

CHAPTER FIVE

Airport Alternatives and Recommended Development

Chapter Overview

The airport alternatives developed as part of this chapter were based upon facility needs and deficits identified in **Chapter 4, Facility Requirements**, as well as concerns and opportunities identified by the Sponsor. During project initiation, the several elements were identified for further evaluation and long-term impacts. These included changes to FAA design, funding, sustainability and operational mandates, including FAA Modernization and Reform Act of 2012 new guidelines, Florida Department of Transportation (FDOT) airport operational, environmental, zoning and land use guidance, as well as the City's need to identify and quantify airport development that coincides with planned regional growth including planned road connectivity. Further, in coordination with this Master Plan Update, an environmental study is being performed to address the on-airport property currently shown as conservation on the Airport Layout Plan. Since airport property is to be used to support aviation activity, the need for this area and its impacts on airport development were considered. The findings and recommendations of the Airport Environmental Study are included in this chapter as well as the remaining chapters of this report and identified on the ALP. Ultimately, the findings and recommendations will be incorporated into the City's Comprehensive Plan and may be used as the baseline for any additionally required environmental analyses.

Using the forecasts and facility requirements as the baseline for proposed development, several airfield, terminal and landside development options were considered. The depth of analysis depended upon the viability of the alternative in relation to short and long-term needs and vision for the airport. **Table 5-1** summarizes long term demand and anticipated facility needs.

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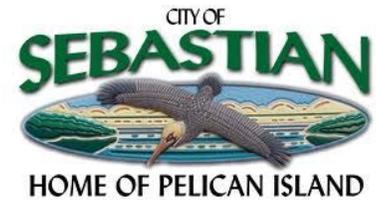


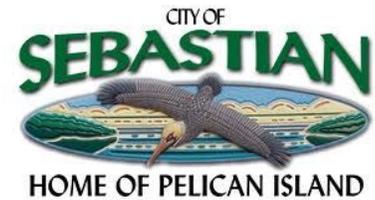
TABLE 5-1 2037 FACILITY REQUIREMENTS SUMMARY	
Airport Facility	2037 Demand
Hangar Demand:	
Shade Hangar	40
T-Hangar	36
Corporate/Box Hangar	8
Conventional Hangar	4* (development is driven by business demand)
Apron Tie-Down	
Based aircraft tie-downs	7
Transient aircraft tie-downs	2* (Based upon peak hour demand)
Fuel Demand (14 day peak fuel demand)	
100 LL	2,656 gallons
Jet A	17,935 gallons
Terminal Building Area	4,050 SF
Auto Parking Spaces (Peak Hour Demand)	113
Support Facilities:	
Airfield Fencing/Security	Relocate and possible expansion depending upon recommended development
Roadway Access	Expansion
Utilities	Extend and expand lines to support planned development (water, sewer, electricity, phone/cable, etc.)
Land Acquisition	To support runway approach and departure protection zones.
Obstruction Mitigation	Remove trees and add obstruction lighting as needed to immovable objects

Source: TKDA 2017

Alternative Development

As noted in FAA Advisory Circular 150/5070-6B, Airport Master Plans, the FAA’s Airport Improvement Handbook (FAA Order 5100.38D), and the Florida Department of Transportation’s Guidebook for Airport Master Planning, airport alternative

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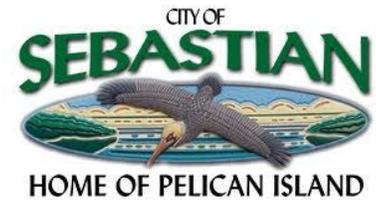
development consists of an iterative process. In other words, multiple options exist to address the facility needs and opportunities impacting the airport, and, therefore, each option was evaluated based upon a specific set of criteria in order to identify the best options for airport development. These elements included, but were not limited to the following:

- Technical feasibility;
- Economic and fiscal soundness;
- Aeronautical utility;
- Viability of phased development;
- Environmental factors;
- Access to the various functional areas of the Airport;
- Future expansion potential beyond the 20-year planning horizon, and
- Qualitative/Quantitative Short List.

The goal of this analysis is to identify and evaluate alternative that address the current and future needs of the airport, the sponsor and local community while also addressing the overall strategic vision for airport development and use. Because of continued strong growth, one of the opportunities being pursued at Sebastian Municipal Airport includes a change in its FAA 3-letter designation. The current airport designation is X26, which the Sponsor and users feel negatively impacts airport development by providing a connotation that Sebastian caters only to small general aviation aircraft. This to some extent holds true for its previous marketing efforts which advertised Sebastian Airport as a small “boutique” airport.

Thus as part of this planning effort and considered as part of the alternatives analysis, Airport Management is proactively working with FAA to change their designator from X26 to SEB. This is part of the Airport Management’s overall strategic plan to market and develop the airport. This strategic vision combined with new and recommended regulatory needs drove development of various airport options and the ultimate airport design plan (ADP). The recommended ADP is illustrated in the Airport Layout Plan and estimated costs for the plan are detailed in the airport capital improvement program (CIP).

Sebastian Municipal Airport Master Plan Update



Stakeholder and Public Involvement

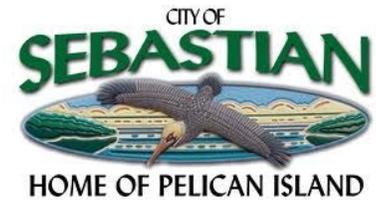
Upon initiation of the master plan process, a public involvement program was created to include members of the community, tenants, airport users, aviation professors, professionals from nearby airports, special interest groups, regulatory agency staff as well as local government. Information on public involvement throughout this master plan process is provided in **Appendix C** of this report. According to AC 150/5070-6B, public involvement should reflect the size of the airport and community interest in the planning process and airports are also required to include such involvement as part of the FAA Grant Assurances (Grant Assurances 7, 8 and 9). FDOT also requires public involvement as part of the master plan process as outlined in FDOT Topic No. 000-525-050, Public Involvement. Like the FAA, the FDOT has grant assurance requirements as part of their Joint Participation Agreement (JPA) with Florida airports. There are currently 24 FDOT Aviation Program Assurances in which an Airport Sponsor must comply as part of their FDOT grant funding. Although the assurances do not specifically address public involvement, these assurances do require making materials available for public review and open access to governmental proceedings.

Further, since the Airport is owned by a public entity, the City of Sebastian, under Florida Statutes Chapter 286.011 (AKA “Florida Sunshine Law”), airport meetings are subject to public review and input. In order for the City and Airport to remain in compliance with all public input requirements, a number of meetings and groups were formed to provide input into the ultimate Airport Design Plan (ADP).

A kick-off meeting was held with the Airport Manager, City Manager and critical staff to discuss the master plan process and identify members for the Technical Advisory Committee (TAC). The TAC has met a minimum of four times at key points throughout the planning process to obtain input and insight regarding existing and future demand and needs.

The preliminary alternatives analysis was presented to City Council on June 14 with a public meeting held from 1 pm to 5 pm on June 15. This public meeting was also taped and presented on the City’s website.

Sebastian Municipal Airport Master Plan Update



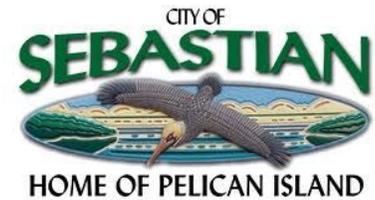
TKDA has also presented information and requested input from the Sebastian City Council and presented the final draft report in Mid November 2017 prior to review by the regulatory agencies. In addition to these meetings, because of public interest, the Airport Manager held a meeting on June 28 with airport neighbors, Friends of the Sebastian River, the Roseland Community Association, and the Collier Club to discuss the findings of the master plan so far as well as to obtain input on preliminary airport development options. Management with TKDA support also held a Pilot Briefing and lunch at the airport on August 12, 2016. This 2 hour briefing in which TKDA participated provided an overview of the master plan, the forecast and facility needs findings as well as alternative development options. These attendees along with member of the community and concerned organizations provided input which was incorporated into the recommended airport design plan. All these individuals were invited to attend the final presentation to the City Council held on November 22 and to provide any additional input regarding ultimate development.

The TAC, regulatory agencies, and city staff received electronic copies of all chapters as part of the review process, and will receive final hard copy publication and a disk with the electronic files upon final approval by the agencies. Summary sheets and data were presented to the public and were available through the Airport Manager's office to facilitate transparency with the community. Since Sebastian Municipal Airport is owned and operated by the City of Sebastian, the findings of this report are available to the public and will be incorporated into the City's overall comprehensive plan.

Existing and Emerging Trends

Several existing and emerging trends were identified in Chapter 4 of this report including airport sustainability, NextGen technology, technological improvements and demand related to light sport aircraft and unmanned aerial vehicle technology, new federal rules and guidance as well as emergency and community support. In identifying airport development options, the impacts of these trends on airport operations and facilities were used to derive airfield, general aviation and landside development options and opportunities. Sebastian Municipal Airport (X26) and its Sponsor (the City of Sebastian) have and continue to aggressively pursue both aviation and non-aviation prospects.

Sebastian Municipal Airport Master Plan Update



The City has already completed design work for the construction of new Taxiways C, D and E to improve overall airport capacity and aircraft movement while improving access to new corporate hangar development and businesses within the southeast portion of the airport property. Taxiway development will also improve access to the northwest quadrant of the airport which will facilitate future aviation growth.

Because of these actions along with the FAA and FDOT support of continued aviation development at X26, development of various airfield, landside, general aviation, support facilities and other miscellaneous considered the impacts and opportunities associated with airport sustainability, NextGen, unmanned aerial systems, light sport aircraft, aircraft sport license, as well as current and future service and role of the airport during the next twenty-plus years.

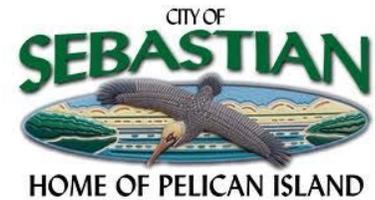
Prior Recommended Development

The previous Airport vision as illustrated on the 2010 Airport Layout Plan recommended the following improvements:

- Two parallel taxiways to Runway 5-23,
- A partial parallel taxiway south of Runway 28
- Lowering approach visibility on Runway 5-23 to greater than $\frac{3}{4}$ mile and 34:1 approach slope
- Upgrading Runway 5-23 to a Runway Design Group of B-II from A-II
- Upgrading Runway 10-28 from a B-I Small to a B-II and adding non-precision approaches with 1 mile or greater visibility (20:1 approach slope)
- Adding Runway End Identification Lights (REILs) to all runway thresholds
- Adding Medium Intensity Runway Lights (MIRLs) to both Runway 5-23 and 10-28
- Adding Medium Intensity Taxiway Lights (MITLs) to all taxiways
- Relocating the Parachute Drop Zone
- Land Acquisition as well as
- Airfield pavement removal projects and extensive hangar and apron development.

However, the City and Airport's current vision does not support such extensive commercial aviation development. As noted in previous chapters, the Airport is

Sebastian Municipal Airport Master Plan Update



surrounded by recreational facilities, residential homes and environmentally sensitive lands. Thus, as part of its “good neighbor” policy, management wants a plan that allows for ultimate airport self-sufficiency while also supporting the needs of the local community. Therefore, options outlined in the previous Airport Layout Plan in addition to new development alternatives were considered based upon forecast demand, user needs and the ultimate airport vision provided by the Sponsor and community at large.

Primary Alternative Elements

FAA AC 150/5070-6B, Airport Master Planning, primary elements include those facilities that require large swaths of contiguous land (i.e. runways, taxiways, apron, and GA development). Secondary elements while still important are more flexible and their location is often defined in relation to the primary elements (i.e. support facilities and landside facilities).

Once the primary and secondary elements were identified, various options for each element were considered and evaluated based upon:

- Technical feasibility;
- Economic and fiscal soundness;
- Aeronautical utility;
- Viability of phased development;
- Environmental factors;
- Access to the various functional areas of the Airport;
- Future expansion potential beyond the 20-year planning horizon, and
- Qualitative/Quantitative Short List.

The preferred development option will include recommended primary and secondary elements. Further evaluation in relation to environmental, airport sustainability, and fiscal viability are analyzed in Chapters 6, 7 and 9, respectively, of this report.

Airfield Alternatives

The Airfield represents the largest portion of contiguous land use on any airport. Airfield modifications and upgrades drive all other aviation related, on-airport land use. As part of the airfield alternatives evaluation, several runway, taxiway, NAVAID and general aviation improvements were considered. Further, since Taxiways C, D and E are

Sebastian Municipal Airport Master Plan Update



already have already been designed and construction will start in FY 2018, primary alternative options considered these taxiways as already constructed for this analysis.

Runway Options

Runway 5-23, the primary runway, is equipped with runway threshold lights and low intensity runway edge lighting (LIRLs). All other portions of the airfield however are not equipped with in-ground lights but rather reflectors. Runways 5, 23, 10 and 28 are each equipped with 2-light precision approach path indicator lights (PAPIs) to support aircraft approach procedures. Again, only Runway 5-23 at the time of this writing is equipped with LPV/LNAV GPS approaches allowing for non-precision instrument approaches down to 1-statute mile (SM) visibility. In addition, controlled airport property on Runway 10-28 is from Roseland Road to the Indian River County Conservation Area boundary.

During several Technical Advisory Meetings as well as community and user meetings, a number of runway alternative options were identified and discussed as to their long term viability. These alternative options as illustrated in **Figures 5-1** and **5-2** include:

- **Option A1:** Extend Runway 23 300 feet to the north and east, remain non-precision instrument runway with 1 mile visibility.
- **Options A2:** Extend Runway 23 400 feet to the north and east, remain non-precision instrument runway with 1 mile visibility.
- **Option B:** Displace Runway 5 landing threshold by 200 feet to allow additional clearance over 3 story house within direct line to the approach, extend Runway 23 by 200 feet, and maintain non-precision instrument approach with no less than 1 mile visibility
- **Option C:** No extension to Runway 5-23 but add a blast pad to Runway 23 and lower the approach on Runway 23 to not less than $\frac{3}{4}$ mile with 34:1 approach slope and includes 40:1 departure surface
- **Option D:** No change to Runway 5-23

FIGURE 5-1 RUNWAY EXTENSION OPTIONS

Source: TKDA 2017

Sebastian Municipal Airport Master Plan Update

In addition to the options discussed regarding Runway 5-23, several options were developed for Runway 10-28. These included:

- Option E: Upgrading Runway 10-28 from a B-I Small to B-II runway, adding non-precision GPS approaches, runway edge lighting and decreasing visibility to 1 mile or greater with 20:1 approach slope.
- Option F: Design Runway 10-28 to support B-II Small aircraft and visual operations only with visibility greater than 1 mile and 20:1 approach slope.
- Option G: Upgrade Runway 10-28 to support B-II aircraft and maintain visual only approach with 20:1 visibility

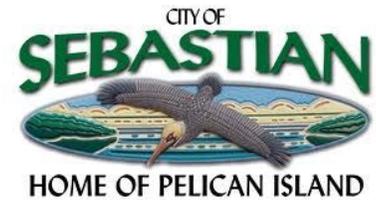
FIGURE 5-2
RUNWAY 5 200 FT. DISPLACED THRESHOLD

Source: TKDA 2017



Before moving into the runway alternatives evaluation, some development considerations must be addressed including critical aircraft and runway design criteria,

Sebastian Municipal Airport Master Plan Update



runway length needs, runway protection zone impacts, declared distances, and lower approach minima.

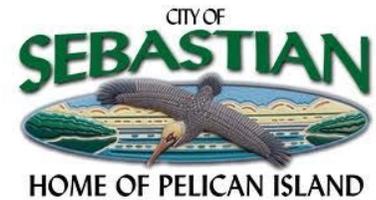
Critical Design Aircraft and Runway Design Criteria

The most demanding aircraft that regularly operates at Sebastian Airport is the Beechcraft King Air 200D (ADG B-II), and the Beechcraft King Air 350i (B-II) is expected to represent the future critical aircraft. As outlined in Chapter 4, Runway 5-23 is the primary runway at X26 at a length of 4,023 feet. It can support aircraft with operating weights greater than 12,500 lbs., it is equipped with non-precision GPS approaches to either threshold, is marked as a non-precision runway and is equipped with low intensity runway lights. As a result, the most demanding aircraft will utilize Runway 5-23.

Runway 10-28 has a published length of 3,199 feet and its pavement strength is unpublished. Therefore, it is assumed that the pavement strength is 12,500 lbs. or less. The runway is not equipped with any runway edge or threshold lights, and it does not support non-precision instrument approaches or approach visibility of 1 mile. The primary users of Runway 10-28 are the flight students from nearby Vero Beach and FIT as well as other small aircraft tenants. The current runway length limits its use to small light aircraft, which typically have a ramp weight of 12,500 lbs. or less. Since some B-II small aircraft do fairly regularly use Runway 10-28, it was recommended in the facility section to upgrade the runway from a B-I small to a B-II small to support small aircraft with approach speeds of 50 knots or greater but with MTOW of less than 12,500 lbs.

In addition, according to Table 3-4 of AC 150/5300-13A, the following minimum requirements are necessary to support an instrument approach:

Sebastian Municipal Airport Master Plan Update



**TABLE 5-2
INSTRUMENT APPROACH REQUIREMENTS**

	¾ to <1 Statute Mile	≥1 statute mile straight in
Visibility Minimums		
HATH	≥250 ft.	≥250 ft.
TERPS QGS	Clear	Clear
TERPS Approach Slope	20:1	20:1
Minimum Runway Length	3,200 ft.	3,200 ft.
Runway Markings	Non-precision	Non-precision
Holding Position Signs and Markings	Non-precision	Non-precision
Runway Edge Lights	HIRL/MIRL	MIRL/LIRL
Parallel Taxiway	Required	Recommended
Approach Lights	Recommended	Recommended
Applicable Runway Design Standards	>3/4-statute mile approach visibility minimums	>3/4-statute mile approach visibility minimums
Survey Required	Vertical Guidance or Non-Visual Guidance depending upon type of approach	Non Visual Guidance

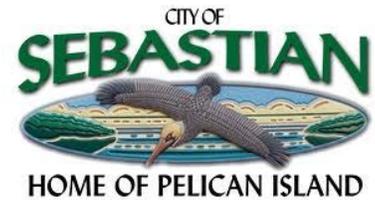
Source: Table 3-4, FAA AC 150/5300-13A

Runway Length Needs

As discussed in **Chapter 4**, the recommended runway lengths for both Runway 5-23 and 10-28 were evaluated based upon the most demanding aircraft or family of aircraft likely to regularly use the runway. The runway length evaluation used the methodology outlined in both FAA AC 150/5325-4B and draft AC 150/5325-4C. It was determined that the draft runway length methodology, which involves using the manufacturer balanced field length for the most demanding aircraft and then applying the airport elevation, mean max temperature and runway grade change, provided a more accurate runway length requirement.

