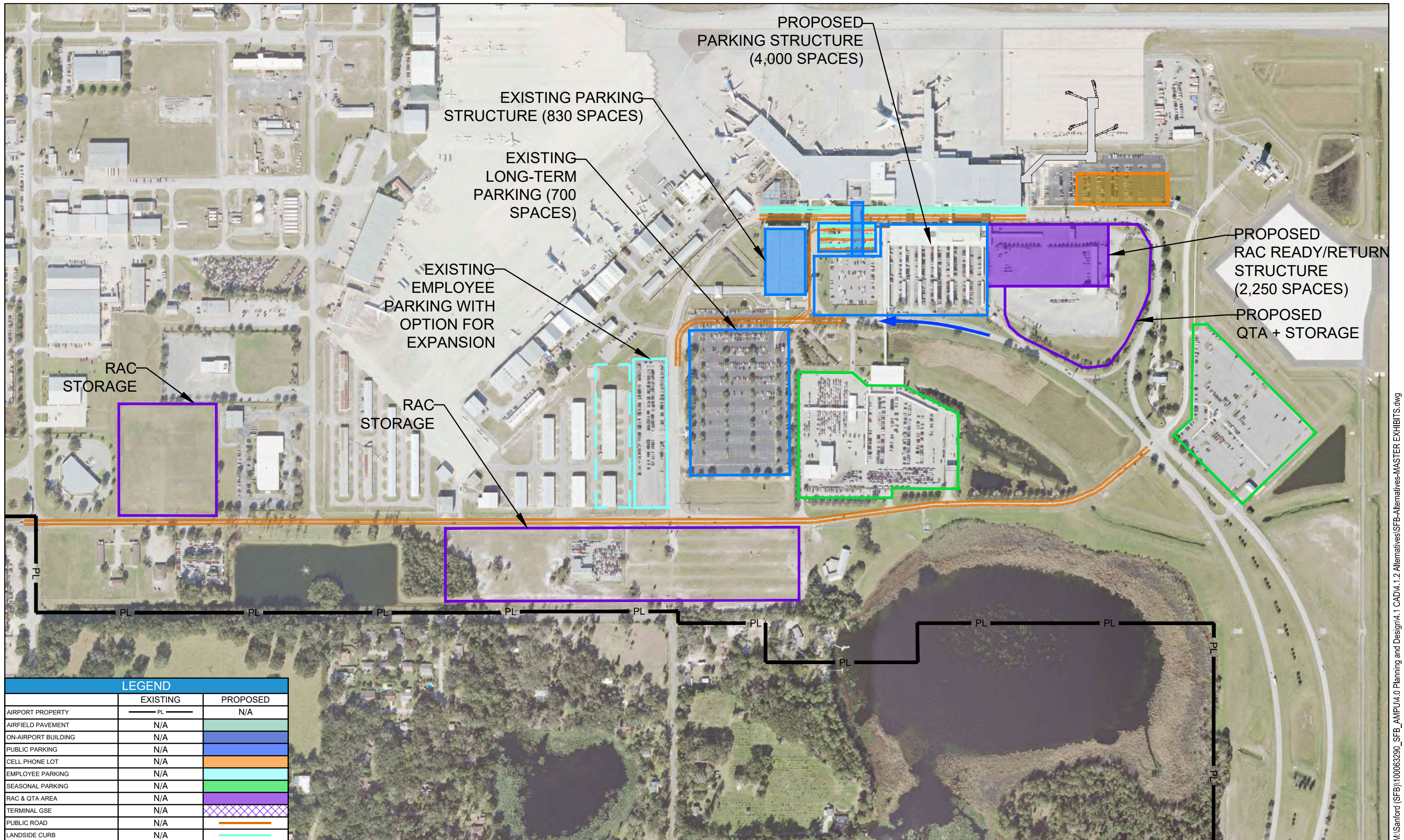
Table 5-13 summarizes the selected preferred runway modifications. Preferred runway modifications were taken from both Development Alternatives 1 and 2.

Table 5-13 - Preferred Runway Modifications Summary

Runway	Preferred Development Alternative
Runway 9R/27L	Split extension to a total length of 7,200 feet
Runway 18/36	Conversion to TDG 5, ADG V taxiway and partial removal
Runway 9C/27C	Runway 27C end eastward relocation/expansion by 643 feet
Runway 9L/27R	No action

Source: Atkins Analysis





5.7.2. Preferred Taxiway Modifications

Table 5-14 summarizes the selected preferred taxiway modifications. Preferred taxiway modifications were taken from both Development Alternative 1 and Development Alternative 2.

