APRIL 2011

Northeast Florida Regional Airport
at Saint Augustine

Fly Smart!

Sustainability Management Plan

NFRA
Northeast Florida Regional Airport
at Saint Augustine
Fly Smart!

Cover Photography (clockwise from upper left):

1. A Great Egret in flight in the vicinity of the Airport, a reflection of the Airport's natural resources and wildlife diversity.
2. The Airport's primary runway 13/31. The runway was reshabilitated in 2010.
3. A section of the Tolomato River and associated wetland system.

Acknowledgements:

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This Sustainability Management Plan was prepared for the St. Augustine – St. Johns Airport Authority by:

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Aerial view of NFRA from the south side of the airport.

ACRONYMS AND ABBREVIATIONS

AAAE	American Association of Airport Executives
ACI-NA	Airports Council International-North America
ACRP	Airports Cooperative Research Program
ADO	Airports District Office
AIP	Airport Improvement Program
Airport Authority	St. Augustine-St. Johns County Airport Authority
ALS	Approach Lighting System
APU	Auxiliary Power Unit
AST	Aboveground Storage Tank
CFASPP	Continuing Florida Aviation System Planning Process
CFC/HCFC	chlorofluorocarbons/hydrochlorofluorocarbons
EERE	Energy Efficiency and Renewable Energy
EONS	"a holistic approach to managing an airport so as to ensure the integrity of the Economic viability, Operational efficiency, Natural resource conservation, and Social responsibility (EONS) of the airport."
EPA	U.S. Environmental Protection Agency
EPP	Environmentally Preferable Purchasing
ETMSC	Enhanced Traffic Management System Counts
FAA	Federal Aviation Administration
FAC	Florida Airports Council
FBO	Fixed Base Operator
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
FEMP	Federal Energy Management Program
FPL	Florida Power and Light
GA	General Aviation
GHG	Greenhouse Gas
GSE	Ground Support Equipment
GTMNERR	Guana Tolomato Matanzas National Estuarine Research Reserve
HVAC	Heating, Ventilating, and Air Conditioning
IPCC	International Panel on Climate Change
LCCA	Life Cycle Cost Analysis
LED	Light Emitting Diode
LEED	Leadership in Energy and Environmental Design
LEED AP	LEED Accredited Professional
LID	Low Impact Development
LTO	Landing/Takeoff Cycle
MPO	Metropolitan Planning Organization
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NFRA (or "the Airport")	Northeast Florida Regional Airport at St. Augustine
NPDES	National Pollutant Discharge Elimination System
NPIAS	National Plan of Integrated Airport Systems
O&M	Operations and Maintenance
OPSNET	FAA Operational Network
PCL	Pilot Controlled Lighting
PGMS	Professional Grounds Maintenance Society
PPA	Power-Purchase Agreement
PV	Photovoltaic
ROI	Return on Investment
RSA	Runway Safety Area
SAAPA	St. Augustine Airport Pilots Association
SAGA	Sustainable Aviation Guidance Alliance
SPCC	Spill Prevention Control and Countermeasures
SWPPP	Storm Water Pollution and Prevention Plan
TRB	Transportation Research Board
UST	Underground Storage Tank
USDOE	United States Department of Energy

Measurement Units

ppm	parts per million
Tpy	tons per year
MT CO_2e	metric tons of CO_2 equivalents
Yr	Year
Sq. Ft	Square Feet

Salt marsh near the south section of NFRA.

The St. Augustine-St. Johns County Airport Authority's overall sustainability goal for the Northeast Florida Regional Airport at St. Augustine is:

ST. AUGUSTINE • ST. JOHNS COUNTY
AIRPORT AUTHORITY

"To maintain and enhance Northeast Florida Regional Airport as a vibrant asset that serves the needs of Northeast Florida residents and businesses, promotes economic growth in the region, and operates in an economically and environmentally sustainable manner that conserves natural resources and protects the environment."

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Aerial view of the Airport
and surrounding areas.

Aerial view of the Airport and surrounding areas. NFRA is bounded by the Tolomato River and U.S. Highway 1.

OVERVIEW

The St. Augustine - St. Johns County Airport Authority (the "Airport Authority") prepared this Sustainability Management Plan to document and guide its efforts in planning for the long-term sustainability of the Northeast Florida Regional Airport at St. Augustine (NFRA or "the Airport"). This plan accomplishes four primary objectives:

- Establishes the Airport Authority's vision for sustainability.
- Identifies the Airport Authority's sustainability goals and objectives.
- Develops a strategy for meeting the Airport's sustainability goals and objectives, which includes identifying sustainability initiatives as well as a plan to implement and manage these initiatives.
- Develops a performance measurement and reporting plan to ensure continual improvement towards the Airport Authority's sustainability goals.

This plan focuses on the following areas:

Economic Vitality – to ensure long-term financial well-being of the Airport, economic issues are also considered when assessing the reasonableness of initiatives considered in all planning categories.

Planned Development – to guide smart development of future facilities to accommodate demand for passenger airline services.

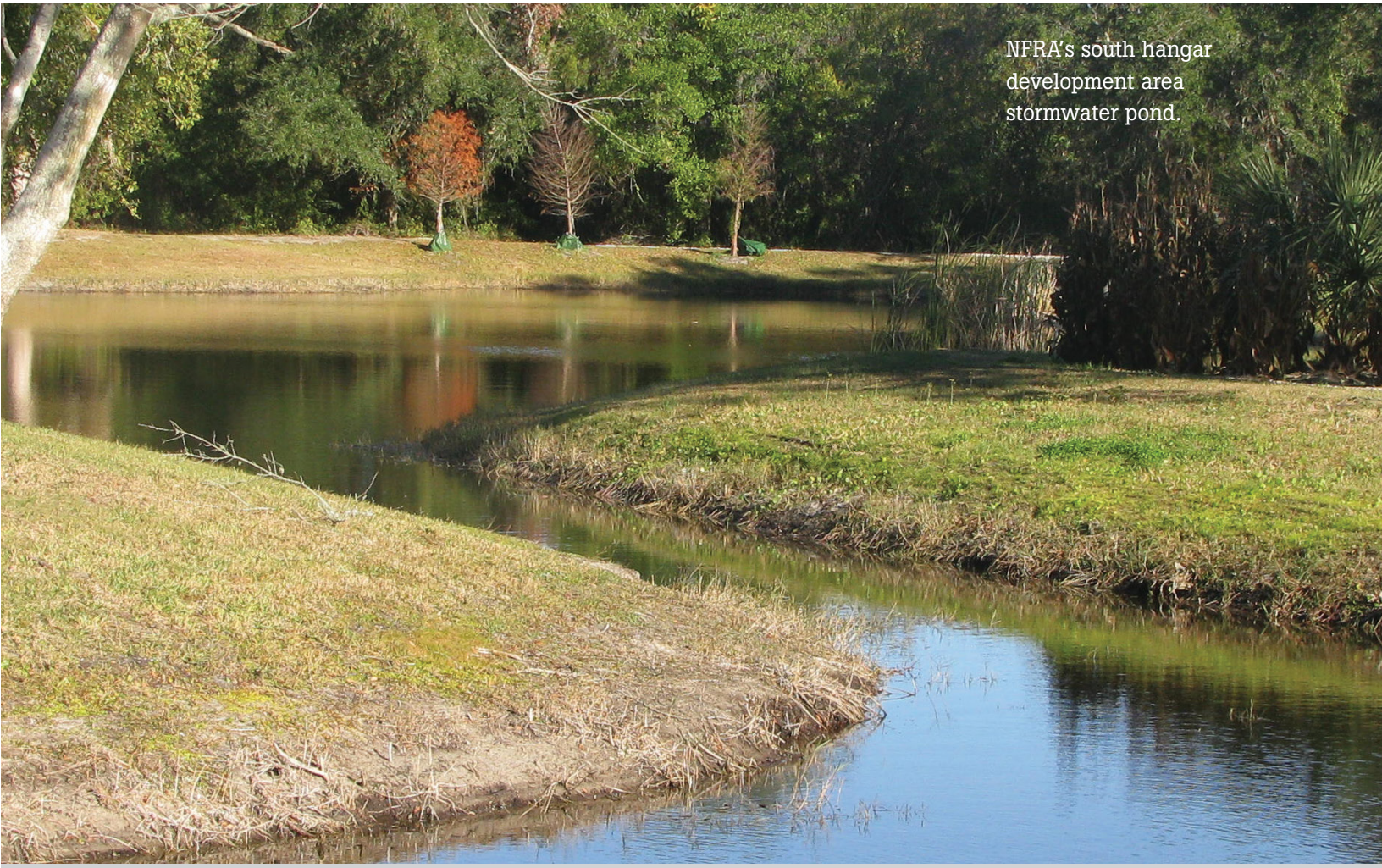
Airport Connectivity – to enhance the efficiency of access to the Airport to accommodate when large increases in passengers and airport users may occur.

Community Relations – to ensure that the public and local decision-makers understand the value and importance of NFRA and for the Airport to stay connected to the community.

Northeast Florida Regional Airport at St. Augustine: A Leader in Sustainability

Airports are subject to a number of environmental regulations that require proper planning, design, operation and maintenance of projects and airport property. The Airport Authority has consistently performed above and beyond these minimum requirements, demonstrating its commitment to the environment and community.

The Airport Authority has shown leadership in sustainability by implementing sustainability initiatives at the Airport, including water conservation projects, energy efficiency projects, use of alternative fuel vehicles, educational opportunities, and community involvement. These proactive initiatives along with demonstrated sensitivity to its natural and social surroundings resulted in the Federal Aviation Administration (FAA) selecting **NFRA as the first airport in the nation to receive Airport Improvement Planning (AIP) funding for stand-alone sustainability planning** *(independent of an airport master plan)*. **This planning effort acted as a precursor to a nationwide Sustainability Planning pilot program,** which the FAA initiated in early 2010. The scope of work from the NFRA effort was provided as guidance to those airports participating in the formal pilot program.



NFRA's south hangar development area stormwater pond.

Demonstrating how to sustainably manage a small Airport

Although the Airport Authority effectively manages its natural resources and continues to implement innovative projects at NFRA, prior to this Plan there was no formalized approach to ensure sustainability was considered during planning, design, construction, operation, and maintenance of the Airport. This Plan provides a framework for the Airport to establish a sustainability "champion", consider sustainability in the decision-making process, and track successes and identify areas needing improvement.

In addition to standard sustainability plan topics, such as natural resources, water use and conservation, and air quality, this plan focuses on other areas that are of particular concern at NFRA and at many smaller airports.

What's next in the sustainability management process?

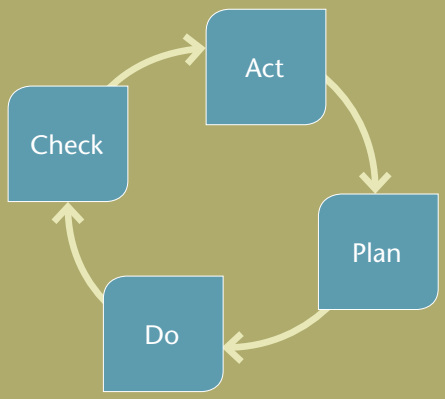
Developing and operating an Airport in a sustainable manner is an ongoing process that should continually improve. Production of this report launched the cycle of continual improvement by establishing a sustainability planning framework for the Airport. In addition to this Plan, other documents will support the continuation of the planning process:

- The Implementation Plan identifies how the Airport Authority will prioritize initiatives to meet their sustainability goals and objectives.
- The Report Card outlines a reporting process for the Airport, which is structured to ensure continual improvement by revisiting goals and objectives at each reporting interval, and re-evaluating performance through the ongoing measurement required to regularly report on the Airport's performance.

The Sustainability Management Plan: A Living Document

This Plan is not a static report but rather a living document meant to steer decision-making and provide a framework for continual improvement at NFRA. The Airport Authority Board and staff will continually revisit the Plan, as described in **Chapter 2, Sustainability Management Approach.** The Airport Authority staff plans on holding regularly scheduled sustainability meetings to ensure implementation of strategies contained in this plan. In addition, NFRA will collect data on Airport performance and will evaluate the progress made towards implementing the recommendations of this plan as well as meeting its goals. Measuring Airport sustainability performance will then allow the Airport Authority to revisit its Sustainability Goals and Objectives each year.

In order to continually move toward NFRA's overall sustainability goals, the Airport will have to adapt to changes in the environmental, social, and economic context in which it operates. Specifically, changes in technologies, aviation and transportation trends, environmental conditions and regulations, and local and regional developments will require NFRA to adjust its sustainability strategy.



Continual improvement is characterized by the "Plan-Do-Check-Act" process, which provided the basic framework for developing this Plan. A more detailed overview of the "continual improvement" process established for NFRA is included in **Chapter 2, Sustainability Management Approach.**

As implementation and reporting can often be a resource intensive process, the Implementation Plan and Report Card were developed to focus staff resources on prioritized areas of sustainability, which may change as the Airport develops.

FAA will derive lessons learned from this sustainability planning process to consider in future guidance. To this end, the Airport Authority has been a national industry leader in sustainability planning; a testament to its forward-looking approach to managing NFRA.

There has been a high level of interest in the airport industry about this study because it is the first comprehensive sustainability management plan performed at an airport of this size, and it is one of two of the first sustainability projects to be funded by FAA with an Airport Improvement Program planning grant. As a result, members of the project team have provided presentations on this Sustainability Management Plan at the following conferences:

- **March 10, 2010** - Federal Aviation Administration *35th Annual FAA Forecast Conference,* Washington D.C.
- **April 23, 2010** - Florida Airports Council *Facilities & IT Conference,* Orlando, FL
- **June 15, 2010** - American Association of Airport Executives(AAAE) / Great Lakes Region *Aviation Environmental Management Conference,* Baltimore, MD
- **August 8, 2010** - Florida Airports Council *Annual Conference,* Tampa, FL

Aerial view of the new Airport Conference Center, located to the southeast of the airfield

- **September 25, 2010** - Airports Council International – North America (ACI-NA) *Environmental Affairs Pre-Conference Seminar,* Pittsburgh, PA
- **October 13, 2010** – *2010 Sustainable Florida Conference* – Palm Beach Gardens, FL
- **February 8-10, 2011**- FAA *Airport Recurrent Environmental Training,* Palm Coast, FL
- **February 25, 2011** – AAAE / Airports Consultants Council (ACC) *Airport Planning, Design, and Construction Symposium,* Denver, CO
- **March 2, 2011** - 2011 *FAA Eastern Region Conference,* Hershey, PA
- **March 29, 2011** - *2011 Passenger Terminal Expo,* Copenhagen, Denmark
- **April 4, 2011** – *Southeast Chapter (SEC) - AAAE Annual Conference,* Mobile, AL

In addition to these past presentations, the Airport's sustainability activities will be featured in the July/August 2011 Issue of *Airport Improvement Magazine.*

What is Airport Sustainability?

"Sustainability" is not a singular, concrete concept, or a defined objective to be reached by a certain date. Rather, the term "sustainability" represents a holistic approach to integrating social, environmental, and financial factors into decision-making over time. Airports Council International-North America (ACI-NA) defines airport sustainability as "a holistic approach to managing an airport so as to ensure the integrity of the Economic viability, Operational efficiency, Natural resource conservation, and Social responsibility (EONS) of the airport."▲ This definition was also adopted by the Florida Airports Council (FAC) in 2010.

▲ Airports Council International – North America. Airport Sustainability: A Holistic Approach to Effective Airport Management. www.acina.org/static/entransit/Sustainability%20White%20Paper.pdf. Accessed August 30, 2010.

Native landscaping near stormwater pond on south side of Airport.

Airport sign displaying some of NFRA's major commercial tenants.

Airport Sustainability is a holistic approach to managing an airport to ensure Economic viability, Operational efficiency, Natural resource conservation, and Social responsibility.

01 INTRODUCTION

The St. Augustine - St. Johns County Airport Authority (the "Airport Authority") prepared this Sustainability Management Plan to document and guide its efforts in planning for the long-term sustainability of the Northeast Florida Regional Airport at St. Augustine (NFRA or "the Airport").

This plan accomplishes four primary objectives:

1. Establishes the Airport Authority's vision for sustainability.
2. Identifies the Airport Authority's sustainability goals and objectives.
3. Develops a strategy for meeting the Airport's sustainability goals and objectives, which includes identifying sustainability initiatives as well as a plan to implement and manage these initiatives.
4. Develops a performance measurement and reporting plan to ensure continual improvement towards the Airport Authority's sustainability goals.

Planning for sustainability demands a long-term, comprehensive, and integrated perspective that considers science, community interests and economic factors. NFRA is already advancing the Airport's sustainability through many initiatives already in place. These initiatives are described throughout this report and are supplemented by potential new initiatives that will serve to further advance the Airport Authority's sustainability efforts.

One of the Airport Authority's greatest assets in advancing sustainability is its ability to engage all aspects of airport management and operation in order to ensure all Airport

Why NFRA?

FAA selected NFRA as the first airport to receive Airport Improvement Program (AIP) funding for stand-alone sustainability planning as a precursor to a nationwide Sustainability Planning pilot program. The scope of work from the NFRA effort was provided as guidance to those airports participating in the formal pilot program.

Some of NFRA's unique characteristics that attracted the FAA include:

NFRA's current role as primarily a General Aviation (GA) Airport: GA airports present unique challenges for addressing sustainability, primarily due to a wide range of aviation activities and limited staff/financial resources.

NFRA's demonstrated commitment to the environment and community: Sustainability initiatives already implemented at the Airport include water conservation projects, energy efficiency projects, use of alternative fuel vehicles, education opportunities, and community involvement.

> "FAA is currently looking at existing policies to see what can be added/changed to incorporate sustainability at airports. Looking ahead, FAA's Office of Airports will continue to work with airports and industry groups (such as SAGA and ACRP) to foster research in the area of sustainability. Once the research is ripe for implementation, FAA can then set policies and subsequent goals, and ensure that airports have the tools they need to reach those goals."
>
> *~FAA Office of Airports, Planning & Environmental Division, 2009*

Resources:

FAA Airport Sustainability Program: **http://www.faa.gov/airports/environmental/sustainability** (updated October 28, 2010)
SAGA: Sustainable Airport Guidance Alliance
ACRP: Airport Cooperative Research program

decisions consider financial and environmental implications, as well as the community at-large. As a result, sustainability is effectively ingrained in all aspects of NFRA management and functions.

Employing this holistic approach, the Airport Authority's overall sustainability goal for NFRA is to:

> *"To maintain and enhance Northeast Florida Regional Airport as a vibrant asset that serves the needs of Northeast Florida residents and businesses, promotes economic growth in the region, and operates in an economically and environmentally sustainable manner that conserves natural resources and protects the environment."*[1]

What are the benefits of managing an airport in a sustainable manner?

Airport sustainability as a business strategy has both immediate and long-term benefits that can be measured and when persistently managed, presents rewards. Some benefits of sustainability initiatives that have been demonstrated at various airports include:

- Reducing development and/or operations and maintenance costs;
- Greater utilization of assets;
- Reducing environmental footprints;
- Facilitating environmental approvals/permitting;
- Improving relationships with community and agencies;
- Enhancing the regional economy;
- Encouraging a holistic approach to planning, design, and decision-making; and

1 This goal was officially adopted by the St. Augustine – St. Johns County Airport Authority at an Airport Authority Board Meeting on July 13, 2010.

NFRA's location within the greater Northeast Florida region.

› Incentivizing creation of new technologies by increasing demand and promoting investment in technologies that will facilitate sustainability.

NFRA Snapshot

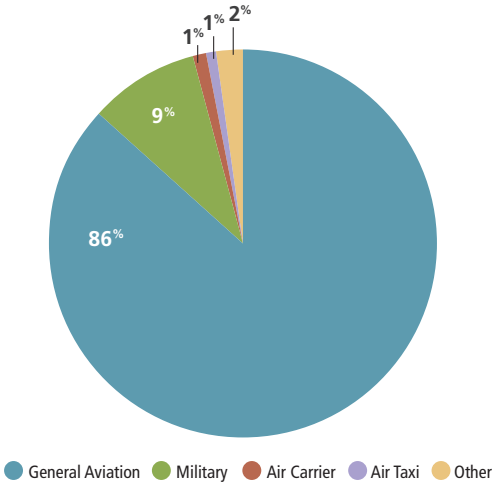
NFRA is a publicly-owned airport located on approximately 750 acres of property within St. Johns County, on the northeast coast of Florida. It is approximately four miles north of the historic city of St. Augustine central business district. The Airport is managed by the St. Augustine - St. Johns County Airport Authority. The Airport is bound to the north, east, and southeast by sensitive natural features, including uplands, and wetlands and saltwater marshes of the Tolomato River. This striking landscape provides habitat for a variety of wildlife, fish, and plant species, a number of which are considered threatened or endangered. These species include the wood stork, American oystercatcher, brown pelican, snowy egret, white ibis, and American alligator.

Recent Airport Awards

- 2009 Florida Department of Education *Commissioner's Business Recognition Award for Outstanding Support of Education*
- 2009 St. Johns County School District *Outstanding Business Partner* in recognition of support for Career Academies in the St. Johns County School District
- 2007 Florida Airports Council (FAC) *Environmental Excellence Award* for Tree Preservation and Relocation for Responsible Growth
- 2007-2010 St. Johns County School District *Superintendent's Award*
- 2009-2010 St. Johns County School District *Advocate Award*

The existing airfield facilities at NFRA consist of three intersecting asphalt runways, the longest of which (Runway 13-31) measures 8,001 feet, as well as three seaplane lanes. The Airport maintains several taxiways, T-hangars, corporate hangars, a terminal building, a fuel storage system, an electrical vault, and an equipment storage building. The Airport provides U.S. Customs services to arriving aircraft and passengers. The Airport is certified as a Part 139 commercial service airport[2] and the Airport accommodated regularly scheduled commercial airline service for a six month period ending in the spring of 2008.

AIRCRAFT OPERATIONS BY OPERATOR CATEGORIES (2009)



Sources:
FAA Enhanced Traffic Management System Counts (ETMSC) Database, 1/2009 through 12/2009. Accessed May 10, 2010. FAA Operational Network (OPSNET) Database, 1/2009 through 12/2009. Accessed May 10, 2010.

Profile of Northeast Florida Regional Airport at St. Augustine		
FAA-defined (NPIAS▲) Role	General Aviation Reliever Airport	
Airport Area (approximately)	750 acres	
Runways		
13/31	8,001 feet	
6/24	2,701 feet	
2/20	2,610 feet	
Seaplane Lanes		
12W/30W	5,000 feet	
17W/35W	12,000 feet	
18W/36W	15,000 feet	
Based Aircraft (est. 2009)	269	
Annual Operations (est. 2009)	92,860	
Total Commercial Tenants	26	
Major NFRA Facilities and Tenants	Florida Aviation Career Training School	Northrop Grumman
	Florida Flyers European School	Ring Power Corporation
	Galaxy Aviation (Fixed Base Operator)	S.K. Logistics (Air charter)
	Infinity Aviation	Southeast Aero Services
	Luhrs Corporation	
Total Airport Staff	11	

▲ FAA's National Plan of Integrated Airport Systems, 2011-2015

2 Part 139 Certification (Title 14, Code of Federal Regulations (CFR), Part 139 [14 CFR Part 139]) was issued by FAA in 2004. This regulation established certification requirements for airports serving scheduled and unscheduled air carrier aircraft with more than 30 seats. **http://www.faa.gov/airports/airport_safety/part139_cert/**

Description of Aircraft Operator Categories at NFRA

A typical single-engine General Aviation aircraft.

General Aviation (GA) consists of privately owned and operated aircraft that are based at the Airport or use the Airport on an itinerant basis. GA uses can include flight training, aerobatics, and recreational flying. The majority of aircraft operations conducted at NFRA are by GA aircraft.

Military training aircraft parked at Northrop Grumman's facility in the North GA Area of the Airport.

Military consists of Department of Defense aircraft, which typically use NFRA to access Northrop Grumman facilities.

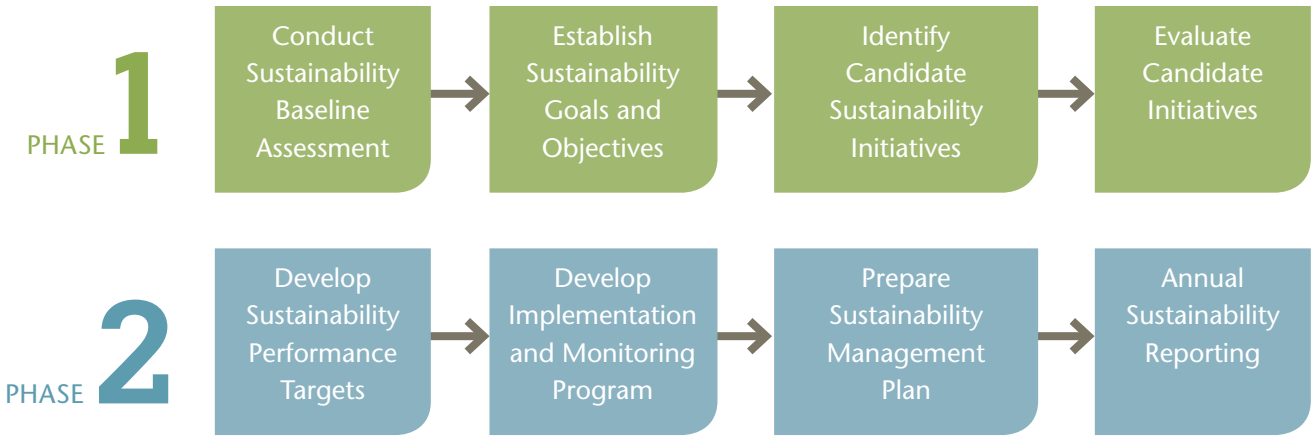
Air carrier aircraft (50-seat Regional Jets) transporting the University of Georgia football team directly from Athens, Georgia to the annual Florida-Georgia football game played in Jacksonville. (photo courtesy of Galaxy Aviation)

Air Carrier refers to airline service to transport passengers or cargo. Regularly scheduled airline service was offered at NFRA in 2008. Currently, air carrier service is provided on a limited, unscheduled basis for special events.

Air taxi service at the Airport can consist of single-engine piston, multi-engine turboprop, or jet aircraft.

Air Taxi consists of charter air passenger or cargo aircraft that operate on an on-demand basis. Various air taxi and charter operators are based or serve the Airport, which feature U.S. Customs facilities that are used by air taxi operators to serve international destinations such as the Caribbean.

Aerial view of NFRA with delineation of Airport property boundary and identification of major facilities and tenants.



The planning process for this sustainability management plan involves two primary phases: the first phase focuses on establishing sustainability goals and objectives, based on the Airport's current performance, then identifying initiatives to help the Airport Authority meet those goals. The second phase focuses on developing the framework for implementation and continual improvement through monitoring and reporting. This process sets the groundwork for a "Plan-Do-Check-Act" cycle for continual improvement.

Sustainability Planning Process

This sustainability management plan was developed for the specific unique needs and characteristics of NFRA. Consideration was given to the role of the airport, its location and size, financial and natural resources, staffing, and most importantly, to the vision and goals of the airport organization.

The sustainability planning process was initiated in December 2009 and lasted approximately 16 months. The process consists of two phases: the first phase includes an inventory of airport activities, resource consumption, and financial records; establishment of sustainability goals and objectives; and identification and evaluation of candidate initiatives to meet the goals and objectives. The second phase consists of establishing sustainability performance targets to help the Airport make regular progress towards achieving its sustainability goals; developing an implementation and monitoring program; and preparing an outline and format of a sustainability performance report card that can be used for future data tracking and reporting by the Airport. The reporting process is structured to ensure continual improvement by revisiting goals and objectives at each reporting interval, and re-evaluating performance through the ongoing measurement.