Using this methodology for the King Air 350i, the future critical aircraft for Runway 5-23, a dry runway length of 3,851 feet was determined. Since the King Air 350i has turboprop engines rather than turbojet engines, an adjustment for wet pavement was not needed. Still looking at the manufacturer’s aircraft specifications data, this aircraft can safely operate on Runway 5-23 4,023 foot runway under the majority of regularly occurring weather conditions.

Sebastian Municipal Airport Master Plan Update



The same methodology was applied to determine the recommended length for Runway 10-28. It appears from observations, discussions with users, and historical data that the primary users are flight students and sometimes by Sebastian Skydiving. Therefore, the most demanding aircraft likely to use Runway 10-28 were the Twin Otter DHC-6-300 and the Cessna 208. Applying the airport’s elevation, mean maximum temperature and changes in runway grade to the balanced field lengths for each aircraft resulted in a recommended length of 3,151 feet for the DHC-6-300 and 2,404 for the Cessna 208.

Following this analysis, the consulting team met with airport users and tenants regarding these lengths and if an extension was warranted. It was found that an extension was not needed, and that Sebastian Skydive primarily uses Runway 5-23 rather than 10-28 for most of their operations. Therefore, the current lengths of both Runway 5-23 and 10-28 are adequate to meet existing and forecast demand.

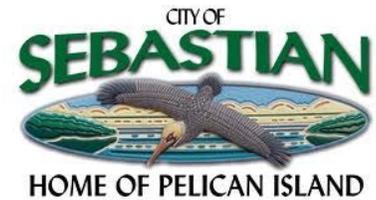
Lower Approach Minima

Another request by the TAC and held over from the 2010 approach airport layout plan was the viability of lowering the approach visibility on Runway 5 and 23 to greater than $\frac{3}{4}$ mile. Lower approach visibility may support expanded airport use, but it does have impacts on several runway safety zones. As a result the opportunities must be weighed against the anticipated impacts.

Table 5-3 outlines the changes in design criteria associated with lower approach minima.

TABLE 5-3 RUNWAY VISIBILITY MINIMA						
Runway 5-23			Runway 10-28			
Approach Reference Code	Existing	With $>\frac{3}{4}$ mile approach	Existing	B-II Small 1-Mile Visibility	B-II Small Visual Only	B-II 1 Mile Visibility
	B-II-5000	B-II-4000	B-I(S)Vis	B-II(S)-5000	B-II(S)Vis	B-II-5000
Approach Runway Protection Zone						
Length	1000	1700	1000	1000	1000	1000
Inner Width	500	1000	250	250	250	500
Outer Width	700	1510	450	450	450	700

Sebastian Municipal Airport Master Plan Update



**TABLE 5-3
RUNWAY VISIBILITY MINIMA**

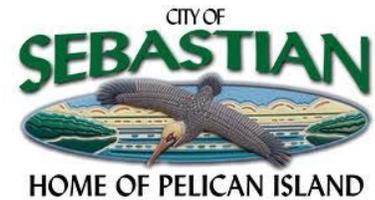
TABLE 5-3 RUNWAY VISIBILITY MINIMA						
Runway 5-23			Runway 10-28			
	Existing	With > ³ / ₄ mile approach	Existing	B-II Small 1-Mile Visibility	B-II Small Visual Only	B-II 1 Mile Visibility
Acreage	13.770	48.978	8.035	8.035	8.035	13.770
Runway Approach Slope (Table 3-2)	20:1	20:1				
Departure Runway Protection Zone						
Length	1000	1000	1000	1000	1000	1000
Inner Width	500	500	250	250	250	500
Outer Width	700	700	450	450	450	700
Acres	13.770	13.770	8.035	8.035	8.035	13.770
FAR Part 77, Obstructions to Air Navigation						
Runway Type	Other than Utility (NPI-B)	Other than Utility (NPI-C)	Utility (Vis-A)	Utility (NPI-A)	Utility (Vis-A)	Other Than Utility (NPI-B)
Primary Surface/Approach Surface Inner Width	500 ft.	500 ft.	250 ft.	500 ft.	250 ft.	500 ft.
Horizontal Surface Radius	10,000 ft.	10,000 ft.	5,000 ft.	5,000 ft.	5,000 ft.	10,000 ft.
Approach Surface Outer Width	3,500 ft.	3,500 ft.	1,250 ft.	2,000 ft.	1,250 ft.	3,500 ft.
Approach Surface Length	10,000 ft.	10,000 ft.	5,000 ft.	5,000 ft.	5,000 ft.	10,000 ft.
Part 77 Approach Slope	34:1	34:1	20:1	20:1	20:1	34:1

Sources: FAA AC 150/5300-13A, FAR Part 77, and TKDA 2017

Runway Protection Zone Impacts

In 2012, the FAA released additional guidance clarifying acceptable land use within the Runway Protection Zone. The Runway Protection Zone is a two-dimensional surface defined as a trapezoidal-shaped area centered about the extended runway centerline that is used to enhance the safety of aircraft operations. It begins 200 feet beyond the end of the runway or area usable for takeoff or landing. The RPZ dimensions are functions of the design aircraft, type of operation and visibility minimums. The RPZs function is to protect people and property on the ground. The RPZ is also sometimes

Sebastian Municipal Airport Master Plan Update



referred to as the 'Clear or Crash Safety zone' since, although rare, aircraft more often experience incidents or accidents during takeoff or landing.

AC 150/5300-13A, Section 310(d) and Interim Land Use within the RPZ Memorandum, 9/27/2012 provides allowable or compatible land use within the RPZs. Although recommended, airports may not have full control over property located within the runway RPZ. Therefore, guidance was provided to evaluate land use in case the following modifications to the airfield were considered:

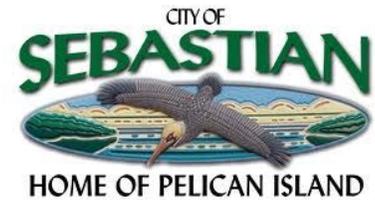
- An airfield project that may require a runway extension, runway shift or other changes to the runway;
- A new or revised instrument approach procedure that increases the RPZ dimensions; or
- A local development proposal in the RPZ.

As a result of any of these changes would likely cause the following items to be located within the RPZ, an RPZ analysis must be performed.

- Buildings and structures (e.g. residences, schools, churches, hospitals or other medical care facilities, commercial/industrial buildings, etc.)
- Recreational land use (e.g. golf courses, sports fields, amusement parks, other places of public assembly, etc.)
- Transportation facilities. (e.g. Rail facilities -light or heavy, passenger or freight; Public roads/highways; vehicular parking facilities)
- Fuel storage facilities (above and below ground)
- Hazardous material storage (above and below ground)
- Wastewater treatment facilities; or
- Above-ground utility infrastructure (i.e. electrical substations), including any type of solar panel installations.

As a result, if a lower approach or runway extension is determined to be needed to support long term development, a preliminary Runway Protection Zone analysis will be performed to address mitigation options associated with Roseland Road and Airport Drive West.

Sebastian Municipal Airport Master Plan Update



Runway Declared Distance Criteria

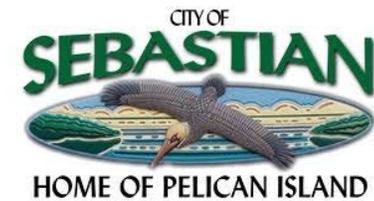
Declared distances pertain to takeoff run available (TORA), takeoff distance available (TODA), accelerate-stop distance available (ASDA), and landing distance available (LDA). TORA is the length of runway declared available and suitable for a ground run of an airplane. It is typically implemented when an obstruction to an approach or departure surface cannot be moved or mitigated. Declared distances typically include different landing and takeoff thresholds. Currently, there are no displaced thresholds at X26.

However, there is a three story home that was built approximately 1,486 feet from the Runway 5 threshold. Clearance at 20:1 over the roofline is approximately 30 feet or less depending upon weather conditions. Although there have been no issues thus far, using declared distances by shifting the landing threshold will allow for increased elevation clearance from the structure.

As noted in Option C, the TAC requested the viability of lower the approach visibility minima to $\frac{3}{4}$ mile or greater visibility with approach of 34:1. Lowering the approach to $\frac{3}{4}$ mile on Runway 5 will require the landing threshold to shift approximately 1,046 feet to the east to provide adequate clearance over the home. Lowering the approach minima on Runway 23 is just as problematic: 1. an extension of this runway east will be impacted by City and County owned conservation property, and lowering the threshold would increase the number of obstructions currently located within the approach; 2. No extension can be added to Runway 5, so any additional length will need to be made to Runway 23. This option would keep the Runway 23 landing threshold at its current location thus limiting landing length to 4,023 feet or less; 3. Lastly, lowering the approach surface to less than 1 mile will trigger greater runway protection and safety area requirements as well as a 40:1 departure surface requirement.

Discussions with the TAC and Agencies recommended avoiding, if possible, the use of declared distances when recommending long-term preferred airfield development. One of several reasons is that declared distance calculations are confusing to most recreational pilots as well as pilots in training; therefore, they are discouraged unless absolutely necessary at general aviation airports. **Table 5-4** outlines declared distance dimensions associated with Runway options A-G.

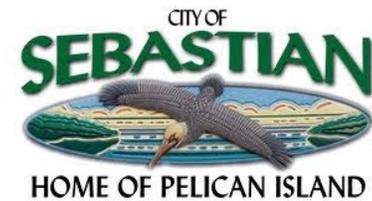
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**TABLE 5-4
DECLARED DISTANCE ESTIMATED DISTANCES**

	Runway 5						Runway 23						
	Existing	Option A1	Option A2	Option B	Option C ³	Option D	Existing	Option A1	Option A2	Option B	Option C ⁴	Option D	
Takeoff Runway Available	4,023	4,323	4,423	4,223	3,523	4,023	4,023	4,323	4,423	4,223	4,023	4,023	
Takeoff Distance Available	4,023	4,323	4,423	4,223	4,023	4,023	4,023	4,323	4,423	4,223	4,023	4,023	
Accelerate Stop Distance Available	4,023	4,323	4,423	4,223	3,523	4,023	4,023	4,323	4,423	4,223	4,023	4,023	
Landing Distance Available	4,023	4,323	4,423	4,023	4,023	4,023	4,023	4,323	4,423	4,223	3,523	4,023	
	Runway 10			Runway 28									
	Existing	Option E	Option F	Option G	Existing	Option E	Option F	Option G					
Takeoff Runway Available	3,199	3,199	3,199	3,199	3,199	3,199	3,199	3,199					
Takeoff Distance Available	3,199	3,199	3,199	3,199	3,199	3,199	3,199	3,199					

Sebastian Municipal Airport Master Plan Update

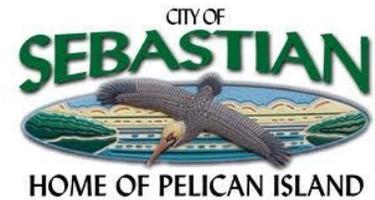


**TABLE 5-4
DECLARED DISTANCE ESTIMATED DISTANCES**

	Runway 5						Runway 23					
	Existing	Option A1	Option A2	Option B	Option C ³	Option D	Existing	Option A1	Option A2	Option B	Option C ⁴	Option D
Accelerate Stop Distance Available	3,199	3,199	3,199	3,199	3,199	3,199	3,199	3,199				
Landing Distance Available	3,199	3,199	3,199	3,199	3,199	3,199	3,199	3,199				

Sources: FAA AC 150/5300-13A and TKDA 2017

Sebastian Municipal Airport Master Plan Update



Runway Development Options

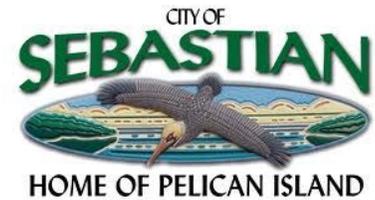
The runway options evaluation considered forecast need, technical feasibility, economic need as well as benefits vs costs, environmental impacts, compatible land use as well as future expansion potential beyond the twenty year planning horizon. These alternatives along with input regarding the remaining primary and secondary elements were identified and discussed during at least two TAC meetings, during the community meeting hosted by the Airport Manager, as well as the Airport tenant and user lunch held in August 2017.

Runway Options A through E focus on changes to Runway 5-23 and Options F through H focus on proposed development of Runway 10-28. The preferred runway development option will include one scenario for each runway either based upon one of the options discussed or a combination.

Option A1: Extend Runway 23 northeast for 300 feet and maintain non-precision approach with 1 statute mile (SM) visibility (**Figure 5-1**).

- Constructively Feasible
 - An extension of 300 feet to Runway 23 could be completed, but will require significant clearance of trees and other obstructions to support the 20:1 approach (FAR Part 77 Obstruction Clearance of 34:1 and Aircraft Approach Slope of 20:1). It will shift the safety areas further to the east requiring additional land acquisition, and the will likely require a relocation of part of the golf course to support development.
 - As part of this extension, edge lighting will need to be added, new markings, the PAPI-2 will need to be relocated, and a new taxiway connector will need to be constructed to provide access to the new threshold.
- Critical Aircraft and Forecast Operational Need
 - The existing and critical aircraft established for Runway 5-23 was the Beech King Air 200 (B-II) and the Beech King Air 350i. Both the existing and future critical aircraft require a balanced field length of less than 4,000 feet. Similar turboprop aircraft within this category can and have

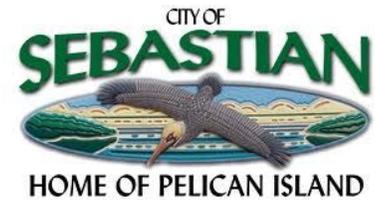
Sebastian Municipal Airport Master Plan Update



safely operated on runways of 4,000 feet or less. Unless the airport is interested in attracting jet traffic, which was not the intent of the sponsor or local community, then there is no forecast need or justification for an extension of Runway 5-23 at this time.

- Economic Need vs Costs
 - At a minimum, the cost for the runway extension alone is estimated at approximately \$200,000. Additional costs for the taxiway connector, land acquisition, obstruction removal, NAVAID relocation, environmental mitigation, etc. are anticipated to add another \$400,000 to \$500,000 to the cost.
 - If the FAA and FDOT deem that an extension is justified, this will still require the City of Sebastian to pay at least \$80,000 for development.
 - Since the Sponsor and the Community have repeatedly stated that they are not interested in attracting large jet aircraft to Sebastian, the cost of the extension is not justified.
- Environmental Impacts
 - Although the extension will remain on airport property, it will shift the runway safety area and runway protection zone further east. There are currently trees associated with the golf course that are already obstructions to air navigation. This would increase the number of obstructions to the Runway 23 as well as potentially impact environmentally sensitive property owned by the City and County.
 - Although scrub jay habitat was not identified in this area, an extension will require relocation of gopher tortoises and make some changes to natural habitats due to safety area clearance requirements.
- Land Use Compatibility and Acquisition
 - An extension to Runway 23 of 300 feet is technically feasible. However, it will shift the runway protection zone (RPZ) off airport property as well as shift a portion of the runway safety area (RSA) to outside the current airport property line. A combination of fee simple and easement property acquisition will be required.
- Other

Sebastian Municipal Airport Master Plan Update



- Maintaining the existing approach visibility minimums will not increase the various FAA and Part 77 safety services, and should avoid potential Roseland Road impacts to Runway 5 approach and departure RPZs.
- This option will provide a slightly longer runway for takeoff. However, it will require significant land acquisition and costs for very little benefit.

Based upon this analysis, Option A1 was removed from further review.

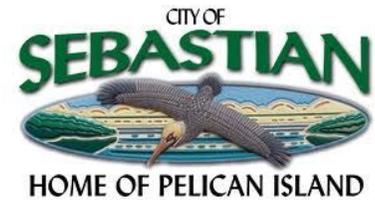
Option A2: Extend Runway 23 northeast for 400 feet and maintain non-precision approach with 1 statute mile visibility (**Figure 5-1**)

The impacts associated with Option A2 are similar as those identified in A1 but to a greater extent. The extension will have an even greater impact on the surrounding properties, require additional land acquisition, impact environmentally sensitive property adjacent to the airport as well as will impact the municipal golf course which provides significant revenue for the City. The cost of the extension is not justified at this time by the need based upon current forecasts of demand. Therefore, Option A2 was removed from further review.

Option B: Displace Runway 5 landing threshold by 200 feet to allow additional clearance over three-story home located within the runway approach path. Extend Runway 23 by 200 feet, and maintain non-precision instrument approach with no less than 1 mile visibility (**Figure 5-2**).

- Constructively Feasible
 - To support a displaced threshold, a new landing threshold will need to be marked and the PAPI-2 must be relocated.
 - Construction of a 200 ft. extension will remain on existing airport property, but will require relocation of the PAPI-2, relocation of taxiway connectors as well as relocation of the airport perimeter road east of the runway.
 - Additional lighting and conduit will need to be added to support the pavement extension and the runway will need to be remarked.
 - The runway extension will also shift the runway safety area and the runway protection zone further east increasing the number of tree

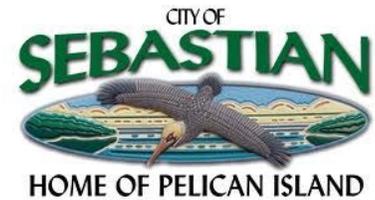
Sebastian Municipal Airport Master Plan Update



obstructions within the approach. The extension will also impact the golf course requiring relocation of one or more of its greens and holes.

