

CHAPTER SEVEN

Airport Sustainability and Solid Waste Management

Chapter Overview and Introduction

As noted in Chapter One of this report, airport sustainability is important to support airport longevity. As a result, the Florida Department of Transportation (FDOT), Federal Aviation Administration (FAA), as well as a number of airport groups and organizations have provided guidance regarding instituting sustainability initiatives and procedures at airports nationwide.

The FAA in conjunction with other programs has and continues to support the sustainability planning as part of the master plan process or as a supplemental document to the master plan depending upon the airport size and types of operations and activity. The FAA has and continues to provide Airport Improvement Program (AIP) funding to support airport sustainability efforts at all NPIAS airports. Airport sustainability, as highlighted by FAA, consists of four equal prongs: community, economy, environment and operations as illustrated in **Figure 7-1**.

The FDOT also supports airport sustainability, and recently published the 2017 Airport Sustainability Guidebook (<http://www.fdot.gov/aviation/sustainability.shtm>). Initially because of the economies to scale benefits, sustainability efforts primarily focused on large and medium sized commercial hubs. However, as the FDOT noted, as these larger commercial and GA airports continue to see growth, capacity constraints will require some operations to shift to nearby non-hub commercial and GA airports. By implementing sustainability guidance, especially during the planning process, these airports can better address forecast traffic needs, community concerns, as well as have an effective economic plan in place to address demand. The FDOT also stated that “GA airports may actually be at an advantage...the lower number of

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departments and staff can make it easier to obtain internal buy in, communicate information and coordinate initiatives.”¹

**FIGURE 7-1
AIRPORT SUSTAINABILITY**



Source: FAA, Environmental Program, Airport Sustainability
(<https://www.faa.gov/airports/environmental/sustainability/>)

Therefore, the FDOT like the FAA is providing funding to support for the implementation of sustainability initiatives and monitoring at airports throughout the state. Further, both FAA and FDOT grant assurances are tied to airport sustainability including those that reference the goal of Airport Self Sufficiency. Again, both the FAA and FDOT seek to increase the “efficacy of their financial investments” in order to support airport longevity through “financial self-sufficiency, operational efficiency, social responsibility, and environmental awareness.”²

The City of Sebastian itself does not have a sustainability program in place, but Indian River County was certified in 2009 as a Florida Green Local Government. This means that the county

¹ “Why Sustainability is Important to Florida Airports.” Airport Sustainability Guidebook 2017, Florida Department of Transportation, Page 3.

² Ibid, pg. 4.

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government incorporates multiple environmental, ecological and sustainable features throughout various county functions. Thus, several county recommendations and functions were considered regarding their applications to the Sebastian Municipal Airport in addition to other initiatives and programs being implemented at similarly sized airports and communities around the country.

The Sebastian Master Plan as part of the project scoping included evaluating and implementing sustainability options on an ad hoc basis meaning that although considered throughout the master plan process, the recommendations and findings were consolidated into a single chapter along with the solid waste management evaluation and recommendations. The ad hoc approach is beneficial to airports with limited resources, but are still interested in integrating some level of sustainability into their daily management and operations. Having a stand along chapter allows both city and airport management the ability to quickly identify options and initiatives with a high likelihood of success. As the airport developments, additional sustainability actions may be initiated.

Using the recent FDOT Airport Sustainability Report as a guide, the sustainability analysis at Sebastian Municipal Airport included: Phase 1. Setting the Stage, Phase 2. Baseline Assessment, Phase 3. Plan Development, and Phase 4. Implementation and Monitoring recommendations. A full in-depth sustainable plan with cost benefit evaluations and performance recording were not performed as part of this preliminary sustainability analysis based upon the sponsor's priorities. However, recommendations moving forward are provided and incorporated into the proposed capital improvement plan and financial analysis.

The second portion of this chapter will focus on evaluating current solid waste management and recycling efforts and providing recommendations in conjunction with proposed development. In 2012, Congress passed the FAA Modernization and Reform Act which requires all NPIAS airports as part of ongoing airport planning to address the feasibility of solid waste recycling at the airport. This includes a waste audit, evaluating the feasibility of solid waste recycling at the airport, identifying ways to minimize the generation of solid waste, identifying operational and maintenance requirements, reviewing ongoing waste management contracts, and identifying the potential for cost savings or the generation of alternative revenue streams. This effort is a requirement of the master planning process as it relates to airport grant assurances as well as being part of the FAA's continued concentration on airport sustainability and compliance.

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Airport Sustainability Planning

Setting the Stage

Based upon discussions during the initial project meeting with the Technical Advisory Committee, a draft airport mission statement was created to drive future development at the Airport.

To maintain and improve the Airport to serve the needs of the Sebastian community and Treasure Coast Region, promote economic growth in the region, while managing and developing the airport in an economically, socially compatible and environmentally sustainable manner that conserves natural resources, protects the environment, promotes airport safety and economic self-sufficiency and compatibility with the local community.

From this, several planning and sustainability goals were identified including:

- Focus on initiatives that achieve objectives with low implementation costs.
- Develop simple tools to support implementation and monitoring of sustainability objectives.
- Prioritize airport economic sustainability and resource conservation
- Plan for initiatives that can be incorporated as airports expand
- Encourage sustainable solutions for project design and construction, including recycling and solid waste management
- Encourage airport tenant and user participation
- Provide users general guidance and contact information for implementing sustainability initiatives, etc.
- Identify and weigh sustainability targets based upon local priorities, environmental criteria, and stakeholder input, etc.

Airport sustainability guidance will be provided throughout this master plan process while using the Airport's mission statement to craft recommended development. As part of the airport facilities analysis, a simple sustainability baseline assessment will be performed, sustainability goals, targets and strategies will be evaluated as part of the master plan alternatives analysis, and recommended implementation strategies and cost savings will be included in the airport implementation plan and recommended twenty-year capital improvement plan (CIP). As technology continues to change, other opportunities for resource and economic sustainability

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will be available to the airport. The plans outlined in this document were designed to provide the City and airport management flexibility to incorporate these opportunities.

Baseline Assessment

The baseline assessment consists of data collection of sustainability related metrics related to airport economic and financial status, community involvement, environmental and operational overviews. This baseline data was used to identify existing concerns and needs while providing a starting point for sustainable plan performance monitoring.

Economy/Financial Status

The Sebastian Municipal Airport is a department that is governed by City of Sebastian Management and City Council. Capital improvements at the Airport are funded through a combination of federal, state and local funds. The City Council and City Management must approve planned development to determine if local funds are available before applying for FAA and FDOT funding. Historically, City Council and Management have supported continued maintenance and growth of the Airport. The local airport funding share may be provided if available and with approval by City Council through the City's general capital improvement fund. The City has also loaned money to the Airport as part of their local share for corporate hangar development based upon a 10-year repayment period and zero interest.