Airport Authority, Stakeholder, and Public Involvement during Plan Development

The Sustainability Management Plan Project Team, which consisted of the Assistant Airport Manager and consultant partners – The LPA Group, VHB, and KB Environmental Services – met by conference call every two weeks to discuss project details, including upcoming project tasks, and the

[L] Stakeholder and Public Visioning Session, held on June 16, 2010 at the Airport's new Conference Center.

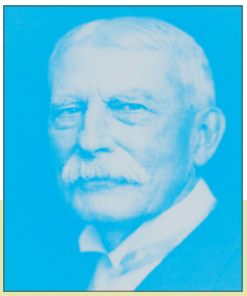
[R] Cover of Sustainability Initiatives Brochure, developed in Phase 1 of the project.

project schedule. During the course of this study, the project team held a number of meetings with Airport staff and Airport Authority Board members, as well as other airport stakeholders, tenants, and members of the public. These regular meetings ensured that stakeholder input was considered and that the feedback received enhanced the value and relevance of the Plan.

The following meetings and coordination efforts took place:

- The **Project Kick-off Meeting** was held at the Airport on November 17, 2009. In attendance were Airport Staff, Authority Board members, FAA representatives, Jacksonville University professors and students, and the Project Team. The attendees took a tour of the airport facilities, followed by a presentation by the Project Team and extensive discussions about the Sustainability Management Plan, the planning process, and project expectations.
- A **Stakeholder and Public Visioning Session** was held at the Airport's new Conference Center on June 16, 2010. A total of 25 members of the public, airport stakeholders (tenants, airport users), and staff from 7 local agencies attended the meeting. After a short presentation by the Project Team, the participants broke into four groups to brainstorm goals, objectives, and initiatives for several sustainability categories. Dozens of very thoughtful and innovative initiatives were gathered from the participants and are included in this plan.
- The Project Team developed a **Sustainability Management Plan website** to describe the process and planning results to interested stakeholders and members of the public after the Stakeholder and Public Visioning Process. The website can be accessed by clicking on "The Airport" tab at http://www.flynfra.com.
- An **Existing Sustainability Initiatives Brochure** was developed as part of the study and is available on the website, and was also distributed at the Florida Airports Council (FAC) Annual Conference in Tampa and the Airport Authority Workshop in July 2010.
- **Airport Tenant Surveys** were developed with Airport Staff, then distributed and collected from the two main fixed base operators (FBOs) and another major tenant at NFRA. The tenant surveys requested information regarding procurement/waste management, aircraft/ground service equipment operations, air and water quality, employee transportation, and energy/fuel use.

History of St. Augustine



[1] Don Pedro Menendez de Aviles.

[2] Henry M. Flagler.

[3] View of a clock tower on St. Augustine town square.

The mainland of the North American continent was first sighted by the Spanish explorer Don Juan Ponce de Leon in Spring of 1513. He is said to have discovered Florida while searching for the Fountain of Youth, a legendary spring that restores the youth of anyone who drinks its waters.

Spanish Admiral Don Pedro Menendez de Aviles, on orders from King Phillip II, colonized the area after arriving at the coast of Florida on August 28, 1565, the Feast Day of St. Augustine. The settlement, which became the first European city in the New World, was named St. Augustine.

In the 1880's, the sleepy old Spanish town began to bustle with the arrival of Henry M. Flagler, who developed the town as a major resort for the leisure traveler. It was during the Flagler era that the minds of St. Augustine residents turned to the leisure life.

Beginning in 1959 and continuing today, the state has undertaken an ongoing preservation effort, meticulously restoring many colonial structures to their original appearance. As a result, historic St. Augustine has become a center of colonial Spanish culture and an important destination for travelers from all parts of the world.

Source:
http://www.oldcity.com/history-information.cfm
Accessed January 12, 2010

The results of the survey were used in the development of the baseline sustainability inventory.

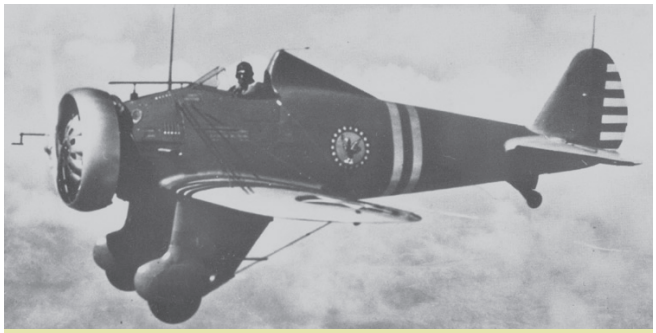
- An **Airport Authority Workshop** was held on July 13, 2010 at NFRA to discuss and confirm draft sustainability goals and objectives. The Project Team received feedback and direction from the Airport Authority and members of the public attending the meeting.
- In addition to the regular bi-weekly project update calls, **Airport Staff Workshops** were held on November 8, 2010 and December 14, 2010 to discuss candidate sustainability initiatives and performance targets, respectively, in greater detail. Airport staff in attendance included the Airport Manager, Assistant Airport Manager, Operations and Maintenance Manager, and Purchasing and Property Coordinator.
- Another **Airport Authority Workshop** was held on March 7, 2011 at NFRA to review the Draft Sustainability Management Plan and address Authority Board members' questions and comments. The Project Team finalized the Sustainability Management Plan documentation shortly thereafter.
- The final **Sustainability Management Plan** was presented to the Board on April 18, 2011. This Plan is published on NFRA's website: http://www.flynfra.com and was advertised through the Airport's social media networks and with a press release.

In addition to the coordination and informational meetings described above, the FAA and Jacksonville University participated in the development of this plan.

Federal Aviation Administration Participation

FAA selected NFRA as the first airport to receive AIP funding for stand-alone sustainability planning (independent of a Master Planning Process) as a precursor to a nationwide Sustainability Planning pilot program. The scope of work for the Plan was developed in close coordination with FAA's Planning and Environmental Division at the Agency's Headquarters in Washington D.C. The Sustainability Management Plan Project Team provided regular updates on project status and "lessons learned" to the Planning and Environmental Division and the Airports District Office (ADO) in Orlando, Florida. FAA representatives from the

1930s



1930s era aircraft.

After various landing strips were developed for training purposes during WWI, recreational use, and passenger service, the City of St. Augustine purchased 276 acres in Araquay Park in 1933. The land was cleared and the airport developed primarily with funds provided by the Civil Works Program. The outbreak of WWII resulted in the U.S. Navy taking over the Airport for training purposes, with upgrades to the facility.

1960s

Production facility at Fairchild Engine and Airplane Corporation.

The St. Augustine - St. Johns County Airport Authority was created in 1963 by the state legislature with the purpose of owning and operating the facility. The Authority oversaw a period of growth and development with the extension of the primary runway to 7,996 feet and installation of airfield lighting. The improvements were needed to accommodate the Airport's then major tenant – Fairchild Engine and Airplane Corporation. Fairchild operated a large aircraft modification facility since 1955 at the Airport and the airfield improvements completed in the 1960s allowed the company to service jet aircraft.

Orlando ADO attended the Project Kick-off Meeting, Stakeholder and Public Visioning Session, and the final Airport Authority Workshop.

Jacksonville University Participation

The Airport Authority has historically provided internships and other learning opportunities for Jacksonville University students. The University offers degrees in Aviation Management and Flight Operations, which educates the next generation of airport and aviation leaders. The Airport Authority's involvement with the University's students in this curriculum provides them valuable real-world experience, and the students' participation in this study is a continuation of that effort.

Students from Jacksonville University's spring 2010 term Airport Planning and Management course (AVM 306) attended the Project Kick-off Meeting that included an extensive tour of the Airport showcasing current sustainability initiatives. A member of the Project Team also visited the University to speak to the students about sustainability planning at airports and introduce potential sustainability-related topics that the students could research to supplement the Sustainability Management Plan. The students developed research papers on the following topics, and were considered in the development of this plan:

Airport tour with students and faculty from Jacksonville University

- Implications of the 500-year storm
- Reduction, Recycling, and Reuse of Solid Waste
- Showcasing Airport Sustainability Initiatives
- Tracking Sustainability at the Airport
- Wind and Solar Energy

2000s

Aerial view of NFRA.

In the new century, the Airport has continued its growth as a major economic engine for St. Johns County, as Northrop Grumman (the successor of Fairchild) and other aviation-related businesses continue to call the Airport "home". In 2008, the Airport hosted regularly scheduled passenger service. The Airport was renamed Northeast Florida Regional Airport at St. Augustine in 2010 to reflect the facility's role as a key aviation and economic asset to the region.

The Airport's Ground Run-up Enclosure used primarily by Northrop Grumman to limit noise impact from aircraft engine testing.

NFRA's Air Traffic Control Tower.

Jacksonville University students and professors also attended and participated in the first Airport Authority Workshop on July 13, 2010 and on March 28, 2011.

Sustainability Management Plan Report

This report is divided into individual categories that were developed specifically for this sustainability management plan. It is important to note that sustainability issues associated with airports catering mainly to GA activities are different from larger commercial service airports that rely on airline fees and passenger revenues, among others. The categories include:

CHAPTER 2 Sustainability Management Approach

CHAPTER 3 Economic Vitality

CHAPTER 4 Community Relations

CHAPTER 5 Planned Development

CHAPTER 6 Energy

CHAPTER 7 Air Quality

CHAPTER 8 Natural Resources

CHAPTER 9 Water Quality and Conservation

CHAPTER 10 Materials and Waste Management

CHAPTER 11 Airport Connectivity

An aircraft on the Airport's Taxiway F.

Within each category evaluated in the plan, the following items are presented:

What are our goals?

This section presents the Airport's goals and objectives. A key component of sustainability planning is the development of goals and objectives. One goal was developed for each category to guide what the Airport ultimately would like to accomplish. A series of objectives were then developed to help achieve each category's goal. The goals and objectives were developed by the Airport staff, Airport Authority members, and stakeholders, including the public, airport users, and local regulatory agency representatives.

Where are we now?

This section presents a snapshot of the Airport's current performance in a number of areas related to its overall sustainability. A thorough evaluation of the Airport's current performance demonstrates how well the organization is doing and identifies possible areas for improvement.

What have we already accomplished?

This section provides an overview of sustainability initiatives the Airport has already planned or implemented. Airports around the country, including NFRA, have enacted measures to meet environmental and other regulatory requirements, and to become better neighbors in the communities in which they are located. Many of these measures are also sustainability initiatives.

How will we reach our goals?

This section outlines potential initiatives that could be implemented on the short- or long-term to assist the Airport Authority in reaching its sustainability goals and objectives. These initiatives were derived from a number of industry sources and screened based on feasibility of implementation and operation at NFRA. Within each category, at least one initiative is featured with more detailed information.

Each initiative is categorized according to strategy type, and cost and manpower needed to implement and maintain.

The initiative strategy types and associated icons are:

 Stand-Alone Strategy

 Building Design Element

 Construction Practice

 Coordination

 Environmentally Preferable Purchasing

 Purchasing

 Reporting/Monitoring

 Tenant and Staff Education

 Policies

 Planned Development Criteria

Costs range from low $ to high $$$ relative to current Airport expenditures. Manpower estimates also range from low  to high  and are relative to the number of current Airport staff.

Airplane taking off at NFRA.

Walking trail on south side of Airport.

Airport Sustainability is a holistic approach to managing an airport to ensure Economic viability, Operational efficiency, Natural resource conservation, and Social responsibility.

02 SUSTAINABILITY MANAGEMENT APPROACH

This chapter provides practical guidance for NFRA to ensure that sustainability is integrated into the Airport organization. A sustainability management approach fosters a "sustainability mindset" and makes possible the consideration of the other initiatives described in this plan.

Guiding Principles of Sustainability

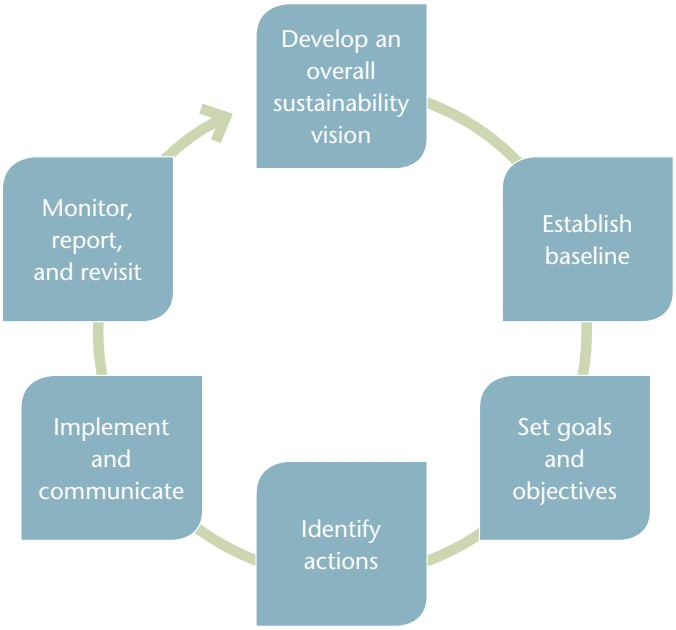
Ensuring the long-term sustainability of an Airport requires an ongoing management approach with a clear focus and direction. As described in **Chapter 1, Introduction**, the term "sustainability" represents a holistic approach to integrating social, environmental, and financial factors into managing an Airport over the long term. For an Airport to optimize its sustainability, this approach should be integrated into the organization management and continue in spite of Airport staff turnover. Three guiding principles can help Airport management to optimize its sustainability potential of the Airport:

1. Transparency
2. Continual and measurable improvement
3. Inclusion of sustainability considerations into airport decision-making

Transparency refers to the accessibility of airport records and activities to the public. It demonstrates a commitment to the general public as well as a willingness to maximize the Airport management's efforts to operate, maintain, and develop an Airport as sustainability and conscientiously as possible.

Continual improvement ensures that the Airport is actively working towards optimizing its decisions for sustainability. Establishing a process of continual improvement also ensures that the latest knowledge and technologies are being incorporated into the decision structure and planned actions of the Airport. Ideally, progress will be able to be measured.

This plan establishes a framework for continual improvement, outlined in the two phases described in **Chapter 1, Introduction**. This framework can be summarized into the following steps:



NFRA's Sustainability Management Plan steps: a continual improvement approach to sustainability. These steps expand upon the "Plan-Do-Check-Act" process described in the overview.

Although this report establishes the basic elements of the framework, it will only be effective if the Airport maintains a culture of sustainability to drive the cycle.

Inclusion of sustainability considerations into Airport decision-making is a third way to ensure the Airport is optimizing the sustainability potential of the Airport. Airport decisions should always consider environmental and social factors in addition to economic concerns. This "triple bottom line" approach to decision-making is a practical way to optimize economic, environmental, and social capital. These decisions should rely on available information to understand on the environmental, social, and financial implications of the Airport Authority's actions. It is important to note that addressing one concern does not necessarily come at the expense of another. Optimally, evaluating a project based on environmental and social concerns will spur innovation that ultimately reduces overall costs over the life of the project. Although evaluation of projects based on quantitative and qualitative factors is ideal, quantitative data may not always be available. In those cases, a qualitative assessment of the "triple bottom line" can also influence decision making.

Sustainability Management Structure

There are some distinct structural changes that can help promote a "sustainability mindset" within an organization.

1. **Formally designating a "sustainability champion".** Most organizations, if not all, that are seeking to advance sustainability have at least one individual that leads the organization's efforts. Formal recognition of this "sustainability champion" validates the organization's sustainability efforts. In addition, the organization can maintain a certain degree of continuity in its sustainability mindset by always ensuring there is a sustainability champion, even when there is employee turnover.
2. **Scheduling regular sustainability coordination meetings.** In order to ensure all airport lines of business are engaged in the Airport's sustainability efforts, the sustainability champion will hold regular meetings with leaders responsible for executive/ business activities and performance; administration and procurement; operations and maintenance of airport grounds and facilities; and community outreach. These meetings will ensure that the principles of sustainability are being considered in all airport activities. For example, the initiatives developed as part of NFRA's Sustainability Management Plan will be coordinated with the Airport's Business Plan and will be re-evaluated when commercial service is initiated and then also when the Business Plan is finalized. These regularly scheduled sustainability meetings will ensure such initiatives are developed cohesively.

Sustainability Meetings

- Agenda -

Meeting Goal: to ensure that the principles of sustainability are being considered in all airport activities

- Discussion of sustainability features and/or opportunities in current and planned projects/activities
- Data collection for sustainability reporting
- Implementation of sustainability initiatives (identified in this plan)
- Challenges/obstacles encountered
- New Ideas for improvement
- Report on successes

Airport Stakeholder Visioning Workshop held during the study at Airport Conference Center.

Because NFRA is managed by a relatively small staff, representatives of airport lines of business will correspond to the normal management team, rather than to a "sustainability committee" as may be required at a larger organization. NFRA should conduct these meetings in conjunction with other regularly scheduled meetings (i.e., monthly financial and committee reports), or as appropriate for the Airport. Special meetings related to specific projects should also be conducted by the sustainability champion to ensure that sustainability initiatives are considered during the planning, design, and construction phases of development.

The Airport is currently reviewing all of its existing policies and guidelines to update and compile from into a Policies and Guidance Manual. The checklists and reporting mechanisms developed as part of this Sustainability Management Plan will be considered for inclusion into the new Policies and Guidance Manual.

3. **Revisiting the Airport's Goals and Performance.** Each year, the Airport Authority will hold an annual meeting with the Airport staff at which the Airport's sustainability performance is presented and its sustainability goals and objectives are revisited against the reported performance. This annual meeting will ensure continual improvement as the Airport, technology, and the political, social, and natural environment changes.

4. **Encouraging employee engagement in Airport's sustainability efforts**

Strategies could include:

- Create an employee award for implementation of aspects of the plan and/or suggestion of new initiatives.
- Incorporate criteria to measure employee participation in sustainability planning process into employee reviews. Examples of criteria include level of success in implementing sustainability initiatives assigned to employee or application of Sustainability Management Tools, such as life cycle cost analyses or the design checklists.
- Educate new employees regarding the Airport's commitment to sustainability during the new employee orientation process.
- Hire employees with interest or experience in addressing sustainability.

South Hangar Development Area. NFRA considered lifecycle costs during the planning phase of this development project. NFRA priced the hangars in order to match the payback period of "traditional" hangars.

Key Steps and Formulas for Life Cycle Cost Analyses

1. Define problem and state objective
2. Identify feasible alternatives
3. Establish common assumptions and parameters
4. Estimate costs and times of occurrence for each alternative
5. Calculate present value of future costs, using the discounting formula.
6. Compute and compare life cycle costs for each alternative
7. Compute supplementary measures if required for project prioritization (e.g. Net Savings, Savings-to-Investment Ratio, and Adjusted Internal Rate of Return)
8. Assess uncertainty of input data
9. Take into account non-monetary costs or benefits (e.g. environmental and social)
10. Select an alternative

The basic formula for calculating building life-cycle cost is:
LCC = I + Repl - Res + E + W + OM&R + O*

LCC	Total life-cycle cost in present value dollars of a given project or alternative
I	Initial cost
Repl	Capital replacement costs (present value)
Res	Residual value (resale value, salvage value) less disposal costs (present value)
E	Total energy cost (present value)
W	Total water costs (present value)
OM&R	Total operating, maintenance, and repair costs (present value)
O	Total other cost if any (present value), (e.g., contract administration costs, financing costs, employee salaries and benefits)

*This equation should consider the costs over the desired useful life of the building or system.

A complete methodology and guidance handbook for conducting LCCAs is available through the *Federal Energy Management Program: Handbook 135, the Life-Cycle Costing Manual for FEMP*, available at **http://www1.eere.energy.gov/femp/information/download_blcc.html#handbook**

Sources:
U.S. Department of Energy (U.S. DOE). Office of Energy Efficiency and Renewable Energy (EERE) Federal Energy Management Program (FEMP), *Handbook 135, the Life-Cycle Costing Manual for FEMP*, 1996
U.S. DOE. EERE FEMP, *Annual Supplement to Handbook 135: Energy Price Indices and Discount Factors for Life-Cycle Cost Analysis*, 2010.

Sustainability Management Tools

The Airport will continue to rely on industry research and advancements to ensure its activities are well-informed. These resources include the Transportation Research Board (TRB) Airports Cooperative Research Program (ACRP) publications; Sustainable Aviation Guidance Alliance (SAGA); as well as information exchange across airports. See the **Bibliography** and **Additional Resources** section at the end of this report for examples of available industry resources.

In addition, the following four categories of management tools provide the airport with concrete instruments to incorporate sustainability into the management of the Airport, ensuring continual improvement of the Airport's Sustainability Management Plan:

1. Decision-Making Tools
2. Implementation Tools
3. Monitoring Tools
4. Reporting Tools

1.
Decision-Making Tools

Life cycle cost analysis (LCCA)

When undertaking development projects, the Airport should conduct a LCCA to optimize the selection of alternatives and seek to reduce costs over the life of the project. LCCA is a useful tool to help decision-making, since it demonstrates a return on investment (ROI) resulting from increased efficiencies. Life cycle costing considers both the initial cost and the cost of ownership (maintenance and/or operational costs) over time. Using LCCA to review utility bills and to identify wasteful equipment and systems can help make the case for improvements to existing buildings, infrastructure and operations.

Because any analysis requires time and resources, the level of detail for the LCCA should be tailored to the scope and needs of the project, which may translate to a "back of the envelope" calculation, or an in-depth analysis that includes researched input data as well as supplementary evaluations such as risk and/or uncertainty analyses.

Building design element checklist

The building design element checklist is a combination of all sustainability initiatives included in **Chapters 3** through **11** that address elements of building design, regardless of which sustainability topic area they benefit. The Airport staff will be able to use this checklist when designing facilities to ensure selected elements of sustainability are incorporated or considered as part of the design. This checklist was specifically developed for the Airport as part of this Sustainability Management Plan.

Planned development checklist

Similar to the building design element checklist, the planned development checklist consists of a combination of all sustainability initiatives included in **Chapters 3** through **11** that address how development at the Airport is planned. This checklist also was developed as part of this Sustainability Management Plan.

2.
Implementation Tools

Prioritization Matrix

The Prioritization Matrix is intended to identify the primary attributes of each strategy that will affect the timing of implementation and relative priority of each strategy. The general approach for prioritizing the sustainability initiatives is to initially pursue projects with low costs and high potential returns, either financial, environmental, and/or social. The "Priority Ranking" identifies the general phasing for each step, categorized as "High", "Medium", and "Low". The level of priority is determined based on the following factors:

- Costs, capital and operating, and includes both financial costs and personnel time.
- Any potential sequencing requirements (e.g. is the initiative contingent on other development or activities?).
- Ease of implementation (can the strategy be combined with another initiative? What is the availability of the person responsible for implementing the initiative? Is special training required?).
- Potential impact of each strategy. This factor is intended to offer a sense of relative contribution to sustainability, when comparing one initiative with another. For example, an impact factor would consider an initiative's ability to reduce environmental impacts such as noise, greenhouse gas emissions, or water contaminants. In addition, the "impact factor" considers both the "visibility" of each initiative (a designation of "high" impact may be given to an initiative that can be easily communicated and understood to the public) as well as the potential for an initiative to reduce operational costs for the Airport.

The format of the prioritization matrix was developed as part of this Sustainability Management Plan, and Airport staff will complete the matrix to implement the plan.

Implementation Chart

The Implementation Chart identifies the steps and personnel responsible for implementing each initiative, as well as the target date for completion of the initiative:

- **Strategy/Initiative** – refers to all sustainability initiatives recommended in the sustainability management plan.
- **Implementation Steps** – identifies the general steps required to implement each initiative. This list is not intended to provide a comprehensive list of steps, but rather offers a rough outline that will serve as a starting point to implement the strategy.
- **Person Responsible** – identifies NFRA staff responsible for implementing the initiative.
- **Target Completion Date** – identifies the date for which the initiative is scheduled to be fully implemented. Interim target completion dates may be set in order to ensure major milestones are met for initiatives that require multiple steps to complete.

The format of the implementation chart was developed as part of this Sustainability Management Plan, and Airport staff will complete the chart to implement the plan.

3.
Monitoring Tools

Performance Measurement

As part of this Sustainability Management Plan, monitoring tools were developed that will help the Airport staff monitor the Airport's sustainability performance, according to the metrics established for each of the sustainability categories. These Measurement Spreadsheets are designed to support the compilation of NFRA's yearly updates in an Annual Sustainability Report Card (See **Appendix D, Annual Report Card,** for a list of metrics tracked through the performance measurement chart).

Collecting and measuring performance is essential for making informed decisions that will help the Airport:

- Evaluate facility performance and identify inefficiencies and problems as they occur.
- Quantify the benefits of sustainability initiatives (e.g. energy or water efficiency strategies).
- Facilitate annual sustainability reporting through ongoing collection of data.

4.
Reporting Tool

Annual Report Card

Included in **Appendix D** of this Plan is an outline and proposed format for the Annual Report Card the Airport will be producing each year to evaluate and report its sustainability performance. The Annual Report Card presents the monitoring results in a straight-forward and transparent manner.

NFRA's recently resurfaced Runway 13/31.

A corporate hangar at NFRA. ✈

Airport Sustainability is a holistic approach to managing an airport to ensure Economic viability, Operational efficiency, Natural resource conservation, and Social responsibility.

03 ECONOMIC VITALITY

While sustainability is often considered primarily an environmental issue, economic vitality is one of its primary tenets along with social considerations. A strong and stable financial foundation is essential to the long-term viability of any airport, which cannot be sustained without careful consideration of the environmental resources that it consumes and the well-being of the community in which it resides. Economic vitality addresses airport activities intended to enhance aeronautical and non-aeronautical revenue generating opportunities, while promoting the Airport's role as a regional economic engine. Airport revenue diversification also strengthens the airport's ability to withstand future decreases in aviation demand.

Goal

Enhance growth and ensure the Airport's long-term financial sustainability by providing an innovative, competitive, and commercially viable facility that contributes to regional economic vitality.

Objectives

- Seek financial self sufficiency.
- Develop and maintain commercially-viable air service to support the regional economy.
- Capitalize on aeronautical and non-aeronautical assets at the Airport.
- Develop and price facility lease rates to provide an acceptable ROI.

The Economic Impact of General Aviation Airports

The general public frequently underestimates the economic impact of GA airports. While these facilities are typically seen as only providing facilities for private aircraft owners, they often are home to and serve various businesses that require and depend on airport-related facilities. NFRA is home to a number of businesses (see **Chapter 1**), including a large Northrop Grumman aircraft manufacturing and maintenance facility.

In 2008, Florida GA airports accounted for 54,250 jobs, resulting in $1.8 billion in payroll and $6 billion in economic activity on an annual basis. In 2008, NFRA's economic impact to the region corresponded to 2,925 jobs, resulting in $94 million in payroll.

A 2007 study by the St. Johns County Chamber of Commerce - Economic Development Council characterized the Airport as "the Economic Gateway to St. Johns County". The study's findings concluded that the Airport directly accounted for 2,767 jobs in 2007, which equals 5% of the total county-wide employed residents. The study also reported that the Airport was one of the largest contributors to the County's economy, adding over $500 million annually.

Where are we now?