- Critical Aircraft and Forecast Operational Need
 - This option would allow for increased clearance over the home located approximately 1500 feet from the Runway 5 threshold as well as greater clearance over Roseland Road.
 - The critical aircraft requires a balanced field length on dry pavement of 3,851 feet. This considers both takeoff and landing requirements. Reviewing both the Beechcraft 200 and 350i manufacturer landing criteria, both aircraft can safely land within 3,400 feet or less.
 - Regular use of Sebastian Airport by aircraft larger or requiring a significantly longer balanced field length than the King Air 350i is not anticipated.
 - Even limited use by light jets such as the Embraer Phenom 300 still require a balanced field length of approximately 3,661 feet on dry pavement and 4,210 on contaminated or wet pavement.
- Economic Need vs Costs
 - The cost for relocating the threshold on Runway 200 feet is minor. However, there is a fairly significant cost of extending the runway 200 feet to the east to recapture the pavement lost due to the displaced threshold. Costs would include additional conduit and lighting, relocating the PAPI-2 at each end, remarking the runway and relocating the taxiway connectors.
 - It is also unlikely that FAA AIP funding could be used to support such an extension since it is merely to recoup the pavement lost as part of the displaced landing threshold and is not needed to support critical aircraft takeoff operations.
 - The rough order of magnitude estimated cost associated with the 200 foot extension is approximately \$150,000 - \$200,000 with an additional \$100,000 estimated for relocation of the threshold, additional lights and conduit, relocation of PAPIs, etc.
 - The costs for the extension would far outweigh the benefits unless aircraft requiring at least 4,000 feet of runway regularly use the airport.

Sebastian Municipal Airport Master Plan Update

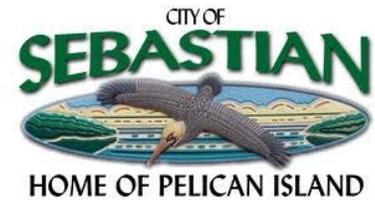


- However, the cost of relocating the threshold, may have positive community effects with little to no impact to safe aircraft operations.
- Environmental Impacts
 - Similar to Options A1 and A2, an extension will shift the runway safety area and runway protection area further east, which will impact the municipal golf course and potentially some environmentally sensitive areas protected by the City and County.
 - Other environmental impacts will likely include mitigation and relocation of some gopher tortoise habitat as well as tree trimming and removal.
 - There will likely be some limited environmental construction impacts, but those are expected to be minimal
 - Also, based upon the anticipated fleet mix and type of operations, noise impacts and INM contours will remain on airport property.
- Land Use Compatibility and Acquisition
 - Although the impacts would not be as great as those discussed in Options A1 and A2, relocation of the Runway 23 end will require a shift in the runway safety area as well as runway protection zone. Thus, any extension to Runway 23 will impact the golf course and may require the City to acquire additional either through fee simple or easement in order to control the property in the RPZ.
 - As mentioned in Chapter 4 and earlier in this chapter, several tree obstructions associated with the golf course are already impacting the approach to Runway 23. Shifting the runway even further east increases the number of trees encroaching upon the approach surface which need to be trimmed or removed.

This is a viable option although it is unlikely that FAA AIP funding could be used to support the 200 foot extension unless strong evidence is provided. The balanced field required to support the King Air 350i and other similarly sized aircraft is 3,851 feet. Therefore, adding a 200 foot or less displaced threshold on Runway 5 could be established to allow for greater altitude clearance over the home.

However, according to the Sponsor, there have been no issues with the home owner concerning airport operations. Thus, at this time, a displaced threshold is not required.

Sebastian Municipal Airport Master Plan Update



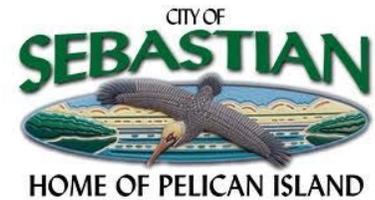
Still, this option is available to the Airport and Sponsor if the need arises. Therefore, since there is no anticipated need and based upon input from the TAC, community and sponsor, Option B was removed from further review.

Option C: No extension to Runway 5-23 but add blast pad and lower approach visibility on Runway 23 to less than 1 mile and greater than $\frac{3}{4}$ mile. Lowering the approach visibility was requested to be reviewed by the TAC as part of this master plan analysis. A lower approach visibility minimum on both Runways 5 and 23 was recommended as part of the 2010 Airport Layout Plan Update along with the installation of blast pads beyond each threshold.

Shoulders and blast pads are typically added to runways that support turbojet operations since they are susceptible to erosion associated with jet blasts. Paved shoulders and blast pads are recommended for runway serving airport design group (ADG) III or higher. Turf, aggregate-turf, soil cement, lime or bituminous stabilized soil are recommended adjacent to paved surfaces accommodating ADG-I and II aircraft. Both the blast pad must be designed to accommodate the occasional passage of aircraft in addition to maintenance and emergency equipment. However, blast pads may not be included in any takeoff, landing or available stop distance calculations.

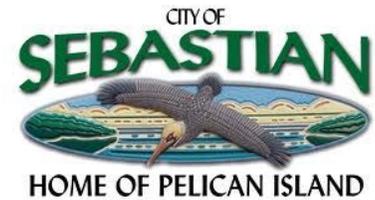
- Constructively Feasible:
 - Lowering the approach visibility to Runway 23 will trigger a variety of additional requirements including: upgrades to runway edge lighting (LIRL to MIRL); installation of runway end identifier lights, and removal of obstructions to the 34:1 approach slope. This most likely include trees on the golf course as well as some in the environmentally protected areas off the airport property.
 - Lowering the approach visibility minimums will also require the airport to upgrade lighting on Runway 5-23 from low intensity to medium intensity edge lighting preferably LED. Runway end identification lighting (REILs) must also be added at a minimum to the Runway 23 threshold as part of the lower approach.
 - Parallel Taxiway C must be equipped with medium intensity taxiway lights along with lighted airfield signage.

Sebastian Municipal Airport Master Plan Update



- Installation of a lower approach will require a greater number of trees on the golf course to be removed and may require relocation of a portion of the golf course.
- The runway protection zone will also increase from 13.770 acres (500 x 1000 x 700 feet) to 49 acres (1000 x 1700 x 1510 feet)
- 95 x 150 foot blast pads consisting of aggregate-turf or soil cement is recommended to be constructed at each end of the runway. The cost for installation of the blast pads could be decreased if using millings and pavement removed as part of another pavement project (i.e. taxiway construction and apron pavement expansion and rehabilitation)
- Critical Aircraft and Forecast Operational Need
 - Aircraft forecast to regularly use Sebastian Municipal Airport include a combination of piston engine and turboprop aircraft. Jet engine aircraft operations with the exception of some light jets and use by small corporate aircraft operators is expected to be infrequent during the 20 year planning period. Growth in the light sport aircraft market as well as continued growth in new turboprop aircraft that can operate on shorter runways are anticipated to represent the likely fleet mix and operational demand at Sebastian Airport.
 - These fixed wing aircraft along with skydiving transport aircraft, ultralights, rotorcraft as well as other experimental aircraft, based upon discussions with users, will continue to use the airport.
- Economic Need vs Costs
 - Blast pads are typically installed on runways that support turbojet aircraft or that have significant problems with soil erosion or debris. During site visits to the airport and preliminary analysis of airfield soils, it does not appear that Sebastian Airport has this issue. If blast pads were to be constructed, they would not qualify for FAA or FDOT funding.
 - As noted, there will be significant costs to upgrade and adding lighting to both Runway 5-23 and Taxiway C and REILs will need to be installed as well. Since this is the primary runway, upgrades to Runway 5-23 may be eligible for FAA AIP funding beyond the \$150,000 general aviation annual entitlement. Prior to obtaining funding, FAA Flight Standards must

Sebastian Municipal Airport Master Plan Update



- determine if a lower approach visibility can be installed safely at the airport.
- Additional costs include obstruction removal, property acquisition, potential loss of revenue associated with the larger runway protection zone, and environmental mitigation costs.
- Based upon an analysis of demand and fiscal responsibility, the cost of lowering the approach to support only a few likely operators does not offset the anticipated cost of upgrades.
- Environmental Impacts
 - A lower approach to Runway 23 will increase the approach slope from 20:1 to 34:1 and require a larger runway protection zone (FAR Part 77 Obstruction Clearance of 34:1 and Aircraft Approach Slope of 20:1).
 - Installation of the blast pads may increase stormwater runoff as a result of construction of a less permeable surface.
 - Additional impacts may require mitigation related to acquisition and easement of property located in the new runway protection zone, tree removal and trimming, increased noise due to the lower approach angle over the golf course, as well as potential lighting and glare impacts which may affect nearby residents and endangered wildlife.
- Land Use Compatibility and Acquisition
 - Installation of a lower approach on Runway 23 will increase the current runway protection zone acreage from 13.770 to 48.978 likely requiring the Airport/Sponsor to acquire 12.8 acres of additional property.
 - This option will also still require the Airport to acquire approximately 1 acre of land prior to Runway 5 in order to control that runway protection zone.
 - The lower approach will require the relocation of the airport perimeter road as well as removal of several trees and vegetation in the approach zone.
 - The larger RPZ will also impact the golf course most likely requiring relocation of several holes and off airport property to the east designated as conservation.
- Other

Sebastian Municipal Airport Master Plan Update



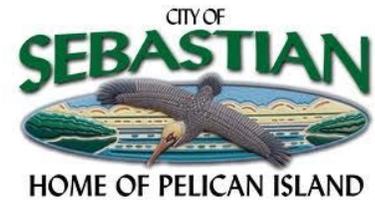
- Decreasing the approach and adding upgrades to airport lighting may unintentionally increase night operations.
- The airport has a number of voluntary noise abatement procedures in place to limit impacts to residential properties located near the airport. An increase in nighttime traffic as well as possible glare from airfield lighting could negatively impact nearby homes. Possibly eroding the good will the airport and City have built with the local community.
- The lower approach will most likely require a relocation of one or two golf holes associated with the Municipal Golf Course since trees and other obstructions will need to be removed to provide clearance.

This option was discussed with the TAC and Airport/City Management, and ultimately was removed from further review.

Option D: No change to Runway 5-23

- Constructively Feasible – No impacts since no change to the Runway infrastructure is planned as part of this alternative option.
- Critical Aircraft and Forecast Operational Need
 - As noted earlier, the existing critical aircraft is the King Air 200 and the future critical aircraft in the King Air 350i. Both of these aircraft are turboprop aircraft and can operate on runways with a full passenger and fuel load of less than 4,000 feet.
 - Based upon anticipated demand, no extension of Runway 5-23 is warranted at this time.
- Economic Need vs Costs
 - Costs associated with this option are related to pavement and facilities maintenance as well as recommended acquisition of property within the existing Runway 5 RPZ. No additional costs are anticipated in conjunction with this option.
- Environmental Impacts
 - No environmental impacts are associated with this option.
- Land Use Compatibility and Acquisition

Sebastian Municipal Airport Master Plan Update



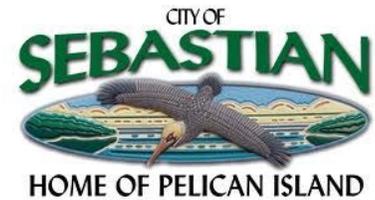
- The only parcel recommended for acquisition is part of the Runway 5 RPZ that crosses Roseland Road. Since this is unlikely to be obtained through fee simple acquisition, an easement is recommended in order to maintain control of the RPZ.
- All other safety areas remain on the airport property. However, as noted in Chapter 4, some trees on the golf course were identified as obstructions to air navigation. These objects will need to be removed or trimmed in order for the airport to maintain its non-precision approach to Runway 23.
- Other
 - With the development of NextGen and other technology, it is anticipated that lower approach minimums without larger runway protection zone requirements will be implemented in the future. This is due to the accuracy of satellite navigation and technological upgrades to aircraft.
 - Since no upgrades are being implemented on Runway 5-23, a runway protection zone analysis to address the impacts and mitigation options associated with Roseland Road is not required at this time.

Through discussions with the Sponsor and TAC along with concerns voiced by the public, this option was the preferred development option for Runway 5-23.

Option E: Upgrade Runway 10-28 from B-I small to B-II runway, add non-precision GPS approaches to one or both ends, and decrease visibility to 1 mile or greater.

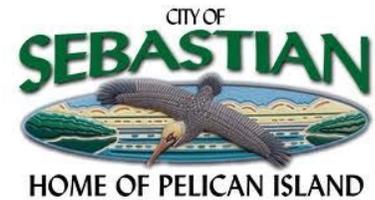
- Constructively Feasible
 - Low intensity or medium intensity runway edge lights will need to be installed along with conduit.
 - Depending upon analysis of pavement condition and subbase, the runway may need to be reconstructed to provide adequate strength to support aircraft with operating weights greater than 12,500 lbs.
 - Runway 10-28 will need to be remarked to illustrate that it is a non-precision instrument runway
 - Runway end identification lighting on both Runway 10 and 28 are also highly recommended.

Sebastian Municipal Airport Master Plan Update



- It is also recommended that Taxiway B, parallel taxiway, be equipped with medium intensity taxiway lighting.
- Critical Aircraft and Forecast Operational Need
 - The existing and future critical aircraft for Runway 10-28 are the Cessna 208 and DH-6-300, primarily used by Sebastian Skydiving. Operational demand on this runway is fairly high since it provides secondary wind coverage for lighter and smaller planes, especially light sport aircraft and those associated with flight training.
 - Adding a non-precision approach may increase the flexibility of airfield use. However, without adding any length to the runway, it will automatically limit operations to smaller and lighter aircraft.
 - Forecast demand overall at Sebastian is anticipated to remain heavily skewed toward piston and turboprop aircraft. Based upon observations and the capacity analysis, the airport is not capacity constrained.
 - Strictly based upon anticipated fleet mix and operational demand, installation of a non-precision approach is not warranted.
- Economic Need vs Costs
 - Installation of a non-precision instrument approach on Runway 10-28 and upgrading the runway to support larger and heavier aircraft will require significant infrastructure improvements.
 - Runway 10-28 is not equipped with any edge or approach lighting. It has an unpublished pavement strength, which will need to be reviewed to determine the condition of the pavement and subbase. It also will need to be remarked as a non-precision runway.
 - Parallel Taxiway B is also not equipped with taxiway lighting which is recommended for taxiways supporting non-precision instrument runways.
 - Anticipated costs associated with these upgrades alone will likely exceed \$1,000,000, and they may not be eligible for FAA AIP funding
 - Additional costs include property acquisition associated with the runway protection zones of Runway 10 and 28. According to current property records, approximately 1.3 acres and 7.9 acres, respectfully, must be acquired to support Runway 5 and 23 RPZs.

Sebastian Municipal Airport Master Plan Update



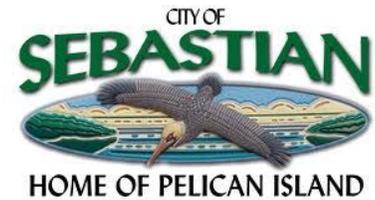
- Environmental Impacts
 - Although no pavement expansion is planned as part of this alternative, there will likely be some level of environmental impacts associated with construction and installation of new conduit and lighting on both Runway 10-28 and Taxiway B.
 - Other construction impacts anticipated include rehabilitation of Runway 10-28 to support heavier aircraft, limited noise impacts as well as potential mitigation/relocation of wildlife such as gopher tortoises.
- Land Use Compatibility and Acquisition
 - With the exception of the property acquisition associated with the Runway 10 and 28 RPZs, no other property acquisition is required to support this development.
 - Also all proposed improvements to the airfield are compatible with existing land use.

This is the option recommended in the last master plan update. Based upon the costs, impacts and lack of demand, it was recommended that Alternative F be removed from further review.

Option F: Update Runway 10-28 to support B-II small aircraft and visual operations only.

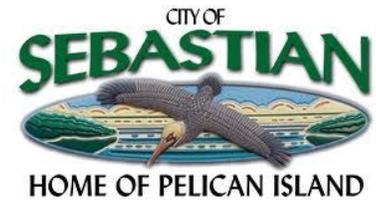
- Constructively Feasible
 - Runway 10-28 is currently marked as a visual runway, and has an unpublished pavement strength. It is also not equipped with any edge or approach lighting. It is however equipped on either end with two box PAPIs.
 - Proposed changes to support this option are minimal. It is recommended that the runway protection zones be decreased from 500 ft. x 1000 ft. x 700 ft. and 13.770 acres to 250 ft. x 1000 ft. x 450 ft. and 8.035 acres. No other changes are needed.
- Critical Aircraft and Forecast Operational Need
 - The current critical aircraft includes a combination of airport design group B-I and A-II aircraft. Therefore, the critical runway design group for Runway 10-28 is B-II. However, both of these aircraft maximum takeoff

Sebastian Municipal Airport Master Plan Update



- weights are less than 12,500 lbs. Therefore, they are considered light aircraft.
- Although Runway 10-28 is used fairly regularly, it is primarily used by small and light aircraft who are impacted by lower crosswind components and can operate on a runway length of 3,199 feet.
 - Since the airport does not have any airfield capacity issues, aircraft during lower visibility and/or poor weather conditions will use Runway 5-23.
 - Forecast demand anticipates shows that Sebastian Airport will continue to support small and medium sized piston and turboprop aircraft with the occasional light jet. The airport's proximity to nearby Vero Beach Regional Airport allows Sebastian to cater to light sport, experimental, small business and recreational users.
 - Economic Need vs Costs
 - Costs associated with this option are minimal, primarily updating the runway protection zone on the airport layout plan and publishing the new information in the Airport Master Record and the FDOT Airport Facility Directory.
 - Environmental Impacts
 - As part of this development, no environmental impacts are anticipated.
 - Land Use Compatibility and Acquisition
 - Property acquisition of 0.7 acres and 5 acres maximum would need to be acquired by the Airport either through fee simple or easement acquisition to control the runway protection zones for Runway 5 and 23, respectively.
 - The decrease in the RPZ on both Runway 10 and 28 will also open up additional airport property for future development and revenue generation.
 - The decrease in the size of the RPZ on Runway 5 also decreases the impact of Roseland Road and Airport West Drive which are both currently located within the RPZ of Runway 10.
 - Other
 - Although having a road in a RPZ is considered an incompatible land use. An RPZ analysis is not triggered unless:

Sebastian Municipal Airport Master Plan Update



- An airfield project that may require a runway extension, runway shift or other changes to the runway;
- A new or revised instrument approach procedure that increases the RPZ dimensions; or
- A local development proposal in the RPZ.