Discussions with the Director of Finance for the City is working with the City Manager, Airport Manager and members of the City Council to potentially forgive one outstanding hangar loan to allow Airport Management to use the repayment funds for continued airport growth and revenue expansion and diversification.

Although use of the general fund historically was used to fulfill the airport's local share of capital improvement funding requirements, it was recommended that participation from general fund not be considered when evaluating short and long-term capital project funding needs. Therefore, as part of the financial pro forma evaluation, the local share was considered to be obtained from airport revenues minus airport expenses only. As additional leaseholds are developed on the Airport property, it is anticipated that use of the City general fund will be limited to only high dollar airport projects.

Table 7-1 illustrates historical airport financials and funding sources associated with past capital improvement projects at the Airport.

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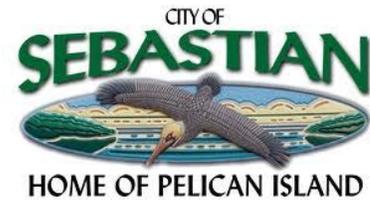


TABLE 7-1 HISTORICAL AIRPORT FINANCIALS BUDGET SUMMARY					
DESCRIPTION	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016
Operating Expenses	\$195,866.00	\$235,291.00	\$219,697.00	\$173,283.00	\$174,190.00
Capital Outlay	\$0.00	\$0.00	\$928.00	\$2,078.00	\$195,809.00
Debt Service	\$16,575.00	\$16,575.00	\$19,425.00	\$19,401.00	\$70,025.00
Non-Operating	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Contingency	\$0.00	\$15,552.00	\$93,608.00	\$0.00	\$0.00
Total	\$420,885.00	\$422,070.00	\$415,148.00	\$311,886.00	\$564,720.00

Source: City of Sebastian Airport Financial Records, 2011-2016 and TKDA 2016/2017

Operations

The City of Sebastian and Sebastian Municipal Airport are uninterested in expanding their facilities to support larger corporate jet traffic or heavy industrialized development. Because the airport is located between environmentally sensitive lands and residential development, the Sponsor intends to continue to develop the airport as a specialized recreational airport or “boutique” airport. Approximately 12 miles south of Sebastian Airport is Vero Beach Regional Airport (VRB) and approximately 19 miles northwest is Melbourne International Airport (MLB). Both of these airports provide facilities that more than adequately support corporate jet traffic and heavy aircraft demands.

As a result of the long-term vision of the Sponsor and users, the following forecasts were established as illustrated in **Table 7-2**.

TABLE 7-2 OPERATIONAL DEMAND SUMMARY					
	2018	2022	2027	2032	2037
Itinerant Operations	16,555	16,966	17,159	17,179	16,991
Local Operations	28,758	32,017	36,157	40,780	45,939
TOTAL OPERATIONS	45,313	48,983	53,316	57,959	62,930
Fleet Mix					
Single-Engine Piston	34,308	36,673	39,919	43,408	47,149

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Multi-Engine Piston	2,372	2,463	2,550	2,636	2,722
Turboprop	3,366	3,939	4,733	5,680	6,809
Jet	0	14	16	19	23
Civil Helicopter (CH)	27	33	42	53	67
Light Sport Aircraft	2,217	3,182	3,877	4,344	4,769
Other (Gliders, UAVs, Ultralights, etc.)	3,023	2,679	2,178	1,818	1,391
TOTAL OPERATIONAL FLEET MIX	45,313	48,983	53,316	57,959	62,930
<i>Sources: Airport historical records, tenant data, on-site inventory and TKDA 2017</i>					

There will be some growth in corporate demand as a result of available facilities on the airport. However, the main use of the airport will remain recreational and light, sport aircraft manufacturing for the foreseeable future. Forecast growth of both light sport and turbine engine aircraft will drive the need for on-site Jet A fuel facilities as well as future bio-fuel facilities. Airport management is already in discussions with the current FBO Pilot’s Paradise about expanding their existing fuel facilities to support Jet A demand as well as looking at other sites for a potential second Fixed Based Operator and consolidation of fuel facilities within the east quadrant of the Airport property near the existing terminal facilities. Anticipated fuel demand is summarized in **Table 7-3**.

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TABLE 7-3 ESTIMATED FUEL DEMAND					
ANNUAL DEMAND	2018	2022	2027	2032	2037
Jet A (Gallons)	163,259.09	201,454.11	257,522.64	328,755.03	419,257.64
Jet A Sales (Dollars)	\$688,953.38	\$850,136.33	\$1,086,745.52	\$1,387,346.23	\$1,769,267.24
100LL (Gallons)	57,276.00	49,770.34	53,707.25	57,812.25	62,086.23
100LL Sales (Dollars)	\$240,559.21	\$209,035.43	\$225,570.45	\$242,811.46	\$260,762.17
November 2017 Jet A Dollars per Gallon					\$4.22
November 2017 100LL Dollars per Gallon					\$4.20
<i>Sources: Historical Demand, Vero Beach Regional Airport Average Jet A fuel cost per gallon, Sebastian Municipal Airport Average 100LL fuel cost per gallon, and TKDA 2017</i>					

Community

The City and the Airport actively work with the local community and have a reputation as a “good neighbor.” Airport management provides numerous opportunities to engage with interested community members and works to keep potential environmental impacts associated with airport operations to a minimum. Airport management has implemented a variety of noise abatement procedures as illustrated in **Figure 7-2**, as well as does not allow flight training on Sundays or after dark. The Airport property is also home to the Sebastian Municipal Golf Course and the local restaurant, Eagle’s Nest. The Airport Manager is working with the local community on addressing tree impacts to the existing runway approaches while looking at landscaping options to mitigate impacts associated with tree clearing.