Performance Snapshot

- **Aviation Activity:** GA activity in the U.S. has steadily declined since 1980, after the Airline Deregulation Act in 1978.[1] GA activity at NFRA has fluctuated over the past thirty years. For example, in the last decade, the Airport recorded a high of 144,000 annual GA operations (2002) and a low of approximately 81,000 annual GA operations (2008). The frequency of GA operations is typically related to local and national economic conditions. NFRA also supported scheduled passenger airline service in 2008. In response to local demand for passenger airline service and to diversify revenue sources on the airfield, the Airport Authority has planned for the development of additional aviation-related facilities and is actively pursuing regularly scheduled airline service while making the Airport as self-sustaining as possible to balance the suspension of the ad valorem tax in 2010.[2,3]
- **Operating Costs:** Total operating costs increased from $4,545,945 in 2008 to $4,694,550 in 2009. Operating costs per aircraft operation decreased from $48.80 in 2008 to $46.90 in 2009.

1 Transportation Research Board (TRB). Airport Cooperative Research Program (ACRP). Synthesis 19: Airport Revenue Diversification. Washington D.C. 2010. Available at **http://onlinepubs.trb.org/onlinepubs/acrp/acrp_syn_019.pdf**

2 St Augustine – St. Johns County Airport Authority. Audit Report. September 30, 2009, and 2008. Prepared by Davis Monk & Company.

3 The St. Johns – St. Augustine Airport Authority was given authority in 1964 to issue a tax on residents of St. Johns County in order to support the Airport. This tax has been used to fund capital improvement projects, and was not applied to operational expenses or salaries.

Economic impacts studies typically calculate the economic contributions associated with on-airport activities, such as those associated with airport tenants and businesses, airport construction, and airport management and operations; as well as off-airport impacts, such as those associated with visitor spending. In addition, induced impacts are also calculated to reflect the recirculation of these on- and off-airport impacts in the local economy.

Sources:

▲ Florida Department of Transportation, Aviation Office, Florida Statewide Aviation Economic Impact Study, March 2010.

● St. Johns County Chamber of Commerce - Economic Development Council: **http://www.stjohnscountychamber.com/main/economicdevcouncil/**

SUMMARY OF NORTHEAST FLORIDA REGIONAL AIRPORT ECONOMIC IMPACTS (2008)

TOTAL EMPLOYMENT (2008) ▲

2,925 jobs

TOTAL PAYROLL (2008) ▲

$94,081,900

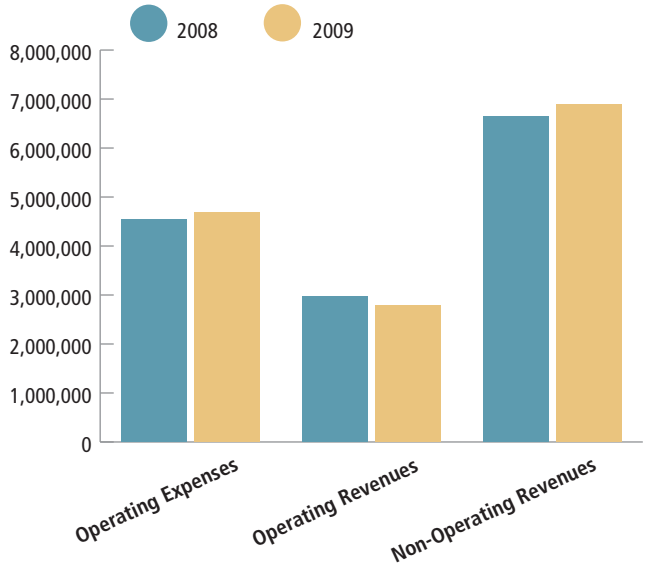
TOTAL ECONOMIC CONTRIBUTION (2007) ●

$256,038,500

Source: Florida Department of Transportation, Aviation Office, Florida Statewide Aviation Economic Impact Study, March 2010.

FIGURE 1

NFRA Financial Snapshot (2008, 2009)



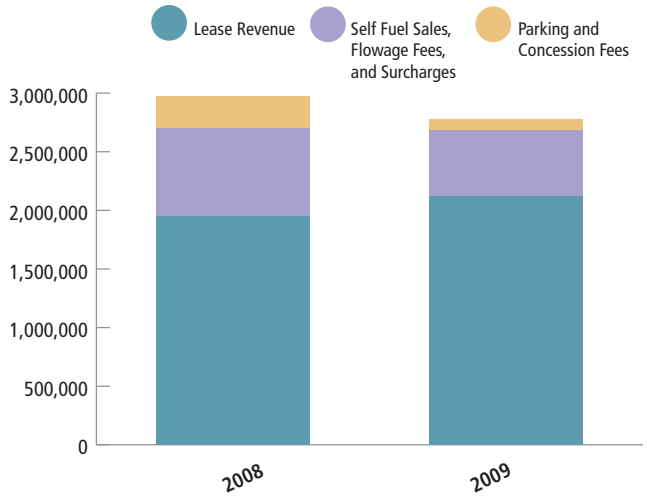
Source: St Augustine – St. Johns County Airport Authority. Audit Report. September 30, 2009, and 2008. Prepared by Davis Monk & Company.

Non-operating expenses were negligible in 2008 and 2009, and therefore are not shown in this figure. Operating expenses, operating revenues, and non-operating revenues were very similar from 2008 to 2009.

[L and R] NFRA Fuel Farm.

FIGURE 2

Breakdown of Operating Revenues (2008, 2009)



Source: St Augustine – St. Johns County Airport Authority. Audit Report. September 30, 2009, and 2008. Prepared by Davis Monk & Company.

Lease revenue is the largest source of operating revenue, representing 65% of total operating revenue in 2008, and increasing to 76% in 2009. Fuel sales and parking/concessions sales represented 25% and 9% of total operating revenue in 2008 (respectively). Both decreased in 2009, to 20% and 4% (respectively). These changes in revenue are likely due to elimination of commercial passenger service since 2008.

- **Operating Revenues:** Operating revenues decreased from $2,975,643 in 2008 to $2,779,769 in 2009, most likely due to the cessation of commercial operations. The Airport's primary sources of operating revenue are from leases, fuel sales/fuel flowage fees, and parking/concession fees.
- **Lease Revenues:** NFRA leases five types of aircraft hangars: 12 Commercial/Corporate hangars, 111 Standard T-hangars, 17 Port-a-Port units, 24 Box hangars (2,000-4,000 sq.ft.), 4 Galaxy Aviation hangars, and 3 large industrial hangars (Northrop Grumman). Revenues from Corporate hangars represent approximately 22% of the Airport's total hangar lease revenues.[4] Corporate hangars are leased on a square footage basis, with lease lengths ranging from 1 to 20 years.

The Airport prices its hangar leases primarily based on a favorable return on investment of between 7% and 9%. However, in a comparison of average T-hangar lease rates at other comparable airports in Florida, T-hangar lease rates at NFRA are consistently lower on the basis of absolute cost as well as cost per square footage (see Hangar Lease Rates tables). Although there are a number of different factors that contribute to T-hangar lease rates, this generally shows that NFRA lease rates are competitive.

4 St. Augustine – St Johns County Airport Authority Financial Statements – Historical and Budgeted for the Three Months Ended December 31,2009

[L and R] Hangars at NFRA.

TABLE 1

NFRA T-Hangar Lease Rates▲

T- Hangar Type	Area (sq. ft) per Hangar	Monthly Lease Rate ($)●	Monthly Lease Rate/Area ($/sq. ft)
Port-a-Port Units	846	$185.00	$0.22
Standard T-Hangars	1,181	$219.00	$0.19
Premium T-Hangars with electric Bi-Fold Doors	1,012	$246.00	$0.24
Large T-Hangars (Light Twin-Engine)	1,353	$271.00	$0.20

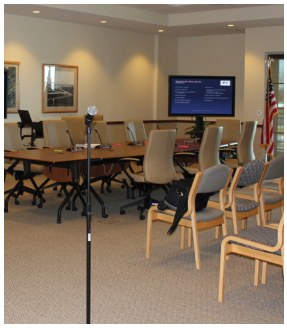
Source: NFRA Website
Note: Does not include Corporate Hangars
▲ As advertised on the NFRA website as of July 2010
● Does not include taxes

TABLE 2

T-Hangar Lease Rates Comparison

	Comparative Average▲	NFRA
Average Area	1,331	1,098
Average Monthly Lease Rate	$386.38	$230.25
Average Monthly Lease Rate/Area	$0.29	$0.20

Source: Florida Airport Hangar Survey, January 2008
▲ Average areas and lease rates are based on an aircraft hangar survey distributed to twenty Florida Airports in January 2008.



NFRA's new Airport Conference Center, a multi-purpose building designed to enhance the Airport's generation of non-aeronautical revenue.

Interior meeting space with complete audio-visual equipment as well as kitchen facilities.

What have we already accomplished?

Current Sustainability Initiatives

NFRA has been actively developing airport facilities to support new commercial airline service as well as to accommodate demand for new aeronautical and non-aeronautical facilities, such as aircraft hangars, office space, and a multi-purpose space (the "Airport Conference Center") that can be used for meetings, special occasions, and banquets. Other unique features of the Airport include an aircraft run-up enclosure and a passenger airline terminal.

Specific activities related to economic vitality that the Airport has already undertaken include:

- **Non-Aeronautical Facilities**
  To achieve the Airport's objective of financial self-sufficiency, the new Airport Conference Center was designed and completed in 2010 to enhance non-aeronautical revenue generating potential. The 3,000 square foot building provides the Airport with a unique additional source of revenue from rental space on the first floor (office space) and on the second floor (meeting spaces). Four offices spaces on the first floor are leased, in addition to an office for the on-Airport flight school. The second floor space is designed for multi-purpose use that can be subdivided into multiple spaces or kept as one large room, with kitchen facilities available. Access to the second floor is available through an elevator and staircases in front and along the side of the building, minimizing disturbance to the offices downstairs. These rental facilities are available for public and private use such as wedding receptions, corporate functions, small convention meetings, and other gatherings.

- **South Hangar Development Area**
  The Airport recently invested in the construction of six new premium hangars with additional hangar development and associated structures in initial planning stages. As described in **Chapter 5, Planned Development**, these hangars were designed to minimize impacts to old-growth trees. As a result, these premium hangars are surrounded by existing old oak trees, offering a unique physical environment for airport hangars.

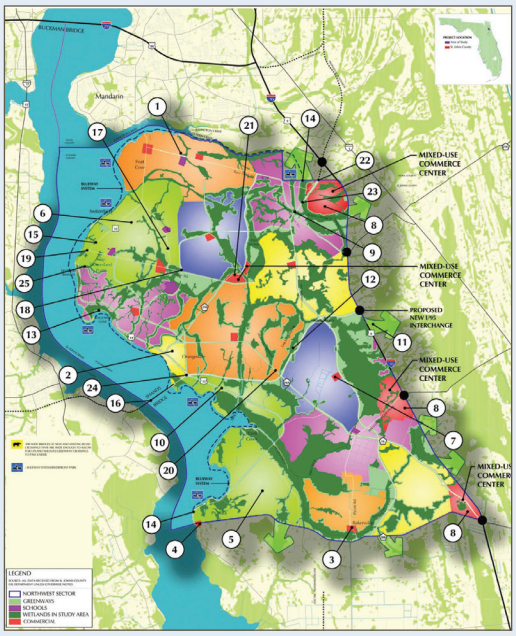
- **Development of an Airport Business Plan**
  The Airport Authority is in the process of developing a Business Plan for the Airport to identify business opportunities, enhance transportation connections, and establish prominence in the region. The recent renaming of St. Augustine-St. Johns County Airport to "Northeast Florida Regional Airport at St. Augustine" (NFRA) is consistent with this approach. The development of a comprehensive business plan is part of the Airport Authority's strategy to capitalize on the Airport's assets and develop its resources to become a regional transportation hub.

How will we reach our goals?

Recommended Sustainability Initiatives

The Airport has identified a number of potential initiatives in an effort to meet its economic goals and objectives. These initiatives differ in their type, degree of effectiveness, and cost. In addition, some of these initiatives are new, derived from industry best practices, internal Airport recommendations, and public and stakeholder visioning, whereas other initiatives represent enhancements of current initiatives. The following sections identify these potential sustainability initiatives that can be used by the Airport to meet its goals and objectives. NFRA will pursue as many of these initiatives as is feasible, given staffing and financial limitations.

How can long-term, compatible development occur in and around the Airport?



(source: St. Johns County Planning Department)

The St. Johns County Northwest Sector Vision Plan Framework Map.

The Airport is located to the southeast of the Northwest Sector Vision Plan boundaries.

Long-term Land Use Planning

The Airport is an economic engine for St. Johns County, accounting for 2,925 jobs throughout St. Johns County, which equals approximately 5% of the total employed residents of the County.▲ To maximize its local economic impact, the Airport Authority and County should plan for conceptual long-term build-out of the Airport environs. The Airport Authority should coordinate with the St. Johns County Planning Department to develop a type of "sector" plan that considers economic development, community values, mobility, creation of green spaces and livable communities. Future land use patterns should be designed to develop an airport-related regional employment center adjacent or close to the Airport that would provide sites to attract increasingly diverse types of clean industrial and commercial development. This type of development could capitalize on close access to the Airport, and in turn spur demand for Airport services including passenger airline service.

The term "aerotropolis" has been coined to note the importance airports have in the development patterns of their surrounding communities. Time-sensitive manufacturing and distribution; hotel, entertainment, retail, convention, trade and exhibition complexes, and office buildings that house air-travel, intensive executives and professionals are likely land uses around active airports. **(www.aerotropolis.com)**.

Land use planning is intended to reduce or limit land uses that are "noncompatible" with various levels of noise caused by airport operations.● For example, residential land uses and schools are noncompatible with noise levels above DNL 65 dB. Land uses that are typically compatible with airport noise levels include recreational land, which is compatible with levels up to DNL 75 dB and agricultural land uses, which are compatible with all noise levels, although they may attract wildlife hazardous to aircraft. Despite land uses being considered compatible with noise levels less than DNL 65 dB, local needs may dictate further delineation based on specific local requirements.

Incentives for Business Expansion and Relocation

Incentives for job-creating business expansions and relocations are provided by St. Johns County, in cooperation with the St. Johns County Chamber of Commerce Economic Development Council, and include expedited permitting, application assistance with any potential State incentives, and an economic development grant. Depending on total qualifications, grants may be awarded for amounts up to four years' value of ad valorem tax, four years' value of tangible personal property tax, and up to 100% rebate of water and sewer unit connection fees. Northrop Grumman relocated services that employed 95 people from elsewhere in the U.S. to its facility at NFRA with assistance from the Qualified Defense Contractor Tax Refund.■ The Airport is in the process of developing a Business Plan to identify opportunities to recruit businesses and other development to (or near) the Airport to maximize the facility's economic benefits and revenue potential.

Sources:

▲ Florida Department of Transportation, Aviation Office. Florida Statewide Aviation Economic Impact Study; March 2010

● Advisory Circular 150/5020-1 contains a table which identifies compatible and noncompatible land uses (Appendix A, Table 1 - Land Uses Normally Compatible with Various Noise Levels, **http://www.faa.gov/documentLibrary/media/advisory_circular/150-5020-1/150_5020_1.pdf**)

■ St. Johns County Chamber of Commerce website: **http://www.stjohnscountychamber.com/business-climate/success-stories/**, accessed January 17, 2011.

Curbside of Passenger Airline Terminal

Each initiative is categorized according to strategy type, and cost and manpower needed to implement and maintain.

The initiative strategy types and associated icons are:

- Stand-Alone Strategy
- Building Design Element
- Construction Practice
- Coordination
- Environmentally Preferable Purchasing
- Purchasing
- Reporting/Monitoring
- Tenant and Staff Education
- Policies
- Planned Development Criteria

Costs range from low $ to high $$$ relative to current Airport expenditures. Manpower estimates also range from low to high and are relative to the number of current Airport staff.

Potential Short-Term Sustainability Initiatives

The following potential sustainability initiatives focus on strategies that are feasible to implement and can commence within a relatively short-term timeframe of approximately 1-5 years. During this period, it is expected that only relatively small-scale capital improvements and essential maintenance activities will be conducted at the Airport. The Short-Term Initiatives primarily consist of strategies that have the potential for high effectiveness while also being relatively low-cost and easy to implement.

Short-Term Initiative	Description	Strategy Type	Benefits	Costs
Develop commercial airline service *Continuation of a Current Initiative*	Seek to attract airline operators to the Airport by meeting with potential airlines, working with local and regional councils, and others to demonstrate local demand as well as NFRA's ability to support regularly scheduled airline service. Specific strategies to develop airline service that are consistent with FAA policies could include:▲ • Minimum revenue guarantees • Guaranteed ticket purchases (i.e., travel banks) • Marketing and advertising • Non-financial (in-kind) contributions		• Enhance the Airport's revenues. • Enhance the Airport's economic contribution to the region. • Increase ease of access for local residents to travel destinations.	$

Short-Term Initiative	Description	Strategy Type	Benefits	Costs
Work with local tourism, regional governments, and aviation groups to advertise services and available opportunities at NFRA *Enhancement of a Current Initiative*	Take steps to solidify the Airport's service area in St. Johns County and expand it to include southern Duval, Flagler, and Volusia counties: • Work with City and County Marketing and Tourism Departments to promote Airport and associated facilities as providing a connection to Northeast Florida. • Use websites and other publications for advertisement (look at regional marketing outside of St. Johns County). • Market the new Multi-use Facility to aviation groups for "fly-in" events. (see below) • Use air shows to promote airport to the community and aviation community. • Advertise Airport's unique mix of aviation-related features to potential users (i.e., Customs facility, seaplane base, Aerobatic box, commercial maintenance and overhaul facility [MRO]). In addition to the promotion of the Airport's aviation-related services, the Airport will seek to market its facilities that support non-aviation activities to both private and public local community members, while abiding to FAA policies on airport revenue use, as outlined in FAA order 5190.6B, *FAA Airport Compliance Manual*, Chapter 15, *Permitted and Prohibited Uses of Airport Revenue.*		• Enhance the marketing of the Airport. • Grow the Airport's service area. • Increase awareness and use of underutilized aviation-related assets. • Increased fuel sales from fly-in events. • Attract the public to the airport. • Enhance Airport's value to the community.	
Price hangar lease rates to ensure acceptable ROI *Continuation of a Current Initiative*	Price hangar lease rates to an acceptable ROI (between 7 and 9%).		• Maintain competitive lease rates. • Maintain Airport's ability to integrate sustainability practices that may not have immediate financial returns.	
Maintain involvement in airport industry organizations *Continuation of a Current Initiative*	Maintain Airport personnel and Authority Board Members' participation in the following industry organizations: • FAC's Board of Directors and Environmental Committee; • Continuing Florida Aviation System Planning Process (CFASPP); • American Association of Airport Executives (AAAE); • Professional Grounds Maintenance Society (PGMS) (see **Chapter 4, Community Relations**); and • ACI-NA.		• Give NFRA voice in industry regulatory issues. • Promote the Airport within the industry. • Access to information on emerging industry trends and topics.	

Short-Term Initiative	Description	Strategy Type	Benefits	Costs
Formalize marketing plan for the Airport Conference Center	The Airport Conference Center (multi-use building) is a valuable new addition to NFRA. The Conference Center offers 3,000 square feet of conference space, including kitchen facilities to accommodate a variety of events. A formal marketing plan would target local and national aviation groups for fly-in events, and non-aviation groups for Conference Center functions. As part of the marketing plan, highlight the facility on the Airport website.		• Maximize revenue generation of new facility and enhance the Airport's return on investment. • Increase visibility of the Airport to national aviation groups and the local community.	$$
Highlight Airport Businesses	NFRA will regularly feature an Airport business on NFRA's social media networking sites and on its website. These highlights will help promote Airport businesses.		• Promote the Airport's businesses within the community. • Attract the public to the Airport.	$
Actively participate in the Federal Surplus Personal Property Donation Program	The Federal Surplus Personal Property Donation Program enables certain nonfederal organizations (which includes public airports) to obtain personal property that the federal government no longer needs. NFRA should first obtain access to the Federal Surplus database through the Florida Department of Management Services, Bureau of Federal Property Assistance. NFRA can then search the database for items of use for Airport operations.		• Promotes principal of reduce, reuse, and recycle. • Saves money by obtaining available goods for free.	$

Potential Long-Term Sustainability Initiatives

Planning for sustainability inherently implies planning for the long-term future. Some of the following potential "long-term sustainability initiatives" are associated with long-term Airport redevelopment, which is tied to increases in aviation activity and funding availability. Other strategies, however, may be dependent on future development in the region, which would not occur in the immediate future.

Long-Term Initiative	Description	Strategy Type	Benefits	Costs
Consider non-aeronautical development	Potential non-aeronautical development of currently undeveloped land could include:▲ • Commercial or industrial park • Silviculture (tree farm) • Transit-oriented development surrounding potential Multimodal Facility (see **Chapter 11, Airport Connectivity**) The Airport will ensure that any non-aeronautical development on NFRA property is consistent with FAA policies on Airport Revenue Use.■		• Diversify the Airport's revenue streams. • Enhance the Airport's revenues. • Enhance the Airport's economic contribution to the region. • Provide a service to local businesses and/or residents.	$$$

Long-Term Initiative	Description	Strategy Type	Benefits	Costs
Create a barge terminal/ seaport at the Airport *Enhancement of a Current Initiative*	The Airport has conducted preliminary planning efforts to construct a barge terminal/seaport in the area of the existing seaplane base. The Florida Inland Navigation District (FIND) has awarded NFRA with a $40K grant to pay for half of the estimated design/permitting costs of the chance to connect to the Intracoastal Waterway. The Airport should continue preliminary planning and determine the feasibility of developing and operating a barge terminal/seaport on Airport property.		• Expand the Airport's industrial services. • Enhance the Airport's revenues. • Enhance the Airport's economic contribution to the region.	
Hire Airport Business Development and/or Marketing staff	As airport activity increases, the Airport would hire staff dedicated to developing aeronautical and non-aeronautical business opportunities for the Airport.		• Relieve workload burden on current staff. • Diversify the Airport's revenue streams.	
Keep costs to potential airlines low	As the Airport attracts an airline(s) and service matures to the point where airline fees are being collected, NFRA needs to maintain a competitive cost advantage by keeping airline fees low. Well-planned aviation-related development and successful airport revenue diversification will allow NFRA to grow without passing on a cost burden to airlines (and ultimately commercial passengers). The success of maintaining low costs to potential airlines depends on implementation of other long-term sustainability strategies, such as non-aeronautical development.		• Maintain competitive cost advantage in future. • Retain and attract future airline service.	
Consider advertising, sponsorship, and naming rights opportunities	As the Airport grows in the future as a result of possible new airline service and development of a multi-modal facility to serve the Florida East Coast rail line (see **Chapter 11, Airport Connectivity**), opportunities could exist to sell advertising rights in building areas with high passenger traffic or naming rights of existing (Airport Conference Center) and future buildings.		• Enhance revenue generating potential of facilities with high "foot traffic".	
Incentivize the development of complementary land uses	Coordinate with local government and adjacent property owners to incentivize (through tax credits, expedited local permitting and zoning reviews, etc.) the development of land uses that are complementary to aviation and industries that depend on aviation to move goods and services.		• Enhance likelihood of complementary industry and business around airport. • Strengthen the Airport as an "economic engine". • Minimize noise impacts.	

▲ *FAA Order 5190.6B, FAA Airport Compliance Manual*, Chapter 15, Permitted and Prohibited Uses of Airport Revenue
http://www.faa.gov/airports/resources/publications/orders/compliance_5190_6/media/5190_6b_chap15.pdf

■ *Policy and Procedures Concerning the Use of Airport Revenue,* 64 Fed. Reg. *7696*, February 16, 1999, (Revenue Use Policy).
http://www.faa.gov/airports/resources/publications/federal_register_notices/media/obligation_final99.pdf

NFRA public visioning meeting was held at the Airport Conference Center to receive Airport stakeholder input on this plan.

Students from St. Augustine High School's Aerospace Academy taping an Airport Authority Meeting. ✈

Airport Sustainability is a holistic approach to managing an airport to ensure Economic viability, Operational efficiency, Natural resource conservation, and Social responsibility.

04 COMMUNITY RELATIONS

As a general aviation reliever airport, NFRA's perceived value to its community may be less than that of larger commercial service airports. Therefore, fostering a positive relationship with the community while conveying the benefits of the Airport is vitally important to its long-term sustainability. **NFRA defines its "community" as Airport users and tenants, as well as local residents, businesses, and neighboring community groups.**

NFRA strives to do more than just "co-exist" with its community by providing educational outreach, public use facilities, and sharing the on-Airport natural landscape (Nature Education Area). In this way, the Airport continues to foster a positive relationship with the local and regional community.

This chapter addresses how the Airport has and continues to cultivate a positive relationship with the local community. Engaging with the community will enhance the Airport's ability to effectively respond to community concerns and make informed decisions with regard to actions that could impact the community in general.

Goal

Continue to cultivate a positive relationship between the Airport and the local and regional community and communicate with the public so the Airport is viewed as a shared asset.

How should the Airport engage its tenants in enhancing the sustainability of their operations?

Although this Sustainability Management Plan primarily addresses activities within the Airport's direct ownership and control, some recommended sustainability initiatives address activities of Airport users and tenants. Therefore, it is important to engage the tenant community in the Airport's plans to become more sustainable.

The Airport communicates regularly with tenants about SWPPP and SPCC requirements and utilizes tenant newsletters as a mechanism to distribute information. In addition, the NFRA Facebook page provides a forum for interaction amongst the airport community, including tenants.

Key strategies to engage tenants on sustainability, include:

- Leading by example
- Education/communication (e.g., include with the annual tenant SWPPP inspection results, a list of every sustainability initiative and the Airport's Annual Sustainability Report Card)
- Incentives (e.g. annual "green" award for tenants)
- Requiring actions in the tenant lease language (to be used only as a last resort)

Northrop Grumman, the largest employer at the Airport, has its own Corporate Responsibility program. The company's latest published Corporate Social Responsibility Report covers items such as corporate governance and ethics, supply chain corporate responsibility and diversity, workforce diversity and inclusion, health and safety, environmental issues (including sustainability), and community investment. (see **http://www.northropgrumman.com/corporate-responsibility/csr-reports/index.html**)

Objectives

- Increase communication with the public through various media.
- Increase participation in community events.
- Support aviation or airport-related educational initiatives.
- Promote the Airport's value to the business community and public.
- Increase use of local vendors and suppliers.
- Track and address noise complaints and educate pilot community about surrounding noise sensitive areas.
- Provide forum for the public to express concerns or provide feedback to the Airport.
- Ensure continued well-being of Airport employees.
- Ensure equitable Airport employment opportunities.
- Engage all communities neighboring the Airport.

Where are we now?

Performance Snapshot

- A 2007 study by the St. Johns County Chamber of Commerce - Economic Development Council issued a report characterizing the Airport as "the Economic Gateway to St. Johns County". The study's findings included the fact that companies leasing space at the St. Augustine Airport account for 2,767 jobs throughout St. Johns County, which equals 5% of the total employed residents of the County.[1] The study also reported that the Airport and its associated activities contributed over $500,000,000 to the County economy.
- A 2010 FDOT study reported that the airport generated 2,925 jobs with a total payroll of $94,081,900 in 2008.[2]

1 St. Johns County Chamber of Commerce - Economic Development Council: **http://www.stjohnscountychamber.com/main/economicdevcouncil/**

2 "Florida Statewide Aviation Economic Impact Study", March 2010, Prepared for Florida DOT – Aviation Office, Prepared by Wilbur Smith Associates.

Electric tug used by a tenant of NFRA to tow airplanes.