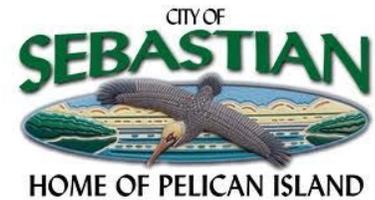
In this case, none of these factors are triggered. Therefore, it is requested that the Roseland Road and Airport West Drive be grandfathered in and that no RPZ analysis is warranted at this time.

Based upon this analysis and input from the Sponsor and public, it is recommended that Option F be retained for further evaluation and review.

Option G: Upgrade Runway 10-28 to support B-II aircraft but maintain visual approach only.

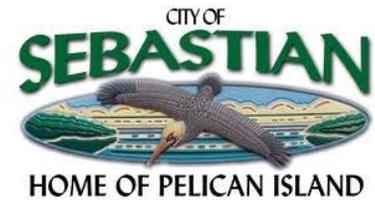
- Constructively Feasible:
 - This option does not require any extension to Runway 10-28, but will require the runway to be strengthened to support larger aircraft.
 - Further, existing runway protection zones, safety areas as well as FAA Part 77 Surfaces will increase in size to support larger aircraft operations.
- Critical Aircraft and Forecast Operational Need
 - The current critical aircraft identified for Runway 10-28 were the Cessna 208 and the DHC-6-300. Both aircraft weigh less than 12,500 lbs. and can operate on a runway length of 3,199 feet.
 - However, the airport critical aircraft is the King Air 350i. According to manufacturer data adjusted physical factors specific to X26, the King Air 350i requires a runway length of 4,023 feet. Further, based upon review of aircraft with maximum takeoff weights of greater than 12,500 lbs., all larger and heavier aircraft will require a runway length that exceeds Runway 10-28's current length.
- Economic Need vs Costs:
 - The airport currently caters to smaller lighter aircraft and is home to several light sport manufacturers, the cost to strengthen the runway to

Sebastian Municipal Airport Master Plan Update



- support heavier aircraft is negated by the fact that larger and heavier aircraft will not be able to use the runway due to limited length.
- Further, since the runway is not equipped with any type of runway lighting and is not equipped with any type of instrument approaches, the likelihood of larger aircraft users regularly using Runway 10-28 is further decreased.
 - Further, the costs associated with the upgrading the runway pavement strength will not likely compete effectively for state or local funding since Runway 10-28 is a crosswind runway which is needed to support small, light aircraft that are impacted by crosswind conditions of 10.5 knots or less. Larger aircraft are not as susceptible to crosswinds, and, therefore, FAA and state funding may not be available.
 - Therefore, the costs associated with upgrading Runway 10-28 to support B-II aircraft outweigh any anticipated benefits.
- Environmental Impacts
 - A preliminary assessment of potential environmental impacts include the likelihood of increased noise, poorer air quality, and community impacts as well as some potential impacts to protected species and contiguous environmentally sensitive lands.
 - Noise and air quality impacts are expected since larger aircraft having to use a short runway for takeoff or landing will “spool” up the engines near the runway threshold to almost full power so that they are able to take off on a shorter runway. Spooling engines to full power while not moving increases fuel emission and decreases air quality as well as causes increase noise impacts.
 - Land Use Compatibility and Acquisition
 - Any development or project that triggers a change to the current airport operations will require an RPZ analysis. Currently, Airport West Drive is located within the Runway 10 RPZ which is an incompatible land use. Therefore mitigation may include closure, road relocation, Runway 10 threshold relocation or some type of modification to standards.

Sebastian Municipal Airport Master Plan Update



Therefore, based upon the information identified above, Option G was removed from further valuation.

After evaluating the needs, opportunities and potential impacts associated with the various runway alternative options, the TAC and Sponsor agreed that the preferred options based upon their long-term vision of the airport were Option D, no physical changes to Runway 5-23, and Option F, Upgrading Runway 10-28 to support B-II small aircraft and maintain visual approaches only to Runways 10 and 28.

Taxiway Options

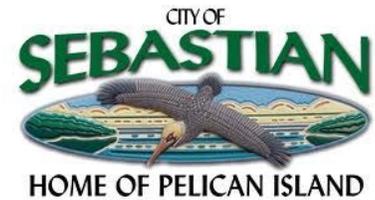
Taxiway options are related to proposed airfield and general aviation development. The design of Taxiways C, D and E have already been completed and submitted to FAA for review and approval. Construction is expected to begin early in fiscal year 2018 (fall 2017). Additional taxiway and taxilane improvements include remarking Taxiway A to provide a consistent 35 foot width to support Taxiway Design Group (TDG) 2 aircraft (e.g. King Air 350i). Since Taxiway A runs along the apron edge, any excess pavement will be remarked as part of the general aviation apron improvements.

As part of the northeast airfield development, it is recommended that former Runway 15/33 be converted to a taxiway with a width of 35 feet in order to support future development. The runway pavement is recommended to be used as subbase as part of the Taxiway construction as well as contiguous apron construction.

The 2010 Master Plan Update also recommended construction of another full parallel runway on the south and east side of Runway 5-23, designated as future Taxiway D. However, based upon runway and taxiway separation requirements, the new taxiway would impact the primary stormwater drainage ditch for the airport. This would ultimately require the drainage ditch to be relocated along with the fenceline.

Evaluating forecast demand and airfield capacity needs, construction of this second parallel taxiway is not needed to support short or long-term demand. Further, the cost of installation and environmental impacts does not warrant construction. The Sponsor and users have stated that it would be more conducive to have an internal perimeter road that would allow access from the terminal and corporate hangars to and from the west quadrant of the Airport property. This would negate the need for airport business

Sebastian Municipal Airport Master Plan Update



tenants and their employees to cross two active runways to access the apron and aircraft parking facilities on the west side of the airfield. This will be discussed in more detail as part of the general aviation and support facility requirements later in this chapter.

The pavement leading to and in between hangars are important to ensuring the safe passage of aircraft to the taxiway system, and subsequently the national airspace system. The taxilanes include the taxilanes leading to the hangars and the taxilanes between those hangars. The pavement conditions vary amongst the taxilanes from fair to satisfactory condition.

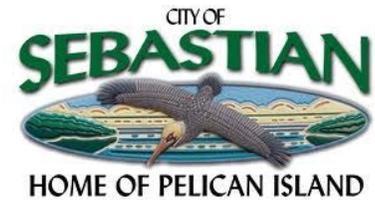
Taxilanes must allow the safe passage of aircraft between hangars and to other facilities. Taxilanes which provide access to and from the t-hangars on the west side of the airport appear to be only 15 feet wide. Thus, it is recommended that all taxilanes be designed to support at least TDG Category 1A and 1B aircraft requiring a width of 25 feet. Although the T-hangar is currently full, the size of the taxilanes limit its use by slightly larger aircraft. Therefore, proposed development will be designed to satisfy the taxilane object free area separation of 79 for ADG I aircraft, and 115 feet for ADG II aircraft.

Remaining taxilane improvements will be incorporated as part of proposed general aviation development. Depending upon the location of the facilities and the fleet mix in which they support, taxilane widths will vary from 25 to 35 feet. This is part of the FAA and FDOT's efforts to right size facilities for specific forecast needs and demand. In addition, new taxilanes will be added as part of planned new development to allow adequate and safe movement of aircraft in and around existing and planned infrastructure.

Parachute Landing Zone

The parachute landing zone is located in the north infield of the airport across north of Taxiway B. The location is directly across from Skydive Sebastian's leasehold. Operations and activity associated with Skydive Sebastian has grown significantly since the previous 2002 master plan and even from the 2010 ALP update. Growth is expected to remain strong throughout the planning period.

Sebastian Municipal Airport Master Plan Update



Because of the continued growth, in 2015, the City of Sebastian installed a Swoop Pond on the northeast section of the drop zone near the old runway. The new pond is over 100 x 300 feet and approximately 4 feet in depth and it fed by a well. The space around the pond is designed to allow for running courses in either direction and also includes zone accuracy pits on either end. The inclusion of the swoop pond allows the airport to support a variety of parachuting organizations and is now part of the Florida Canopy Piloting Association Swoopleague. Currently only Sebastian Airport and Skydive City at Zephyrhills Municipal Airport are equipped with swoop ponds.

The 2010 Airport Layout Plan recommended relocating the drop zone to the south infield area between Runway 10-28 and 5-23, as shown in **Figure 5-3**, to allow for aviation commercial development in the north infield. However, this option would require skydivers to cross both an active taxiway and runway. Further, DOT/FAA/AR-11/30, *Development of Criteria for Parachute Landing Areas on Airports*, May 2012, the edge of the parachute landing area/drop zone should be located at least 40 feet from any known obstacle. Although, the drop zone is located approximately 100 feet from the edge of the t-hangars, it is adjacent to an active taxiway (Taxiway A). Since Skydive Sebastian supports student training, tandem and professional parachute operations, the center of the drop zone should be located approximately 300 feet from the nearest obstruction.

Sebastian Municipal Airport Master Plan Update

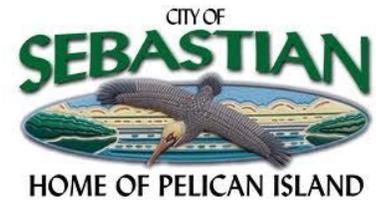
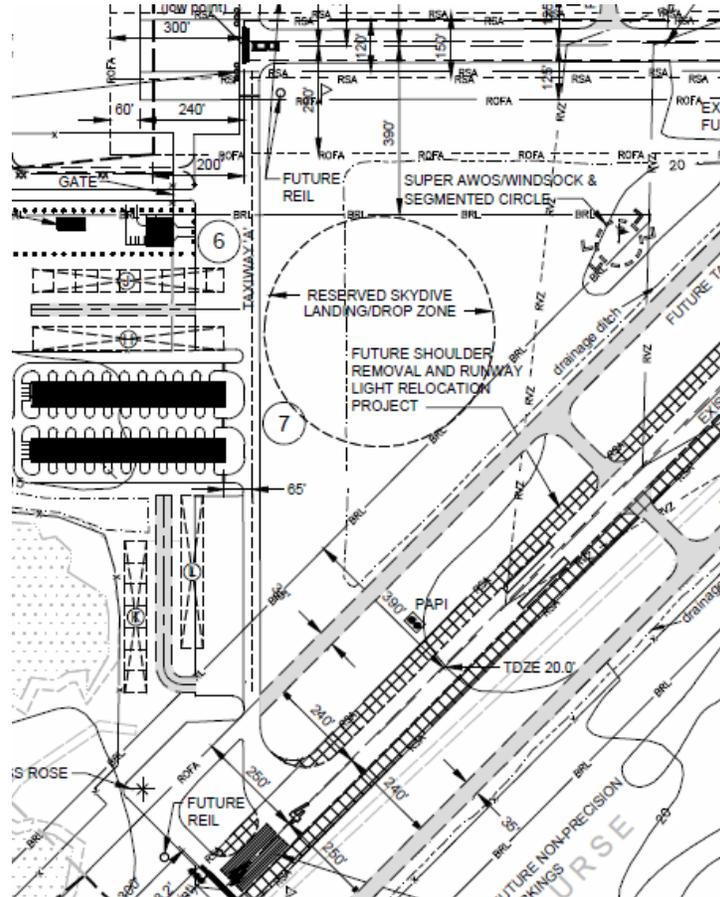


FIGURE 5-3
2007 AIRPORT LAYOUT PLAN UPDATE RECOMMENDED DEVELOPMENT

Source: 2010 Sebastian Airport ALP, The LPA Group Inc.



Since the existing location already meets those safety requirements and the Sponsor has already invested in infrastructure to support continued parachute/skydive operations, it is recommended that the drop zone remain at its current location.

Sebastian Municipal Airport Master Plan Update

**FIGURE 5-4
AIRPORT DROP ZONE**

Source: Google Earth Aerial Image, 2017



However, as noted in **Chapter 4**, on-airport parachute landing area perimeter boundaries should be marked in some way to allow parachutists to discern the landing area from the air. Therefore, it is recommended that some type of markings or other method of identifying the drop zone be added. This could include one or more of the following options:

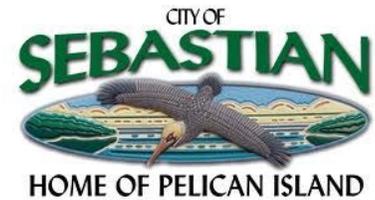
- Dashed line, a minimum of 3 inches wide in white or orange chalk, paint, or engineering tape
- Traffic-style cones
- Flags
- Streamers or
- Landscaping

It is also recommended to use different types of markers when designating areas within the PLA and the perimeter of the PLA.

Navigational Aids, Lighting, and Signage

As noted in Chapter 4, Sebastian Airport was the first airport in the United States to have an operational ADS-B Tower. Other navigational aids at the airport include: two airport beacons, a lighted wind cone and segmented circle, and the run-up area near the

Sebastian Municipal Airport Master Plan Update



Runway 5 threshold is equipped with a magnetic wind rose. Runways 5-23 and 10-28 are also equipped with PAPI-2s.

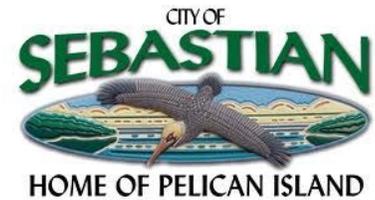
The airfield is equipped with limited lighting. Only Runway 5-23 is equipped with threshold lights and low intensity runway lights, while Runway 10-28 and Taxiways A and B are equipped with reflectors. As part of the new Taxiway C, D and E construction, these taxiways will also be equipped with edge reflectors instead of taxiway lights.

Although it is not recommended that a lower visibility approach be added to Runway 5-23, runway end identification lights (REILs) are recommended to be added to Runway 5 and 23. Although not required, the FAA recommends adding REILs to runways equipped with non-precision instrument approaches with 1 mile visibility. The REILs will improve overall runway visibility during low light or poor conditions, and increase the overall safety of the airport. Since Runway 5-23 is the primary runway, lighting upgrades are recommended. Further, the REILs can be shielded to limit glare and lighting impacts.

In addition to adding REILs to Runway 5-23, lighted airfield signage is also recommended. The airport is not currently equipped with any airfield signage. This could cause confusion to users unfamiliar with the airport. Therefore, in accordance with FAA AC 150/5340-18F, Standards for Airport Sign Systems, 2010, the following reflective signs should be added to the airfield:

- **Holding Position Sign** for Taxiway/Runway Intersections – mandatory instruction sign per AC.
- **Holding Position Sign** for Runway/Runway Intersections – mandatory instruction sign per AC.
- **Runway identification signage**
- **Location signs.** These signs identify the taxiway or runway where the aircraft is located. It has a yellow inscription with a yellow border on a black background. The location sign does not contain arrows.
- **Holding position signs** along with taxiway location signs installed on all taxiways that intersect the runways
- **Holding position signs** have been installed at the intersection of the two runways

Sebastian Municipal Airport Master Plan Update



- **Exit signs** should be installed at the taxiways where aircraft normally exit.
- **Direction and Outbound and Inbound Destination Signs** since the airport is uncontrolled. Direction signs have black inscriptions on a yellow background and always contain arrows. The arrows should be oriented to approximate the direction of turn. A destination sign has a black inscription on a yellow background and always contains an arrow.

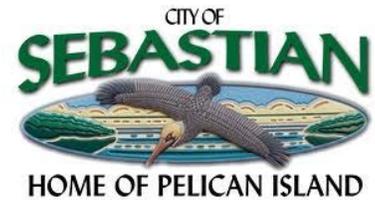
Mandatory instruction signs have white inscription with a black outline on a red background. Signs are always placed on the left side of the taxiway. Signs are not to be installed between the taxiway/runway holding position sign and the runway. According to the AC airfield signage should be illuminated when runway and taxiway lights are illuminated. Since the only runway equipped with lights is Runway 5/23, several options may be available including solar powered or retroreflective signage. The addition of signs along with holding markings on the taxiways should limit runway incursions and improve the safe movement of aircraft.

At the time of this writing, the Sponsor was replacing its old Super Automated Weather Observing System (AWOS) with an AWOS-3, which will provide better coverage. The new AWOS-3 will be equipped with dual coverage to allow users to hear both weather as well as airport traffic communications within the airport airspace. The new AWOS-3 is located within the infield area between future Taxiway C and Runway 10-28 within the southwest quadrant of the airport property. This location provides unobstructed coverage, which should provide accurate weather and wind data.

Runway Visibility Zone

Since Sebastian Airport is not equipped with an air traffic control tower and it has multiple runways, a runway visibility zone was defined based upon the recommended runway configurations identified in Runway Options D and F. The Runway Visibility Zone (RVZ) is an area of the airport that must be kept clear of permanent object so as to allow unobstructed line of site from any point five feet above the runway centerline to any point five feet above the intersecting runway centerline.

Sebastian Municipal Airport Master Plan Update

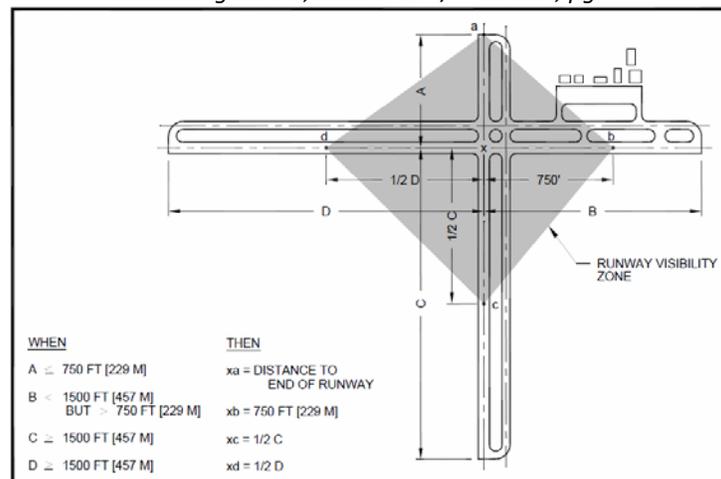


The runway visibility zone is defined as an area formed by imaginary lines connecting the two runways' line of sight points. Locate the runway line of sight points as follows: “(1) The end of the runway if runway end is located within 750 feet (229 m) of the crossing runway centerline. (2) A point 750 feet (229 m) from the runway intersection (or extension) if the end of the runway is located within 1,500 feet (457 m) of the crossing runway centerline or extension. (3) A point one-half of the distance from the intersecting runway centerline (or extension), if the end of the runway is located at least 1,500 feet (457 m) from the crossing runway centerline or extension.”¹ A sample RVZ is provided in **Figure 5-5**.