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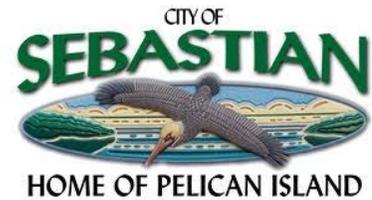
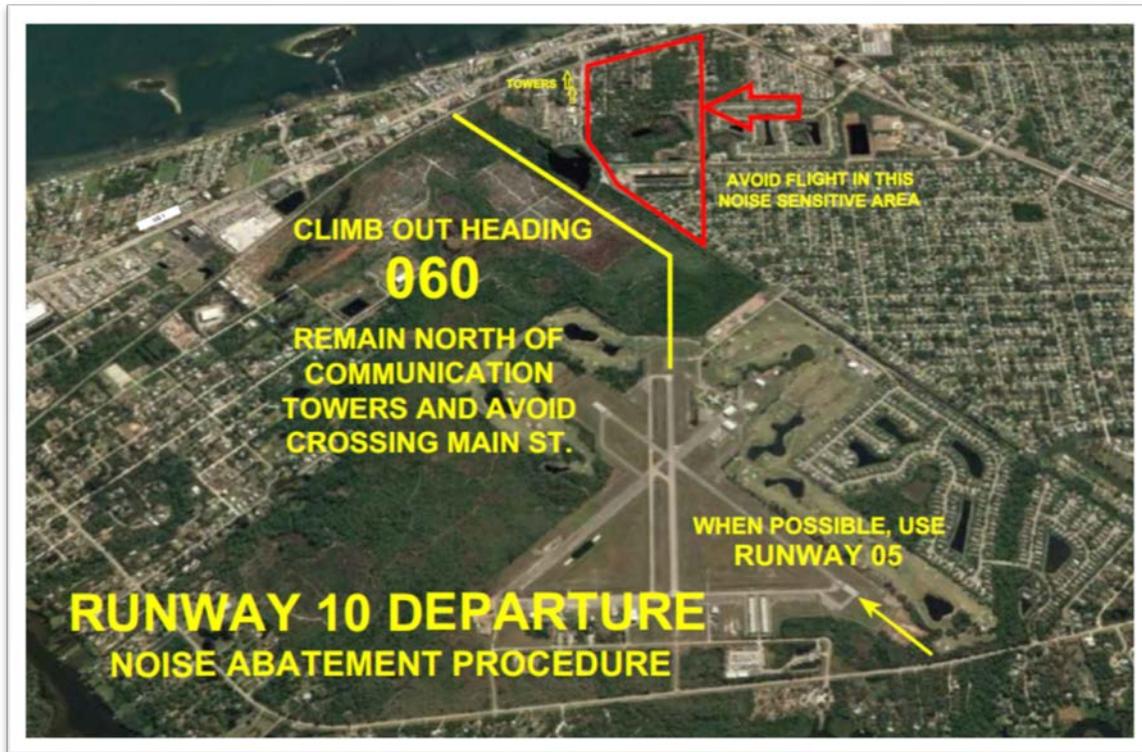


FIGURE 7-2
VOLUNTARY NOISE ABATEMENT PROCEDURES

Source: TKDA 2017



As part of this master plan process, the community and airport stakeholders were engaged throughout the planning effort. Recommended development is a compilation of recommendations and goals obtained from the community, stakeholders and Airport/City Management. As part of the sustainability airport planning efforts, engagement with the local community and users is key to promoting the longevity and safety of airport operations.

Environment

As discussed in **Chapter 6**, Airport Environment, of this report, the Sponsor engaged in four separate environmental studies in tandem with this master plan: Florida Scrub Jay Survey; Wetland Delineation and Mitigation Assistance; Full Airport Environmental Assessment; and Habitat Conservation Plan.

The previous master plan and Airport Layout Plan designated portions of the Airport property as conservation primarily due to potential Scrub Jay habitats. However, according FAA Grant

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Assurances and Land Use Guidance, conservation is not an approved or recommended on-airport land use.

Since Sebastian is a smaller GA, recreational airport, environmental impacts related to noise, air quality impacts, water quality impacts, fuel usage and waste management is fairly minimal. The Airport is located near conservation and residential properties, as shown in **Figure 7-2**; therefore the Airport has already implemented and enforces voluntary noise abatement procedures. All fuel farms are equipped with spill prevention facilities, and both the FBO and City have up to date spill prevention control and countermeasure (SPCC) plans.

The State of Florida continues to take measures and provide funding for projects to maintain and support Florida's resources. The City of Sebastian in 2015 was recently awarded \$175,000 by the Florida Department of Environmental Protection for stormwater improvements which will reduce nutrients from entering Indian River Lagoon and St. Sebastian River. The City is actively working with various state and local agencies in addition to community organizations to identify opportunities to integrate sustainable practices within the City and County as well as at the Airport. Looking at "best practices" for similar communities throughout the state as well as nationally, sustainability options and objectives which could be implemented at the Airport will be further refined based upon anticipated operations, facility requirements, community support, financial feasibility as well as potential environmental concerns and opportunities.

Plan Development

Using the baseline data, goals and long-term vision established by the Sponsor, sustainability initiatives that are most appropriate and beneficial to the airport were identified. These initiatives included identifying who would be responsible for initiating and monitoring the sustainability initiatives, potential timeline for implementation and return on investment as well as providing recommendations for a simple comprehensive plan to monitor and track initiatives.

Recommended Development

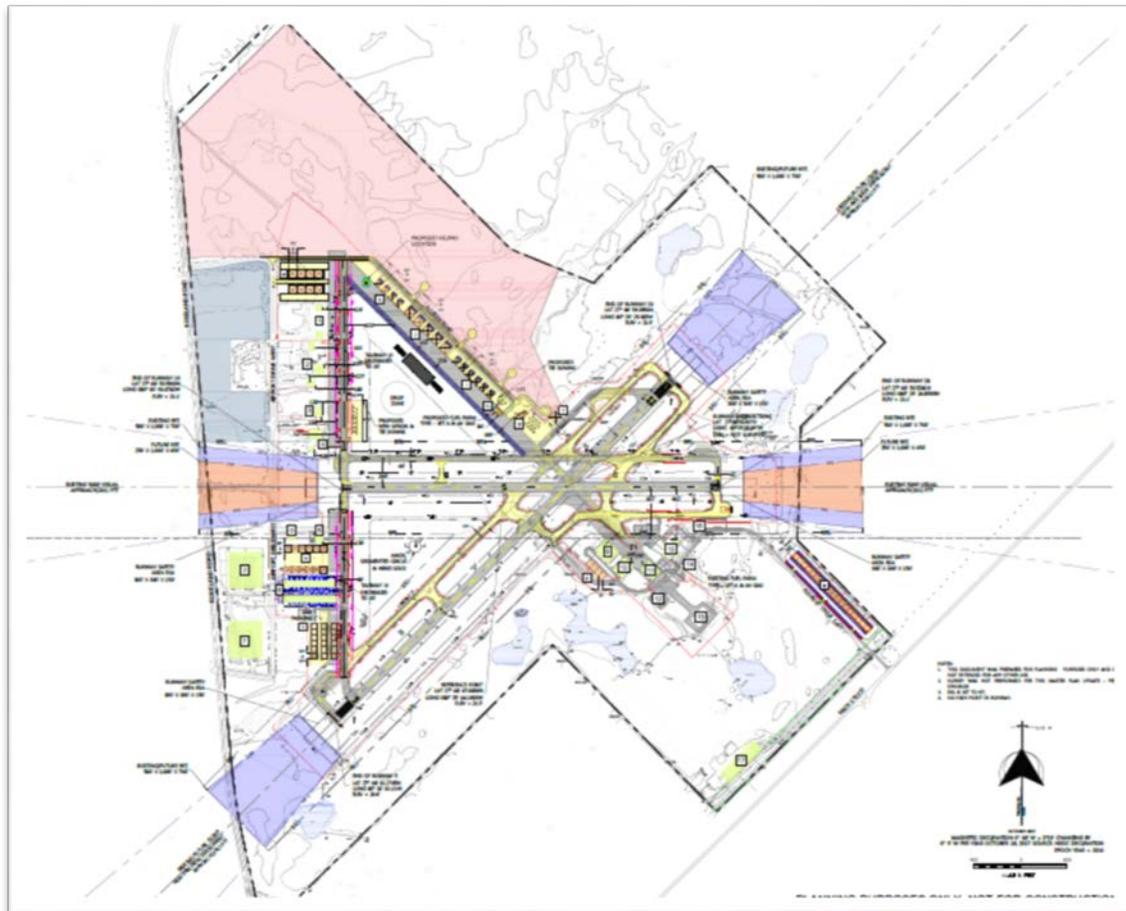
With input from the Sponsor, TAC and Public, recommended development was established as illustrated in **Figure 7-3**.