- The Airport is engaged with the community and offers an internship program with the Aerospace Academy of the local high school as well as with Jacksonville University.
- The mean salary of NFRA employees exceeds $63,728, the 2007 mean household income for St Johns County.[3]

FIGURE 3

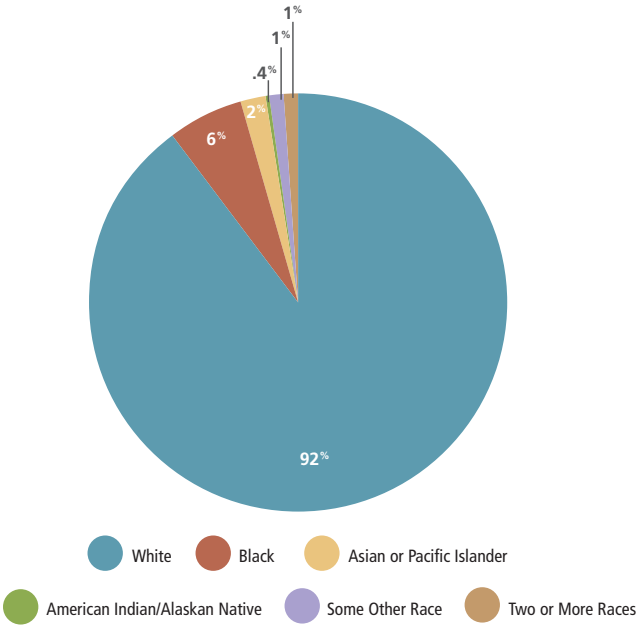
Economic and Income Data for St. Johns County and the State of Florida

	St. Johns County	State of Florida
Median Household Income (2007)	$63,728	$47,804
Per Capita Income (1999)	$28,674	$21,557
Persons Below Poverty Level (2007)	6.7%	12.1%

Source: U.S. Census Bureau, 2009

FIGURE 1

Racial and Ethnic Composition of St. Johns County (2008)

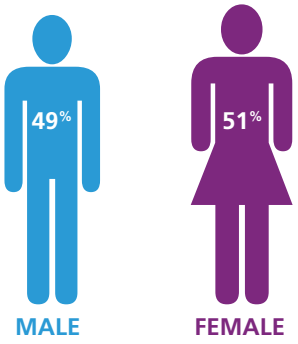


Source: St. Johns County Chamber of Commerce, 2008. Demographic Detail Summary Report▲
Note: Percentages may not total 100 due to racial/ethnicity overlaps

▲ St. Johns County Chamber of Commerce, Economic Development Council. (2008, Dec. 2). St. Johns County Demographics. **http://www.stjohnscountychamber.com/index.php?submenu=DataCenter&src=directory&view=Resources**

FIGURE 2

Gender Ratio in St Johns County (2008)



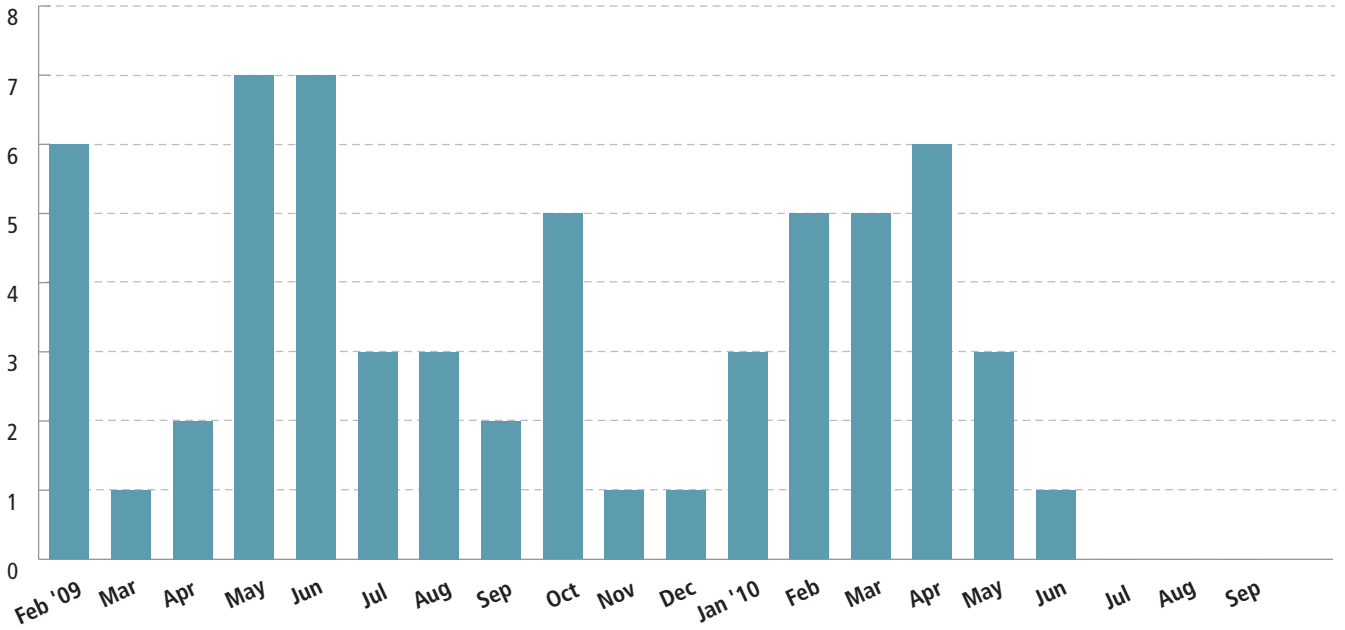
Source: St. Johns County Chamber of Commerce, 2008. Demographic Detail Summary Report▲

▲ St. Johns County Chamber of Commerce, Economic Development Council. (2008, Dec. 2). St. Johns County Demographics. **http://www.stjohnscountychamber.com/index.php?submenu=DataCenter&src=directory&view=Resources**

3 Source: U.S. Census Bureau, 2009

FIGURE 4

Monthly Noise Complaints (Feb 2009 - Sept 2010)



Source: NFRA Noise Complaints Database, February 2009 through September 2010

This chart tracks monthly noise complaints from the period between February 2009 and January, 2010. The highest number of noise complaints that were submitted in a month was seven during both May and June, 2009.

What have we already accomplished?

Current Sustainability Initiatives

Partnerships with Local Schools

NFRA partners with local schools, such as the St. Johns County Aerospace Academy at St. Augustine High School and Jacksonville University (Davis School of Business), offering internships and classroom involvement with airport projects.

Airport Tours

Airport staff voluntarily provides airport tours to interested parties and community groups.

Open Meeting Policy

NFRA makes all Airport Authority meetings open to the public. In addition, some projects also have public meetings.

Press Releases

The Airport issues press releases to communicate major airport events.

Involvement in Community Affairs

Airport staff actively participate in a number of community-oriented groups, including:

- Airport Citizens Group
- St. Augustine Airport Pilots Association (SAAPA)
- Public Relations Committee
- Park Committee

Local Vendors

NFRA sources materials and services from local vendors and suppliers, whenever feasible, even if the costs are greater - but still competitive - than alternatives. Use of local vendors and suppliers not only supports the local economy, but also reduces air emissions associated with material transport.

Ground Run-up Enclosure

The Airport installed a ground run-up enclosure, which is used primarily by one of NFRA's largest tenants, Northrop Grumman. The ground run-up enclosure mitigates noise from aircraft engine run-up activity.

How can the Airport monitor air quality with the help of nature?

A beekeeper inspecting a hive.

Although there are no serious air quality issues associated with the St. Augustine and St. Johns County area, and no concerns about air quality emissions as a result of operation of the Airport, the use of "biomonitoring" to track air quality can have multiple positive consequences.

Biomonitoring involves the use of living organisms to test environmental health. In Germany, eight airports have installed bee hives on airport property. The honey produced by the bees are tested twice a year to determine air emissions pollutant levels.▲ The monitoring results can be communicated with the public and are very simple to understand.

The Airport Authority could coordinate with a local agriculture group to develop the bee "farm" on an accessible portion of Airport property, such as the Nature Education Area. Coordination with local groups to construct and maintain the facility would enhance the Airport's community presence. Honey that is not used in the testing samples could be gathered, jarred, and used as valuable and innovative marketing collateral for the Airport.

Valuable resources of information on beekeeping and its benefits is provided by:

- The University of Florida's Honey Bee Research and Extension Laboratory, **http://entnemdept.ufl.edu/honeybee/index.shtml**
- Florida State Beekeepers Association, **http://floridabeekeepers.org/**

▲ "At German Airports, Bees help monitor air quality", New York Times, June 28, 2010. **(http://www.nytimes.com/2010/06/29/business/29airports.html?_r=1&scp=1&sq=air%20monitoring%20bees&st=cse)**

Coordination with Neighborhood Organization

The Airport has coordinated with an organized neighborhood group concerned primarily with aircraft noise issues. This coordination has been effective in educating the group and addressing issues community proactively.

Local Volunteer Efforts

The Airport actively works with local volunteer networks such as Angel Flights, Pilots N Paws, Veterans Groups, Multiple Sclerosis Fund Raiser (MS bike ride).

Natural Buffer

NFRA's "Nature Education Area" was designed and is being constructed partially by local youth groups in conjunction with Airport staff to promote environmental education, wellness, and natural resources protection. The park is used for passive recreation and aviation viewing/education, and also acts a natural buffer between the airport and residential land uses.

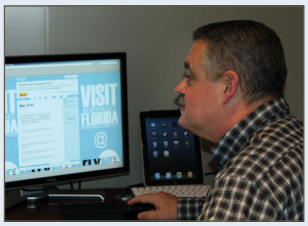
Complaint Mechanism

The Airport website provides an electronic form for the public to log noise (or other) complaints.

Employee well-being

A number of initiatives described in other chapters also have benefits to Airport employees. These include indoor air quality improvements such as the use of citrus-based cleaning products (see **Chapter 7, Air Quality**); integrated pest management techniques that minimize use of

How can the Airport use social media outlets effectively?



Airport Executive Director, Edward Wuellner, updating NFRA's Twitter feed.

NFRA's Facebook page updated to include photos of the Airport's recently completed Runway 13/31 resurfacing project.

The Airport Authority operates two unique web sites to communicate with airport users and the public:

- **www.flynf.com**: provides regional visitor information, airport directions, ground transportation
- **www.flynfra.com**: provides airport information (planning studies, history, environmental documents, etc.) and hangar lease information

In addition to the more "traditional" internet presence, the Airport Authority has been active in social media outlets such as **Facebook**,[1] **Twitter**,[2] and **Youtube**[3] to communicate with users and the public:

- Facebook site: **www.facebook.com/pages/Northeast-Florida-Regional-Airport/150187361673054**
- Twitter Feed: **www.twitter.com/flyust**
- YouTube Channel **www.youtube.com/user/FLYNFChannel**

In addition to these resources, other airports use blogs on their website, **Flickr** (a photo-sharing site), and **LinkedIn** (a business-oriented social media site). Although these forums are relatively new, airports around the country of similar size as NFRA have been effectively using them as communications, public relations, and marketing tools. Uses of these resources vary, and include:

- Advertisements of airline fare sales and/or airport tenant services.
- Notifications of flight delays, severe weather, ground traffic re-routing, and construction projects.*
- Posting of suggestions for making holiday travel easier, and updated security directives.
- Customer service portal to collect and/or address complaints.*
- Solicitation of opinions for future projects, amenities, or airline service.
- Keeping the community up-to-date on attempts to attract new service, and find out what new service travelers want/need.
- Encouraging community engagement in potential projects, or get airport supporters organized around a certain cause.
- Contests and prizes to attract fans/friends/followers.
- Photo and video space for plane spotters to post to, and for airport employees to show their own photography/video.*

** Items that the Airport Authority uses their internet and social media sites to address.*

Facebook users connect with other users by "friending" them. The number of friends that a user has is a measure of how popular they are with other users. In the case of airports with Facebook accounts, the number of friends indicates how many other users the airport can communicate with directly. The most popular non-hub airport Facebook sites are South Bend (Indiana) Regional Airport with approximately 5,500 friends and Charleston-Yeager (West Virginia) Airport with approximately 5,200 friends.

South Bend Regional Airport has used a commercial promotion builder service to run a sweepstakes on its site. Sweepstakes and other promotion prizes have ranged from free airport parking coupons to two free roundtrip airline tickets.

chemical-based fertilizers and pesticides (see **Chapter 8, Natural Resources Management**); and designing buildings with environmentally friendly features, such as maximizing natural light, that enhance employee health and productivity.

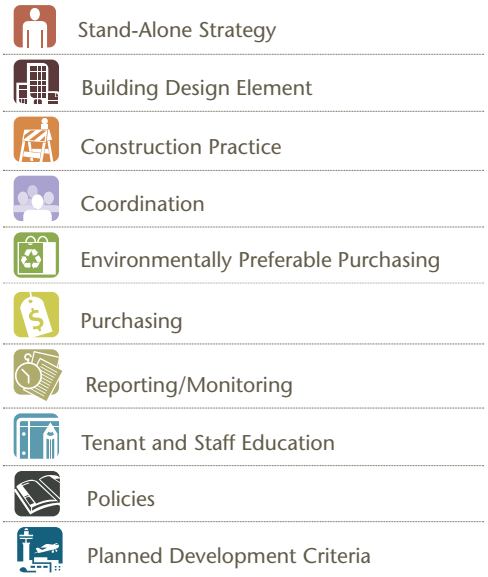
How will we reach our goals?

Recommended Sustainability Initiatives

The Airport has identified a number of potential initiatives in an effort to meet its community relations goals and objectives. These initiatives differ in their type, degree of effectiveness, and cost. In addition, some of these initiatives are new, derived from industry best practices, internal Airport brainstorming, and public and stakeholder visioning, whereas other initiatives represent enhancements of current initiatives. The following sections identify potential sustainability initiatives which can be used by the Airport to meet its goals and objectives. NFRA will pursue as many of these initiatives as is feasible, given staffing and financial limitations.

Each initiative is categorized according to strategy type, and cost and manpower needed to implement and maintain.

The initiative strategy types and associated icons are:



Costs range from low $ to high $$$ relative to current Airport expenditures. Manpower estimates also range from low to high and are relative to the number of current Airport staff.

Potential Short-Term Sustainability Initiatives

The following potential sustainability initiatives focus on strategies that are feasible to implement and can commence within a relatively short-term timeframe of approximately 1-5 years. During this period, it is expected that only relatively small-scale capital improvements and essential maintenance activities will be conducted at the Airport. The Short-Term Initiatives primarily consist of strategies that have the potential for high effectiveness while also being relatively low-cost and easy to implement.

Short-Term Initiative	Description	Strategy Type	Benefits	Costs
Construct an Aircraft Observation Area *Continuation of a Current Initiative*	NFRA has designed its "Nature Education Area" to include an aircraft observation area. This observation area showcases the airport as a location of interest, where the public can come observe airplane departures and landings, as well as other operations on the airfield.		• Enhance community's connection to the Airport. • Offer a leisure activity to the local community.	$
Offer College Scholarships *Enhancement of Current Initiative*	The Airport already gives a number of scholarships to high school students at the aviation academy who are continuing their pursuit of an aviation-related degree. The Airport is looking into expanding this program.		• Support community. • Invest in the future of aviation.	$

Short-Term Initiative	Description	Strategy Type	Benefits	Costs
Offer aviation-related entertainment *Enhancement of Current Initiative*	The Airport currently hosts air shows and other airport events on occasion to attract people to the airport. NFRA is seeking to expand aviation-related events and activities.		• Attract the public to the airport. • Enhance Airport's value to the community.	
Develop an apiary on the Airport	Work with local apian community to maintain beehives on Airport property. This apiary can be used as an educational tool as well as a potential way to monitor air quality in the vicinity of the airport, if needed. Honey can be distributed or sold, depending on quantity produced.		• Provide educational service to the community. • Air quality monitoring. • Pollination of on-airport plants.	
Implement a Sustainability Communication Plan *Enhancement of Current Initiative*	Develop an internal and external communication plan to report on sustainability performance. As part of this sustainability management plan, the Airport established a system for regular monitoring and reporting, by planning to publish an annual Sustainability Report Card.		• Enhance communication with public. • Enhance transparency.	
Make sustainability monitoring and reporting data available to the public	Make sustainability monitoring data available through a report or on NFRA's website.		• Enhance communication with public. • Enhance transparency.	
Promote the Airport's contribution to local community *Enhancement of Current Initiative*	The Airport is seeking to improve how it promotes its economic contribution as well as opportunities and services that the airport offers to the local and regional community. Some of these include: • 1,800 jobs, of which many are higher paying • $500 million economic benefit to community • Suspension of the Airport's ad valorem tax • Involvement in local community groups • Airport tours • Air shows • Educational opportunities • Community-oriented events hosted at the Airport • College scholarships • Disclosure easement, etc These activities will be reported in future updates on the Airport's sustainability initiatives.		• Enhance Airport's value to the community.	
Develop and maintain a community noise resource website *Enhancement of Current Initiative*	Establish and maintain a website to share information about airport operations and noise mitigation efforts. The Airport currently offers a complaint system on its website. This could be enhanced by increasing the accessibility of this form.		• Enhance communication with public. • Enhance response to community concerns. • Enhance transparency.	

Short-Term Initiative	Description	Strategy Type	Benefits	Costs
Promote aircraft noise disclosures in land title transfers for properties near Airport	It is unlikely that voluntary measures will be acted upon. Mandatory measures would require County action.		• Reduce potential for future noise complaints.	
Work with County to develop a second land use overlay	A second land use overlay with lower compatibility requirements would help to reduce future noise-related conflicts.		• Enhance land use compatibility in order to reduce aircraft noise disturbance.	
Enhance participation with the Wounded Warriors program through the St. Johns' County Veteran's Council *Enhancement of Current Initiative*	Pursue an expanded relationship with the Wounded Warriors program through the St. Johns' County Veteran's Council by offering free flights and programs at the Airport.		• Enhance Airport's value to the community.	
Develop a local community outreach plan	The outreach plan would outline practices for the Airport to reach out to local community groups. Practices could include: • Regularly offering Airport tours. • Establishing an Airport Speaker's Bureau, in which each Airport staff member would be responsible for regularly speaking on a particular topic or set of topics. • Regularly offering an "Airport 101" course for the public. This course would involve a short series of classes intended to educate the public about Airport operations. The class could include a tour and a diploma/certificate at the end.		• Enhance community's connection to the Airport. • Attract the public to the Airport. • Inform the public about Airport operations. • Enhance Airport's value to the community.	
Develop an "Airport Ambassadors" program	Airport Ambassadors would consist of non-NFRA employees (e.g. airport tenants or users), who would volunteer to communicate the purpose, role, and/or value of the Airport to the community. Participation in the Airport Ambassadors program would be voluntary. NFRA staff would regularly convene the Airport Ambassadors to share information. The Airport could potentially provide the "Airport Ambassadors" with a golf shirt or other item that could be used as an identifier and token of thanks.		• Promote Airport within the community. • Engage tenants. • Communicate Airport activities to the local community.	

Short-Term Initiative	Description	Strategy Type	Benefits	Costs
Include environmental clauses in lease agreements *Enhancement of Current Initiative*	Include in lease language requirements for tenants to provide results/reports for environmental analyses, as well as conduct specified BMPs. The Airport would ensure that this initiative is reasonable for tenants to meet and would be applied without discrimination.		• Ensure tenants protect environmental resources.	
In hiring practices, strive to reflect racial/ethnic composition as well as gender ratio of St. Johns County	To ensure just and equitable hiring practices, the Airport Authority should be cognizant of the racial composition and gender ratio of the County when hiring new staff.		• Ensure equitable and inclusive employment opportunities.	

Potential Long-Term Sustainability Initiatives

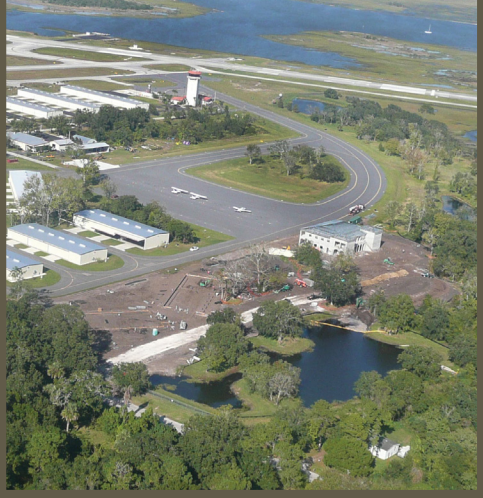
Planning for sustainability inherently implies planning for the long-term future. Some of the following potential "long-term sustainability initiatives" are associated with long-term Airport redevelopment, which is tied to increases in aviation activity and funding availability. Other strategies, however, may be dependent on future development in the region, which would not occur in the immediate future.

Long-Term Initiative	Description	Strategy Type	Benefits	Costs
Develop a Noise and Land Use Compatibility Policy	A Noise and Land Use Compatibility Policy ensures future development surrounding the Airport is not negatively impacted by noise.		• Enhance land use compatibility in order to reduce aircraft noise disturbance.	
Track noise complaints through GIS	Through use of GIS, NFRA may better identify where noise problems are occurring surrounding the airport.		• Improves tracking of noise complaints. • Enhance response to community concerns.	
Promote noise abatement procedures	As operations increase, the Airport may consider encouraging tenants to implement noise abatement procedures, reducing the noise exposure to the community.		• Reduce noise impacts on local community.	

photo courtesy of Kim Morris

The NFRA hosted the start and finish of the Multiple Sclerosis Society's MS PGA Tour Cycle to the Shore on October 2, 2010 (the Airport hosted the event in 2009 also). Participants started and completed the ride on one of the Airport's runways.

Northrop Grumman facilities located on the north side of the Airport.



Aerial view of NFRA from the south showing construction of hangars. ✈

Airport Sustainability is a holistic approach to managing an airport to ensure Economic viability, Operational efficiency, Natural resource conservation, and Social responsibility.

05 PLANNED DEVELOPMENT

NFRA is committed to planning future development that balances financial viability with its natural environment. NFRA's coastal location features sensitive natural systems and vulnerability to coastal flooding. Well-designed buildings that minimize the use of natural resources, reduce harmful effects on the environment, and create healthier environments for people makes both environmental and economic sense.

This chapter describes the Airport's approach to incorporating financial, environmental, and social considerations into decisions concerning future development.

Goal

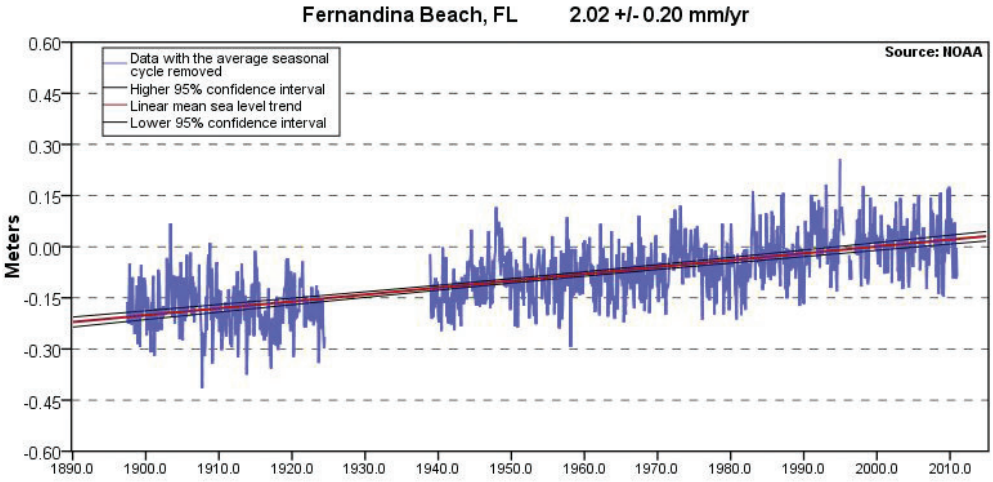
Incorporate sustainability initiatives into future Airport development plans to minimize lifecycle costs and adverse environmental and social impacts of future projects.

Objectives

- Design new facilities and upgrade existing facilities using principles of environmental sustainability and low-impact development.
- Plan for increased flood risk resulting from rising sea levels and increased intensity of hurricanes, when planning Airport development and rehabilitation projects, depending on the useful life of the infrastructure.
- Design projects to consider future airport growth scenarios.

FIGURE 1

Mean Sea Level Trend: Fernandina Beach, Florida



Data collected at Fernandina Beach, FL, located approximately 55 miles north of the Airport, shows the long-term linear trend of mean sea level. The mean sea level trend is 2.02 mm/yr with a 95% confidence interval of +/- 0.31 mm/yr based on monthly mean sea level data from 1928 to 2006 which is equivalent to a change of 0.79 feet in 100 years.▲

▲ Tides & Currents. Mean Sea Level Trend – 8720030 Fernandina Beach, FL. **http://tidesandcurrents.noaa.gov/sltrends/sltrends_station.shtml?stnid=8720030**. Accessed February 12, 2011

What is Low-Impact Development?

Low-Impact Development (LID) refers to an approach to managing stormwater runoff through land planning and engineering design. LID emphasizes conservation and use of on-site natural features to protect water quality and other natural resources.

Where are we now?

Performance Snapshot

Facility Design: The Airport has effectively designed new facilities with a "sustainability mindset" during the past decade. In constructing six new hangars and a new multi-purpose building, NFRA used principles of Low Impact Development (LID) such as:

- Hangar development around mature trees. Where avoidance was not possible, mature trees were replanted elsewhere on Airport property.
- Natural space conservation. Incorporation of energy efficiency elements into building design.
- Some past developments were designed with inadequate parking capacity due to a high demand for use of the facility. When designing new facilities, an assessment of peak demand is necessary to ensure adequate parking capacity.

Vulnerabilities to Sea Level Rise: Due to the Airport's proximity to the Tolomato river and existing vulnerability to flooding, potential sea level rise is likely to increase the Airport's risk of flooding.

Sea level along the northeast Florida coast has increased over the last century. Sea level data collected over the past 100 years at three stations in the vicinity of the St. Augustine coast - Fernandina Beach, Mayport, and Daytona Beach Shores – indicate an average increase in sea level ranging from 2.02 mm/year, 2.40 mm/year, and 2.32 mm/year, respectively. These increases are equivalent to a rise of 0.66 ft, 0.79 ft, and 0.76 ft, over 100 years, respectively.[1] Note that sea level has not risen uniformly throughout all coastal areas in the U.S., showing average variation between 2.0-3.0 mm per year. Increases in sea level on the northeast Florida coast are therefore on the lower end of the spectrum.

The International Panel on Climate Change (IPCC) estimates that the global average sea level will rise by 7.2 to 23.6 inches (0.6 ft to 2.0 ft) by 2100 relative to 1980-1999 levels under a range of scenarios.[2]

1 National Oceanic and Atmospheric Administration (NOAA) Tides & Currents. Sea Levels Online. **http://tidesandcurrents.noaa.gov/sltrends/sltrends.shtml** Accessed February 10, 2011.

2 IPCC, 2007: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning (eds.)]. Available at **http://www.ipcc.ch/ipccreports/ar4-wg1.htm**

In addition to sea level rise, the IPCC projects with 66% probability that tropical hurricanes will become more intense, "with larger peak wind speeds and more heavy precipitation."[3] Together, these changes could lead to higher storm surge and increased risk of flooding. Future airport development projects should be designed to consider this increased flooding risk. The Airport currently designs its facilities above the 100-year floodplain, in accordance with St. Johns County Building Code and the Federal Emergency Management Agency.

What have we already accomplished?

Current Sustainability Initiatives

› Land Use Compatibility Coordination

The Airport coordinates with local planning agencies to ensure that land developed contiguous to the Airport is compatible with the airport operations.[4] Key considerations include local zoning and municipal land use planning and policies.