Based upon these dimensions and the preferred runway configurations, the RVZ was established and was used to define the location of future development on the airfield.

FIGURE 5-5
SAMPLE RUNWAY VISIBILITY ZONE

Source: Figure 3-7, FAA AC 150/5300-13A, pg. 58

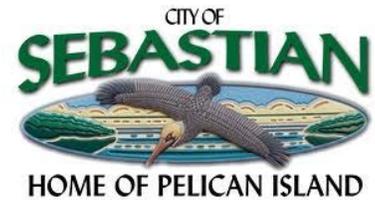


General Aviation Alternatives

Sebastian is a general aviation airport that supports recreational, training, aircraft manufacturing and some limited maintenance, as well as corporate and limited air taxi operations. General Aviation Alternative development was broken into four airport

¹ FAA AC 150/5300-13A, Runway Visibility Zone, page 58, 2012

Sebastian Municipal Airport Master Plan Update



quadrants: Northwest Airfield quadrant, Southwest Airfield quadrant /T-Hangars, Northeast Airfield quadrant/North Ramp and South Airfield Quadrant/Terminal Area.

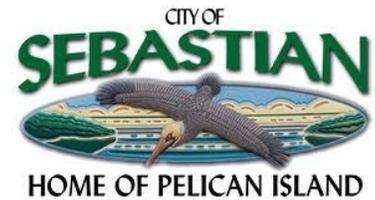
Development options considered facility needs identified in Chapter 4 as well as safety area and development object free area requirements to support planned development beyond the 20-year planning period. Note, the recommendations provided allow for maximum use of airport existing land and facilities. However, development is flexible and hangar and parking options may be modified to address an immediate need.

Summary of Facility Needs

Development of general aviation alternative options considered forecast demand and facility needs identified in Chapter 4. **Table 5-5** summarizes the long-term facility needs based upon forecast demand.

TABLE 5-5 2037 FACILITY REQUIREMENTS SUMMARY	
Airport Facility	2037 Demand
Hangar Demand:	
Shade Hangar	40
T-Hangar	36
Corporate/Box Hangar	8
Conventional Hangar	4* (development is driven by business demand)
Apron Tie-Down	
Based aircraft tie-downs	7
Transient aircraft tie-downs	2* (Based upon peak hour demand)
Fuel Demand (14 day peak fuel demand)	
100 LL	2,656 gallons
Jet A	17,935 gallons
Terminal Building Area	4,050 SF
Auto Parking Spaces (Peak Hour Demand)	113
Support Facilities:	
Airfield Fencing/Security	Relocate and possible expansion depending upon recommended development
Roadway Access	Expansion

Sebastian Municipal Airport Master Plan Update



**TABLE 5-5
2037 FACILITY REQUIREMENTS SUMMARY**

Airport Facility	2037 Demand
Utilities	Extend and expand lines to support planned development (water, sewer, electricity, phone/cable, etc.)
Land Acquisition	To support runway approach and departure protection zones.
Obstruction Mitigation	Remove trees and add obstruction lighting as needed to immovable objects

Source: TKDA 2017

Building Restriction Lines

A building restriction line (BRL) is a line on the airport layout plan depicting where buildings and other infrastructure can be built in relation to the airport operating area (AOA). The BRL must be set beyond the Runway Protection Zones (RPZs), the Obstacle Free Zones (OFZs), the Object Free Areas (OFAs), the runway visibility zone, NAVAID critical areas, areas required for terminal instrument approach procedures (TERPS), and ATCT clear line of sight (LOS).

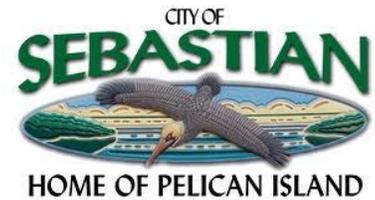
The location of the BRL is dependent upon the selected allowable structure height. According to FAA AC 150/5300-13A, typical allowable structure height is 35 feet (10.5 m) above ground level. The closer development is allowed to the Aircraft Operations Area (AOA), the more impact it will have on future expansion capabilities of the airport.

As part of this analysis, a BRL of 57 feet above ground level was used to allow for expansion of the terminal and other facilities on the airport without impacting the current and future airfield design. This height takes into consideration changes in elevation between the airfield, general aviation, and landside development.

Southwest Airport Quadrant/T-Hangar Area

The Southwest Airport Quadrant/T-Hangar Area included all infrastructure south of Runway 10 and north of Runway 5. This area currently supports the Airport T-Hangars and general aviation apron area.

Sebastian Municipal Airport Master Plan Update



Alternative 1

Alternative 1 as illustrated in **Figure 5-6** includes the addition of two new 14 unit T-hangar buildings, and expanded apron and installation of 15 shade hangars, the remarking of Taxiway A to 35 feet and construction of additional apron space to support small aircraft tie-downs. This apron will also include a 25 foot wide taxilane to support aircraft movement.

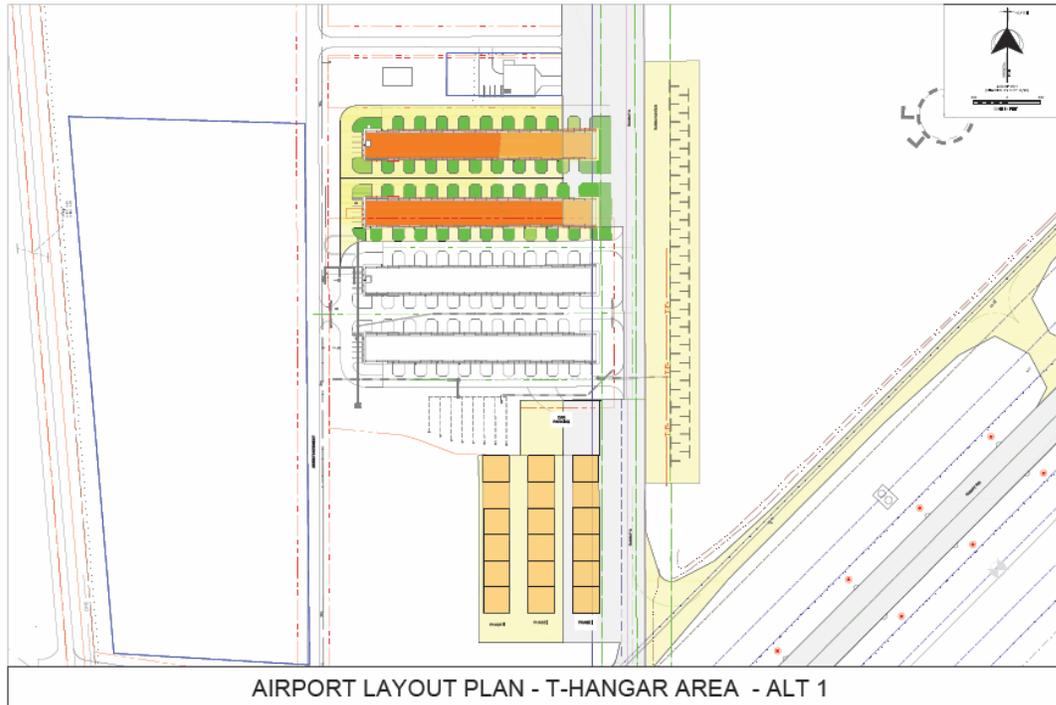
Strengths and weaknesses associated with this alternative include:

SOUTHWEST AIRPORT QUADRANT/T-HANGAR ALTERNATIVE 1	
Strengths	Weaknesses
<ul style="list-style-type: none"> ▪ Utilizes available space to maximize revenue expansion ▪ Allows for reuse of the south apron and development of shade hangars ▪ Provides additional small aircraft storage facilities ▪ Easy access is provided via Airport Drive west and Roseland Road ▪ Does provide additional tie-down apron and movement areas. 	<ul style="list-style-type: none"> ▪ Demand for T-hangars is low. The current T-hangar facilities are not fully leased ▪ Revenue from T-hangars limited since part of Sheltair Lease ▪ Taxilane between t-hangars and size of hangars are limited to small aircraft only ▪ Limited flexibility since development is designed for small aircraft ▪ Will require additional stormwater retention areas, relocation of existing drainage ditches and permitting

Sebastian Municipal Airport Master Plan Update

**FIGURE 5-6
ALTERNATIVE 1**

Source: TKDA 2017



Alternative 2

Alternative two, as illustrated in **Figure 5-7**, provides for the following development:

- Apron expansion to the north, south and east of the T-hangar facilities.
- Construction of 6 60 x 60 Box hangars north of the T-hangars and installation of 35 foot taxilane
- Installation of 12 shade hangars
- Construction of 100 x 80 foot multi-use hangar facility, and
- Construction of aircraft parking/tie-down infrastructure with 25 foot edge taxilane.

Strengths and weaknesses associated with this alternative include:

Sebastian Municipal Airport Master Plan Update



SOUTHWEST AIRPORT QUADRANT/T-HANGAR ALTERNATIVE 2	
Strengths	Weaknesses
<ul style="list-style-type: none"> ▪ Utilizes available space to maximize revenue expansion ▪ Provides flexible development to allow multi-use of facilities ▪ Opens up opportunities for third party development ▪ Provides for phased development as needed. ▪ Accommodate existing and future fleet mix needs ▪ Provides higher source of revenue generation ▪ Allows for reuse of the south apron and development of shade hangars ▪ Easy access is provided via Airport Drive west and Roseland Road ▪ Does provide additional tie-down apron and movement areas. 	<ul style="list-style-type: none"> ▪ Demand may be limited in the short term ▪ Cost and competition from nearby airports could impact development ▪ Will require additional stormwater retention areas, relocation of drainage ditches and associated permitting

Sebastian Municipal Airport Master Plan Update

**FIGURE 5-7
ALTERNATIVE 2**

Source: TKDA 2017

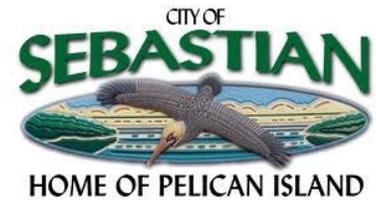


Northwest Airport Quadrant

The northwest airport quadrant consists of leaseholds north of Runway 10 and west of Airport West Drive. As part of planned development, the Sponsor has had utilities and other infrastructure expanded to allow for construction of a consolidated public works compound adjacent to the airport. Since the public works department assists the airport with on-site maintenance, this is a compatible land use.

Blue lines shown in both **Figures 5-8 and 5-9** demonstrate the existing leaseholds of the current tenants. During meetings with Skydive Sebastian, the company has plans to expand their facilities including adding off site camping grounds. Other tenants located in this area have also discuss possible expansion plans, but none have provided any specific details.

Sebastian Municipal Airport Master Plan Update



According to leasehold data, the northwest apron is part of the Pilot's Paradise lease and they obtain revenue from tie-down parking. Still, based upon on-site inspections, the area is not well marked which causes some adjacent tenants to be blocked from their facilities. Thus as part of proposed development, remarking Taxiway A along with adding movement area and parking markings to more efficiently use the existing apron facilities was considered.

Airport tie-down demand consists of both based aircraft and transient aircraft demand. Aircraft parking requirements were based upon the length and wingspan of the typical aircraft fleet at X26 as well as a 10 and 20 foot buffer around the aircraft.

Alternative 1:

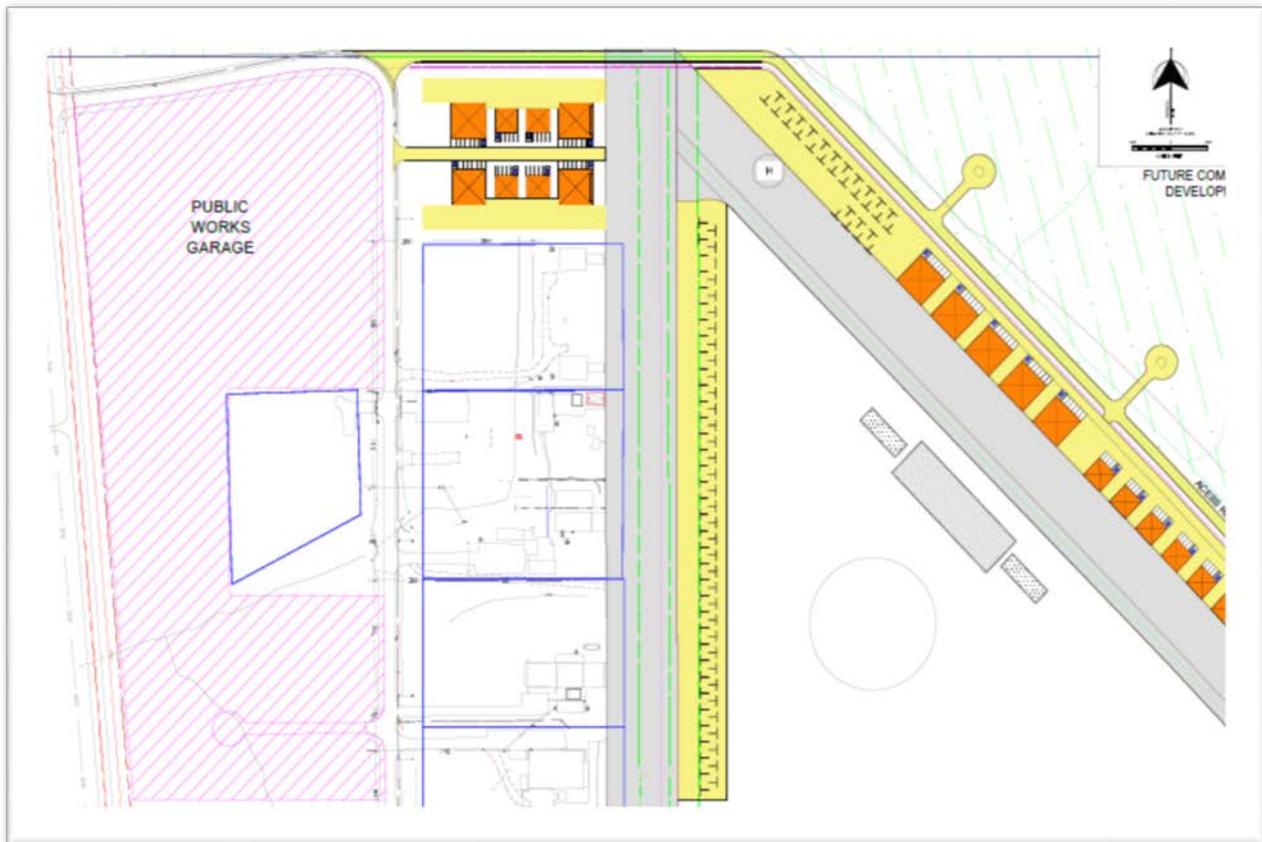
Alternative 1 highlights the property that is not currently leased and could be used for future aviation development. Since utilities have already been expanded to support the planned public works development, site preparation to support box and corporate hangar development will be reduced. Hangar development outlined in this scenario is recommended for third party development rather than airport sponsor development.

This alternative recommends:

- Construct four 80 x 80 box hangars
- Construct four 60 x 60 box hangars
- Construct access road, two 2900 SY of adjacent apron, and auto parking.
- Taxiway A should be remarked to provide a 35 foot width to support TDG 2 aircraft, and the remainder of the pavement will be marked as apron movement areas, in addition to
- Construction of additional apron to provide movement area and parking.

Sebastian Municipal Airport Master Plan Update

FIGURE 5-8
ALTERNATIVE 1
Source: TKDA 2017



Sebastian Municipal Airport Master Plan Update



Strengths and weaknesses associated with this alternative include:

NORTHWEST AIRPORT QUADRANT ALTERNATIVE 1	
Strengths	Weaknesses
<ul style="list-style-type: none"> ▪ Utilizes available space to maximize revenue expansion ▪ Provides flexible development to allow multi-use of facilities ▪ Opens up opportunities for third party development ▪ Provides for phased development as needed. ▪ Accommodate existing and future fleet mix needs ▪ Recommends third party/private funding for development ▪ Provides higher source of revenue generation ▪ Easy access is provided via Airport Drive west and Roseland Road ▪ Does provide additional tie-down apron and movement areas. 	<ul style="list-style-type: none"> ▪ Expanded apron east could impact Drop Zone ▪ Costs for apron construction to provide additional parking may not be cost effective use. Current issue of parking and aircraft movement due to Tenant leaseholds ▪ Requires stormwater drainage relocation associated with apron and tie-down development

Alternative 2:

Alternative 2 has similar recommendations as Northwest Alternative 1 except it shows the full build-out of the north area to allow for 8, 80 x 80 box hangars. Proposed infrastructure improvements associated with Alternative 2 include:

- Construct eight 80 x80 box hangars
- Construct access road, two 2900 SY of adjacent apron, and auto parking.
- Taxiway A should be remarked to provide a 35 foot width to support TDG 2 aircraft, and the remainder of the pavement will be marked as apron movement areas, in addition to
- Construction of additional apron to provide movement area and parking.

Sebastian Municipal Airport Master Plan Update

FIGURE 5-9
ALTERNATIVE 2
Source: TKDA 2017



Strengths and weaknesses associated with this alternative include:

NORTHWEST AIRPORT QUADRANT ALTERNATIVE 2	
Strengths	Weaknesses
<ul style="list-style-type: none"> ▪ Utilizes available space to maximize revenue expansion ▪ This option shows full buildout with 8 80 x 80 SF hangars ▪ Provides flexible development to allow multi-use of facilities ▪ Opens up opportunities for third party development ▪ Provides for phased development as needed. ▪ Accommodate existing and future fleet mix needs 	<ul style="list-style-type: none"> ▪ Expanded apron east could impact Drop Zone ▪ Costs for apron construction to provide additional parking may not be cost effective use. Current issue of parking and aircraft movement due to Tenant leaseholds ▪ Requires stormwater drainage relocation associated with apron and tie-down development

Sebastian Municipal Airport Master Plan Update



NORTHWEST AIRPORT QUADRANT ALTERNATIVE 2	
Strengths	Weaknesses
<ul style="list-style-type: none"> ▪ Recommends third party/private funding for development ▪ Provides higher source of revenue generation ▪ Easy access is provided via Airport Drive west and Roseland Road ▪ Does provide additional tie-down apron and movement areas. 	