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**FIGURE 7-3
PLANNED AIRPORT DEVELOPMENT**

Source: TKDA 2017



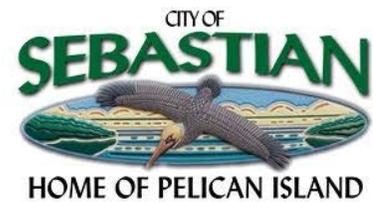
Initiatives

Low Cost Sustainable Development Options

Other sustainable opportunities that the Sponsor and its users may want to consider include obtained from the Sustainability Aviation Guidance Alliance Search Engine (<http://www.airportsustainability.org/sustainable-practices#>). The majority of recommendations provided are considered low cost to implement:

➤ **Energy and Climate:**

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- ✓ Plug all electrical equipment into surge protector and power strips. Turn off when not in use
- ✓ Purchase and use printers and fax machines that have a power-down or “sleep” option
- ✓ Unplug any unnecessary devices when not in use
- ✓ Develop and implement an environmental/sustainability tracking process
- **Ground Transportation**
 - ✓ Encourage transit authority to provide bicycle friendly buses and trains
 - ✓ Provide safe pedestrian and bicycle lanes
 - ✓ Provide employees bus passes or encourage car pooling
 - ✓ Provide bicycle storage and shower facilities for employees and tenants
- **Economic Performance**
 - ✓ Purchase high content post-consumer recycled paper
 - ✓ Limit printed materials
 - ✓ Integrate sustainable language and requirements into contracts
 - ✓ Use local/regionally sourced materials
- **Design and Materials**
 - ✓ Use zero or low volatile organic compound paint and coatings
 - ✓ Use zero or low volatile organic compound cleaning products
 - ✓ Reuse existing structure and building components
 - ✓ Reuse existing runway pavement
- **Community Engagement and Leadership**
 - ✓ Donate surplus goods to charities and other community organizations
 - ✓ Purchase used furniture and other equipment
 - ✓ Hold training and other community events at the airport
 - ✓ Clearly define sustainability goals
 - ✓ Include sustainable training requirements in all bid documents
- **Water and Waste**
 - ✓ Recycle non-potable water for landscaping
 - ✓ Install waterless urinals and composting toilets
 - ✓ Implement and enforce construction waste management plan and tracking system
 - ✓ Use clean-cut or trenchless technology when installing utilities
- **Natural Resources**
 - ✓ Develop and implement sustainable landscaping guide

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- ✓ All vegetation removed composted on-site for mulch
- ✓ Install a non-reflective solar panel roof on buildings or use reflective coating or roof materials on buildings that will not impact aircraft operations
- **Human Well-Being**
 - ✓ Provide safe bicycle and walking paths, but not within airport safety areas.
 - ✓ Provide preferred parking
 - ✓ Post no-idling signs
 - ✓ Install motion sensors and timers on building lighting

Aviation and Non-Aviation Land Use

As part of the federal government's sustainability initiatives and existing airport grant assurances, airport sponsors need to evaluate and implement plans to become and remain financially self-sustaining. This is often extremely difficult for small GA airports which have limited resources. Therefore, options to utilize airport property for both aviation and compatible non-aviation development may be allowed with support by the FAA and FDOT.

Airport land, first and foremost, is to be used for aviation use. However, there may be pockets of available land that cannot efficiently support aviation activity. However, these 'land pockets' may be suitable for aviation support or non-aviation use. It is important to note that alternative uses of aviation land must be based upon fair market value, must include short-term lease terms, and be compatible with aviation activity. All revenue obtained from these sources must be directed back into the airport fund for on-going maintenance and improvements.

Compatibility criteria for non-traditional airport land use includes:

- ➔ Does not exceed height standards
- ➔ Does not attract large concentrations of people
- ➔ Does not create wildlife attractant(s)
- ➔ Does not cause a source of smoke or plumes
- ➔ Does not cause electrical interference
- ➔ Meets compatible day-night average sound levels (DNL)
- ➔ Does not impact airport safety and security
- ➔ Other requirements include, but are not limited to, the following:
- ➔ No through the fence operations are allowed
- ➔ Property/Lease must be based upon fair market value

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- Requires shorter lease terms (typically 10 years)
- Requires FAA and local DOT coordination and approval
- Complies with FAA Grant Assurance requirements
- Complies with FDOT Land Use and Grant Criteria
- Revenue must be used to support airport only
- Airport has the option to either maintain or sell property outright, but will require approval of FAA and FDOT.

Compatible non-traditional land use options may include:

- Aviation support facilities
- Wholesale and retail facilities
- Building materials
- Hardware
- Farm equipment, etc.
- Agricultural and forestry
- Commercial development and land use:
- Manufacturing (dependent upon type)
- Warehousing
- Freight forwarding
- Cell phone antenna (in combination with airport beacon)
- Industrial park development
- On-airport concessions
- Airport Concessions:
- Rental cars
- Restaurants
- Hotels
- Long and short-term parking
- Advertising programs
- Multi-modal facilities:
- Bus stations
- Light rail stations
- New technology
- Mineral rights and resources
- Foreign trade zones, etc.

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All proposed development, including aviation and non-aviation use, must consider existing and long-term demand and must balance operational and safety needs with revenue. Further, the Sponsor should consider if proposed development would be coordinated through the airport or via third party development. There are costs and opportunities associated with each option which should be considered carefully before agreeing to development. Lastly, it is recommended that all non-traditional leases include language that the Sponsor/Airport has the right end a lease if the property is needed for aviation use.

Action Plan Development

Using the objectives outlined in the previous sections combined with the vision and objectives of the sponsor, users and community, sustainability monitoring metrics were created as outlined in **Table 7-4** using the recommended sustainability tracker outlined in the FDOT's Airport Sustainability Handbook.