› Low-Impact Hangar Development Project

When planning a hangar development project in a previously forested area on airport property, NFRA implemented a policy to design the hangars around the existing trees and vegetation to conserve these mature trees and maintain local biodiversity. In cases where avoidance was not feasible, the Airport opted to relocate the trees. This project won an industry award for its outstanding commitment to protecting the environment (see Airport Awards in **Chapter 1, Introduction**).

› Sustainable Construction Measures

The Taxiway B Rehabilitation project incorporated sustainable construction measures such as construction material reuse and waste minimization techniques. The Taxiway B Extension, Runway Safety Area (RSA) Stabilization, and Approach Lighting System (ALS) projects were designed to have a smaller footprint, thereby minimizing natural resource impacts. A modification of FAA Design Guidelines was issued by FAA to allow a shorter spacing length between the lights and the total length of the light array. Spoil material resulting from excavation for the taxiway extension is being used as base material to stabilize the RSA thereby reducing costs associated with purchased fill and fuel for spoil transport.

› Energy Efficient Design of Multi-Purpose Building

The Airport designed a new multi-purpose building that incorporates energy efficient design elements as well as water efficient fixtures. In addition, this building combines several uses (office space, Airport Authority boardroom, and Airport Conference Center) into one facility, which minimizes the Airport's development footprint.

› Enhancement of Facilities' Useful Life

The Airport primes and paints hangar steel beams and uses durable construction materials (despite increased upfront expense), to extend the useful life of buildings, thereby reducing the natural resource use and saving operating and maintenance costs.

How will we reach our goals?

Recommended Sustainability Initiatives

The Airport has identified a number of potential initiatives in an effort to meet its planned development goals and objectives. These initiatives differ in their type, degree of effectiveness, and cost. In addition, some of these initiatives are new, derived from industry best practices, internal Airport brainstorming, and public and stakeholder visioning, whereas other initiatives represent enhancements of current initiatives. The following sections identify potential sustainability initiatives which can be used by the Airport to meet its goals and objectives. NFRA will pursue as many of these initiatives as is feasible, given staffing and financial limitations.

3 IPCC, 2007: Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, Pachauri, R.K and Reisinger, A. (eds.)]. IPCC, Geneva, Switzerland, 104 pp. Available at **http://www.ipcc.ch/publications_and_data/ar4/syr/en/contents.html**

4 Land use compatibility is intended to reduce or limit land uses that are "normally compatible" or "noncompatible" with various levels of noise caused by airport operations. For example, residential land uses and schools are noncompatible with noise levels above DNL 65 dB. Land uses that are typically compatible with airport noise levels include recreational land which is compatible with levels up to DNL 75 dB and agricultural land uses which are compatible with all noise levels. Although all land uses may be considered compatible with noise levels less than DNL 65 dB, local needs may dictate further delineation based on specific local requirements. Advisory Circular 150/5020-1 contains a table which identifies compatible and noncompatible land uses (Appendix A, Table 1 - Land Uses Normally Compatible with Various Noise Levels, **http://www.faa.gov/documentLibrary/media/advisory_circular/150-5020-1/150_5020_1.pdf**).

How can the Airport ensure its facilities are protected against the long-term effects of sea-level rise?

[photo courtesy of: Timothy Aanured]

St. Paul, Minnesota airport flood in 1995.

Because of the Airport's close proximity to the Tolomato River (part of the Intracoastal Waterway) and the Atlantic Ocean, it is particularly vulnerable to rising sea levels, increasing frequency and intensity of storms, and resultant increases in storm surge and flooding.

The IPCC estimates that the global average sea level will rise by 7.2 to 23.6 inches (0.6 ft to 2.0 ft) by 2100 relative to 1980-1999 levels under a range of scenarios.▲ In addition to sea level rise, the IPCC projects with 66% probability that tropical hurricanes will become more intense, "with larger peak wind speeds and more heavy precipitation."● Although estimates these may seem relatively minor, a sea-level rise of just one foot can increase the inland movement of storm surge by 2,000 to 10,000 feet depending on terrain, and result in a three-fold increase in the frequency of storm surge events.■

The Airport Authority currently designs and constructs buildings at the base floodplain elevation. Because of the increased risk of flooding resulting from rising sea levels and increased intensity of storms, the Airport Authority should consider adaptation measures to protect its infrastructure investments and coordinate with FAA on the development of guidelines for adaptation at airports that are vulnerable to the effects of sea-level rise. The Airport Authority should advocate for FAA funding in the future for adaptation of new or existing facilities to climate change.

Adapting to sea-level rise must consider economic implications of taking action versus not taking action, and should also consider when certain adaptation techniques should be considered. In other words, more substantial adaptation measures (seawalls, increased airfield elevation, etc.) should be considered when investing in long-term infrastructure projects that have high costs and a long life. The magnitude of such infrastructure investments make it important to consider the risks of damage from sea level rise and associated effects, in order to protect the Airport's investment.

▲ IPCC, 2007: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning (eds.)]. Available at **http://www.ipcc.ch/ipccreports/ar4-wg1.htm**

● IPCC, 2007: Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, Pachauri, R.K and Reisinger, A. (eds.)]. IPCC, Geneva, Switzerland, 104 pp. Available at **http://www.ipcc.ch/publications_and_data/ar4/syr/en/contents.html**

■ Harrington, J and Walton, T (2007). Climate Change in Coastal Florida: Economic Impacts of Sea Level Rise. Retrieved November 7, 2010 at **http://www.bipartisanpolicy.org/library/research/climate-change-coastal-florida-economic-impacts-sea-level-rise**

Each initiative is categorized according to strategy type, and cost and manpower needed to implement and maintain.

The initiative strategy types and associated icons are:


Stand-Alone Strategy


Building Design Element


Construction Practice


Coordination


Environmentally Preferable Purchasing


Purchasing


Reporting/Monitoring


Tenant and Staff Education


Policies


Planned Development Criteria

Costs range from low $ to high $$$ relative to current Airport expenditures. Manpower estimates also range from low to high  and are relative to the number of current Airport staff.

Potential Short-Term Sustainability Initiatives

The following potential sustainability initiatives focus on strategies that are feasible to implement and can commence within a relatively short-term timeframe of approximately 1-5 years. During this period, it is expected that only relatively small-scale capital improvements and essential maintenance activities will be conducted at the Airport. The Short-Term Initiatives primarily consist of strategies that have the potential for high effectiveness while also being relatively low-cost and easy to implement.

Short-Term Initiative	Description	Strategy Type	Benefits	Costs
Implement Low Impact Development (LID) *Enhancement of Current Initiative by formalizing into Design Standards*	LID uses various land planning and design practices and technologies to simultaneously conserve and protect natural resource systems and reduce infrastructure costs. Recent examples of the LID at the Airport was the south side hangar project, which inventoried tree growth in a development area and conserved mature trees while constructing rows of T-hangars, and the installation of pervious pavement for the passenger terminal parking lot area.		• Conserve and protect natural resources. • Reduce stormwater facility requirements. • Enhance water quality.	$$ 
Promote compatible land uses in and around Airport *Continuation of Current Initiative*	Coordinate with bordering jurisdictions to properly zone land surrounding Airport to ensure compatibility with existing operations and future development plans. Land uses that should be discouraged to develop within the vicinity of the Airport include residential developments and sensitive receptors, such as schools and libraries. NFRA has coordinated with St. Johns County to ensure that all Airport-owned property is zoned "Airport Development".		• Protect from residential encroachment of Airport. • Allow for future growth and development of the Airport. • Prevent airspace obstructions, or hazards to air navigation. • Limit potential noise and air quality impacts. • Limit potential for wildlife attractants.	$ 

Short-Term Initiative	Description	Strategy Type	Benefits	Costs
Develop a proactive land acquisition program *Continuation of Current Initiative*	Establish an aggressive land acquisition program that seeks to prevent residential encroachment, preserve wetlands and green spaces, and allow for future Airport development. A land acquisition program should consider existing and future aircraft noise exposure to prevent incompatible land uses due to noise (14 CFR Part 150, *Airport Noise Compatibility Planning*, Appendix A, Table 1). *(See Airport Cooperative Research Program Report 27: Enhancing Airport Land Use Compatibility)*		• Protect from residential encroachment of Airport. • Allow for future growth and development of the Airport.	$$$
Establish a design or construction sustainability champion/ liaison *Continuation of Current Initiative*	As part of design or pre-construction meetings, identify a sustainability champion/liaison for each project. Hold regular meetings with designated sustainability champion/liaison to track sustainability components of the project. The Airport's Project Manager is typically the sustainability champion/liaison – for example, the Project Manager explored sustainable construction methods and cost minimization initiatives during the recent Runway 13-31 rehabilitation project.		• Focus sustainability effort with one designated person.	$
Encourage or require Airport staff and/or consultants to pursue LEED accreditation *Continuation of Current Initiative*	Involve or require a LEED Accredited Professional (AP) at all levels of planning and design. Assign a LEED AP to review information regarding sustainable concepts and practices with project team members including green building design and construction early in the project life cycle. The Airport requires consultants to have LEED AP representation on project teams. LEED concepts are implemented depending on effectiveness and funding availability.		• Ensures LEED/ sustainability design elements are incorporated into planning and design.	$
Proactively evaluate environmental resource conditions of potential project areas	Perform a "pre-NEPA" (National Environmental Policy Act) analysis of environmental conditions as part of project planning efforts (e.g., initial site survey or environmental assessment).		• Save time and resources during more detailed planning. • Enhance effectiveness of "avoidance and minimization" of sensitive natural resources.	$$
Promote "in-fill" development	Where applicable, redevelopment of existing facilities, or on/adjacent to the site of existing facilities should be prioritized.		• Avoid impacting previously undeveloped land resulting in fewer environmental impacts. • Generally redevelopment provides an opportunity to build facilities that enhance energy efficiency.	$$

▲ For additional information, see FAA Southern Region's Land Use and Compatibility at Airports; Florida Department of Transportation, Aviation Office, Airport Compatible Land Use Guidebook; Airport Cooperative Research Program (ACRP) Report 27: Enhancing Airport Land Use Compatibility.

Potential Long-Term Sustainability Initiatives

Planning for sustainability inherently implies planning for the long-term future. Some of the following potential "long-term sustainability initiatives" are associated with long-term Airport redevelopment, which is tied to increases in aviation activity and funding availability. Other strategies, however, may be dependent on future development in the region, which would not occur in the immediate future.

Long-Term Initiative	Description	Strategy Type	Benefits	Costs
Utilize prefabricated equipment *Enhancement of Current Initiative by formalizing into Design Standards*	The use of prefabricated assemblies avoids the need to assemble buildings and other facilities on-site. The existing passenger terminal is a prefabricated structure.		• Reduce construction traffic and air quality emissions relating to on-site construction. • Reduce the amount of time required for construction activities.	$
Maximize light-colored or vegetated surfaces *Enhancement of Current Initiative by formalizing into Design Standards*	Maximize the use of vegetation or light-colored pavement for roadways, parking lots, and sidewalk areas.		• Reduces heat island effects.	$
Design "combined", or multi-use, facilities *Continuation of Current Initiative*	Where applicable, new facilities should be designed to accommodate multiple uses. The Airport recently constructed the Airport Conference Center, a multi-purpose building that houses Airport-related businesses and the Airport Authority Board room. It can also serve as a conference center or banquet facility rental to the public.		• Reduces overall footprint of facilities. • Combines non-revenue generating spaces with revenue generating opportunities.	$$
Implement "Green" building and design standards *Enhancement of Current Initiative by formalizing into Design Standards*	Incorporate sustainable design principles into the design of new buildings. These design elements include water and energy efficient features, similar to those incorporated in to the construction of the new Airport Conference Center facility. Standards could incorporate applicable principles of U.S. Green Building Council LEED standards. (See Chapter 6, Energy)		• Reduces utility costs of facilities. • Reduces construction costs. • Reduces construction waste.	$

Long-Term Initiative	Description	Strategy Type	Benefits	Costs
Consider long-term future development plan in design of shorter-term development projects *Continuation of Current Initiative*	Considering longer-term future development plans in the design and construction of short-term projects can create efficiencies in future construction. For example, fill requirements for a future project may be met with fill removal from a current project.		• Potentially reduces costs of future projects. • Potentially limits environmental impacts.	$
Plan and design future facilities for changing climate conditions	Evaluate the Airport's vulnerability to the effects of climate change and implement climate change adaptation measures if necessary. *(See Pew Center on Global Climate Change, Coping with Global Climate Change: The Role of Adaptation in the United States)*		• Reduce risk from damage from future significant flood or weather events. • Potential use of Airport as a shelter during high wind or hurricane events.	$$
Perform pre- and post-tenant facility environmental inspections	Perform inspections to identify and facilitate resolution of potential environmental impacts.		• Contributes to environmental compliance. • Avoids/reduces potential environmental impacts. • Avoids/reduces cost of violation fines and/or remediation for spills.	$
Perform environmental site assessments prior to property purchases	In order to protect property investments, the FAA strongly encourages airport sponsors to conduct an Environmental Site Assessment (ESA) prior to actual acquisition of property. The ESA process offers a reasonable assurance that no hazardous wastes, other wastes, or unacceptable hazards exist on the property, or that any existing environmental contamination are reasonably manageable. The Airport should contact the FAA early in the property acquisition process to determine the extent of environmental assessment that is required. FAA Advisory Circular Land Acquisition and Relocation Assistance for Airport Improvement Program Assisted Projects (AC 150/5100-17) provides procedural guidance to airport sponsors to help them carry out their acquisition and relocation programs in conformance to the Uniform Act and the implementing regulations (49 CFR part 24).		• Reduces exposure to potentially hazardous materials. • Avoids/reduces cost of violation fines and/or remediation for spills.	$

Long-Term Initiative	Description	Strategy Type	Benefits	Costs
Track sustainability elements in construction projects	Require regular sustainability progress reports during construction projects (either quarterly or at certain construction progress milestones). Data should be collected based on pre-established sustainability performance metrics. If implemented, this requirement should be incorporated into construction-related Request for Proposals or bid documents. This initiative is consistent with the recommended approach provided in **Chapter 2, Sustainability Management Approach**.		• Provides information to report on sustainability performance to stakeholders. • Provides accurate estimate of potential return on investment potential for land development.	
Sustainable Contractors	Require that the building service contractors provide a monthly log, which documents the collection, storage and disposal of recyclable materials; as well as materials used in low environmental impact cleaning equipment (including Green Label equipment, low noise level and low emissions equipment). If implemented, this requirement should be incorporated into construction-related Request for Proposals or bid documents.		• Provides information to report on sustainability performance to stakeholders. • Reduces resource use. • Reduces waste.	
Conduct regular meetings with environmental regulatory agencies	Hold quarterly or annual meetings with agencies such as the Florida Department of Environmental Protection, St. Johns Water Management District, the U.S. Army Corps of Engineers and other regulatory agencies to describe future development plans to solicit permitting or other agency concerns early in the project planning process.		• Save time during more detailed planning and design phase by addressing relevant agency issues early in process. • Fosters a collaborative relationship with permitting agencies.	

Airport passenger airline terminal and tenant facilities.

Assistant Airport Director, Bryan Cooper, with the Airport's hybrid vehicle. ✈

Airport Sustainability is a holistic approach to managing an airport to ensure Economic viability, Operational efficiency, Natural resource conservation, and Social responsibility.

06 ENERGY

Energy conservation and the use of renewable energy yield multiple environmental benefits including greenhouse gas (GHG) emissions reductions, improvements in air quality, and cost savings. NFRA is committed to reducing its rate of energy usage by increasing the energy efficiency of its facilities and exploring the feasibility of renewable energy alternatives. The challenge for NFRA is to minimize its rate of energy use while also continuing to meet demand for additional facilities. However, as discussed in **Chapter 5, Planned Development**, new facilities at NFRA have been planned, designed, and constructed to minimize use of energy and environmental resources.

Goal

Minimize the Airport's rate of energy consumption and increase use of renewable energy sources.

Objectives

- Enhance energy efficiency as the Airport develops.
- Actively pursue financially feasible generation of renewable energy sources.

Where are we now?

Performance Snapshot

Electricity for the Airport is currently provided by Florida Power and Light (FPL), the local utility company. Primary sources of electricity consumption correspond to airfield lighting, hangar and building lighting, and heating/cooling

demands. Non-aircraft fuel consumption at the Airport is generated from Airport Authority-owned vehicles[1] and tenant ground service equipment.

Electricity Use

- **Overall Electricity Use:** The Airport and its tenants used approximately 1,223,291 kWh in 2009, costing approximately $135,775. While some of these costs are recovered through tenant fees, electricity still represents a significant portion of the Airport's annual operating costs. In 2009, electricity cost NFRA directly $30,699.48, amounting to 9.74% of the Airport's administrative expenses.[2]
- **Tenant Electricity Use:** Airport tenants used approximately 769,968 kWh of electricity in 2009, accounting for approximately 63% of total airport electricity consumption.
- **Airfield Electricity Consumption:** The airfield lighting and the Air Traffic Control Tower[3] together used 346,908 kWh in 2009. This represents the largest single source[4] of electricity consumption, amounting to 28% of total electricity used at the Airport in 2009.

Fuel Use

- **Aircraft:** In 2009, jet engine aircraft consumed approximately 638,414 gallons of fuel and piston engine aircraft consumed approximately 154,219 gallons of fuel while operating at the Airport.[5] Aircraft taxiing and take-off/landing operations represents the largest source of fuel consumption at an airport. It is also an aspect of airport activity over which the Airport has no control.
- **Ground Support Equipment (GSE):** Of the ground-operated machinery, GSE represents the second largest source of fuel use, consuming over approximately 8,610 gallons of diesel fuel and over approximately 6,900 gallons of gasoline. The Airport's FBOs operate these GSE, therefore the Airport has little direct control over this equipment other than advocating the replacement of diesel and gasoline powered GSE to electric or other fuel efficient technologies.
- **Auxiliary Power Units (APUs):** APUs accounted for approximately 2,413 gallons of fuel burned in 2009. The Airport has little control over this category of fuel use, other than advocating for reduced use of APUs or providing aircrafts with ground power systems.
- **Airport Authority Vehicles:** Airport Authority vehicles accounted for approximately 1,097 gallons of gasoline consumption in 2009, which includes and estimated reduction of 80 gallons compared to Airport's use of a vehicle using average fuel economy.

What have we already accomplished?

Current Sustainability Initiatives

- **Airport Policy to Purchase Energy Efficient or EnergyStar-rated Appliances**
  When replacing or purchasing new products, the Airport installs EnergyStar or other high energy efficiency-rated appliances.
- **Airport Policy to Install Energy Efficient Heating, Ventilation, and Air Conditioning (HVAC) Systems**
  The Airport has constructed new buildings with high-efficiency HVAC units. Old units are replaced with high-efficiency units when existing units reach the end of their useful life.
- **Use of Alternative Fuel Vehicles**
  The Airport owns one hybrid vehicle and one electric golf cart. In using hybrid electric vehicles, NFRA estimated that it saved approximately 321 gallons of gasoline ($891) in 2008, and 80 gallons ($222) in 2009.
- **Efficient Meetings**
  NFRA recently changed the format of their Board Meetings to minimize meeting time by providing electronic project status reports via email. This initiative reduces paper use and a shorter meeting results in reduced electricity use. In addition, the Airport schedules meetings concurrently on the same day, wherever possible, which saves gas and associated air emissions, as well as travel time.

1 The Airport Authority does not operate aircraft at the Airport. Therefore, fuel consumption of aircraft is not within Airport control.

2 St. Augustine – St Johns County Airport Authority Financial Statements – Historical and Budgeted for the Three Months Ended December 31,2009

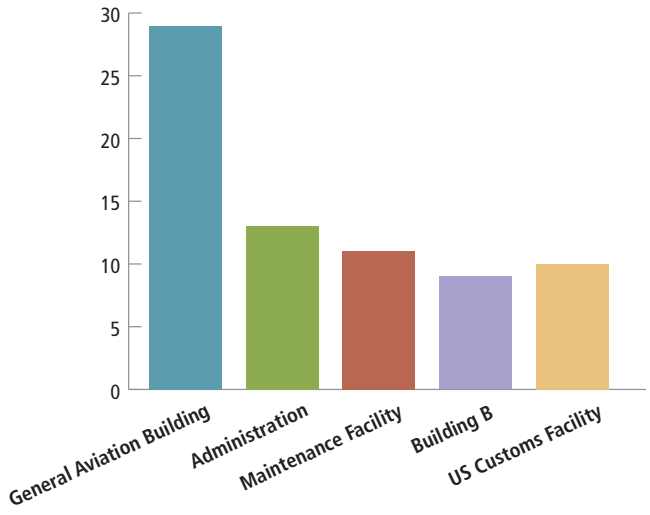
3 The Air Traffic Control Tower at NFRA is operated by a private company under FAA's Contract Tower Program.

4 "Single-source" refers to electricity from the same meter. Reference Appendix A for the list of meters and associated building energy consumption data.

5 Criteria Air Pollutant and Greenhouse Gas Emissions Inventories for Northeast Florida Regional Airport at St. Augustine (NFRA); see Appendix B.

FIGURE 1

Electricity Use per square foot by Facility (2009)▲



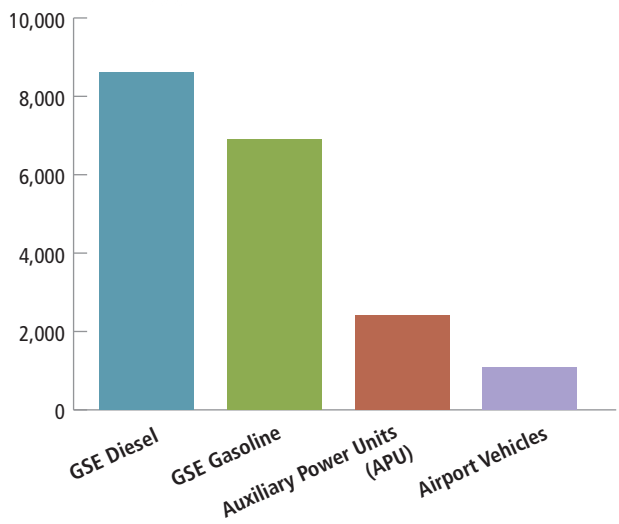
Source: NFRA Utility Bills for 2009

This figure shows electricity consumption on a square footage basis for the primary staffed facilities at NFRA (see map below). According to this metered data, the General Aviation Building uses the most electricity per square foot.

▲ Table E-5 or "Electric Meter 5C53390" (Building Description: "Old Vault") notes no energy use, but still charges a monthly rate on this meter. NFRA to look into removing this meter

FIGURE 2

Fuel Consumption by Source (2009)



Source: NFRA and Tenant Surveys

This figure shows the distribution of fuel consumption across different Airport users. NFRA only controls the Airport Vehicles category shown on this chart.

NFRA-owned and operated facilities.

Note: Because of the close link between energy consumption and air emissions, these energy-related initiatives also serve to reduce air emissions, including greenhouse gases.

How will we reach our goals?

Recommended Sustainability Initiatives

The Airport has identified a number of potential initiatives to help meet its energy-related goals and objectives. These initiatives differ in their type, degree of effectiveness, and cost. In addition, some of these initiatives represent enhancements of current initiatives, whereas other initiatives are new - derived from industry best practices, internal Airport brainstorming, and public and stakeholder visioning. A number of these initiatives are described in the ACRP publication, "Synthesis 21: *Airport Energy Efficiency and Cost Reduction*". Aside from building retrofit initiatives, the Airport will have the greatest opportunity to initiate many of these initiatives as new facilities are developed in the future.

The Airport has tried to identify potential initiatives that are within its funding capabilities and limited staff resources. The following sections identify potential sustainability initiatives which can be used by the Airport to meet its goals and objectives. NFRA will pursue as many of these initiatives as is feasible, given staffing and financial limitations.

How can the Airport take advantage of new alternative energy technologies?

Example of a Solar PV array.

Renewable energy systems at airports can reduce demand for traditional energy sources, and in turn, reduce energy expenditures. The use of renewable energy sources also reduces an airport's GHG emissions.

Implementation of renewable energy sources, particularly solar energy through photovoltaic (PV) technology, is occurring at airports of similar size as NFRA. Typically, development of solar power production can take place as a stand-alone PV array or through the installation of PV panels on existing or new buildings or structures.

At airports with large areas of vacant land that is not designated for aviation-related development, the development of solar PV arrays through a Power-Purchase Agreement (PPA) may be feasible. A PPA allows a utility company to build the renewable energy system at no cost to the airport sponsor with an agreement from the airport to purchase the power at a specified price for a pre-determined time period. The agreed-upon energy price is typically lower than the electrical energy costs that the renewable energy would be replacing. Florida laws allow municipalities and independent airport authorities to enter into PPAs with utility companies.

Another method of generating renewable energy is to install PV panels on the roof of new or existing facilities, such as passenger terminal buildings, automobile parking shades, or rental car facility buildings. The Airport should consider the integration of solar PV panel technology into the rehabilitation of existing buildings or future planned facilities. Although technology has advanced significantly to reduce the payback horizon (return on investment) for solar projects, local programs and grants, such as the Energy Efficiency and Conservation Block Grant (EECBG) program, can greatly enhance the financial viability of implementing these types of projects.

The FAA's Office of Airports recently issued guidance for the development of solar energy production at Airports, and it can be accessed at: **http://www.faa.gov/airports/environmental/policy_guidance/media/airport_solar_guide_print.pdf.**

A Case Study of Implementing Renewable Energy Systems at a Small Airport is provided in the *ACRP Report 43: Guidebook of Practices for Improving Environmental Performance at Small Airports.*

Each initiative is categorized according to strategy type, and cost and manpower needed to implement and maintain.

The initiative strategy types and associated icons are:


Stand-Alone Strategy


Building Design Element


Construction Practice


Coordination


Environmentally Preferable Purchasing


Purchasing


Reporting/Monitoring


Tenant and Staff Education


Policies


Planned Development Criteria

Costs range from low $ to high $$$ relative to current Airport expenditures. Manpower estimates also range from low to high  and are relative to the number of current Airport staff.

Potential Short-Term Sustainability Initiatives

The following potential sustainability initiatives focus on strategies that are feasible to implement and can commence within a relatively short-term timeframe of approximately 1-5 years. During this period, it is expected that only relatively small-scale capital improvements and essential maintenance activities will be conducted at the Airport. The Short-Term Initiatives primarily consist of strategies that have the potential for high effectiveness while also being relatively low-cost and easy to implement.