Table 5-14 - Preferred Taxiway Modifications Summary

Taxiway	Preferred Development Alternative
Taxiway A	<ul style="list-style-type: none"> Taxiway A3 relocation by approximately 750 feet west Full north parallel taxiway to Runway 9L/27R Entrance taxiway and bypass connector on the 9L approach end
Taxiway B	<ul style="list-style-type: none"> Taxiway B2 relocation by approximately 700 feet west Taxiway B apron connector enhancement
Taxiway C	<ul style="list-style-type: none"> East taxiway extension to relocated Runway 27C approach end, additional runway end connector to Taxiway B, and aligned taxiway removal up to proposed Runway 27C approach end
Taxiway E	<ul style="list-style-type: none"> No action
Taxiway K	<ul style="list-style-type: none"> Taxiway K1 relocation
Taxiway L	<ul style="list-style-type: none"> No action
Taxiway M	<ul style="list-style-type: none"> Extension across Runway 9C/27C connecting to Taxiway B Fillet enhancement
Taxiway P	<ul style="list-style-type: none"> Taxiway removal
Taxiway R	<ul style="list-style-type: none"> Removal south of Taxiway S intersection Removal north of Runway 9L/27R
Taxiway S	<ul style="list-style-type: none"> Taxiway S1, S2, and S4 fillet enhancement Taxiways S3 and S5 relocations
Taxiway U	<ul style="list-style-type: none"> Fillet enhancement
Runway 18/36	<ul style="list-style-type: none"> Convert Runway 18/36 to a TDG 5 Taxiway Q
Future Taxiway D	<ul style="list-style-type: none"> New full parallel TDG 3 Taxiway D north of Runway 9R/27L and exit taxiways D1 and D2

Source: Atkins Analysis

5.7.3. Preferred Apron Modifications

Table 5-15 summarizes the selected preferred apron modifications. Preferred apron expansion was taken from both Development Alternatives 1 and 2.

Table 5-15 - Proposed Apron Modifications Summary

Proposed Development Alternative
<ul style="list-style-type: none"> ~15,000 square yard apron area connected to the south of Taxiway K1 relocation Increased itinerant apron area associated with proposed conventional hangar development south of Million Air facilities

5.7.4. Preferred Commercial Service Terminal Modifications

Table 5-16 summarizes the selected preferred commercial gate and associated terminal expansion. Preferred commercial gate and associated terminal expansion was taken from Development Alternative 1.

Table 5-16 – Preferred Commercial Terminal Gate Modifications

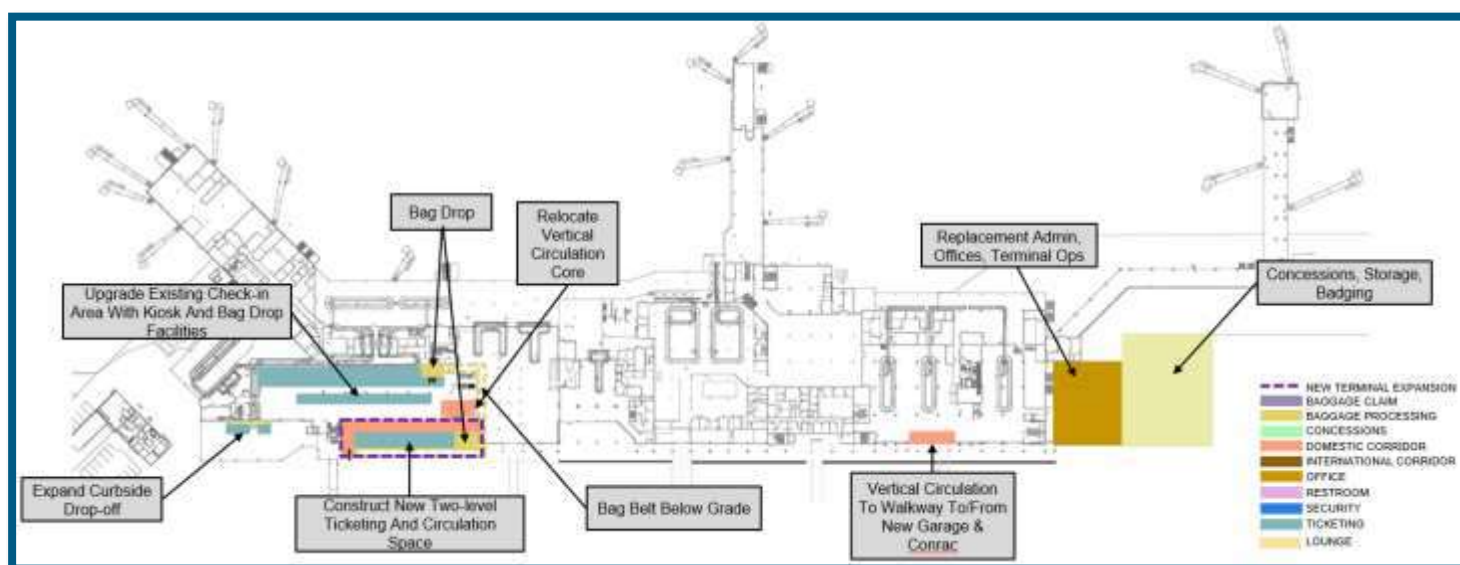
Commercial Service Aspect	Preferred Development Alternative
Airside Gate Expansion & Associated Terminal Expansion	<ul style="list-style-type: none"> Three (3) new gates capable of supporting ADG III to ADG V aircraft <ul style="list-style-type: none"> 61,400 square-foot east terminal expansion 37,447 square yard apron expansion Enhance existing Gate 16 to accommodate ADG III aircraft <ul style="list-style-type: none"> 12,600 square-foot west terminal expansion Relocation of existing flight kitchen facility