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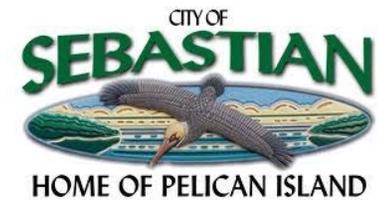


Table 7-4 Sample Sustainability Tracker							
Resource Category	Goals	Objectives	Metrics	Current Level	Target Level	Initiatives	Action Steps
OPERATIONAL EFFICIENCY	Incorporate sustainability principles into long-range business strategy and day-to-day operations. Also develop standard operating procedures and incorporate into existing airport procedures.						
Office Resources	Implement processes to more efficiently use resources and limit costs		TBD	TBD	TBD		Monitor office resource use; look at ways to cut paper and ink use
Energy Use	Become more energy efficient		TBD	TBD	TBD		Monitor utility information
Airside Management	Improve access and egress, and eliminate any “hot spots”		TBD	TBD	TBD		
Landside Management	Improve overall airport access to different portions of the airfield, and minimize auto use of airfield		TBD	TBD	TBD		
WATER MANAGEMENT	Minimize water consumption, use gray water for landscaping, protect existing watersheds and address stormwater management and treatment						

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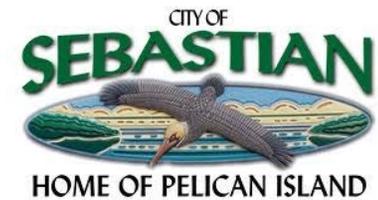


Table 7-4 Sample Sustainability Tracker							
Resource Category	Goals	Objectives	Metrics	Current Level	Target Level	Initiatives	Action Steps
Stormwater Management	Minimize stormwater impacts associated with new development		TBD	TBD	TBD	Analyze stormwater management options for new projects	Maximize pervious surfaces
Stormwater	Reduce sediment in stormwater drainage ditches					Evaluate maintenance efforts to limit sedimentation and clean out needs	Explore options to capture and reuse stormwater
Landscaping	Minimize water use and plant Florida native landscaping		TBD	TBD	TBD		Establish active management of landscape contracts to install drought tolerant native plants and weed growth prevention
SOLID WASTE MANAGEMENT AND RECYCLING	Minimize generation of solid waste and reuse and recycle collected waste to maximum extent possible.						

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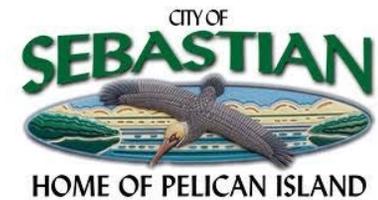


Table 7-4 Sample Sustainability Tracker							
Resource Category	Goals	Objectives	Metrics	Current Level	Target Level	Initiatives	Action Steps
Construction Waste	Maximize use of construction waste on airport		TBD	TBD	TBD		Implement and enforce construction waste management plan and tracking system
Offer recycling facilities on airport to users and tenants	Minimize solid waste creation	Encourage users and tenants to recycle and limit solid waste generation	TBD	TBD	TBD		Develop and implement on-airport and office solid waste program
Landscape Waste	Minimize landscape waste creation and disposal in landfills		TBD	TBD	TBD	Install native and low growth landscaping	Reuse landscape waste as mulch both on and off the airport
COMMUNITY OUTREACH	Enhance communication with, and in support of airport and local community						

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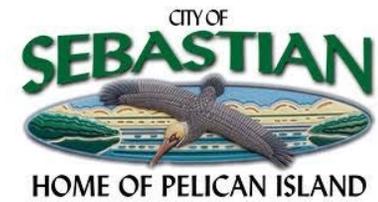
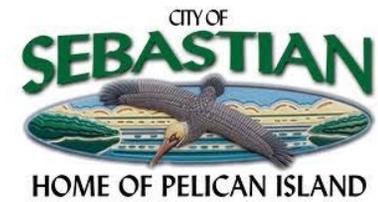


Table 7-4 Sample Sustainability Tracker							
Resource Category	Goals	Objectives	Metrics	Current Level	Target Level	Initiatives	Action Steps
	Maintain “Good Neighbor” Airport Image			9	10		Develop internal and external communication plan concerning sustainability performance
Noise	Reduce noise impacts related to aircraft operations		DNL Noise Data	TBD	TBD	Voluntary Noise Abatement Procedures	<ul style="list-style-type: none"> • Publish voluntary noise abatement procedures on websites • Work with tenants and flight schools to consistently fly recommended procedures • Work with the community to identify hotspot areas and explain improvements, etc.

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**Table 7-4
Sample Sustainability Tracker**

Resource Category	Goals	Objectives	Metrics	Current Level	Target Level	Initiatives	Action Steps
CONTRACT AND LEASE MANAGEMENT	Integrate sustainable practices into internal policies, business processes and written agreements						
Bid and Lease documents	Implement sustainability initiatives as part of capital improvement and airport maintenance		TBD	TBD	TBD		Include sustainable training requirements in all bid documents

Notes: TBD = To Be Determined
Sources: Sustainability Tracker Sample, Table 10, FDOT Airport Sustainability Handbook, 2017, FAA Sustainability Guidance, TRB Airport Sustainability Guidance, Port Authority of New York and New Jersey Sustainability Plan, 2016, and City of Sebastian Staff, Tenant and Community Meetings and TKDA 2016-2017.

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Implementation and Performance Monitoring

As recommended by FDOT, proposed initiatives are evaluated based upon suitability, timeline and costs of implementation. As part of the sustainability process, a monitoring plan will be created using recommendations provided by FDOT, FAA, Transportation Research Board and other local resources to create an effective and accurate process to evaluate airport sustainability goals, objectives and the proposed effectiveness of each initiative.

It is also recommended that the Airport and Sponsor regularly communicate progress with regard to sustainability improvements to City Council, tenants and community as a whole. This supports the Airport and City's efforts to remain a "good neighbor" to the local community as well as to support tenant on-airport growth. This information should also be regularly reported to the FAA and FDOT to assist with future funding requests for sustainable improvements at the Airport.

Implementation Strategies

Successful implementation of sustainability initiatives all hinge on coordination with airport and city management and staff as well as encouraging the Airport Staff and Tenants to have a say in airport sustainability process. No matter the size of the airport, it is recommended that one individual or department oversee the implementation and monitoring of sustainability goals, objectives and financing. This person/department should also work with local organizations, experts and academia to provide outreach and stakeholder involvement.

Further, it is not recommended that GA airports with limited staff try to initiate a large number of sustainability initiatives at one time. Rather, a more effective strategy is to address one or two high impact areas first, such as energy use, noise and/or construction requirements. This allows the Airport Staff and users not to become overwhelmed while allowing for continued engagement.

Performance Monitoring and Plan Evaluation

Airport sustainability planning is not a "one time and done" project, but rather consists of ongoing and living document. The Airport Sustainability plan should be referred to consistently to determine what options and initiatives are currently supporting planned airport development while considering new opportunities. The Airport and Sponsor should evaluate the airport's goals and objectives while assessing and reassessing performance metrics. Thus allowing the Sponsor and Airport the flexibility to make changes that best support Airport

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longevity and community needs. **Figure 7-4** provides a graphical representation of the Airport Sustainability Planning.