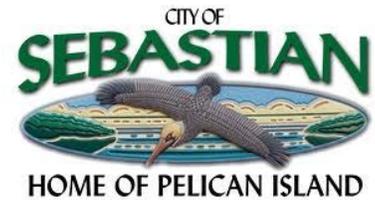
Since T-hangar demand at Sebastian is down, this option provides the greatest flexibility by allowing areas both north and south of the t-hangars to be developed for alternative aircraft storage (i.e. box hangars and shade hangars). This option allows for private hangar development and sizing allows for more than one aircraft to be stored in one building. However, if demand for T-hangar facilities returns, there is ample room to add an additional 6 unit T-hangar and move the box hangars further north or replace some of the planned development to south with a 12-14 unit T-Hangar building.

Northeast Airport Quadrant/North Ramp

The northeast quadrant is currently undeveloped. The only related aviation infrastructure in the northeast ramp is the former 150 foot runway. The pavement is currently in disrepair and is not currently being used. Discussions with the Sponsor, airport management and TAC considered potential development options for this area. Discussions were held with FAA concerning through the fence operations and private development, but the Agency stated that this was not an approved operation. Therefore, alternative aviation development options were considered including private organization hangar development, flying clubs, helicopter parking and storage, and other support infrastructure.

Since this area is not currently equipped with utilities or landside access, development of the northeast apron is anticipated to begin no sooner than 2030 unless unforeseen demand for development is warranted. Development proposed adjacent to the airfield would be aviation facilities requiring direct access to the AOA. Additional commercial development could include businesses supporting aviation research and development,

Sebastian Municipal Airport Master Plan Update



training, education, and other commercial opportunities to create alternative revenue streams for the airport.

Alternative 1:

Figure 5-10 illustrates proposed development which includes:

- Construction of a 35 foot taxiway
- Construction of expanded apron area
- Installation of new access road and expanded utilities
- Construction/installation of 100LL and Jet A self-fueling facilities
- Installation of additional tie-down parking
- Construction of 5 80 x 80 corporate/box hangars
- Construction of 60 x 60 box hangars
- Construction of taxilanes, auto parking and other associated facilities

Strengths and weaknesses associated with this alternative include:

NORTHEAST AIRPORT QUADRANT/NORTH RAMP ALTERNATIVE 1	
Strengths	Weaknesses
<ul style="list-style-type: none"> ▪ Utilizes available space to maximize revenue expansion ▪ Provides flexible development to allow multi-use of facilities ▪ Opens up opportunities for third party development ▪ Provides for phased development as needed. ▪ Accommodate existing and future fleet mix needs ▪ Provides higher source of revenue generation ▪ Allows for multi-use development; combination of aviation, aviation support and non-aviation growth ▪ Provides alternative revenue sources for airport growth 	<ul style="list-style-type: none"> ▪ No infrastructure in this location including utilities, access, etc. ▪ No immediate demand or need for development ▪ Current infrastructure is not being used ▪ Tie-down facilities do not typically provide a strong source of revenue ▪ Will require stormwater retention facilities and possible offsite mitigation ▪ Possible wind impacts to Skydiving operations

FIGURE 5-10

Sebastian Municipal Airport Master Plan Update



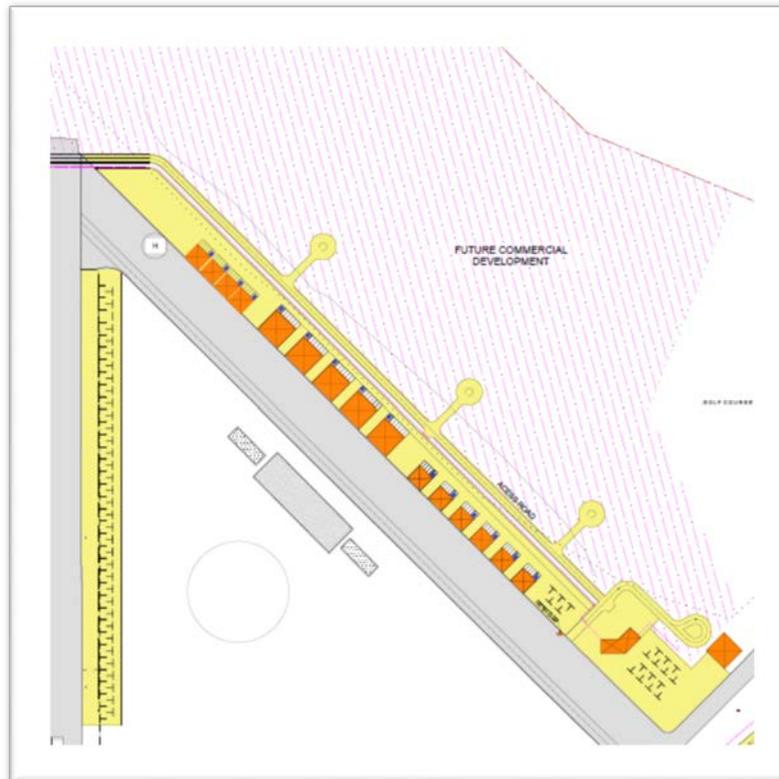
- 5 80 x 80 box hangars
- Construct 35 foot taxiway and 35 foot taxilanes
- Construct new access road and provide site preparation for future commercial development
- Install Jet A and 100LL self-fueling system

Strengths and weaknesses associated with this alternative include:

NORTHEAST AIRPORT QUADRANT/NORTH RAMP ALTERNATIVE 2	
Strengths	Weaknesses
<ul style="list-style-type: none"> ▪ Utilizes available space to maximize revenue expansion ▪ Provides flexible development to allow multi-use of facilities ▪ Allows for phased development ▪ Opens up opportunities for third party development ▪ Provides for phased development as needed. ▪ Accommodate existing and future fleet mix needs ▪ Provides higher source of revenue generation ▪ Allows for multi-use development; combination of aviation, aviation support and non-aviation growth ▪ Provides alternative revenue sources for airport growth 	<ul style="list-style-type: none"> ▪ No infrastructure in this location including utilities, access, etc. ▪ No immediate demand or need for development ▪ Current infrastructure is not being used ▪ Will require stormwater retention facilities and possible offsite mitigation

Sebastian Municipal Airport Master Plan Update

FIGURE 5-11
ALTERNATIVE 2
Source: TKDA 2017



Terminal Area

Table 4-33 of the Facility Requirements shows that total terminal area demand based upon current tenants, peak hour passengers, airport offices, etc. is approximately 8,050 square feet (sf). The current terminal building is 10,000 sf., which shows a surplus of 1,950 sf. However, although there is a surplus of area, there is an opportunity to expand the building to support additional tenant demands and growth. The terminal is located in a prime location and is easy to access. There is plenty of parking, and the location and appearance of the facility is a positive reflection on the airport.

Since GA Terminals often provide a visitor a first impression of the city and local community, two proposed expansion and development options were identified for Sebastian Airport.

Sebastian Municipal Airport Master Plan Update



Alternative 1:

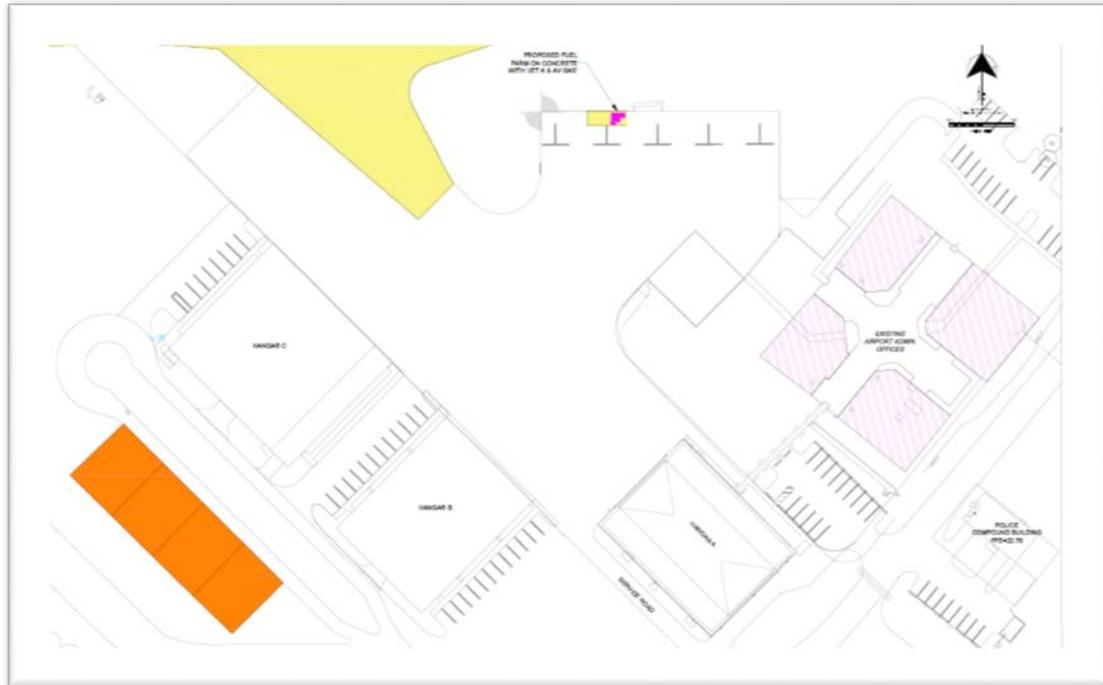
Proposed development related to alternative 1 include expansion of the Terminal Building to provide up to 20,000 SF of usable space for available lease and revenue development. Since the terminal apron is located near the large corporate hangars, it is recommended that the current tie-downs be relocated to another portion of the apron and the self-fueling facilities would be expanded to allow Jet A and 100 LL. As part of that development, a 35 ft. wide taxilane along the terminal apron edge and temporary fueling area would be established near the fuel area to allow for the efficient movement of aircraft. Other development includes construction of a 100 x 300 multi-bay hangar facility to support additional small aviation business development and research.

Strengths and weaknesses associated with this alternative include:

TERMINAL AREA ALTERNATIVE 1	
Strengths	Weaknesses
<ul style="list-style-type: none"> ▪ Utilizes available space to maximize revenue expansion ▪ Provides flexible space and development options to allow multi-use of facilities ▪ Opens up opportunities for third party development ▪ Provides for phased development as needed. ▪ Accommodates existing and future fleet mix needs ▪ Provides higher source of revenue generation ▪ Provides an area near new Hangar C for helicopter parking ▪ Allows additional revenue development and leasehold opportunities ▪ Easy access to facilities and auto parking ▪ Possible opportunities for public/private development 	<ul style="list-style-type: none"> ▪ Cost and competition from nearby airports could impact development ▪ Requires removal of existing fuel facilities and installation of new facilities and spill prevention infrastructure. ▪ Proposed self-fueling location limits the apron movement area, parking and requires fuel trucks to cross the existing apron. ▪ Requires relocation of existing tie-downs ▪ Currently no demand to justify terminal expansion

Sebastian Municipal Airport Master Plan Update

FIGURE 5-12
ALTERNATIVE 1
Source: TKDA 2017



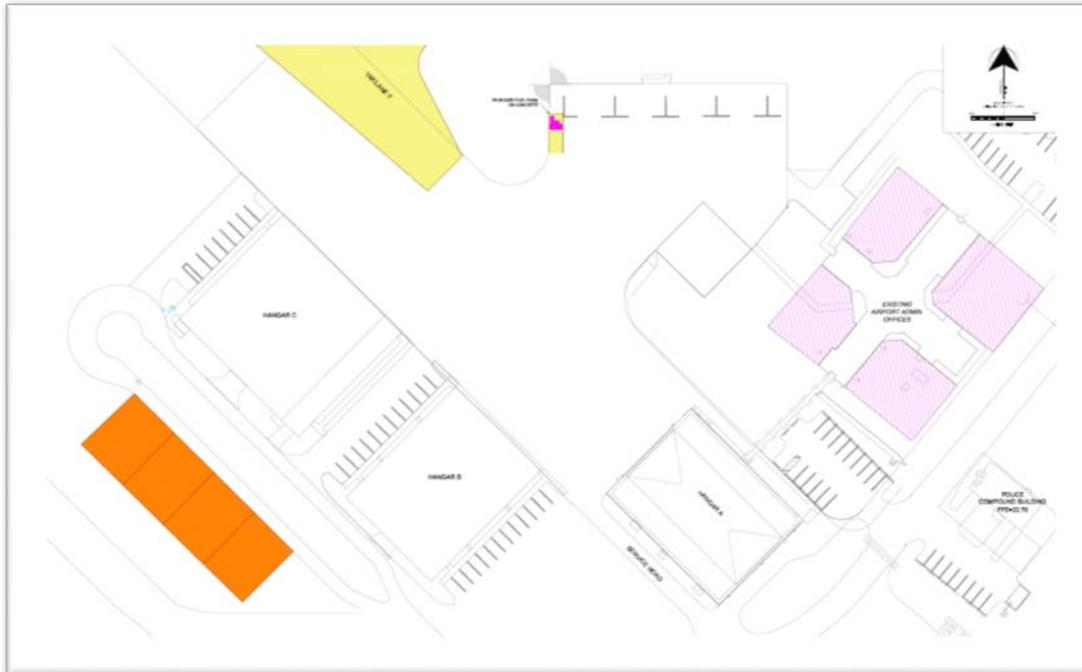
Alternative 2:

Terminal Alternative 2 is similar to Alternative 1 with the exception of relocating and expanding the fuel facilities to the northwest corner of the terminal apron. This will still require relocation of existing tie-downs but is anticipated to allow for better aircraft and fuel truck access to self-fueling facilities. Proposed development is recommended to be phased and based upon need. Currently, there is ongoing demand for corporate style hangar facilities and Jet A fuel. **Figure 5-13** illustrates the proposed terminal area development.

Sebastian Municipal Airport Master Plan Update



FIGURE 5-13
ALTERNATIVE 2
Source: TKDA 2017



Strengths and weaknesses associated with this alternative include:

TERMINAL AREA ALTERNATIVE 2	
Strengths	Weaknesses
<ul style="list-style-type: none"> ▪ Utilizes available space to maximize revenue expansion ▪ Provides flexible development to allow multi-use of facilities ▪ Opens up opportunities for third party development ▪ Provides for phased development as needed. ▪ Accommodate existing and future fleet mix needs ▪ Provides higher source of revenue generation ▪ Allows for reuse of the south apron and development of shade hangars 	<ul style="list-style-type: none"> ▪ Cost and competition from nearby airports could impact development ▪ Requires removal of existing fuel facilities and installation of new facilities and spill prevention infrastructure. ▪ Requires relocation of existing tie-downs ▪ Currently no demand to justify terminal expansion

Sebastian Municipal Airport Master Plan Update



TERMINAL AREA ALTERNATIVE 2	
Strengths	Weaknesses
<ul style="list-style-type: none"> ▪ Easy access is provided via Airport Drive west and Roseland Road ▪ Does provide additional tie-down apron and movement areas. 	

General Aviation Development Evaluation

Eight general aviation alternatives were developed, two per sector, to identify development that would most effectively achieve the Sponsor and communities vision of the airport. Screening factors included flexibility, phasing/construction, environmental effects, and operational effectiveness and safety considerations.

- **Flexibility** – pertains to the total growth potential of each concept and the process inherent to achieving that growth. The evaluation criteria associated with this category include the ability to respond to uncertain demand levels, the balance of support functions, the ability to satisfy changing tenant demands as well as fiscal responsibility and soundness of the development (i.e. minimize cost compared to revenue development).
- **Phasing/Construction** – pertains to designated land uses and associated impacts to on-airport operations and the level of difficulty involved in implementing the proposed land uses. The evaluation criteria associated with this category include the ability to phase construction, the impact on existing facilities, and the ability to incrementally expand site development.
- **Environmental Effects** – performs a general assessment to determine the degree proposed land uses would potentially impact various components of the surrounding environment.
- **Operational Effectiveness** – compares the overall efficiency levels and usage of existing or proposed infrastructure associated with the general aviation area. The evaluation criteria associated with this category includes the compatibility with the long-range airfield, roadway access to development area, the competitive

Sebastian Municipal Airport Master Plan Update

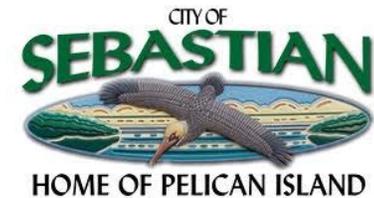


environment, and assures the highest and best use.

- **Safety Considerations** – measures each component for compliance with FAA standards that have a direct effect on the daily operations and safety at the airport facility. Evaluation factors include the overall compatibility with the Airport Operations Areas and Part 77 surfaces, and airport security.
- **Community Recommendations/Acceptance** – performs a general assessment of the likelihood to which the proposed landside improvements meet the recommendations outlined by the Sponsor and the Technical Advisory Committee as well as acceptance by the community at large.

Table 5-6 presents an evaluation matrix that addresses the aforementioned criteria. The range of the analysis was from 0 to 5 with 5 representing if an element or recommendation meets the evaluation criteria by 100 percent. This matrix summarizes the consultant’s analyses of the development concepts.