Short-Term Initiative	Description	Strategy Type	Benefits	Costs
Purchase renewable/ alternative energy generated off-site	Purchase renewable/alternative energy from local utility or energy provider.		• Encourages funding of research, development, production, and use of renewable energy technology. • Demonstrates Airport's commitment to sustainability.	$$ 
Install energy-efficient lighting *Continuation of Current Initiative*	LED lighting can be used on the airfield to reduce energy consumption. Although LED lighting can be more expensive to install, energy savings typically lead to return on investment of two years. NFRA management is currently working with the FAA to obtain approval and financing for installation of LED lighting coinciding with rehabilitation of Runway 13-31 and extension of Taxiway Bravo. LED should also be considered for outdoor lighting, specifically the Administration, Maintenance, General Aviation, and Commercial Terminal Buildings as well as for the apron.		• Reduces electricity usage.	$$ 

Short-Term Initiative	Description	Strategy Type	Benefits	Costs
Purchase and install EnergyStar appliances and computers *Enhancement of Current Initiative*	The Airport purchases energy-efficient appliances when replacing items that have reached the end of their durable life. This initiative would enhance the Airport Authority's current practice by formalizing this purchasing into an official purchasing policy.		• Reduces electricity usage.	$$
Shut down airfield lighting during nighttime, off-peak hours *Continuation of Current Initiative*	Enable pilot controlled lighting (PCL) for aircraft operating during nighttime, off-peak hours.		• Reduces electricity usage.	$
Use automobile sun shades *Continuation of Current Initiative*	The Airport uses sunshades in its vehicles to reduce the need for air conditioning.		• Reduces automobile fuel usage.	$
Install energy efficient HVAC units *Continuation of Current Initiative*	Efficiency of HVAC units are enhanced with smart controls/energy efficiency settings. High efficiency HVAC units are installed on all new buildings at the Airport. Older existing units are replaced with higher efficiency units as needed.		• Reduces electricity usage.	$$
Install solar-powered signage for the airfield and airport buildings, and/or security lights	Discrete photovoltaic power sources for outlying equipment, ancillary buildings, and parking lighting. FAA is currently researching and evaluating the use of solar-powered airfield lighting at General Aviation airports.▲		• Reduces electricity usage.	$
Establish Building Systems Commissioning	Building Systems Commissioning ensures that all systems are working optimally, as designed.		• Reduces energy usage.	$$
Perform an energy audit	Engage an energy performance contractor or local utility to conduct an energy audit of Airport facilities. Utility companies often perform energy audits free of charge. External experts can provide objective recommendations on equipment repairs, equipment upgrades, and changes to operating procedures to reduce costs.■ Recommendations that could result from an energy audit include installation of additional insulation, water heater insulation, or mechanical system upgrades. The Airport Authority could utilize the FPL energy rebate program and offering of free energy evaluations: **http://www.fpl.com/business/energy_saving/index.shtml.**		• Reduces energy usage.	$

Short-Term Initiative	Description	Strategy Type	Benefits	Costs
Issue a Request for Proposal for a Power Purchase Agreement (PPA) for a solar energy system	A Power Purchase Agreement (PPA) is a legal contract between an electricity provider and the electricity user, in this case, the Airport. The electricity provider typically installs and maintains the solar energy system, constructed on Airport property, as well as determines the feasibility of such an installation. Contractual terms typically last between 15 and 20 years, and during this time the electricity user buys electricity, often as a fixed rate that is below market rate. Based on the Airport's current electricity usage, an appropriately-sized system for NFRA would be approximately 850kW. Engaging in a PPA would enable the Airport to source its electricity directly from a renewable energy source, at zero additional cost to the Airport. *(See FAA's Technical Guidance for Evaluating Selected Solar Technologies on Airports)*		• Monetary savings. • Reduce use of fossil fuels. • Reduce greenhouse gas emissions. • Provides fixed energy costs.	
Install occupancy sensors	Controlling the time when light fixtures are on is one of the most basic methods of limiting energy use and saving operating costs. Occupancy sensors detect movement or sound to determine when a space is occupied and shuts off fixtures after a specific period of time if no occupancy is detected. Electricity savings of 35-45 percent could be obtained with occupancy sensors.		• Reduce electricity usage.	
Install daylight harvesting lighting controls	Daylight harvesting occurs when a photosensor measures daylight illumination levels and signals a control to adjust light output. A basic photocontrol system uses daylight photocell sensors to adjust lighting output to achieve a certain target ambient illumination level. The control mechanism can be a dimming ballast that continuously tunes light output to maintain a set light level, a stepped-dimming system that changes light levels with smooth transitions between several points, or a switching control that operates the lights.		• Reduce electricity usage.	
Develop an operation and maintenance (O&M) manual	Develop a comprehensive O&M manual that includes record logs, for all systems and operations: all HVAC system equipment, lighting controls and sensors, refrigeration systems, vertical transport, building envelope, emergency power generators and automatic transfer switching, uninterruptible power supply systems, life safety systems (fire protection fire alarm, egress pressurization, lightning protection), domestic and process water pumping and mixing systems, equipment sound control systems, data and communication systems, paging systems, security systems, irrigation systems, plumbing and fixtures.		• Reduce energy usage. • Central location for documentation thus saving time in locating records.	
Upgrade indoor lighting to more efficient fixtures	Use LED light bulbs to replace incandescent, fluorescent and halogen bulbs. Where possible, utilize natural light.		• Reduce electricity usage.	

Short-Term Initiative	Description	Strategy Type	Benefits	Costs
Track and report annual energy consumption	Track energy use as a performance measure, using an energy baseline. Track and report annual energy numbers/savings after implementing energy reduction strategies for use as a marketing mechanism, to set/accomplish energy goals, manage strategies, etc.		• Reduce energy usage.	$
Install an "advanced metering system" (smart metering system)	An advanced metering system gathers energy use data on a defined schedule as well as on-demand, enabling real-time monitoring of electrical use, time-based electrical rates, and continuous commissioning. The system can, at a minimum, provide data daily to support operations and other energy management functions.		• Reduce electricity usage.	$$

▲ See FAA Engineering Brief No. 76: Using Solar Power for Airport Obstruction Lighting

■ See California Energy Commission's website for Energy Efficiency Handbooks at: **http://www.energy.ca.gov/reports/efficiency_handbooks/**

Potential Long-Term Sustainability Initiatives

Planning for sustainability inherently implies planning for the long-term future. Some of the following potential "long-term sustainability initiatives" are associated with long-term Airport redevelopment, which is tied to increases in aviation activity and funding availability. Other strategies, however, may be dependent on future development in the region, which would not occur in the immediate future.

Long-Term Initiative	Description	Strategy Type	Benefits	Costs
Implement "Green" building and design standards ***Enhancement of Current Initiative by formalizing into Design Standards***	Develop standards for new buildings that incorporate environmentally-friendly and energy efficient features into design and construction, similar to those incorporated in to the construction of the new Airport Conference Center facility. Standards could incorporate applicable principles of U.S. Green Building Council LEED standards.		• Reduce energy costs of facilities.	$
Design and implement flexible ticket counter for future passenger terminal facilities ***Enhancement of Current Initiative by designing future facilities with common-use elements***	Flexible ticket counters, or common-use facilities, can be used by multiple airlines as needed in passenger terminal facilities. The existing passenger terminal at NFRA is common-use, and any future passenger terminal expansions could be designed with common-use facilities. *(See ACRP 30: Reference Guide on Understanding Common Use at Airports)*		• Reduce building footprint. • Minimize energy use.	$

Long-Term Initiative	Description	Strategy Type	Benefits	Costs
Conduct a renewable and alternative energy feasibility study	Renewable energy production options to consider on an airport include wind, solar PV system, and geothermal. With government incentives and financial assistance, renewable energy systems can be financially feasible to implement.		• Reduces Airport greenhouse gas emissions. • Reduces fluctuations of electricity costs.	
Issue a Request for Proposal for a Power Purchase Agreement (PPA) for a solar energy system	A method of installing and producing solar power on-site is through a PPA. The PPA would evaluate the airport's solar array siting options, as well as recommend a certain size system, appropriate for the Airport's use. PPAs are often considered a "win-win" for Airports, as they lock-in the Airport to a price of electricity below that of utilities, and fixed for the duration of the agreement. The PPA holder then installs system as well as performs any required maintenance. Contractual terms typically last between 15 and 20 years, and during this time the electricity user buys electricity, often as a fixed rate that is below market rate. Based on the Airport's current electricity usage, an appropriately-sized system for NFRA would be approximately 850kW. *(See FAA's Technical Guidance for Evaluating Selected Solar Technologies on Airports▲)*		• Reduce electricity cost. • Reduce use of fossil fuels. • Reduce greenhouse gas emissions. • Reduce electricity cost variability.	
Use natural gas instead of oil	Should natural gas become available to the Airport, NFRA should consider using it to replace use of oil. Natural gas burns cleaner and more efficiently than oil, and therefore results in reduced emissions air pollutants.		• Reduced air emissions. • Increased efficiency. • Reduced strain on energy resources.	
Install HVAC systems that allow recapture and reuse of water	Although new HVAC systems are often more efficient than older systems and use less water, when designing new buildings, the Airport should consider cost/benefits of installing a water recapture system.		• Reduced water loss.	
Install "green" roofs	When designing new buildings, the airport should consider incorporation of green roofs. While traditional green roofs can be maintenance-intensive and require a relatively deep layer of soil, "extensive" green roofs, are designed to be virtually self-sustaining, requiring minimal maintenance and occasional weeding and/or fertilizer application.		• Increase roof lifespan. • Reduce heating costs (by adding mass and thermal resistance value). • Reduce cooling costs (by evaporative cooling). • Reduce stormwater run off. • Captures carbon dioxide.	
Maximize use of natural light and other daylighting strategies	Maximize use of large windows to maximize natural light. Utilize mesh roller shades to reflect sunlight during hotter months. Consider hurricane and sound resistant windows that would reduce noise and the Airport's vulnerability to hurricanes.		• Reduce lighting requirements and electricity usage. • Reduce noise. • Increase durable life.	

Long-Term Initiative	Description	Strategy Type	Benefits	Costs
Install a solar thermal hot water system	Solar thermal systems consist of roof-mounted panels through which water or a glycol/water mixture passes to gain thermal energy. This heated fluid is then pumped through a high-efficiency heat exchanger, which transfers energy to potable water to be used for domestic hot water. Solar thermal systems are one of the more proven technologies that utilize renewable energy, and typically produce a return on investment of two to five years. PPAs, tax incentives, and grants should be explored to offset implementation costs.		• Reduce electricity usage. • Short-term payback.	$$
Consider the integration of alternative energy production sources into the design of new development	As the Airport plans new development, alternative energy sources (such as roof-top solar photovoltaic panels) that would result in a favorable return on investment could be considered in the design of new buildings. PPAs, tax incentives, and grants should be explored to offset implementation costs.		• Reduces Airport greenhouse gas emissions. • Reduces fluctuations of electricity costs. • Minimizes installation costs.	$
Provide electric charging stations in parking areas	As electric cars become more prevalent in the future, charging stations could be provided in Airport parking areas. The charging stations could be solar-powered to reduce operational costs to the Airport. PPAs, tax incentives, and grants should be explored to offset implementation costs.		• Promotes use of electric vehicles. • Reduces greenhouse gas emissions associated with travel to and from the Airport.	$$
Use tankless water heaters	Tankless water heaters provide near instantaneous hot water.		• Increases energy efficiency. • Reduces electricity costs. • Short-term payback.	$
Implement Cogeneration	Cogeneration is the simultaneous production of electricity and thermal energy. It can provide significant energy cost reduction in cases where steam and electric loads coincide or where a secondary market for excess electricity exists. Absorption chillers are commonly coupled with cogeneration equipment to balance the load profiles.		• Substantially increases energy efficiency.	$$$
Submeter Energy Use	Energy submetering involves measuring and collecting detailed energy use data within one or more facilities at the area. Energy submetering can be implemented at various scales and can be gradually integrated into the Airport's infrastructure.		• Helps evaluate building performance and identify inefficiencies and problems as they occur. • Facilitates tracking and quantification of the benefits of energy reduction initiatives.	$

▲ FAA's Technical Guidance for Evaluating Selected Solar Technologies on Airports. Federal Aviation Administration, Office of Airports, Office of Planning and Programming. November 2010. **http://www.faa.gov/airports/environmental/policy_guidance/media/airport_solar_guide.pdf**

Entrance to the Airport
Conference Center.

Section of the Tolomato River adjacent to NFRA.

Creek near NFRA.

Airport Sustainability is a holistic approach to managing an airport to ensure Economic viability, Operational efficiency, Natural resource conservation, and Social responsibility.

07 AIR QUALITY

Air pollutants are generated from aircraft emissions, GSE, cars and buses traveling to and from the Airport, and from Airport fuel and energy use. The air quality pollutants and GHG emissions generated by Airport activities are very minor in comparison to larger airports, as documented in this Sustainability Management Plan.

Goal

Minimize NFRA's emission of air pollutants and greenhouse gases (GHG).

Objectives

- Seek to reduce GHG emissions from Airport Authority-controlled activities over five year periods. Operational emissions from aircraft are not included in this objective.
- Improve indoor air quality in Airport-managed facilities.
- Encourage use of low emission vehicles, equipment and supplies.

Where are we now?

Performance Snapshot

This section presents baseline emissions inventories for criteria air pollutants[1] and greenhouse gases[2] for NFRA. Appendix B, Criteria Air Pollutant and Greenhouse Gas Emissions Inventories for Northeast Florida Regional Airport at St. Augustine, contains the full methodology, analysis, and findings summarized in this section. In addition, this report contains an analysis of estimated future-year (2019) conditions.

1 The term "criteria pollutants" means those pollutants (or their precursors) for which the U.S. Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS). These include carbon monoxide (CO), nitrogen oxides (NO_X), sulfur oxides (SO_X), and particulate matter equal to, or less than, 10 and 2.5 microns in diameter ($PM_{10/2.5}$), respectively. Because ozone (O_3) is formed from the precursors of NO_X and volatile organic compounds (VOCs), these two pollutants serve as surrogates.

2 Emissions of individual GHG carbon dioxide (CO_2), nitrous oxide (N_2O) and methane (CH_4) are the most common of airport-related GHG, and hence are calculated in this inventory.

For the most part, the emissions at NFRA arise from the combustion of fossil fuels (e.g., jet fuel, avgas, diesel, gasoline, natural gas, etc.) and are by-products contained in the engine exhausts. In the case of GHGs, emissions associated with the consumption of electricity at the airport (but generated elsewhere by the burning of coal, oil, and natural gas) were likewise included.

Criteria Pollutant Emissions

Preparing a criteria pollutant emissions inventory of airport activities can help NRFA gauge compliance with pertinent air quality regulations that will apply in the event that the St. John's County area becomes nonattainment for ozone or any other pollutant regulated under the National Ambient Air Quality Standards (NAAQS). Notably, for example, the U.S. Environmental Protection Agency (EPA) proposed revisions to the current NAAQS for ozone that could lower the current standard to a level between the range of 0.060 and 0.070 parts per million (ppm). The Florida Department of Environmental Protection (FDEP) has reviewed ozone-

FIGURE 1

Sources of Criteria Pollutant and GHG Emissions

Sources	Characteristics of Emissions
Aircraft	Exhaust products of fuel combustion that vary depending on aircraft engine type (e.g., turbo-jet, turbo-prop, etc.), fuel type (Jet-A, avgas), number of engines, power setting (e.g., taxi/idle, take-off), and amount of fuel burned.
Ground service equipment/ Auxiliary power units	Exhaust products of fuel combustion from aircraft service trucks, tow tugs, belt loaders, and other portable equipment. Emissions are also emitted by APU used to furnish power to some aircraft when the main engines are off.
Motor vehicles	Exhaust products of fuel combustion from passengers, employee and cargo motor vehicles moving about the airport site. These include automobiles, vans, trucks, and buses. Emissions vary depending on vehicle type (e.g., gasoline, diesel, etc.) and the amount of fuel consumed.
Stationary sources and fuel facilities	Exhaust products of fossil fuel combustion in boilers for space heating and emergency generator units. Evaporative emissions from fuel storage and transfer facilities are also included.
Electrical consumption	Emissions associated with the production of electricity at off-site utilities that use coal, oil, or natural gas.

Source: KB Environmental Sciences, Inc. 2010.

This table shows the primary sources of emissions associated with NFRA. These include aircraft operating within the landing/takeoff (LTO) cycle;[1] GSE and APUs; an assortment of stationary sources; and motor vehicles operating on the internal roadways and parking facilities.

1 The landing/take-off (LTO) cycle includes aircraft approach, landing, taxi-in, taxi-out, take-off and climb-out up to an altitude of about 3,000 feet. For greenhouse gases, aircraft emissions are based on fuel throughput records and therefore also include aircraft emissions that occur beyond the LTO.

FIGURE 2

2009 Criteria Pollutant Emissions Inventory for NFRA

Emission Source	Pollutant[a] (tpy)					
	CO	VOCs	NOx	SO_2	$PM_{2.5}$	PM_{10}
Aircraft[b]	718	42	16	3.4	0.5	0.5
GSE/APUs[c]	7	<1	1	<0.1	<0.1	<0.1
Motor Vehicles[d]	2	<1	<1	<0.1	<0.1	<0.1
Fuel Facilities[e]	--	<1	--	--	--	--
Totals	727	45	18	3.6	0.7	0.7

Source: KB Environmental Sciences, Inc., 2010.
Tons = short ton = 2,000 lbs.

a. CO – carbon monoxide, NOx – nitrogen oxides, VOC – volatile organic compounds, SOx – sulfur oxides, PM10/2.5 – particulate matter equal to, or less than, 10 and 2.5 microns in diameter, respectively.
b. Aircraft includes ground-based start-up, taxi-in and out; and within the LTO cycle.
c. GSE/APUs – Ground Support Equipment/Auxiliary Power Units.
d. Airport-related (e.g., passengers, employees, cargo) motor vehicles on the internal roadway network and parking facilities.
e. Fuel storage facilities for jet fuel, av gas, and motor vehicle fuel.

This table shows 2009 criteria pollutant emissions for NFRA. CO is emitted in the greatest quantities followed by VOCs, NOx, etc. and aircraft represents the largest source followed by GSE/APUs motor vehicles and fuel facilities.

What are the National Ambient Air Quality Standards (NAAQS)?

A geographic area possessing ambient concentrations of an U.S. EPA-regulated pollutant in excess of the NAAQS is considered "nonattainment" of that NAAQS and an area possessing ambient concentrations below the applicable NAAQS is considered "attainment". Importantly, although the St. Johns County area is currently designated "attainment" of all NAAQS, U.S. EPA is in the process of revising the NAAQS for O_3 to a lower level. Based on monitoring data provided by the Florida DEP, the area could become "nonattainment" for O_3 in the near future. Therefore, the General Conformity provisions of the Federal Clean Air Act could apply to NFRA actions in the future.

What pollutants do the National Ambient Air Quality Standards (NAAQS) apply to?

- Carbon monoxide (CO)
- Lead (Pb)
- Nitrogen dioxide (NO_2)
- Ozone (O_3)
- Respirable particulate matter (PM_{10})
- Fine particulate matter ($PM_{2.5}$)
- Sulfur dioxide (SO_2)

related air quality monitoring data for the state of Florida as a result of these proposed revisions, and has determined that between 9 and 30 counties in Florida could be considered nonattainment for the new ozone standard, once finalized. Specifically, FDEP has concluded that St. John's county would be considered in nonattainment if the new standard is set at 0.065 ppm or lower.

Greenhouse Gas Emissions

The TRB ACRP Publication, *Guidelines on Preparing Airport GHG Emissions Inventories*[3] state that the "boundaries" of the GHG inventory should be set based upon emission source "ownership" and "control." From this, the three following categories were established and used for this inventory:

- **Scope 1/Direct** – GHG emissions from sources that are owned and controlled by the reporting entity. These include on-airport owned and controlled stationary sources (e.g., boilers, emergency generators, etc.) and airport-owned GSE and fleet motor vehicles.
- **Scope 2/Indirect** – GHG emissions associated with the generation of electricity consumed by the reporting entity.
- **Scope 3/Indirect & Optional** – GHG emissions that are associated with the activities of the reporting entity, but are associated with sources that are neither owned nor controlled by NFRA. These include aircraft-related emissions, emissions from airport tenant's activities, as well as ground transportation to and from the airport.

What have we already accomplished?

Current Sustainability Initiatives

- **Alternative-fuel Vehicles**
  The Airport purchased and utilizes one electric powered golf cart in addition to the Airport's hybrid electric vehicle.
- **Greenhouse Gas Inventory**
  The Airport has conducted a GHG inventory that identifies direct (NFRA owned and operated emissions sources – motor vehicles and electricity) and indirect and operational (tenant/public owned and operated) sources.
- **Full Runway Access**
  There are currently no full-length taxiways on Runway 31. The Airport is extending Taxiway B to provide access to the full length of Runway 31 and reduce aircraft idling time (less emissions) for take-offs on Runway 31.

How will we reach our goals?

Recommended Sustainability Initiatives

The Airport has identified a number of potential initiatives in an effort to meet its air quality goals and objectives. These initiatives differ in their type, degree of effectiveness, and cost. In addition, some of these initiatives are new, derived from industry best practices, internal Airport brainstorming, and public and stakeholder visioning, whereas other initiatives represent enhancements of current initiatives. The following sections identify potential sustainability initiatives which can be used by the Airport to meet its goals and objectives. NFRA will pursue as many of these initiatives as is feasible, given staffing and financial limitations.

3 Transportation Research Board (TRB) Airports Cooperative Research Program (ACRP), Report 11: Guidelines for Preparing Airport GHG Emissions Inventories, Washington D.C. April 2009. Available at **http://www.aci-na.org/static/entransit/acrp_guidebook_on_greenhouse_gases_april09.pdf**

FIGURE 3

2009 Greenhouse Gas Emissions Inventory

Emission Source	Greenhouse Gases ($MT CO_2e$)[a]	% of Total
SCOPE 1/DIRECT (NFRA OWNED/OPERATED)		
Motor Vehicles[b]	8	<0.1
Subtotal	8	<0.1
SCOPE 2/INDIRECT (NFRA OWNED/OPERATED)		
Electricity[c]	775	8.8
Subtotal	775	8.8
SCOPE 3/INDIRECT & OPTIONAL (TENANT OWNED/OPERATED & PUBLIC)		
Aircraft[d]	7,450	84.7
GSE/APUs[e]	188	2.1
Motor Vehicles[f]	325	3.7
Stationary Sources[g]	<1	<0.1
Electricity[h]	51	0.6
Subtotal	8,015	91.2
Total Emissions	**8,798**	**100**

Source: KB Environmental Sciences, Inc. 2010.
a. MT - metric tons of CO2 equivalents (1 MT = 1.1 Short Tons = 2,200 lbs.).
b. Motor vehicles owned and operated by NFRA.
c. Electricity generated off-site and purchased and used for NFRA occupied buildings and facilities.
d. Aircraft includes ground-based start-up, taxi-in and out; and the LTO cycle.
e. GSE/APUs – Ground Support Equipment/Auxiliary Power Units.
f. Airport-related (e.g., passengers, tenant, cargo) motor vehicles on the internal roadway network and parking facilities.
g. Small generator(s), etc.
h. Electricity generated off-site and purchased and used for tenant occupied buildings and facilities.

As shown, Scopes 1 and 2 GHG emissions (i.e., those for which the NFRA has some ownership and control over) represent 783 metric tons or about nine percent of the overall total. By comparison, Scope 3 emissions (e.g., aircraft, GSE/APUs, etc.) comprise the vast majority – 8,168 MT, or roughly 91 percent of the total. These findings are typical for airports of similar size and function as NFRA.

Corporate aircraft and GSE at the General Aviation Terminal apron.

Each initiative is categorized according to strategy type, and cost and manpower needed to implement and maintain.

The initiative strategy types and associated icons are:

Icon	Strategy type
	Stand-Alone Strategy
	Building Design Element
	Construction Practice
	Coordination
	Environmentally Preferable Purchasing
	Purchasing
	Reporting/Monitoring
	Tenant and Staff Education
	Policies
	Planned Development Criteria

Costs range from low $ to high $$$ relative to current Airport expenditures. Manpower estimates also range from low  to high  and are relative to the number of current Airport staff.

Potential Short-Term Sustainability Initiatives

The following potential sustainability initiatives focus on strategies that are feasible to implement and can commence within a relatively short-term timeframe of approximately 1-5 years. During this period, it is expected that only relatively small-scale capital improvements and essential maintenance activities will be conducted at the Airport. The Short-Term Initiatives primarily consist of strategies that have the potential for high effectiveness while also being relatively low-cost and easy to implement.

Short-Term Initiative	Description	Strategy Type	Benefits	Costs
Encourage employees to use alternative fuel/ hybrid vehicles *Enhancement of Current Initiative*	The Airport has one Toyota Prius and an electric golf cart. An enhancement of this current initiative could include preferred parking for all alternative fuel/hybrid vehicles.		• Reduce pollutant emissions. • Reduce automobile fuel costs. • Promote use of alternative fuel/hybrid vehicles.	$$
Encourage conversion of gasoline-fueled GSE to electric vehicles *Enhancement of Current Initiative*	Encourage the conversion of FBOs' gasoline-fueled GSE (including tugs, small trucks, and service vehicles) to electric. Establish a policy that all new applicable GSE vehicles will be electric.		• Reduce pollutant emissions.	$
Utilize more environmentally friendly cleaning agents *Enhancement of Current Initiative*	Follow LEED indoor air quality principles and review maintenance and janitorial programs to eliminate toxic agents as part of cleaning program. The Airport currently uses citrus-based products. An enhancement of this current initiative could include documentation of products used (i.e., report the percent of cleaning agents that are environmentally friendly).		• Enhance indoor air quality.	$

Short-Term Initiative	Description	Strategy Type	Benefits	Costs
Reduce aircraft taxiing times *Continuation of Current Initiative*	Although NFRA is not a capacity constrained facility that has unreasonable aircraft taxi times, some practices are in effect that reduce aircraft idling and taxi times. Aircraft typically obtain departure clearance before turning engines on, thereby reducing engine idling during ATC coordination. The Airport is constructing an extension to Taxiway B, which would enhance airfield efficiency.		• Reduce pollutant emissions. • Reduce aircraft fuel use.	$
Use aircraft tugs to move aircraft on airfield *Continuation of Current Initiative*	The use of electric tugs reduces aircraft engine usage, saves fuel, and reduces aircraft taxi emissions. The Airport uses electric tugs where operationally feasible.		• Reduce pollutant emissions. • Reduce aircraft fuel use.	$
Minimize fugitive dust emissions during construction *Continuation of Current Initiative*	Apply routine watering or dust suppressants on exposed earth or unpaved roadways commonly used by motor vehicles during construction. This initiative is currently required for all National Pollutant Discharge Elimination System (NPDES) construction permits.		• Reduce fugitive dust emissions.	$
Conduct routine maintenance of equipment and facilities *Continuation of Current Initiative*	Ensure regular and thorough maintenance of fossil fuel engines to improve burn efficiency and stationary sources to ensure effectiveness of required control technologies. Include initiative as an element of tenant education.		• Maintain peak efficiency of engines and buildings.	$
Ensure new building HVAC equipment does not use CFC or HCFC refrigerants	Design new HVAC requirements without CFC/HCFC refrigerants. Inventory existing equipment that uses CFC/HCFC refrigerants and adopt a replacement schedule to eliminate use of them.		• Reduces emissions of atmospheric ozone-depleting chemicals.	$$
Utilize low-emissions construction equipment/ vehicles	Encourage or require contractors to use electric-powered, alternative-fueled, or otherwise low emissions equipment and vehicles to the extent commercially available and economically feasible.		• Reduce construction-related air emissions.	$
Provide preferred parking locations for low-emissions vehicles	With increased commercial passenger service, provide preferred parking spaces for low emissions vehicles in the passenger terminal parking lot. Consider reduced parking rates if there are paid parking facilities in the future.		• Promote the use of low emissions vehicles.	$
Use low-emitting construction materials	Encourage or require the use of low-emitting asphalt, paints, and other construction materials (e.g. warm-mix asphalt).		• Reduce construction materials emissions.	$
Avoid construction during adverse weather conditions	Alter construction scheduling to limit activity during high wind or poor air quality conditions.		• Reduce construction-related air emissions.	$

Potential Long-Term Sustainability Initiatives

Planning for sustainability inherently implies planning for the long-term future. Some of the following potential "long-term sustainability initiatives" are associated with long-term Airport redevelopment, which is tied to increases in aviation activity and funding availability. Other strategies, however, may be dependent on future development in the region, which would not occur in the immediate future.