FIGURE 7-4
AIRPORT SUSTAINABILITY PLANNING
Source: FDOT Airport Sustainability Guidebook 2017

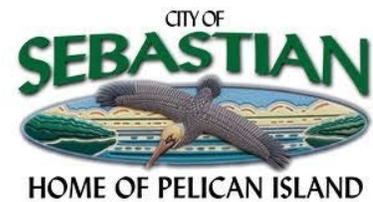


Using the Sample Sustainability Tracker, provided in Table 7-4, the City and Airport can develop a monthly monitoring plan to track utility use, recyclables, capital project costs, landscaping, etc. This monitoring system can be as simple as an excel spreadsheet that can be used to track sustainability goals and actions against baseline data.

Next Steps

Sustainable initiatives related to proposed capital improvements were incorporated into the estimated costs of development. Independent sustainability initiatives were identified in both the Airport's capital improvement program and pro forma financial analysis in order to track likely costs and return on investments. This information should be included in the airport

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sustainability monitoring plan to determine if proposed sustainability recommendations need to be changed or discontinued.

Since staff availability to implement and monitor proposed sustainability recommendations, at least initially, may be limited, it is recommended that the City and Airport initiate simple, low cost improvements first. This will allow the Airport to create a fairly simple electronic monitoring program that can be expanded as opportunities become available. Further, it is also recommended that the City and Airport include some sustainability language and requirements in their planning, design and building projects, especially those that include federal and state funding, thus shifting the burden to the consultants and contractors.

Airport Solid Waste Management

waste audit, evaluating the feasibility of solid waste recycling at the airport, identifying ways to minimize the generation of solid waste, identifying operational and maintenance requirements, reviewing ongoing waste management contracts, and identifying the potential for cost savings or the generation of alternative revenue streams.

To support the City of Sebastian sustainability efforts, the methodologies used and recommendations were obtained from a combination of Stakeholder and community goals, FDOT Airport Sustainability guidance, Indian River County Green Program Initiatives, the FAA Synthesis Document: *Recycling, Reuse and Waste Reduction Plans at Airports*, *FAA Guidance on Airport Recycling, Reuse and Waste Reduction*, ACRP Report 80: *Guidebook for Incorporating Sustainability into Traditional Airport Projects*, in addition to other international, national and regional guidance.

Baseline Waste Audit

Waste Management services, according to Ordinance No. O-03-12, adopted June 2003, was granted exclusively to Waste Management Inc. Waste Management Inc. would provide both solid waste collection and recycling services to the residential and commercial incorporated communities within the City of Sebastian. Another ordinance was adopted in June 2013, which continued to grant Waste Management, Inc. of Florida an exclusive contract, which also includes an automatic five year renewal unless either party notifies the other in writing. Solid waste and recycling products are brought the Indian River Solid Waste District for disposal and recycling. Solid waste and recyclables produced by the airport with the exception of green waste is taken by Waste Management Inc. for disposal at the Indian River Solid Waste District.

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Baseline Solid Waste and Recycling Audit

Overall, minimal waste is created at X26 due to its small size. Waste management services is provided through a contract with Waste Management Inc. The City currently has a five-year contract with the company for waste management and recycling services for both residential and commercial services. Their contract is set to expire in 2023.

In the terminal area, recycling is primarily associated with paper products which are collected weekly. There are no vending machines or other food preparation areas located in the terminal building. Discussions with tenants during initial interviews also showed that the City contract with Waste Management Inc. is part of their lease agreements. Garbage and recycling receptacles are located in and near the tenant's leaseholds. Several trash and recycling containers are located in and around Skydive Sebastian facilities including their on-site restaurant and Tiki Bar. There are also waste receptacles found near the Skydive Sebastian camping area and in the shower and changing building.

Waste Disposal

Solid waste including vegetative waste as of January 2, 2017 is now sent to the Indian River County Solid Waste Disposal District located at 1325 74th Ave SW, Vero Beach, FL 32968. The County works with commercial haulers to bring commercial related wastes to the Indian River County Landfill and Disposal District. Further, to encourage business recycling, Indian River secured a competitive rate with Waste Management Inc., Sebastian commercial hauler, to provide a single stream recycling rate that is less than the current solid waste collection rate. Both the County and the City of Sebastian is encouraging residents and commercial entities to participate in the recycling programs.

Maintenance Waste

Another source of waste is green waste related to on-site airport maintenance, mowing and tree trimming. The Public Works Division provides all public works maintenance for the Sebastian Municipal Airport. Typically green waste is created year round; however, spikes typically occur during the rainy season in late spring, summer and early fall. Tree limbs and other usable debris are recycled to provide mulch around plants and on-airport equipment.

Construction Waste

Construction waste is the responsibility of the Contractor for each specific project. Design for construction of Taxiways C, D and E is currently in process. Construction is anticipated to begin

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in late 2017 and will require the removal of old portions of taxiways to allow for realignment adjacent to Runway 32 as well as the taxilane on the southeast quadrant of the airport. The contractor will have the option to recycle the asphalt to be used in future recycled asphalt pavement projects or use for other construction activities.