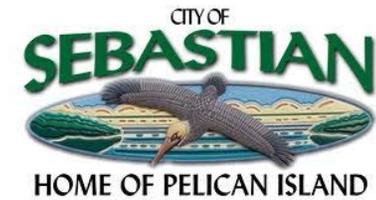
Sebastian Municipal Airport Master Plan Update



**TABLE 5-6
EVALUATION MATRIX**

	SW Quadrant/T-Hangars		NW Quadrant		NE Quadrant/North Ramp		Terminal Area	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
Flexibility:								
<i>Ability to Respond to Uncertain Growth</i>	2	4	3	3	4	4	3	3
<i>Balance of Support Functions</i>	3	4	2	2	4	4	3	4
<i>Ability to Satisfy Changing Tenant Demands</i>	2	4	3	3	5	5		
<i>Revenue Creation and Collateral Development</i>	2	4	4	4	3	5	4	4
Phasing and Construction:								
<i>Ability to Phase Construction</i>	3	4	4	4	4	4	4	4
<i>Impact to Existing Facilities</i>	3	3	2	2	4	4	2	2
<i>Ability to Incrementally Expand</i>	2	4	4	4	4	4	3	3
Environmental Effects:	5	5	4	4	4	4	5	5
Operational Effectiveness:								
<i>Compatible with Long-Range Airfield</i>	2	4	3	3	5	5	5	5
<i>Roadway Access to Potential Development Areas</i>	4	4	4	4	1	1	5	5
Safety Considerations:								
<i>Compatibility with Airport Operations Areas and FAR Part 77 Surfaces</i>	4	4	3	3	5	5	5	5
<i>Airport Security</i>	4	4	4	4	4	4	4	4

Sebastian Municipal Airport Master Plan Update



**TABLE 5-6
EVALUATION MATRIX**

	SW Quadrant/T-Hangars		NW Quadrant		NE Quadrant/North Ramp		Terminal Area	
	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2	Alt. 1	Alt. 2
Community Recommendations/Acceptance:								
<i>Likelihood of Public Acceptance</i>	4	4	3	3	4	4	3	4
<i>Compatible with Adjacent Land Use</i>	4	4	3	3	4	4	2	3
TOTAL	44	56	46	46	55	57	48	51

Sebastian Municipal Airport Master Plan Update



Secondary Element Alternatives

As noted in both FAA AC 150/5070-6B, Airport Master Plans, and the FDOT Airport Master Planning Guidebook, secondary elements are those infrastructure improvements that support the primary elements. Their location is somewhat dependent upon the orientation and location airfield and general aviation infrastructure. These support elements may be located in areas unsuitable for primary facilities.

In this analysis, secondary elements consisted of support infrastructure and alternative land use options for revenue enhancement.

Support Facility Alternatives

Although not indicated on the various alternatives shown in this chapter, expansion and growth of airport support facilities are necessary to account for increases in aviation activity which will result from the proposed development options. The following paragraphs highlight potential improvements to various support facilities including: security fencing, fuel storage, utilities, stormwater management, etc.

Fuel Farm/Self-fueling Facilities

Two fuel farms are located at Sebastian Airport, Pilot's Paradise the local FBO located on the west side of the airport provides 100LL fuel. Pilot's Paradise is equipped with one 10,000 gallon tank as well as a 1200 gallon fuel truck. There is also a self-fueling, 100 LL system located on the south side of the terminal apron. The City is also equipped with one 10,000 gallon fuel tank that provides 100LL as well as a fuel truck and self-fueling equipment. The area is marked to allow aircraft to pull up to the pump without impacting existing airport parking or other movement areas. The self-fueling facility on the terminal is owned and operated by the City of Sebastian. Neither Pilot's Paradise nor the City sell Jet A. Skydive Sebastian aircraft use Jet A fuel, but they have their own 10,000 gallon tank onsite.

Based upon the fleet mix forecast, demand for Jet A is currently needed to support existing and future demand. Demand for 100LL was anticipated to remain fairly stable with an average 14-day peak month fuel need of 2,517 gallons. Whereas Jet A was expected to grow exponentially. Current peak month 14-day demand is roughly 6,600 gallons. This is expected to growth to more than 17,000 gallons by 2037.

Sebastian Municipal Airport Master Plan Update



In addition changes in environmental regulatory requirements, including emissions, spill prevention, monitoring, removal of underground tanks, as well as demand for clean burning fuel will likely change demand. There has and continues to be a push to discontinue 100LL and replace it with some clean burning bio fuel. As of yet, this has not become feasible. However, development of this technology may require different aircraft dispensing requirements.

Therefore, based proposed development, at least three self-fueling facilities were recommended. It is recommended that Airport Management have a discussion with the FBO concerning the existing fuel system and future development. It may be more cost effective for the Sponsor to allow the FBO to provide fuel and oversee the maintenance and upkeep of the fuel farm while paying a percentage on the gallon to the airport. This option along with others will be discussed in more detail in later chapters of this report.

Utilities

The majority of the airport property with the exception of the North Ramp area are equipped with all needed facilities including water, sewer, electric, phone/cable, etc. As part of planned construction of Public Works facility near the Northwest airport quadrant, utilities have expanded along Airport Drive West. Utilities are also available along Airport Road East, which will support expansion of the terminal area as well as potential non-aviation commercial or educational development along Airport Drive East. There is excess utility capacity on and adjacent to the airport that will support growth. However, significant site preparation and utility infrastructure will be require before development of the North Ramp area may be fully realized.

Stormwater Drainage

Stormwater drainage at X26 is provided via a series of on-site manmade and natural ditches, swales and retention basins which are located on the airport golf course. Drainage facilities are used to divert runoff from the paved airport operating areas well as the skydiving jump zone. Based upon Indian River County FEMA Flood Insurance Rate Information, updated December 4, 2012, airfield stormwater runoff drains from the north and west toward retention areas to the south and east of the airport property. During heavy rain events, standing water can be found in the infield area of the airport due to the type of airport soils. However, most of this water

Sebastian Municipal Airport Master Plan Update



dissipates between 24 and 48 hours of such an event. Further according to our analysis and information obtained from stormwater management, there is existing capacity on the airport.

Proposed tie-down areas on the west side of the airport will require some relocation and expansion of drainage ditches to accommodate additional non-pervious surfaces. Since tie-down needs are limited to the northwest apron area, it is recommended that a phased approach be taken to expanded apron development to limit impacts to stormwater drainage.

Auto Parking

An analysis of auto parking requirements based upon visitor and forecast demand was presented as part of **Chapter 4, Facility Requirements**. It was determined that Sebastian had surplus parking facilities based upon the available number of parking spaces and the airport and forecast demand. On-site inventory identified approximately 135 total parking spaces (5,400 square yards)

However, the location of these parking facilities in some cases do not support demand. Therefore, recommended parking facilities associated with general aviation and terminal development are recommended as follows:

- Additional parking adjacent to box and corporate hangar infrastructure. A 60 x 60 SF hangar is estimated to require at least 3 to 5 parking spaces whereas larger facilities will increase exponentially based upon facility size and use.
- Parking facilities adjacent to the terminal building are adequate to support anticipated demand. However, with proposed expansion of the terminal building to support additional tenants and users, expansion of the parking facility will likely be warranted.

Airport Security

In July 2017, the Transportation Security Administration released Security Guidelines for General Aviation Airport Operators and Users² which provides specific guidance to address GA airport vulnerabilities, infrastructure hardening, operational recommendations, training, etc.

² https://www.tsa.gov/sites/default/files/2017_ga_security_guidelines.pdf

Sebastian Municipal Airport Master Plan Update



Since 9/11 with the strengthening of commercial airport security and infrastructure, the concern is that “bad actors” will switch to softer targets like GA airports. Traditionally, security issues at GA airports primarily were related to theft, vandalism and trespassing. Today, Airport Operators and users must work together to not only address these traditional issues but also increased threats related to domestic and international terrorism.

Recommended improvements include additional fencing and construction of internal perimeter road. Installation of additional access gates and security equipment. Fencing and monitoring of the electrical vault and fuel facilities is also recommended. Ultimately, the best way for a small airport to handle security is to work with tenants and other users to become aware of who and who should not have access to the airfield as well as keeping gates closed and monitored at all time.

Compatible Land Use

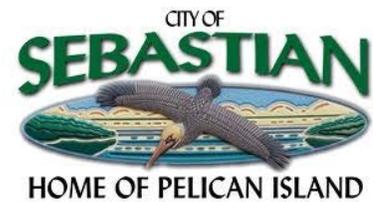
Current airport property encompasses 620 acres of which approximately 1/3 is used by the Sebastian Municipal 18-hole golf course. In addition to the golf course, portions of the current airport property was designated as conservation to support Scrub Jay, Gopher Tortoise and other habitats. According to federal funding grants, conservation is not an acceptable on-airport land use. Therefore, in conjunction with this master plan update, an airport environmental study is being performed. This study along with the property encumbrance report and Exhibit ‘A’ Property Map identifies the 88 acres of airport property that were identified for conservation but now may be used for aviation project construction. In addition, with the closure of former runway 13-31 on the north side of the airfield, this opened up along with other areas within the existing property approximately 100 acres for industrial development and an additional 70 acres for corporate park development

Airfield improvements which may shift required safety areas may require additional property acquisition either via fee simple or via an easement agreement. Land necessary to support planned airport development, to maintain compliance with FAA directives, and support compatible contiguous land use were identified in Chapters 5 and 6 of this report.

Recommendations related to land acquisition or sale to support long-term airport development including likely funding sources is provided in detail in Chapter 8, *Airport Implementation Plan*, of this report.

Alternative Revenue Generation – Non-Aviation Use

Sebastian Municipal Airport Master Plan Update



The Sponsor may designate some areas of the airport for non-aviation use with FAA approval. Some recommended non-aviation development is illustrated along Airport Drive East as illustrated in **Figure 5-14**. However, aeronautical facilities must be dedicated to use for aviation purposes. Limiting certain areas to the airport strictly for aviation use will ensure that airport facilities are available to meet demand. The FAA states that aviation tenants and aircraft owners should not be displaced by non-aviation commercial uses that could be conducted off airport property. Further, leases associated with non-aviation development cannot be longer than 20 years and must include a revocation clause allowing the sponsor to retake the property if needed to support aviation development. These leases must also be developed based upon fair market value of property and infrastructure.

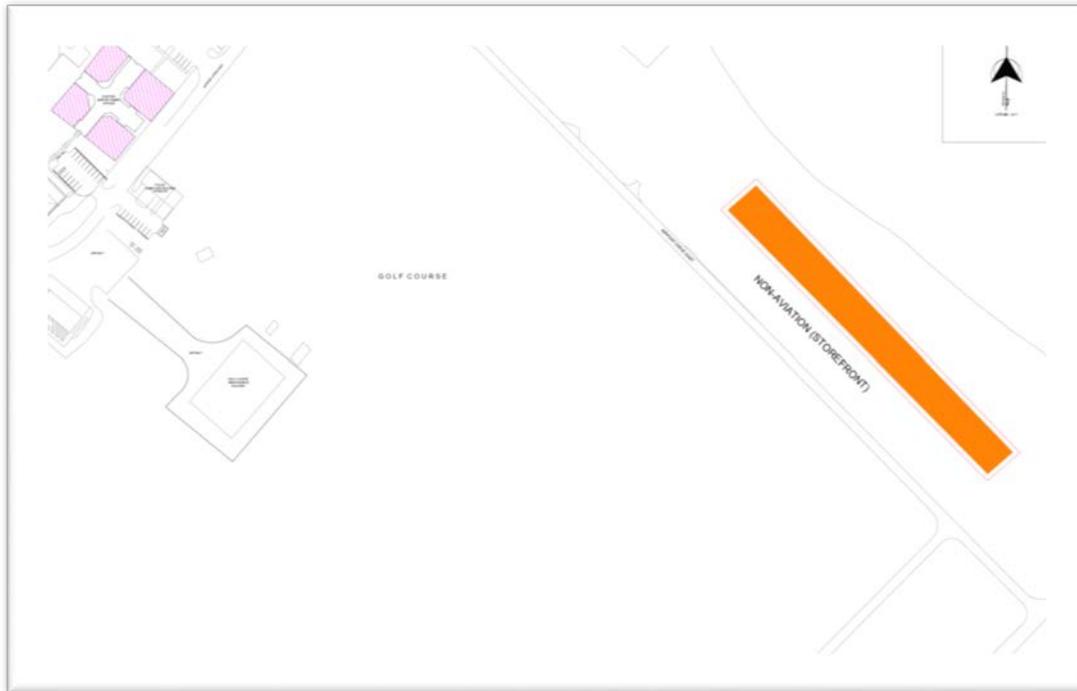
The FAA's policy, outlined in FAA Order 5190.6B, Airport Compliance Manual, paragraph 22.6, September 30, 2009, a designated aeronautical facility must obtain approval from the FAA for any non-aeronautical purpose, even if temporary. The identification of non-aeronautical use of aeronautical area receives special attention as part of the FAA airport land use compliance inspections. Areas of the airport designated for non-aeronautical use must be shown on the airport's ALP.

Sebastian Municipal Airport Master Plan Update



**FIGURE 5-14
NON-AVIATION DEVELOPMENT**

Source: TKDA 2017

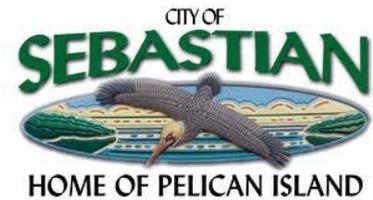


AIRPORT DRIVE EAST

Clearly identifying non-aeronautical facilities not only keeps aeronautical facilities available for aviation use, but also assures that the airport sponsor receives at least Fair Market Value (FMV) revenue from non-aviation uses of the airport. The AAIA requires that airport revenues be used for airport purposes, and that the airport maintain a fee structure that makes the airport as self-sustaining as possible. [49 U.S.C. 47107](#)(a)(13)(A) and (b)(1). The FAA and the Department of Transportation Office of the Inspector General have interpreted these statutory provisions to require that non-aviation activities on an airport be charged a fair market rate for use of airport facilities rather than the aeronautical rate. See *FAA Policies and Procedures Concerning the Use of Airport Revenue*, ([64 FR 7696](#), 7721, February 16, 1999).

If an airport tenant pays an aeronautical rate for a hangar and then uses the hangar for a non-aeronautical purpose, the tenant may be paying a below-market rate in violation of the sponsor's obligation for a self-sustaining rate structure and FAA's Revenue Use Policy. Confining non-

Sebastian Municipal Airport Master Plan Update



aeronautical activity to designated non-aviation areas of the airport helps to ensure that the non-aeronautical use of airport property is monitored and allows the airport sponsor to clearly identify non-aeronautical fair market value lease rates, in order to meet their federal obligations. Identifying non-aeronautical uses and charging appropriate rates for these uses prevents the sponsor from subsidizing non-aviation activities with aviation revenues.

A sponsor's Grant Assurance obligations require that its aeronautical facilities be used or be available for use for aeronautical activities. If the presence of non-aeronautical items in a hangar does not interfere with these obligations, then the FAA will generally not consider the presence of those items to constitute a violation of the sponsor's obligations. When an airport has unused hangars and low aviation demand, a sponsor can request the FAA approval for interim non-aeronautical use of a hangars, until demand exists for those hangars for an aeronautical purpose. Aeronautical use must take priority and be accommodated over non-aeronautical use, even if the rental rate would be higher for the non-aeronautical use. The sponsor is required to charge a fair market commercial rental rate for any hangar rental or use for non-aeronautical purposes. ([64 FR 7721](#)).

Recommended Development

With input from the Sponsor, TAC and Public, preliminary recommended development was established. A summary of proposed development is provided as follows:

Airfield Improvements: Airfield improvements were based upon Runway options D and F as well as recommended taxiway, parachute drop zone, and NAVAIDs.

- Maintain Runway 5-23 at current length
- Maintain 1 Mile Non-precision approach to both Runways 5 and 23
- Pavement rehabilitation of Runway 5-23 recommended for 2022
- Maintain Runway 5-23 as B-II-5000 with approach slope of 20:1
- Add Runway End Identifier Lights (REILs) to Runway 5-23 thresholds
- Acquire property easements for Runway 5 and 23 runway protection zones
- Remove obstructions to approach to regain lower approach LPV approach visibility; currently using circling approach minimums
- Change Runway 10-28 from B-I small to B-II small

Sebastian Municipal Airport Master Plan Update



- Maintain visual approach only (greater than 1 mile) and basic runway markings
- Rehabilitate Runway 10-28 and determine actual pavement strength in 2027
- Rehabilitate Taxiway B in conjunction with Runway 10-27
- Decrease Runway Protection Zones from 500 x 1000 x 700 to 250 x 1000 x 450 feet on both Runway 10 and 28.
- Decrease Runway 10-28 primary surface to 250 feet
- Request modification to standards for Airport Drive West and portion of Roseland Road located in Runway 10 RPZ
- Acquire property or obtain easement for property(s) located within the Runway 10 RPZ
- Narrow Taxiway A to 35 feet to allow for adjacent movement area and development
- Redevelop former runway into 35 foot taxiway to support future development
- Provide additional connector taxiways
- Maintain drop zone in current location. Add markings to designate area.
- Construct two helipad parking areas: one near existing terminal and Corporate Hangar C and the second on the northwest side of the proposed North Quadrant redevelopment.
- Airport is in the process of upgrading the AWOS to newer model.
- Add self-serve fuel location including Jet A and 100LL (or new bio equivalent) to the south corner of the North quadrant development in conjunction with second FBO development.
- Add lighted wind cone near infield and north ramp to support skydiving activity.

GA and Terminal Improvements: General aviation development and terminal improvements include a combination of various aircraft storage hangars, apron expansion and redevelopment, site preparation for private hangar development as well as aircraft tie-down and parking facilities. Recommended development based upon forecast demand, fleet mix, and highest and best land use and growth in support of airport fiscal self-sustainability. Hangar development with the exception of the shade hangars were recommended to be privately developed with the City/Airport receiving land lease revenues. If fuel services will be operated by the FBO, a renegotiated rate on the gallon and dollar should be implemented. The same is true regarding tie-down and aircraft parking fees. Proposed GA development is illustrated in **Figures 5-15** through **Figure 5-18**.