Long-Term Initiative	Description	Strategy Type	Benefits	Costs
Encourage use of single-engine taxiing	Encourage aircraft to use single-engine taxi procedures to reduce aircraft engine usage, save fuel, and reduce aircraft taxi emissions. This practice has a secondary benefit of reducing noise.		• Reduce aircraft taxi air and noise emissions.	$
Encourage car rental fleets to use low-emissions vehicles	Develop preferred car rental parking and/or lot locations for car rental fleets that offer low-emissions vehicles. Grant concessions to car rental firms that have the highest percentage of low-emissions vehicles in their fleet.		• Promote the availability of low emissions rental car vehicles.	$
Enhance options for non lead-based fuel capabilities at Airport	Following the EPA ruling on lead-based fuels, explore opportunities to provide reduced to no-lead fueling options.		• Reduce aircraft lead emissions.	$
Reduce aircraft APU usage	Reduce APU usage by providing 400 Hz electricity and preconditioned air at gates during passenger boarding and deplanement. This feature could be incorporated into future passenger terminal designs (to serve airline aircraft).		• Reduce aircraft idling emissions.	$$
Install efficient ductwork products	Follow LEED indoor air quality principles by installing ductwork products that can be easily cleaned or those that protect against mold/fiber shredding.		• Enhance indoor air quality.	$
Develop an Air Quality Management Plan	An Air Quality Management Plan could be developed as part of an Airport Master Plan update or Airport Improvement Program. Following LEED indoor air quality principles, an indoor air quality management plan would specify practices for HVAC operation, housekeeping, maintenance, as well as minimizing pollutants associated with renovations, painting, and pest control.		• Improve airport-related air quality emissions. • Enhance indoor air quality.	$$
Install vapor recovery technology for fuel storage and transfer facilities	Encourage FBOs to install vapor recovery technology to recover evaporative hydrocarbons to prevent them from escaping into the atmosphere.		• Reduce hydrocarbon pollution.	$$$

Airport butterfly garden.

Dahoon Holly berries from the Airport's on-site nursery.

Airport Sustainability is a holistic approach to managing an airport to ensure Economic viability, Operational efficiency, Natural resource conservation, and Social responsibility.

08 NATURAL RESOURCES MANAGEMENT

NFRA property includes appreciable acreage of natural features, including uplands, wetlands, and saltwater marshes. These resources provide habitat for a wide variety of vegetative communities and terrestrial and aquatic wildlife, a number of which are considered threatened or endangered. NFRA has embraced its natural landscape and is dedicated to conserving these valuable resources and sharing their value with the public. This chapter presents an overview of the Airport's natural resources and describes NFRA's approach to managing them.

Goal

Minimize unavoidable impacts to natural areas and continue to protect local biodiversity.

Objectives

- Develop on-Airport natural areas to promote education and awareness, while providing a natural buffer to neighboring land uses.
- Identify on-airport mitigation areas associated with protecting specific flora and fauna, while maintaining consistency with the Airport's Wildlife Hazard Assessment and Management Plan.

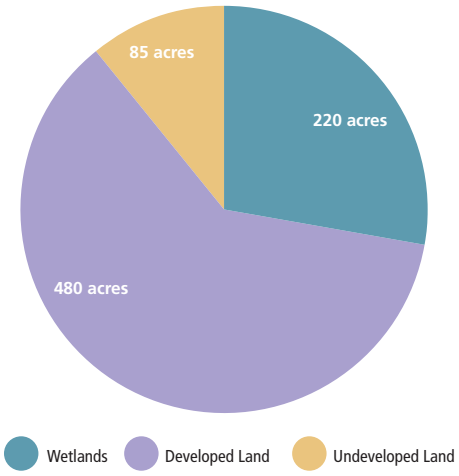
Where are we now?

Performance Snapshot

FIGURE 1

General Airport Land Use

This chart shows the acreages and percentages of various general land uses at the Airport.

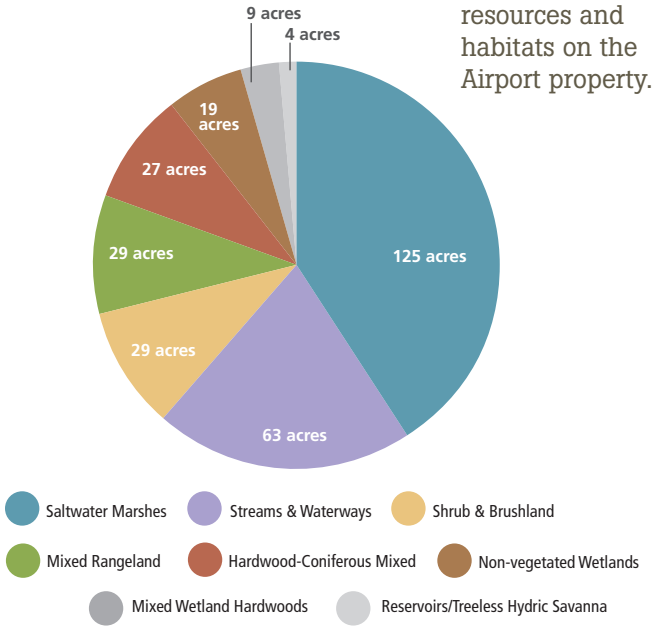


Source: Northeast Florida Regional Airport at St Augustine. Environmental Assessment for Taxiway C Replacement, RSA Compliance, and Approach Lighting System, June 2010

FIGURE 2

Natural Areas by Type

This chart shows the large variety of natural resources and habitats on the Airport property.



Source: Northeast Florida Regional Airport at St Augustine. Environmental Assessment for Taxiway C Replacement, RSA Compliance, and Approach Lighting System, June 2010

Natural Environment & Wildlife

Extent: The Airport is a steward to valuable natural resources on its property, which it seeks to conserve. Within the Airport boundary, there are approximately 3.9 acres of streams and waterways, and over 125 acres of saltwater marshes.

Ecological Services: These natural areas offer important ecological services, providing habitat for shrimp, members of the Snapper-Grouper complex, and coastal shark species. Commercial fishing is also a key component of the local economy. Juvenile shrimp utilize the Airport's saltmarsh habitat, and blue crabs and stone crabs also inhabit the Airport's salt marshes and oyster beds.

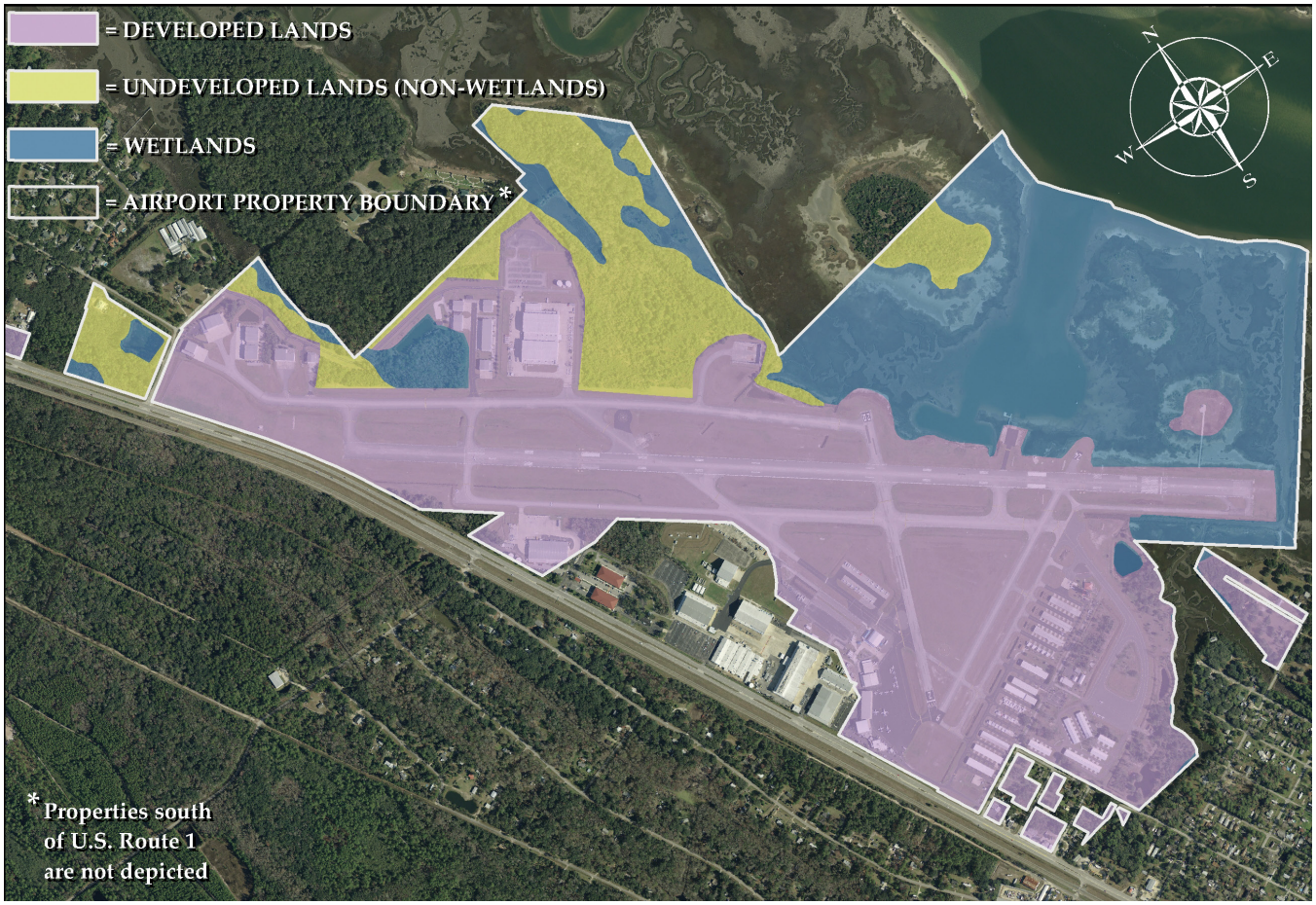
Wildlife Strikes: Of 26 total wildlife strikes reported in 2009, 25 were birds and one was a white tailed deer.

Natural Resource Management Activities

Conservation: The Airport has set aside an area along its southeast property boundary as a "Nature Education Area" to serve as a natural buffer to neighboring land uses, as well as offering educational and leisure opportunities to the local community.

Management Procedures: The Airport currently implements the following general procedures to publicly accessible lawn areas only (i.e., Airport terminal, admin, and Conference Center):

- Mows grassed areas twice weekly during the rainy season and once monthly during the dry season to keep the grass low and drainage areas clear of debris;
- Applies fertilizer to maintain lawn areas;
- Maintains dry and clean floors and ground surfaces;
- Regularly picks up and disposes of garbage and waste material;



Airport land uses.

- Regularly cleans paved surfaces that are exposed to industrial activity;
- Properly disposes of landscape waste, wash water, sweepings, and sediments;
- Makes sure equipment used in daily operations is functioning properly;
- Routinely inspects for leaks;
- Incorporate areas of landscape in the design of new facilities in order to minimize runoff from the site;
- Incorporates landscape design that uses native, drought-tolerant plants at new facilities or to upgrade existing facilities, to reduce the need for irrigation, and fertilizer, herbicide, and pesticide use.

Evaluation of Management Procedures: Although the Airport employs a number of best management practices listed previously, lawn management continues to impact the environment, due to energy use, GHG emissions, and nitrogen and phosphorus discharges into surface waters, irrigation water use, and fertilizer use. There may be opportunities for the Airport to reduce the impacts associated with this activity.

Wildlife Compatibility: The Airport seeks to minimize wildlife that are hazardous to aircraft by selectively planting vegetation and minimizing where possible, creation of wildlife habitat.

What have we already accomplished?

Current Sustainability Initiatives

Airport "Nature Education Area"

NFRA's Nature Education Area and trail were designed and are being constructed by staff and local youth groups to promote environmental education, and wellness. The area will be used for passive recreation and aviation viewing/ education, and also acts a natural buffer between the airport and residential land uses.

Nature Education Area

Bridge over stormwater pond in the NFRA Nature Education Area.

NFRA has currently initiated the development of a Nature Education Area, one of the Airport Authority's ambitious sustainability initiatives. The Nature Education Area will serve as a visual and noise buffer to the neighboring residential community south of the Airport, and provide a large natural area with a nature trail designed and constructed by staff and local youth groups to promote aviation, environmental education, wellness, and natural resources protection.

Challenges in implementing this initiative include maximizing support and utilization of the area, obtaining funding, and receiving recognition for the forward-thinking attributes of this initiative.

The following presents some suggestions for overcoming these challenges:

Maximizing Support and Utilization

- Form partnerships with the local chapter of the Boy Scouts of America for the Eagle Scout Program. Boy Scouts could contribute to the program by constructing benches, wooden signs, etc.
- Form partnership with the St. Johns County Cooperative Extension for their Master Gardener's Program. People seeking or wanting to maintain their certification can volunteer at the Nature Education Area.
- Form partnership with local schools to use the Nature Education Area as an outdoor classroom. Nearby schools include St. Johns High School, St. Johns Youth Academy, Sebastian Middle School and Rogers Middle School. Examples of contributions include the high school shop/woodwork classes helping to create and install wooden signs for the trail, or students from local schools planting flowers in the butterfly garden and assisting with maintenance.
- The Airport should promote participation of the Nature Education Area by issuing press releases describing student or community activities in the Project.
- Establish the Nature Education Area as a local Audubon Society birding location to be included in their winter count and other birding activities. The benefits would include developing a positive relationship with a community group and documentation of birds that use the Nature Education Area and the adjacent salt marsh.
- Form a partnership with the Garden Club of St. Augustine to help maintain the Nature Education Area and perhaps dedicate a section for the members to maintain or plant throughout the year with drought tolerant flowering plants.

Obtaining Funding

- Seek donations on trail enhancement construction from local and national home improvement stores, in exchange for signage noting their participation.
- Reach out to socially conscious corporations, such as Timberland and Patagonia, to evaluate availability of grants for which NFRA could apply. Also coordinate with on-airport tenants for volunteers and sponsorships of the Nature Education Area (similar to the popular "adopt a roadway" programs).
- Sell sponsorship or dedication for wooden planks of the observation platform, benches, stretching stations, signs, etc.

Recognition

- Apply for a Florida Friendly Community Award from the University of Florida's Institute of Food and Agricultural Sciences (UF/IFAS).
- Prepare a press release about the Nature Education Area and distribute to local newspapers and television, in addition to promoting the Nature Education Area on NFRA's social networks.

Operations and Maintenance Manager, Kevin Harvey, loading a golf cart with plants from the Airport's on-site nursery.

On-Site Nursery

All of the Airport's open spaces are planted with items grown in NFRA's on-site nursery. This avoids transport costs and associated emissions and demonstrates the Airport's care and connection to its natural landscape.

Reduced Fertilizer/Pesticide Use

Airport has reduced fertilizing from three times annually to once per year. The Integrated Pest Management program for the Airport utilizes the following:

- Spot treatment of infested areas that are open to the public (airfield areas are not treated).
- Application of a non-systemic insecticide in heavily affected areas only, as necessary. The airport typically applies insecticide to maintain lawn grass coverage once a year.
- Use of environmentally friendly substances such as oil, soapy water, grits, and others materials to control pests.
- Application of a systemic insecticide is used as a last resort.

Landscape Management

The Airport regularly evaluate existing vegetation, irrigation, and maintenance frequency to ensure optimum efficiency. When planting, NFRA chooses vegetation that does not attract wildlife. In areas of the Airport where trees would be considered a safety hazard, NFRA favors long-term vegetation management by planting meadow or shrubs over periodic tree cutting.

The following initiatives, which also contribute to natural resource conservation, are described in **Chapter 5, Planned Development:**

- Low-Impact Hangar Development Project
- Sustainable Construction Measures
- Energy Efficient Design of Multi-Purpose Building

How will we reach our goals?

Recommended Sustainability Initiatives

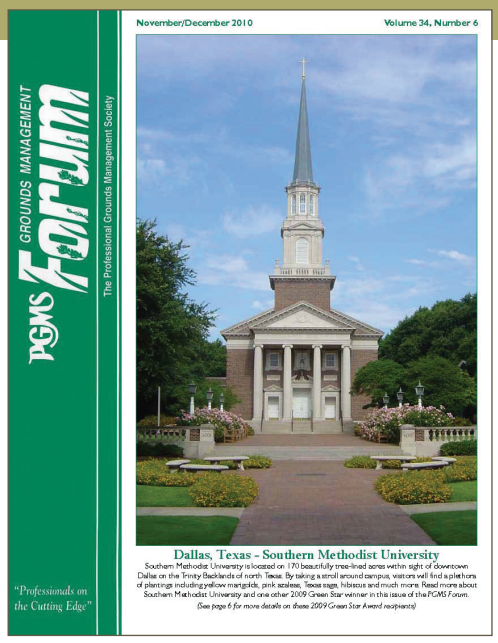
The Airport has identified a number of potential initiatives in an effort to meet its natural resource conservation goals and objectives. These initiatives differ in their type, degree of effectiveness, and cost. In addition, some of these initiatives are new, derived from industry best practices, internal Airport staff recommendations, and public and stakeholder visioning, whereas other initiatives represent enhancements of current initiatives. The following sections identify these potential sustainability initiatives that can be used by the Airport to meet its goals and objectives. NFRA will pursue as many of these initiatives as is feasible, given staffing and financial limitations.

How can the Airport continue to be an industry leader in Natural Resources Management?

View of aircraft and Airport Conference Center from the Nature Education Area.

NFRA has demonstrated their commitment to the environment by initiating many innovative and proactive activities that protect natural resources *and* allow the Airport to operate and develop in a fiscally responsible manner. It was this commitment to effective natural resources management that initiated FAA participation in funding this unique Sustainability Management Plan.

The Airport Authority should continue its exemplary management of natural resources and remain active in leadership roles of industry organizations that can, among other benefits, be used as a forum to promote its activities. Airport personnel are currently active in Florida Airports Council (including its Environmental Committee) and the Professional Grounds Maintenance Society.



An article written by Kevin Harvey, NFRA Operations and Maintenance Manager, that details sustainability initiatives implemented at the Airport. The article was published in the November/December 2010 issue of the PGMS Grounds Management Forum, Volume 34, Number 6.

Each initiative is categorized according to strategy type, and cost and manpower needed to implement and maintain.

The initiative strategy types and associated icons are:


Stand-Alone Strategy


Building Design Element


Construction Practice


Coordination


Environmentally Preferable Purchasing


Purchasing


Reporting/Monitoring


Tenant and Staff Education


Policies


Planned Development Criteria

Costs range from low $ to high $$$ relative to current Airport expenditures. Manpower estimates also range from low to high and are relative to the number of current Airport staff.

Potential Short-Term Sustainability Initiatives

The following potential sustainability initiatives focus on strategies that are feasible to implement and can commence within a relatively short-term timeframe of approximately 1-5 years. During this period, it is expected that only relatively small-scale capital improvements and essential maintenance activities will be conducted at the Airport. The Short-Term Initiatives primarily consist of strategies that have the potential for high effectiveness while also being relatively low-cost and easy to implement.

Short-Term Initiative	Description	Strategy Type	Benefits	Costs
Join in partnerships with environmental non-profit organizations *Enhancement of Current Initiative*	Formalize partnership with Guana Tolomato Matanzas National Estuarine Research Reserve (GTMNERR) in order to develop a wetland mitigation bank to ensure no net loss of wetlands as a result of future Airport development.		• Supports environmental initiatives. • Engages with the community. • Protects sensitive natural features.	$
Formalize landscape ordinance *Enhancement of Current Initiative*	Revise the Airport's land use planning initiative to follow Florida Department of Transportation's (FDOT) Compatible Land Use document and coordinate with St. Johns County Building Services (Growth Management Department) to formalize the Airport's exemption to the County's landscaping and tree mitigation ordinance.		• Prevent/minimize wildlife hazard attractants (tree species in ordinance are wildlife attractants). • Reduce construction cost (less trees to plant).	$

Short-Term Initiative	Description	Strategy Type	Benefits	Costs
Establish Nature Education Area *Continuation of Current Initiative*	NFRA's Nature Education Area will be designed and constructed by staff and local youth groups to promote environmental education, and wellness. The area is planned to be used for passive recreation and aviation viewing/education, and also acts a natural buffer between the airport and residential land uses.▲		• Supports environmental initiatives. • Provides a community asset. • Provides educational opportunities. • Protects sensitive natural features. • Visual and noise buffer between Airport and neighboring residential areas.	
Develop a stormwater master plan	For the area of the airport on the other side of U.S. and its future development, the Airport should consider developing a stormwater master plan that would address water quality, wetlands and protected species for the entire area, instead of on a project/area basis.		• Land conservation. • Reduced overall costs.	
Inventory wetlands and upland vegetation areas	An inventory/ characterization of wetlands and upland vegetation areas would provide NFRA with important information to manage spill events, if they occur. An inventory of wetlands and upland vegetation areas would serve as a baseline to understand the effects of a spill and would inform and expedite the restoration process.		• Cost savings.	
Create a library of existing material/ information of on-Airport natural resources	The Airport should seek to build a library of educational materials relating to the Airport's natural environment. There are free educational materials from state, local and federal government on the value of wetlands, stormwater runoff treatment, manatees, wood stork, etc. that could be made available to tenants and airport visitors. In addition to already developed materials, NFRA could create a list of flora, fauna, and other natural features of the Airport, gradually building these into a more comprehensive database with informative materials on each of these natural resources. This information could be built into a virtual library that could also be linked to the Airport website.		• Promote awareness of natural features of the Airport.	

▲ It is important to note that establishing a publicly-accessible recreation area on Airport property could potentially limit future changes in that area's land use, due to "Section 4(f)" regulations that protect public parks or recreation areas. Section 4(f) of the Department of Transportation (DOT) Act of 1966 was set forth in Title 49 United States Code (U.S.C.), Section 1653(f). Additional information available at U.S. Department of Transportation Federal Highway Administration. Section 4(f). **http://www.environment.fhwa.dot.gov/projdev/4fpolicy.asp#intro**

Potential Long-Term Sustainability Initiatives

Planning for sustainability inherently implies planning for the long-term future. Some of the following potential "long-term sustainability initiatives" are associated with long-term Airport redevelopment, which is tied to increases in aviation activity and funding availability. Other strategies, however, may be dependent on future development in the region, which would not occur in the immediate future.

Long-Term Initiative	Description	Strategy Type	Benefits	Costs
Seek out innovative design techniques to minimize natural resource impacts of development *Continuation of Current Initiative*	As the Airport develops, NFRA should continue to investigate and utilize innovative design techniques that minimize impacts on the natural environment. For example, use of new stormwater design could minimize pond size and land impacts.		• Conserves natural resources.	$
Design stormwater storage and conveyance systems to withstand between a 100-year and 500-year storm *Enhancement of Current Initiative*	Because of climate change predictions that estimate that storms will become more intense in the future, the Airport should consider designing its stormwater storage and conveyance systems to withstand heavier rainfall and more frequent flooding. NFRA should seek to minimize its flooding risks by ensuring future development is designed to withstand conditions associated with a 100-year to 500-year storm.		• Reduces airport's vulnerability to climate change. • Reduces costs associated with operational impacts of flooding. • Reduces costs associated with increased maintenance requirements as a result of flooding.	$$

Pond located adjacent to the Nature Education Area, which provides natural water filtration.

The Airport's on-site nursery enables NFRA to plant native plants that are adapted to the local environment and therefore require little additional irrigation.

Airport Sustainability is a holistic approach to managing an airport to ensure Economic viability, Operational efficiency, Natural resource conservation, and Social responsibility.

09 WATER QUALITY AND CONSERVATION

With increased stress on water sources in the southeastern United States and Florida, reducing the Airport's use of potable and groundwater through increased efficiency and eliminating use of potable water for landscaping is of primary importance to the sustainability of the Airport and of the area. Water conservation also contributes to habitat protection and results in cost savings. In addition to minimizing the Airport's use of water, ensuring that stormwater runoff contributes to the enhancement of water quality in the Tolomato River and ensuring that water that is used by the Airport is able to recharge the local aquifer through filtration through pervious surfaces on the Airport.

This chapter discusses NFRA's strategy to continue to conserve potable water and protect water quality.

Goal

Minimize water consumption and continue to protect water quality.

Objectives

- Maximize water use efficiency within buildings and reduce potable water consumption and wastewater outflow as opportunities become available.
- Continue to educate tenants on Airport Storm Water Pollution Prevention (SWPP) practices.
- Minimize development of new impervious surfaces.

The Airport wash rack ensures contaminated water is collected and treated.

Where are we now?

Water Use

- **Facility water and sewer use:** In 2009, NFRA directly incurred $3,401.52 of water and sewer expenses. This expense represents 1% of the Airport's total general and administrative expenses for 2009.[1] The Airport does not harvest rainwater or recycle greywater.[2]
- **Irrigation:** In 2009, the Airport used 660,000 gallons of water to irrigate the property. Approximately 90% of this amount is sourced from Airport artesian/groundwater wells.

Stormwater Management

- The Airport strictly adheres to the requirements of its Storm Water Pollution and Prevention Plan (SWPPP) and Spill Prevention Control and Countermeasures Plan (SPCC).
- The Airport's drainage outfalls are located within ecologically-sensitive saltmarsh areas. The Airport monitors these outfalls regularly.

What have we already accomplished?

Current Sustainability Initiatives

Water Conservation

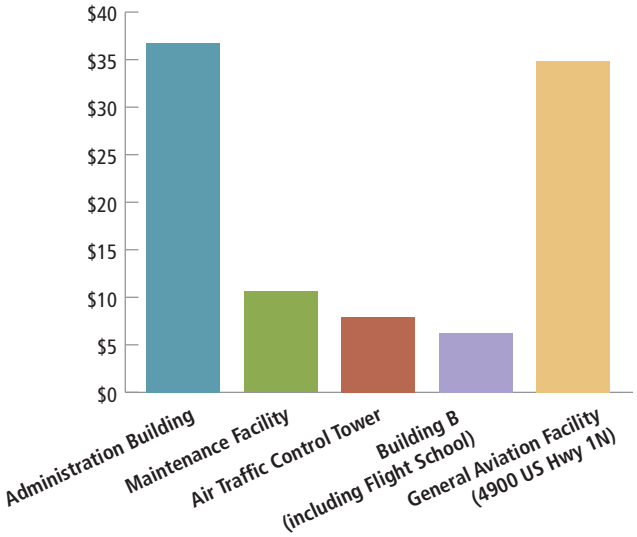
- **Drip Irrigation**
  The Airport is transitioning to a drip irrigation system that includes rain gauges to ensure the system does not operate during rain events. Water for irrigation is obtained from groundwater/artesian wells.
- **Water-Efficient Fixtures**
  NFRA requires new buildings to have low-flow toilets and motion sensor faucets, which contributes to the Airport's water conservation efforts.
- **Water-Efficient Landscaping**
  Wherever possible, the Airport plants drought-tolerant, native plants that are adapted to the local environment and therefore rarely require additional irrigation. The Airport seeks to use plants that do not attract wildlife that are hazardous to aircraft.

1 Northeast Florida Regional Airport Financial Statement 12-2009

2 Greywater is wastewater generated from airport lavatories (excluding water from toilets), which can be recycled for other Airport uses such as landscape irrigation.