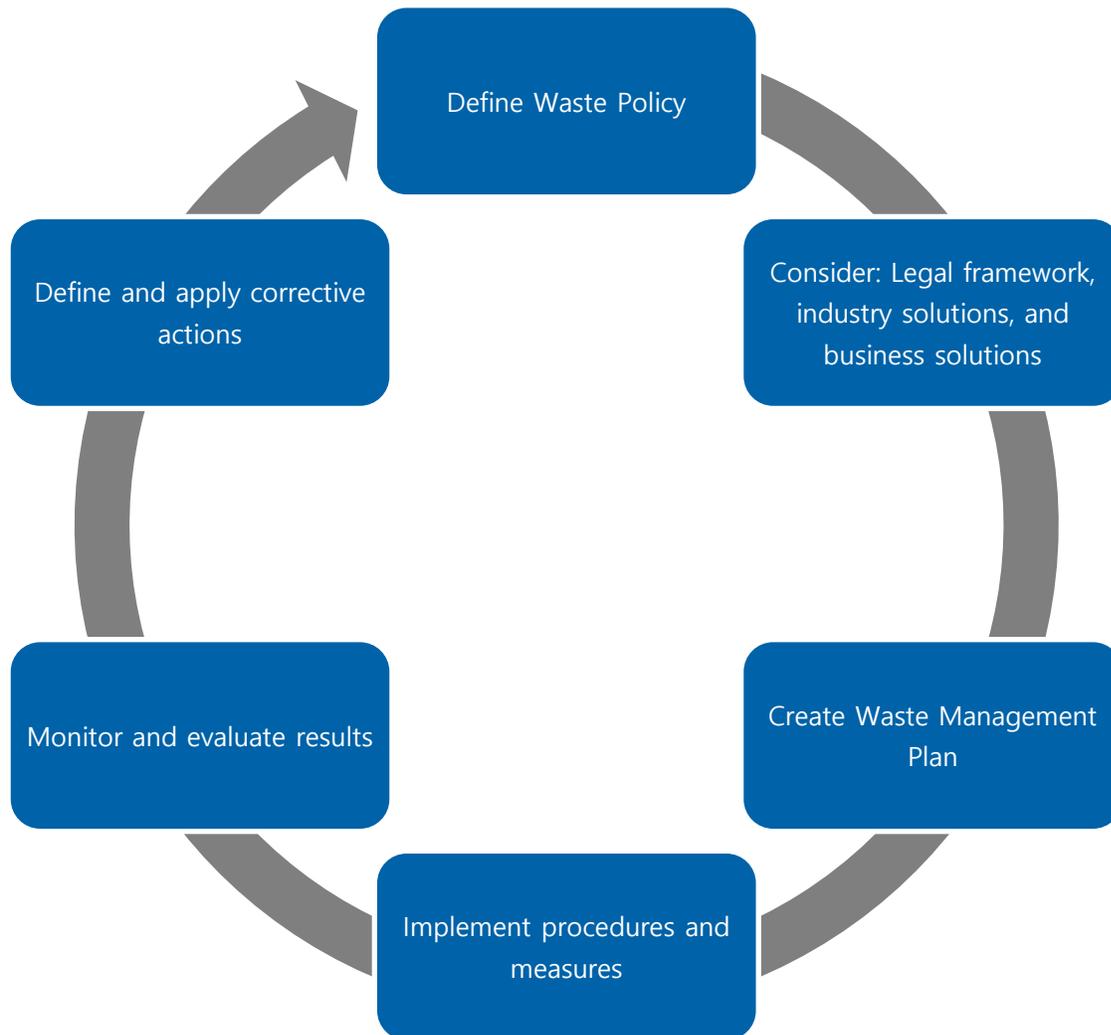
As part of the sustainability initiatives at the airport, reuse of old pavement and facilities was considered as part of future infrastructure recommendations. For example, development of the northeast quadrant could allow the consultant to reuse pavement from the north closed runway as a subbase for future taxiways and parking areas.

Viability of Solid Waste Recycling - Why Implement an Airport Waste Management Plan

Other than federal and state regulatory guidance, why should an airport implement a waste management plan? Airports are small cities supporting a variety of operations each producing continuous and various qualities of waste such as paper, waste water, food waste, oil and aircraft fuel, etc. Some of this waste may be hazardous to humans as well as the local ecosystem, and, therefore, disposal must be factored as a relevant operational cost factor. FAA's support for encouraging development of an airport solid waste management program was to assist sponsor in gathering data regarding potential environmental impacts, develop mitigation and implement environmentally friendly substitutes ultimately to provide the sponsor and airport tenants mitigation and cost saving options.

A successful waste management plan requires constant review and evaluation of various measures. A sample waste management approach is provided in **Figure 7-5**.

**FIGURE 7-5
SAMPLE WASTE MANAGEMENT APPROACH**

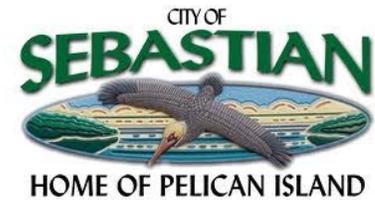


Source: Zurich Airport Waste Management Presentation, 7/12/2010

Recycling Feasibility

Smaller municipal general aviation airports provide little in the way of solid waste creation with the exception of “green” municipal solid waste and construction-demolition waste. Sebastian Municipal Airport is an example of one of these small airports. Recycling with the exception of

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industrial or construction waste is not currently financially feasible since they don't produce enough waste to justify the overall costs.

However, green waste related to on-airport landscaping can be easily recycled and reused onsite thereby decreasing the airport's overall environmental footprint. The City's recycling efforts along with several sustainable initiatives such as decrease use of paper, consumer product recycling (e.g. paper, cans, bottles, ink cartridges, etc. and the purchase of energy saving equipment has had a positive benefit on not only the City but the Airport's financial bottom line.

The Airport also obtains cost savings since it is owned and operated by the City of Sebastian. Therefore, it is not necessary to have a separate agreement with local waste management companies, and the Sponsor also receives a reduced rate. All of these efforts in addition to the Sponsor's overall sustainability initiatives have and continue to save the Sponsor money. Even with the possible initiation of commercial passenger services and expansion of corporate and cargo operations, the Sponsor has an effective baseline plan in place to support continued growth.

Operation and Maintenance (O&M) Requirements

According to FAA guidance,³ a successful waste management plan is the result of "careful planning, precise execution and continual testing and improvement."⁴ Therefore, to effectively initiate and execute such a plan, various logistical and management initiatives must be implemented and monitored. To facilitate use of onsite recycling and waste containers, the airport should create a waste collection infrastructure that includes clear signage and labeling for collection and separation of materials. Depending upon the market, local commodity values, and types of haulers, there are at a minimum three waste collection systems.

The most efficient is the Separate stream recycling system, which requires separation of materials at the point of origin while ensuring material collection maintains a high level of quality. If done correctly, the separate stream system depending upon volume provides the highest return for most materials.

³ *Recycling, Reuse and Waste Reduction at Airports, A Synthesis Document*. Prepared for the Office of Airports, Federal Aviation Administration. April 24, 2013. 1-46, pp. 7

⁴ Ibid

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The commingled system allows all materials to be placed in the same bin to be recycled later. Again depending upon the type and volume of materials, this could lead to lower return compared to the previous system.

Mixed Waste Processing involves post-collection separation of all materials. This system has airport travelers and tenants dispose of recyclables and trash all in the same receptacle. This system is labor intensive, causes increased contamination and likely comes with a higher cost.

Implementing a single stream system as part of program development will allow for little system disruption as operations and waste increase and also maximizes returns while minimizing overall costs.

Management commitment, according to both the FAA and EPA, was identified as the key to establishing an effective airport recycling and waste minimization program. It is recommended that an airport have a program director to oversee the recycling and waste minimization program, and to work with tenants and upper management to encourage participation and implementation. The program manager should establish procurement agreements that include reusable packaging, bins, buy back or recycling options. The program director will also oversee and control all disposal contracts, will establish and monitor various data capturing tools to determine the amount and type of waste produced and by whom. In addition, it is recommended that the management plan include reporting mechanisms for users, tenants, airport management, etc. thereby allowing for successful oversight and demonstration of airport successes to both management and the community.

Construction and Demolition Waste

Any on-airport construction requires some environmental analysis of potential impacts. Therefore, any proposed construction plans must include procedures to handle construction waste in an appropriate manner. Construction of the airport and supporting infrastructure are considered together since there will be permanent effects to the airport environment. The waste management plan will provide set targets for the recycling of construction and operations waste as well as the potential to incorporate recycled materials into construction. These targets shall be monitored and revised throughout the contract period.