Source: Jacobsen | Daniels Analysis

Figure 5-26 and **Figure 5-27** depict the preferred terminal services modifications first floor and second floor configurations, respectively. The preferred terminal services modifications is a refined version taken from Development Alternative 1. Primary adjustments between Development Alternative 1 and the Preferred Development Alternative is the replacement of displaced administration offices and terminal operations offices to the east portion of the terminal. Additionally, concession, storage, and badging support areas are proposed to be expanded to the east of the proposed administration buildings. Within the primary check-in area on the first-floor terminal, it is proposed to further expand the kiosk and bag drop facilities compared to Development Alternative 1. Expanded curbside drop-off points will allow for enhanced passenger satisfaction and efficient throughput.

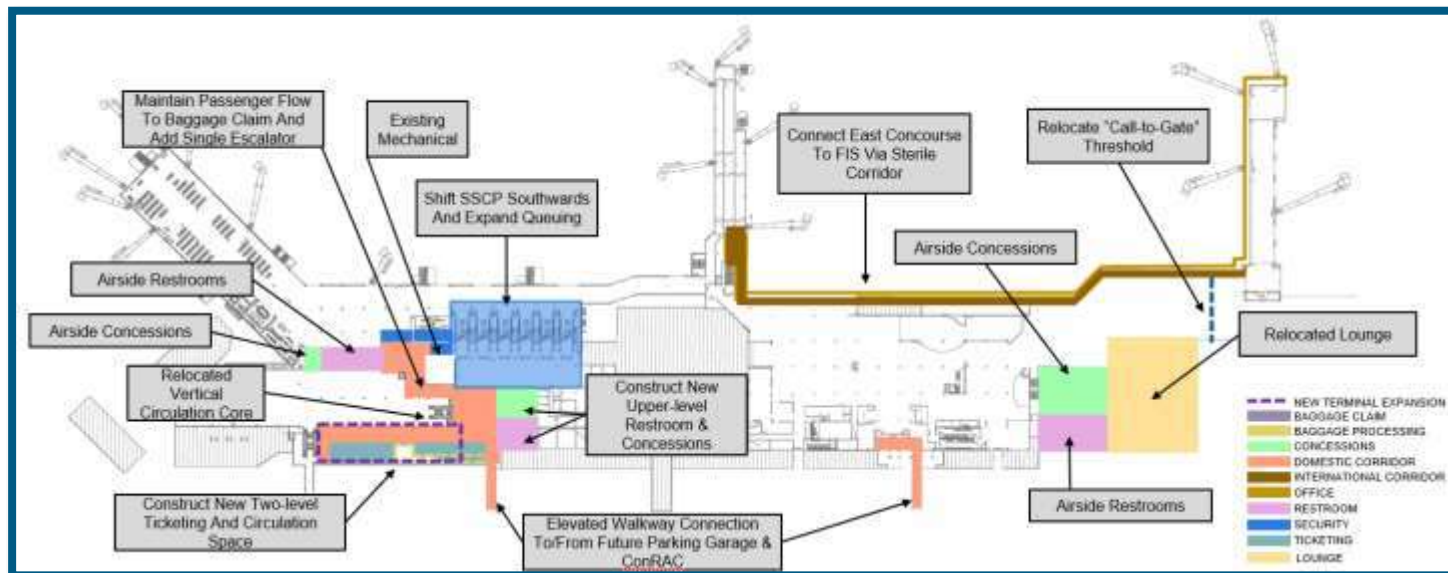
For preferred terminal services modifications on the second floor, it is proposed to have a secondary walkway on the eastern portion of the terminal connecting to the future parking garage. This walkway is in addition to the proposed elevated walkway that is proposed on Development Alternative 1 which ties into the check in area of the terminal. Above the proposed replacement administration offices, concessions, storage, and badging area, it is proposed on the second floor to provide a relocated airside lounge area, airside restrooms, and airside concessions. The proposed sterile corridor to the east concourse has been preserved within the preferred alternative.