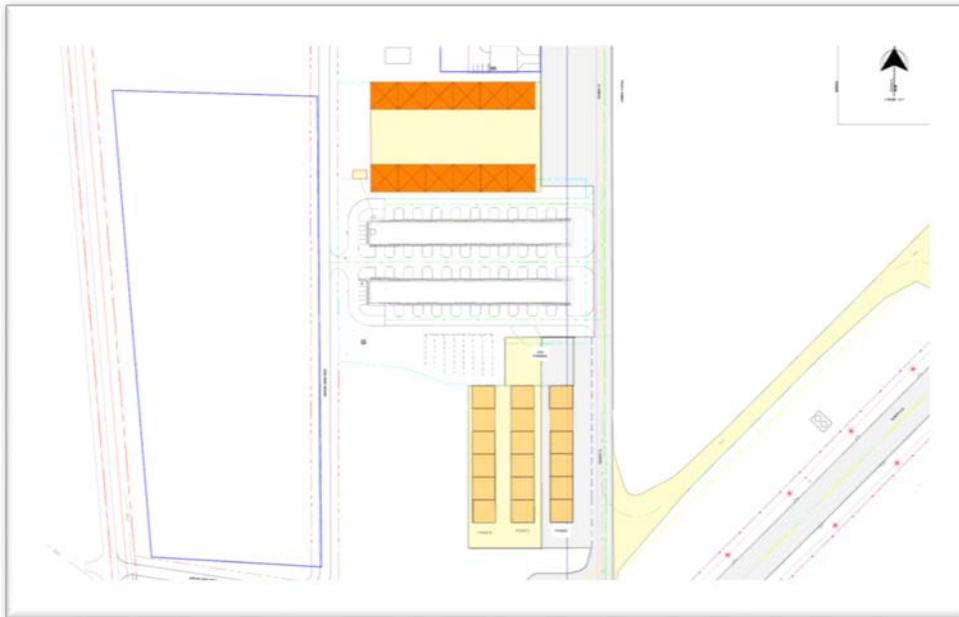
Sebastian Municipal Airport Master Plan Update



Southwest Quadrant: Proposed development is based upon Alternative Option 2 with some modifications including removal of multi-use hangar facility, expansion of apron and shade hangars, expansion of corporate hangar and box hangar development as well as removal of the expanded apron to the east and associated aircraft tie-downs. With the exception of the apron and the shade hangars, the airport will provide land leases to private development for hangar construction and expansion. Also, limiting expansion of the apron will decrease impervious surfaces and eliminate the impacts to the on-site drainage ditches.

FIGURE 5-15
RECOMMENDED SOUTHWEST QUADRANT DEVELOPMENT

Source: TKDA 2017



Northwest Quadrant: Most of the northwest quadrant of the airport is leased including the apron area in front of the existing hangars. As part of the Pilot's Paradise (on-site Fixed Based Operator {FBO}) lease agreement, they are responsible for parking and movement on the apron area along the northwest and southwest quadrants. Due to parking and lack of movement area, there is a need for additional tie-down spaces. Thus, instead of adding 400 LF of additional apron, it was instead recommended to only add approximately 12 to 14 parking spaces along with an apron edge taxilane adjacent to Taxiway A near the intersection of

Sebastian Municipal Airport Master Plan Update

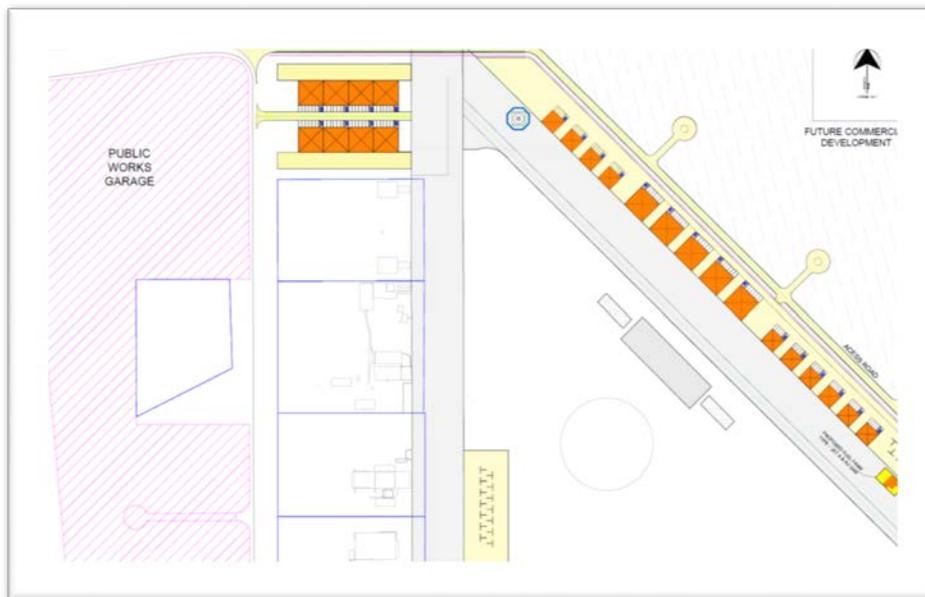


Taxiway B. This will provide needed parking to support Pilot’s Paradise operations as well as open up movement areas for contiguous leaseholds.

Other recommended development includes construction of a controlled north airport access road off of Airport Drive West to allow development within the north corner of the airport as well as support future growth of the Northeast Quadrant of the airport. Development could consist of multiple corporate hangars or one large hangar and apron facility to support another aircraft manufacturer, corporate aircraft maintenance, repair and overhaul facility, another FBO, or even a flight academy or other aviation business with need for direct access to the runways.

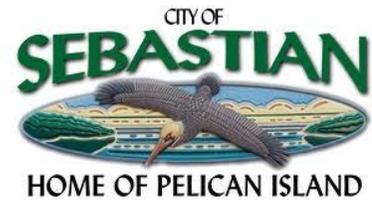
FIGURE 5-16
RECOMMENDED NORTHWEST QUADRANT DEVELOPMENT

Source: TKDA 2017



Northeast Quadrant: The Northeast Quadrant is identified for long-term development but provides an excellent opportunity for additional aviation and commercial support growth at the Airport. It is suggested that the City and Airport Management work with local economic development to identify potential interested parties. Development of this area again should be phased based upon need and demand. The southeast quadrant closest to the terminal area could be developed first since expansion of utilities is viable. This is another location that may

Sebastian Municipal Airport Master Plan Update

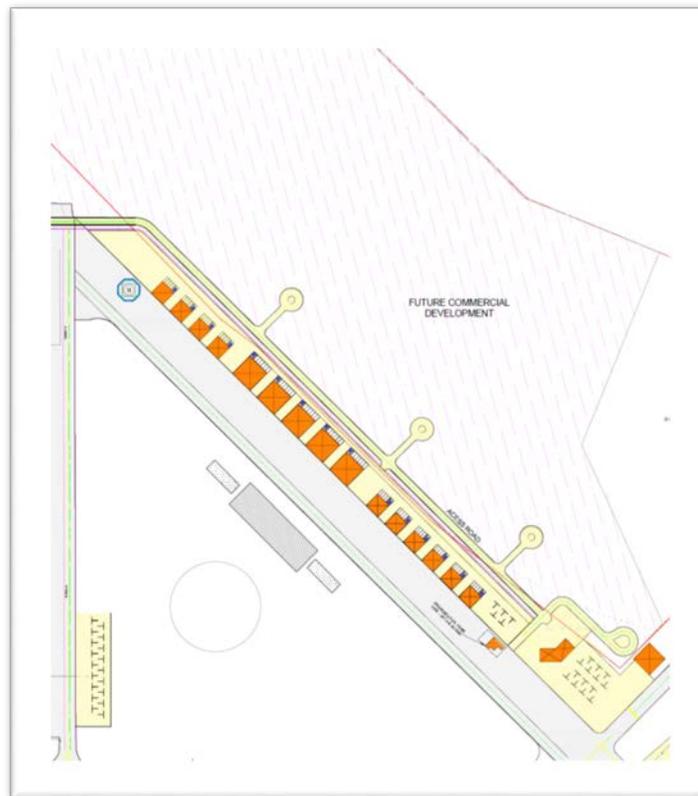


be feasible for another large aircraft manufacturing or FBO operation. Growth includes installation of additional Jet A and 100LL or bio-fuel facilities to support anticipated demand.

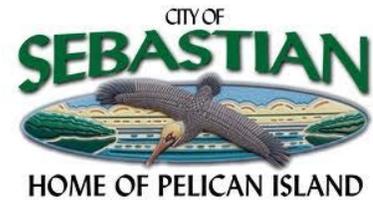
Costs could be kept to a minimal for the Sponsor and the airport by keeping site preparation to a minimal and offering development for approved private development. The airport also has property in this area that does not provide direct access to the airfield without significant infrastructure improvements. Some of this area could be used for aviation support and non-aviation opportunities. The ultimate purpose is to allow the Airport to remain financially self-sustaining while remaining a good neighbor to the local community.

FIGURE 5-17
RECOMMENDED NORTHEAST QUADRANT DEVELOPMENT

Source: TKDA 2017



Sebastian Municipal Airport Master Plan Update



Terminal Area Development: The Terminal area provides the ideal location for corporate development. The area currently supports two aircraft manufacturer showroom and manufacturing facilities as well as offices for several businesses within the terminal building. There is room for additional hangar development including a multi-use flexible hangar to the west of the large corporate hangar facilities.

Fuel storage and self-fuel facilities currently located on the southwest corner of the apron in the short to mid-term need to be upgraded or retrofitted to comply with new EPA aviation fuel regulations. This is recommended to coincide with limited expansion of the existing fuel storage to support Jet A or biofuel demand.

Initially expansion of the terminal facilities and apron area were recommended along with relocation of existing aircraft tie-down and fuel facilities. However, based upon input from airport management and existing tenants, more cost effective options are available. In the short to mid-term, relocation of a non-aviation tenant from the terminal building to another location, potentially along Airport Drive East, would open up two wings for aviation use. Discussions with airport management included some small changes to the interior of the Terminal Building to support transient and local visitors.

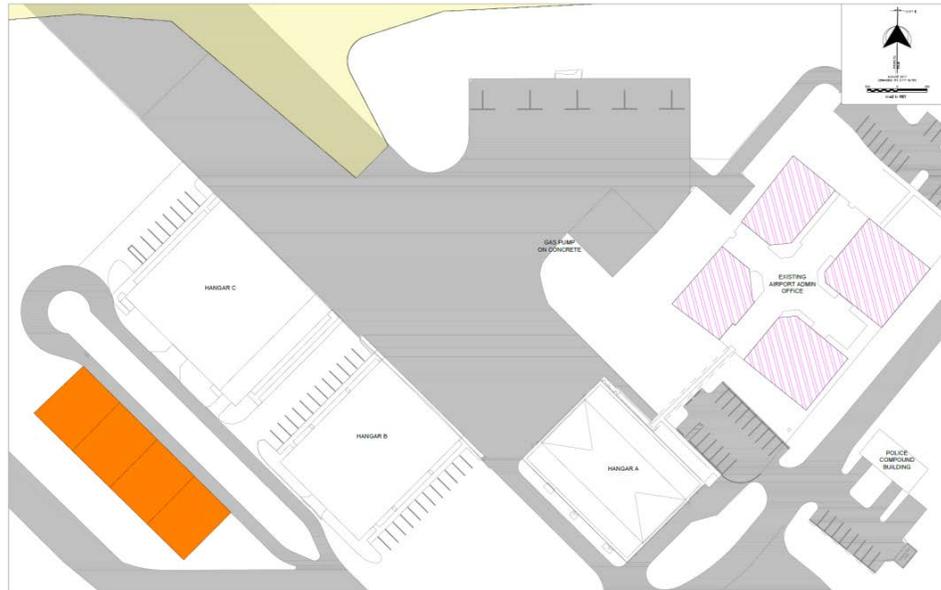
Expansion of the terminal, however, is still recommended for the long-term to allow Airport Management the flexibility to support other potential aviation uses including a pilot store, rental car counter, flight training and pilot amenities, while also opening up the building for different aviation and non-aviation events. This is all part of the City's efforts to make the airport as self-sustaining while providing the flexibility and strong return on investment.

Sebastian Municipal Airport Master Plan Update



FIGURE 5-18
RECOMMENDED TERMINAL AREA DEVELOPMENT

Source: TKDA 2017



Landside Improvements: Landside improvements include development outside the fence line in support of aviation activity, access to the airport, non-aviation development and land use in addition to proposed land acquisition via easements or fee simple purchase.

- Sebastian Skydive continues to draw individuals and groups to the Sebastian Airport. They currently lease property on the north side of Pilot's Paradise, as shown in **Figure 5-19** designated with the blue box, which includes their Jet A fuel farm and parachute packing hangar facilities. They also lease a large parcel of property that supports the Café and other support facilities including bathrooms and showers. Their lease property also includes land which can be used for parking and on-site camping.

The company is very interested in expanding their facilities including new hangars and support buildings. They are looking to add some recreational/camping space to their existing leasehold. The area outlined by the red circle is area already leased by Sebastian Skydive for future recreational development.

Sebastian Municipal Airport Master Plan Update

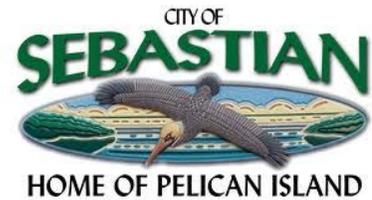


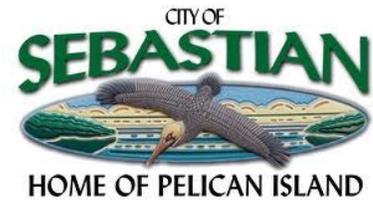
FIGURE 5-19
SKYDIVE SEBASTIAN LEASEHOLD AND EXPANDED FACILITIES REQUEST

Sources: Google Earth and TKDA 2017



- In addition, changing Runway 10-28 to a utility runway with visual only approaches allows the runway protection zone to shrink from 500 ft. inner width x 1000 ft. length x 700 ft. outer width to 250 ft. x 1000 ft. x 450 ft. or a decrease from 13.770 acres to 8.778 acres. Thus, allowing more room for revenue generation and decreasing the land acquisition requirements on Runway 10 to approximately .7 acres and on Runway 28 to less than 5 acres.
- Other landside improvements include expanded parking in and around the terminal facilities, upgrades to airport fencing and security, along with recommended utility improvements and improved airport access.
- As part of the north ramp development, a new road is recommended to provide access from Airport Drive West and Roseland Avenue to the north and east side of the airport property to allow for continued growth and development.

Sebastian Municipal Airport Master Plan Update



- Improved access and signage along Main Street will support non-aviation business development along Airport Drive East.
- Recommended long-term expansion of the terminal facilities will also attract tenants and provide facilities for visitors and pilots alike. The airport due to its proximity to City Hall and other venues, the terminal building could also be used to house special events in support of the community.

Non-Aviation Opportunities and Development:

Airport management has recently been approached to support several aviation related and non-aviation opportunities. These include providing space to the Sebastian and Indian River Police Forces for officer training, expansion of the local college facilities, as well as clean laboratory space. Proposed development includes development of 50 x 900 foot building that can support 18 50 x 50 foot flexible spaces (approximately 45,000 SF) which may be reconfigured to provide larger and smaller facilities to meet tenant needs as illustrated in **Figure 5-20**.

Sebastian Municipal Airport Master Plan Update

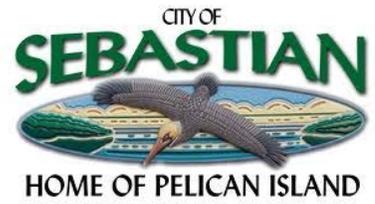


FIGURE 5-20
NON-AVIATION DEVELOPMENT – AIRPORT DRIVE EAST
Source: TKDA 2017



Sebastian Municipal Airport Master Plan Update



It is recommended that the Airport/Sponsor since all utilities are currently available at this site construct the shell of the multi-use facility and then allow tenants to retrofit the internal design to fit their specific needs. It is recommended that leases be based upon square foot needs and utility requirements. This allows tenants to focus financial resources on their facility needs rather than property acquisition.

Sebastian Airport offers businesses lease terms up to 30 years as well as providing attractive and competitive lease rates. The Airport provides sample lease documents for both aviation and non-aviation tenants are available for download on the Airport's website (<http://www.sebastianairport.org>) along with current airport minimum standards and current lease rates. This is part of the Airport and City's continued focus on airport sustainability and the Sponsor's long-term vision for future airport growth.

Miscellaneous Facilities: Miscellaneous facilities include the majority of secondary airport elements including utilities, access, airport security, stormwater management, etc. The airport is only partially equipped with an interior perimeter road, and there is currently no access other than via the airfield to the Northeast Quadrant. Recommendations based upon input from the sponsor and public input are as follows:

- Utilities have already been expanded along Airport Drive West to the north portion of the airport property line to support planned public works department development. Therefore, in conjunction with construction of the north airport access road to the north ramp, utilities could be extended to the northern portion of the north ramp area to allow for development.
- Utility expansion from the south and terminal area to the north ramp area will allow development to move southward to address demand. Development of the north ramp area will be dependent upon need and third party funding. "Through the fence" operations are not allowed, but the area could support a multitude of aviation uses. Depending upon need, development may start in the south corner and move north or vice versa. As part of hangar and building development, consideration must be given to avoid creating wind vortices that could negatively impact parachute operations.
- As part of this analysis, the viability of adding a controlled interior perimeter road to support tenant movement and airport maintenance and operations was also considered. Since a south parallel taxiway to Runway 5-23 is not needed to support

Sebastian Municipal Airport Master Plan Update



planned development, there is now space to add a 12 ft. wide perimeter road to allow access from the southwest portion of the airfield to the corporate hangar and terminal area. This would limit vehicles driving on active taxiways and runways.

Next Steps

The next steps in the master plan process is to provide a more in-depth analysis of potential environmental impacts and mitigation options, land use and acquisition, as well as identify projects to support airport sustainability over the planning period. **Chapter 6** will also include a summary of findings from the environmental analysis and associated recommendations as well as a solid waste management plan.

The recommendations outlined in this chapter and the remaining chapters of the narrative report are being graphically represented in the Airport Layout Plan. As part of the ALP, an updated Exhibit A property map which identifies all existing airport property with good title as well as existing and future land acquisition, and easements will also be provided. Both the narrative report and ALP are designed to provide the Airport and Sponsor a flexible development plan to address forecast demand and opportunities. Projects shown on the ALP may be eligible for federal and state funding, and **Chapter 9** provides a 20-year fiscally responsible Capital Improvement Program for future development based upon anticipated local share of revenues and expenses and likely FAA and State funding.

This information will be used to create a 20-year Capital Improvement Plan for the City of Sebastian and the Airport that may be used to assist with populating the airport's JACIP.

Sebastian Municipal Airport Master Plan Update



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