The Contractor, as part of the design, will create a framework to minimize the amount of waste produced and to maximize the segregation, re-use and recycling of materials. It is recommended that the Contractor put in place measures to reduce the production of waste at

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the source via the project design and management plan or through a waste separation process appropriate to the facilities available and outlined in the Airport waste management plan guidance.

Initiatives and Recommendations to Minimize Waste Generation

The City of Sebastian and its major tenants do not currently have a data collection and analyses system in place to track the type and tonnage of solid waste produced at the Airport.

Therefore, to effectively perform a cost benefit analysis of potential budgetary savings, both the type and pounds of waste produced would need to be known. Environmental Protection Agency practice strategies for waste reduction include:

- ✓ **Source Reduction** – designing products to reduce the amount of waste that will need to be disposed of and to make the resulting waste less toxic.
- ✓ **Recycling** – recovery of useful materials to make new products and reduce need for virgin materials. The average cost to purchase large recycling bins was approximately \$250 each, and each bin had an average lifespan of 10 years.
- ✓ **Composting** – collecting organic waste including food scraps and yard trimming and store under conditions to allow product to break down for ultimate use as a natural fertilizer.

Other options which are more useful at larger airports with several food concessionaires include food recovery, which involves donating food to area food banks, which will reduce their impact on the total waste stream while also saving money. At large passenger service airports such as Seattle Tacoma, Ft Lauderdale, and Dulles International Airports, there is an average saving of approximately \$0.10 per pound of waste.

Using information provided by the EPA, FAA, local data, and general estimates of cost per pound of disposal as well as bin costs from other airports around the country, a sample annual cost vs benefit analysis was created.

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TABLE 7-5 SAMPLE ANNUAL COST V. BENEFIT ANALYSIS				
OPTION STRATEGIES	OPERATING COSTS	EST. POUNDS OF WASTE	COST/(SAVINGS) FOR DISPOSAL	COST/(SAVINGS) PER POUND
Source Separation & Recycling Coordinator¹	\$5,000 ² + \$60,000	150,000	(\$15,000)	(\$0.10) ³
Food Recovery	\$0.00	10,000	(\$1,000)	(\$0.10)
Total Annual Cost/ (Savings)	\$65,000	160,000	(\$16,000)	\$0.31 ⁴

Notes:
¹Recycling coordinator salary estimated at \$60,000
²Assume purchase of 20 bins at \$250 per bin
³Average cost per pound of disposal is \$0.10.
⁴Cost per pound determined by: $(\$65,000 - \$16,000) / 160,000$

Sources: EPA MSW Generation Rates, 1960-2013, Broward County FLL Solid Waste Plan, Seattle-Tacoma International Airport Solid Waste Plan, Municipal Solid Waste Basic Facts, US Environmental Protection Agency, TKDA 2017

Plans to Minimize Solid Waste Generation

The EPA has ranked the most environmentally sound strategies for Municipal Solid Waste: Source reduction (including reuse) is the most preferred method, followed by recycling, and lastly, disposal in combustion facilities and landfills.⁵ Reuse and recycling opportunities exist at Sebastian Municipal for special wastes such as wooden pallets, which can be reused numerous times, and clean plastic wrap that can be recycled.

Studies have shown that the key to long-term success for any program which is implemented is planning and education.⁶ This can be achieved by increasing public awareness through the postage of signs within the terminal area and/or the placement of decals on trash bins indicating that all the waste is being sent to the offsite recycling or waste management facilities. Greater visibility and increased awareness of the recycling that is being done would promote Airport and City’s sensitivity to recycling as well as encourage users to use the garbage cans for their waste disposal.

⁵ <http://www.epa.gov/epaoswer/non-hw/payt/intro.htm>

⁶ “Decision Maker’s Guide to Solid Waste Management”, Volume II, (EPA 530-R-95-023), 1995.

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Recommended strategies to minimize solid waste generation are outlined in **Table 7-6**

TABLE 7-6 WASTE MANAGEMENT STRATEGIES	
SYSTEM SUGGESTIONS	RECOMMENDATIONS
Optimize waste management to reduce disposal costs	<ul style="list-style-type: none"> • Determine factors and overall market values for recyclables and solid waste disposal • Identify areas where waste may be minimized or donated to reduce waste stream
Establish strategies to prevent origination of waste	<ul style="list-style-type: none"> • Reuse packaging materials • Policies on printing and copying • Reduction in wrapping etc.
Minimize waste	<ul style="list-style-type: none"> • Separation at point of origin • Compacting options
Implement waste treatment options:	<ul style="list-style-type: none"> • Recycling • Incineration (heat production) • Decontamination
Disposal Chain:	<ul style="list-style-type: none"> • Separation at source (most economical): <ul style="list-style-type: none"> ▪ Public areas ▪ Non-public areas • Should not be mixed again • Waste type and volume/weight known before leaving airport • Treatment clarified, accepted and contracted in advance
Disposal Chain:	<ul style="list-style-type: none"> • Separation at source (most economical): <ul style="list-style-type: none"> ▪ Public areas ▪ Non-public areas • Should not be mixed again • Waste type and volume/weight known before leaving airport • Treatment clarified, accepted and contracted in advance
Process Control:	<ul style="list-style-type: none"> • Train and encourage staff <ul style="list-style-type: none"> ▪ Special campaigns ▪ Posters, leaflets ▪ Explanations possibly in multiple languages ▪ Incentive programs • Obtain regular progress reports and meaningful data management <ul style="list-style-type: none"> ▪ Who, how much and type ▪ Who pays for how much and what ▪ How are the waste streams developed • Have tasks, authority and responsibilities defined

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Sources: Zurich Airport Waste Management Presentation, July 12, 2010; Recycling, Reuse and Waste Reduction at Airports, A Synthesis Document. Prepared for the Office of Airports, Federal Aviation Administration. April 24, 2013; Guidance on Airport Recycling, Reuse and Waste Reduction Plans Memo, Federal Aviation Administration, September 30, 2014; and EPA website

Summary and Next Steps

The remainder of the master plan, **Chapters 8, Airport Layout Plan**, and **9, Implementation and Financial Plans**, focus on development identified to likely occur within the next twenty years. The Airport Layout Plan provides a graphical representation of existing and future development at Sebastian Municipal Airport as well as existing and future land use and encumbered property. This data will be used the Sponsor as part of the project' justification process to maximize federal and state funding opportunities. Project phasing and cost estimates were based upon the current Sponsor's vision, regulatory requirements and anticipated demand. Opportunities may arise during the planning period, which may alter demand or development; therefore, the implementation and financial plans were designed to provide the Sponsor flexibility to prioritize projects to address specific needs and available funding.