Figure 5-26 - Preferred Terminal Services Modifications - First Floor



Source: Jacobsen | Daniels Analysis

Figure 5-27 - Preferred Terminal Services Modifications - Second Floor



Source: Jacobsen | Daniels Analysis

5.7.5. Preferred General Aviation Modifications

Table 5-17 summarizes the selected preferred general aviation modifications. Preferred general aviation expansion was taken from both Development Alternatives 1 and 2.

Table 5-17 - Preferred General Aviation Modifications Summary

Hangar Type	Preferred Development Alternative
Conventional Hangar	<ul style="list-style-type: none"> • (5) 6,300 Square Feet Facilities • (3) 9,600 Square Feet Facilities • (1) 35,000 Square Feet Facility • (1) 5,500 Square Feet Facility
T-Hangar	<ul style="list-style-type: none"> • (4) 20-Unit Facilities • (1) 10-Unit Facility

Source: Atkins Analysis

5.7.6. Preferred Ground Transportation and Landside Parking Modifications

The preferred landside alternative is derived from a refinement of Development Alternative 2. Primary adjustments includes revisions to the proposed five level parking structure and four level RAC storage structure. A RAC QTA and storage surface lot of 5.4 acres is proposed to encompass the east and south side of the proposed RAC storage structure to meet forecasted demand. The proposed five level parking structure has the capacity to hold approximately 4,000 spaces. Area to the northwest section of the proposed parking structure has been reserved and planned for taxi and commercial transportation areas. This area is proposed to have three curb and queue lanes for passenger pick up. Necessary parking expansion option has been proposed directly west of the existing employee parking lot in the event that additional parking is required.

5.7.7. Preferred Support Facility Modifications

Table 5-18 summarizes the selected preferred support facility modifications. Preferred support facility modifications were taken from both Development Alternatives 1 and 2.

Table 5-18 - Preferred Support Facility Modifications Summary

	Preferred Development Alternative
Air Traffic Control Tower	<ul style="list-style-type: none"> • East relocation
Airport Maintenance Facility	<ul style="list-style-type: none"> • Secondary maintenance complex: 1.20 acres • South to proposed ATCT
Compass Calibration Pad	<ul style="list-style-type: none"> • Relocation off Taxiway B
Fuel Storage	<ul style="list-style-type: none"> • Expand existing infrastructure site

Source: Atkins Analysis

5.7.8. Preferred Ancillary Modifications

Table 5-19 summarizes the selected preferred ancillary modifications. Preferred ancillary modifications were taken from both Development Alternatives 1 and 2.

Table 5-19 - Preferred Ancillary Modifications Summary

	Preferred Development Alternative
Future Property Acquisition	<ul style="list-style-type: none"> • Required (RPZ): 39.67 acres • Airport expansion: 186.23 acres • Total: 225.90 acres
Storm Pond Expansion	<ul style="list-style-type: none"> • Approximate 13-acre expansion
Solar Farm Development	<ul style="list-style-type: none"> • 39.34 acres • South of Marquette Avenue
Rail Access Expansion	<ul style="list-style-type: none"> • Northwest expansion into airport property
Future Aeronautical Development Area	<ul style="list-style-type: none"> • 465.79 total acres
Future Non-Aeronautical Development Area	<ul style="list-style-type: none"> • 167.90 total acres

Source: Atkins Analysis

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