FIGURE 1

Total Annual Rates of Water Use by Facility (per square foot)

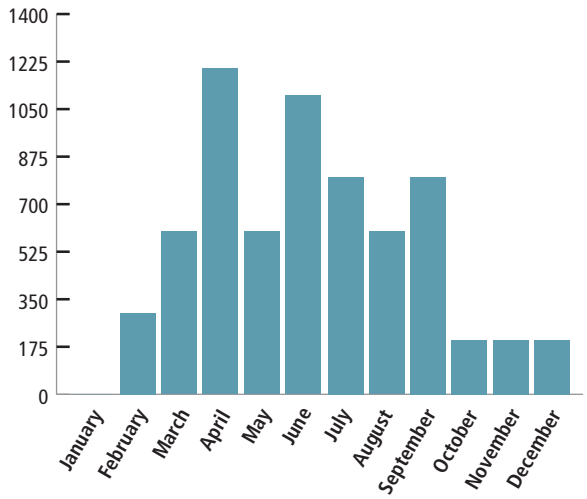


Source: NFRA Water Utility Bills, 2009

This graph presents annual rates of water consumption per building square foot for primary staffed airport facilities. The Administration Building and the General Aviation Facility consume the most water per square foot.

FIGURE 3

Potable Water Use for Irrigation

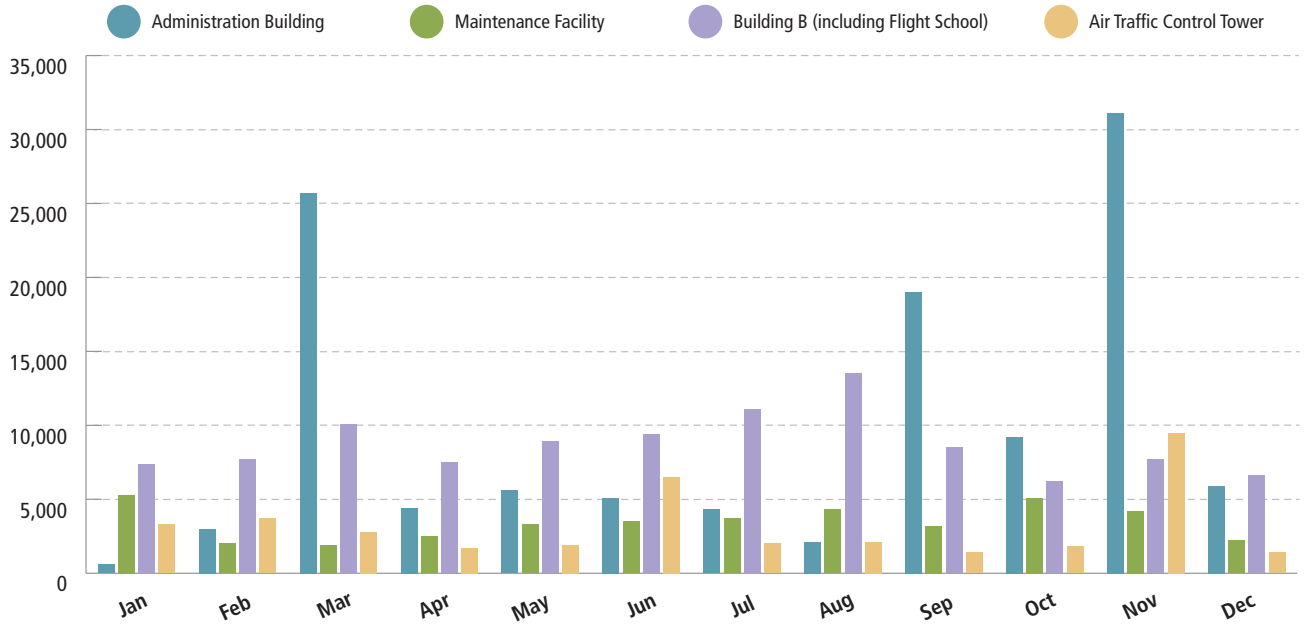


Source: NFRA Water Utility Bills, 2009

This graph presents monthly use patterns for irrigation, representing only irrigation using municipal potable water. Only 10% of the water used for landscape irrigation by the airport is derived from the municipality. The remaining water used for irrigation is sourced from artesian/groundwater wells.

FIGURE 2

Water Use by Facility



Source: NFRA Water Utility Bills, 2009

This graph represents total monthly water use for primary staffed facilities. The administration building is one of the most water use-intensive facilities, with spikes in consumption in March, September, and November. Total water consumption in 2009 associated with the building administration was 116,000 gallons. It is possible that the unusual timing of these spikes is due to billing not being directly tied to usage.

How can the Airport harvest rain water for landscaping?

An inexpensive method of reducing potable water use for landscaping irrigation and reducing stormwater runoff quantity is to capture rainwater in barrels and deliver the water to landscaping when needed. Rain barrels typically hold anywhere between 50 to 200 gallons of water and typically used by homeowners. Cisterns range in size between hundreds to thousands of gallons. A single residential-sized rain barrel system costs around $200, whereas implementation of a commercial-size cistern can cost thousands to tens of thousands of dollars depending on its size. Both rain barrels and cisterns require minimal maintenance.

As a general rule of thumb, one inch of rain on 1,000 sq. feet of roof will yield approximately 600 gallons of rainwater.[1] St. Augustine averages 47.4 inches of rain annually.[2] Therefore; a collection system from one 1,000 sq. ft. roof area could generate 28,440 gallons of rainwater annually.

The Airport Authority could install the smaller rain barrel systems on its existing buildings, where feasible, and design future facilities to include either rain barrel or cistern systems. The Airport only uses City water for 10 percent of its irrigation needs (artesian well water is used for the rest), which corresponds to 6,600 gallons of municipal water use, costing the Airport Authority $221 in 2009, and corresponds to $0.033/gal. Therefore, a 200 gallon rain barrel would pay for itself within one year, considering it would cost the Airport approximately $200 to install and would capture enough water to eliminate the use of municipal water for irrigation.

› **Artesian/Groundwater Wells**
NFRA draws 90% of its irrigation water from artesian/groundwater wells, thereby reducing its reliance on municipal potable water.

Surface Water Quality

› **Wash Rack Use**
A wash rack has been constructed to minimize water consumption and reclamation. Tenants are allowed to use this facility only after receiving training that outlines the rules and requirements for use, to ensure efficient and correct use. This use is not monitored.

› **Spill Containment**
The Airport provides spill containment measures for its fuel farm to minimize impacts of spills, if/when they occur.

› **Proactive Stormwater Pollution Prevention**
A Storm Water Pollution Prevention Plan and a Spill Prevention Control and Countermeasures Plan are in place to minimize the likelihood of pollutants entering Tolomato River. Although these plans are regulatory requirements, the Airport proactively engages tenants to abide by the requirements of these plans and monitors for spills.

› **Pervious Pavement Use**
Pervious pavement was installed within a portion of the terminal parking area (approximately 472,000 square feet) which allows stormwater to percolate back into the landscape, thereby reducing the impacts of stormwater runoff on streams and sewers.

› **Natural Stormwater Management System**
NFRA has a stormwater management system that consists of ponds, ditches, swales, oil water separators, and aeration systems.

1 "Florida Field Guide to Low Impact Development – Cisterns/Rain Barrels", University of Florida, 2008, **http://buildgreen.ufl.edu/Fact_%20sheet_Cisterns_Rain_Barrels.pdf**
2 National Climatic Data Center (NCDC), 1971-2000.

[L] A double rain barrel system is shown.

[R] A large metal cistern.

› Pollution Prevention Education

The Airport conducts annual spill prevention and stormwater pollution prevention training to Airport staff and tenants.

The Airport distributes an educational pamphlet on sump fuel recycling to pilots that use their facilities, including the Fixed Base Operator.

How will we reach our goals?

Recommended Sustainability Initiatives

The Airport has identified a number of potential initiatives that will help meet its water quality and conservation goals and objectives. These initiatives differ in their type, degree of effectiveness, and cost. In addition, some of these initiatives represent enhancements of current initiatives, whereas other initiatives are new - derived from industry best practices, internal Airport brainstorming, and public and stakeholder visioning. The following sustainability initiatives identify potential opportunities for the Airport to meet its goals and objectives. NFRA will pursue as many of these initiatives as is feasible, given staff and financial limitations.

Each initiative is categorized according to strategy type, and cost and manpower needed to implement and maintain.

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Purchasing


Reporting/Monitoring


Tenant and Staff Education


Policies


Planned Development Criteria

Costs range from low $ to high $$$ relative to current Airport expenditures. Manpower estimates also range from low  to high  and are relative to the number of current Airport staff.

Potential Short-Term Sustainability Initiatives

The following potential sustainability initiatives focus on strategies that are feasible to implement or for which implementation can commence within a relatively short-term timeframe of approximately 1-5 years. During this period, it is expected that only relatively small-scale capital improvements and essential maintenance activities will be conducted at the Airport. The Short-Term Initiatives are primarily strategies that have potential for high effectiveness while also being relatively low-cost and easy to implement.

Short-Term Initiative	Description	Strategy Type	Benefits	Costs
Eliminate Underground Storage Tanks (UST) *Enhancement of Current Initiative*	The majority of Airport underground storage tanks are double-walled. The Airport is currently in the process of replacing the Galaxy Aviation tanks with double walled tanks. The Airport could seek to encourage Northrop Grumman, the only tenant using USTs that are not double-walled, to convert its tanks.		• Minimizes risks of leakage and contamination. • Saves costs associated with potential clean up requirements (in the event of ground contamination).	$$ 
Develop water reuse and/ or rainwater capture systems	Due to the age and configuration of the Airport's existing facilities, water recycling or "greywater" systems do not currently exist at NFRA. When feasible, NFRA could seek to incorporate water recycling systems into new buildings. NFRA could explore construction of rainwater capture systems for existing facilities as well as future development.		• Reduce use of municipally-provided potable water. • Save water utility costs.	$-$$ 

Potential Long-Term Sustainability Initiatives

Planning for sustainability inherently implies planning for the long-term future. In addition to the short-term sustainability measures the Airport could implement, NFRA is also looking ahead to plan strategies that could be implemented beyond the short-term horizon. Some of the potential strategies are associated with long-term Airport redevelopment, which will be tied to increases in aviation activity and availability of funding. Other strategies may be dependent on development in the region, which would not occur in the immediate future.

Long-Term Initiative	Description	Strategy Type	Benefits	Costs
Use of other properties for regional stormwater treatment	Coordinate with local or city governments to determine if other properties (e.g. parks) can be used for regional stormwater treatment.		• Enhance water quality in the region.	$
Coordinate regularly with St. Johns' Water Management District	Discuss ongoing projects through regularly scheduled meetings.		• Ensure Airport development projects do not unduly stress the county's water system.	$
Install water efficient fixtures *Enhancement of Current Initiative*	New buildings at the Airport, such as the terminal building and the Airport Conference Center, have some low flow plumbing fixtures. Old faucets and other plumbing structures that reach the end of their useful life should be replaced with water-efficient equivalents. The Airport could explore additional water efficient fixtures such as waterless urinals, pressure assisted toilets, or water-conserving aerators.		• Reduce use of municipally-provided potable water.	$$

The Airport incinerates waste collected by the U.S. Customs Facility.

Construction of the Airport's new Conference Center.

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10 MATERIALS AND WASTE MANAGEMENT

From construction materials to office supplies, NFRA uses a variety of materials and products to operate and develop the Airport. To minimize the impacts of these materials, the Airport carefully sources these products as well as seeks to minimize waste output by reducing the use of materials and recycling waste, where possible. This chapter outlines the Airport's management of materials that enter and leave the Airport.

Goal

Minimize the generation and impacts of waste through materials reuse and recycling, and purchase of environmentally preferable materials.

Objectives

- Evaluate the financial and technical feasibility of providing recycling options to all airport tenants.
- Apply the principles of "Reduce, Reuse, Recycle, Resell".
- Reduce quantity of waste generated by the Airport.
- Minimize hazardous materials use and hazardous waste generation wherever practicable.

How can the Airport minimize its landscape waste?

Currently, a private company picks up yard debris collected in a dumpster at the Airport. Trimmings from hedges and trees are either chipped or disposed of in the yard debris dumpster. Grass clippings and leaves are mulched through the mowing process. The implementation of yard debris composting system at the Airport could reduce collection costs, and associated emissions, and provide valuable landscaping materials for use on Airport property, including the on-site greenhouse, thereby savings costs associated with purchase of mulch.

Yard trimmings composting can be done using simple technologies with relatively low capital costs and on-going maintenance costs. The composting facility could even be combined with the "Nature Education Area" to enhance the educational aspect of the facility.

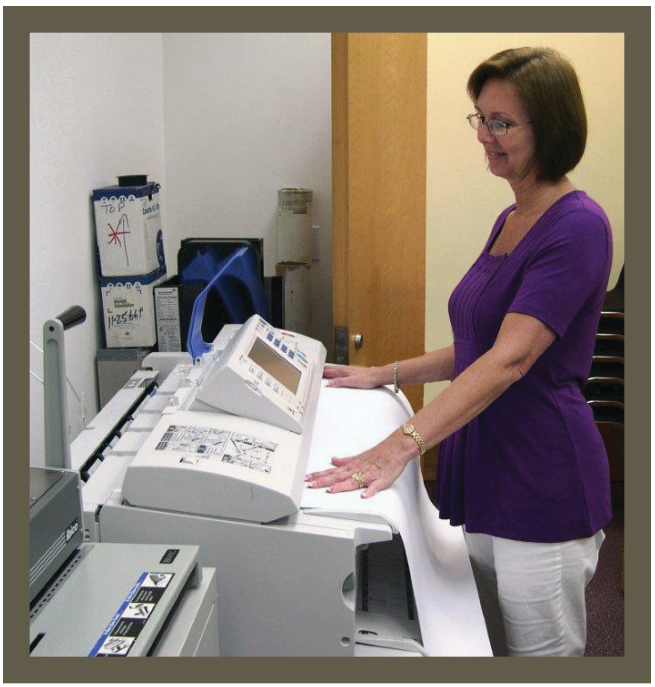
Source: U.S. Environmental Protection Agency, Composting Yard Trimmings and Municipal Solid Waste, May 1994.

Where are we now?

Performance Snapshot

Waste generation:

- **Waste generation:** In the 2009 fiscal year, waste disposal cost the Airport $17,222.12. The Airport does not otherwise track quantities of waste it generates.
- **Recycling:** The Airport does not currently generate enough recyclable materials to attract service from a local recycling company. The Airport does not require contractors to recycle construction demolition waste.
- **Recycling Facilities:** South GA hangar area has small waste receptacles at the end of each hangar row and one main container. Corporate hangar tenants have their own waste container and service.
- **Landscape debris:** A portion of waste generated by the Airport is landscape debris. There may be an opportunity to compost this material on-site, thereby reducing waste disposal costs as well as the costs associated with soil purchase. The Airport purchases approximately 150 c.y. per year of mulch, each costing approximately $21.00 per c.y. In total, the Airport spends approximately $3,150 on mulch each year.
- **Demolition debris:** The Airport reuses some demolition debris. In 2009, 3,000 c.y. of pavement millings were used for the access road (approximately 8 to 12 foot wide).



[ABOVE] NFRA Purchasing and Property Coordinator, Cindy Hollingsworth, scanning maps for electronic filing.

[L] The Airport is considering a landscape composting program to minimize landfilled waste and save costs from purchasing soil.

What have we already accomplished?

Current Sustainability Initiatives

- **Oil and Used Battery Recycling**
  Airport tenants have established collection and recycling systems for oil and used batteries.
- **Pavement Millings**
  In order to reduce landfilled waste, NFRA incorporates used pavement millings into asphalt resurfacing projects.
- **Mulching Mowers**
  NFRA uses mulching mowers, which create grass clippings that remain on the lawn and serve as compost. In addition to reducing landscaping waste, this system also reduces the need for environmentally-harmful fertilizers as well saving labor costs.
- **Electronic Filing**
  NFRA has implemented an electronic file management system to reduce paper use. Airport staff scans all plans, documents, reports and require electronic project submittals. NFRA responds to all requests for documentation with electronic copies. In addition, to further minimize paper use, Authority Board members and the Airport Director use IPads during Board meetings and for other document sharing.
- **Organic Waste Separation**
  The Airport's only concessionary tenant, the "Fly-By Café" recycles its restaurant grease.

How will we reach our goals?

Recommended Sustainability Initiatives

The Airport has identified a number of potential initiatives in an effort to meet its materials and waste management goals and objectives. These initiatives differ in their type, degree of effectiveness, and cost. In addition, some of these initiatives are new, derived from industry best practices, internal Airport brainstorming, and public and stakeholder visioning, whereas other initiatives represent enhancements of current initiatives. The following sections identify potential sustainability initiatives which can be used by the Airport to meet its goals and objectives. NFRA will pursue as many of these initiatives as is feasible, given staffing and financial limitations.

NFRA Operations and Maintenance Manager, Kevin Harvey, watering plants inside the Airport nursery.

Each initiative is categorized according to strategy type, and cost and manpower needed to implement and maintain.

The initiative strategy types and associated icons are:

- Stand-Alone Strategy
- Building Design Element
- Construction Practice
- Coordination
- Environmentally Preferable Purchasing
- Purchasing
- Reporting/Monitoring
- Tenant and Staff Education
- Policies
- Planned Development Criteria

Costs range from low $ to high $$$ relative to current Airport expenditures. Manpower estimates also range from low to high and are relative to the number of current Airport staff.

Potential Short-Term Sustainability Initiatives

The following potential sustainability initiatives focus on strategies that are feasible to implement and can commence within a relatively short-term timeframe of approximately 1-5 years. During this period, it is expected that only relatively small-scale capital improvements and essential maintenance activities will be conducted at the Airport. The Short-Term Initiatives primarily consist of strategies that have the potential for high effectiveness while also being relatively low-cost and easy to implement.

Short-Term Initiative	Description	Strategy Type	Benefits	Costs
Recycle batteries, tires, and pavement millings. Provide "collection points". *Enhancement of Current Initiative*	Many of NFRA's tenants currently collect and recycle batteries. This existing initiative could be expanded to include: • Additional materials, such as compact fluorescent lights, which contain mercury, tires, and other products that contain harmful chemicals (also known as "Universal Waste") • Educating tenants about the recycling systems for each recycling item • Recycling of Airport administration batteries		• Reduces harmful leakage of chemicals from disposed batteries. • Increases Airport recycling rates.	$
For projects or facilities, develop an inventory list of space allocation, infrastructure and equipment that is needed to facilitate waste reduction and recycling. *Enhancement of Current Initiative*	For all new projects as well as existing Airport facilities, evaluate the space availability for the following: • To sort and store recyclables • Recycling bins • Accessibility to waste hauling trucks • Accessibility of unloading area where packaging can be returned to manufacturer, and • Any other equipment to support recycling Although the Airport already allocates storage to recycle materials as part of its SWPP, this initiative could be enhanced to expand storage area(s) and address additional items for recycling as scope of recycling at Airport increases.		• Enables increased recycling at the Airport.	$

Short-Term Initiative	Description	Strategy Type	Benefits	Costs
Establish a landscaping waste composting program	An on-site composting system for landscaping waste would provide soil for the Airport nursery and significantly reduce or eliminate the need to purchase and transport soil to the Airport.		• Reduces costs associated with disposal of landscape waste. • Saves costs from purchasing soil. • Diverts waste from landfills.	
Establish an Environmentally Preferable Purchasing program *Enhancement of Current Initiative*	Implement an Environmentally Preferable Purchasing (EPP) Program, utilizing the EPA's EPP website to find and evaluate sustainable products and services.▲ EPP addresses the use of more durable, longer lasting materials and finishes to extend material life and reduce maintenance requirements; avoiding products that require frequent replacement or regular maintenance to reduce future waste. EPP applies to: • Landscaping materials • Office supplies (including coffee, ink, office paper) • Office furnishing • Office equipment • Construction material		• Reduces use of natural resources. • Encourages social and environmental best practices in manufacturing industries.	
Require contractors to use environmentally preferable supplies for construction activities, when available	Include in RFPs that contractors should seek to use, where possible, material with recycled content, local/regional sources, of rapidly renewable sources, certified wood, salvaged/ reused materials, etc.		• Reduces use of natural resources • Encourages social and environmental best practices in manufacturing industries.	
Work with St. Johns County and the Aerospace Academy at St. Augustine High School to establish a "Hazardous Materials Collection Day"	Establishing a "Hazardous Materials Collection Day" or "Hazardous Materials Amnesty Day" is an effective way to collect and collaborate with St. Johns County to dispose of hazardous materials that can be recycled. St. Johns County has an established residential curbside recycling system, which includes disposal of hazardous materials.		• Enhances public health and community well-being. • Decreases release of harmful chemicals into the environment. • Reduces costs associated with waste disposal.	
Re-evaluate municipal solid waste pickup contract to change billing to weight of pickups	Work with waste haulers to negotiate contracts that allow for charges by weight of bin pickups (instead of flat pickup fee).		• Reduces costs associated with waste disposal. • Ties generation of waste to costs, inducing behavioral changes.	
Coordinate recycling collection infrastructure with hauler capabilities	Work with waste haulers to negotiate contracts that allow for reduction in waste hauls and increases in recycling hauls in order to leverage cost savings potential that may arise from recycling programs. The Airport Management could work with Staff and tenants to evaluate which recyclable items are most frequently discarded.		• Increases rate of recycling. • Reduces costs associated with waste disposal.	

Short-Term Initiative	Description	Strategy Type	Benefits	Costs
Conduct an inventory of PCB-containing equipment	Perform evaluation to identify all PCB-containing equipment at facilities to facilitate planning future developments/construction projects.		• Ensures employee and community health will not be impacted by future planning efforts.	

▲ Environmental Protection Agency (EPA) Environmentally Preferable Purchasing (EPP): **www.epa.gov/epp/index.htm**

Potential Long-Term Sustainability Initiatives

Planning for sustainability inherently implies planning for the long-term future. Some of the following potential "long-term sustainability initiatives" are associated with long-term Airport redevelopment, which is tied to increases in aviation activity and funding availability. Other strategies, however, may be dependent on future development in the region, which would not occur in the immediate future.

Long-Term Initiative	Description	Strategy Type	Benefits	Costs
Establish an Airport-wide recycling program	Establish airport-wide recycling programs targeting passengers, tenants, and airport operations. Install or specify cardboard balers, aluminum can crushers, recycling chutes and other technologies to facilitate waste reduction. Designate easily accessible areas for recyclable collection and storage that are appropriately sized and located in a convenient area. Incorporate an educational component to the program. *Note: This initiative is considered for the long-term planning horizon because it calls for a comprehensive recycling program that would be warranted when Airport user volumes increase.*		• Increases rates of recycling and reduce waste to landfill. • Decreases greenhouse gas emissions associated with waste disposal. • Reduces costs for waste disposal.	
Encourage onboard recycling programs for airlines and cleaning companies, especially paper products	Investigate feasibility of developing a recycling program for airplane waste. As the Airport grows and potentially attracts commercial passenger service, waste streams would expand, and the Airport could consider inclusion of deplaned waste in airport waste disposal system.		• Enables increased recycling at the Airport.	
Establish a centralized airline waste and recycling management program	Work with airlines to combine airlines' individual waste/recycling streams into one that the airport manages. This consolidation may require merging several smaller waste management contracts with individual tenants into one larger contract. Centralizing waste and recycling enables airports to negotiate a lower per-ton hauling and disposal fee.		• Lower per-ton hauling and disposal fee. • Increased recycling.	
Establish a food donation program	With the onset of commercial passenger service and increase in passenger traffic at the Airport, donate leftover pre-packaged goods from food vendors or security to a food bank for local needy.		• Offer assistance to local community members in need. • Divert waste from landfills.	

The Airport's main parking lot is immediately accessible from U.S. Highway 1.

The Airport is approximately four miles from the historical town of St. Augustine.

Airport Sustainability is a holistic approach to managing an airport to ensure Economic viability, Operational efficiency, Natural resource conservation, and Social responsibility.

11 AIRPORT CONNECTIVITY

As the Airport grows and potentially offers regularly scheduled passenger airline service, vehicular traffic and parking demand will also grow. To prevent passenger vehicle traffic congestion on airport roadways and parking areas and to allow unimpeded growth of airline service, the Airport needs to enhance its connectivity within the region. Further, airport ground transportation systems have a significant impact on greenhouse gas emissions and local air quality.

Goal

Strengthen the Airport as a transportation hub by enhancing multi-modal transportation connectivity within the region.

Objectives

- Increase multi-modal transportation options.
- Reduce public transportation travel times to St. Augustine, Jacksonville, and Daytona Beach central business districts.
- Promote rail transportation in the region.

How can the Airport remain easily accessible in the future?

Long-term sustainability of the Airport will in part depend on ensuring convenient airport user and airline passenger access to the facility. One of the major factors in terms of airport choice in a multi-airport region (which Northeast Florida would become with the introduction of scheduled passenger service at NFRA) is convenient access. This will be a competitive advantage of NFRA over Jacksonville International Airport during the initial time period of new airline service. However, if demand for airline service grows and new service is added at NFRA, the Airport Authority must ensure that the advantage of easy access is not lost.

Airport landside and passenger terminal facilities must be planned and designed appropriately to ensure ease of access once on Airport property.

Also, the Airport Authority should coordinate with local transit authorities to ensure frequent and convenient service is provided between the Airport and popular tourist and hotel areas. It may be impractical to envision local residents avoiding use of personal cars, but focusing on transporting tourists to popular destinations, such as historic St. Augustine, World Golf Village, and Ponte Vedra Beach, could ease potential congestion on access roads.

The Airport multimodal facility planning could provide an excellent terminal for bus service to be concentrated in, thereby increasing the likelihood of ridership.

Where are we now?

Performance Snapshot

Public Transportation

Public transportation in the County is provided by the Jacksonville Transit Authority Bus System. However, there are no direct connections to the Airport.

Public Transportation Options vs. Taxi/Car Transportation

The following compares travel logistics and duration for airport users traveling either by public transportation or taxi/car from the Airport to three primary destinations: St. Augustine Central Business District, Jacksonville, and Daytona Beach. Trip duration is compared for public transportation and vehicle.

- Public transportation does not connect directly to the airport, but passengers could take a cab to the nearest bus stop located at the Route 1/Route 16 junction (~5 min). The Red Line can then take passengers to the Saint Augustine central business district (~10 min).

  Approximate trip duration by car/taxi to Saint Augustine's central business district: ~10 minutes

- For connection to Jacksonville: the Red Line followed by the Purple Line to Avenues Mall (~75 minutes) and then bus L7 from there to Rosa L Parks Transit Station in downtown Jacksonville (~55 minutes).

  Approximate trip duration by car/taxi to Jacksonville: ~45 minutes

- There is no public transit route to Daytona Beach currently.

  Approximate trip duration by car/taxi to Daytona: ~70 minutes.

Jacksonville Transit Authority Bus System provides public transportation in St. Johns County.

Development of a Regional Rail System

- Passenger rail service line is planned on the Florida East Coast rail line to connect Jacksonville and Miami, but the specific location of the Saint Augustine stop has yet to be sited. Two possible locations are at the Airport or in the St. Augustine Central Business District.[1]

Advertised Transportation Options

The Airport advertises the following transportation options on its website:

- Rental Cars (Avis, Enterprise, Hertz).
- Taxi Cab Services (Ancient Cab Company, St. Augustine Taxi, Ace Taxi, Yellow Cab, Checker Cab of St. Augustine, I Cab Company).
- Shuttle Service (Yellow Shuttle, Ace Shuttle, Airport shuttle of St Augustine Inc, ABC discount shuttle, Airport Express). Shuttles will take passengers from the airport to anywhere in Jacksonville or Daytona Beach for approximately $60.
- Limousine Services (B & D Limousine Service, Dana's Limousine Service, First Coast Limousine Inc.).

International Access

- A U.S. Customs Facility operates at NFRA and enables international access to the region.

What have we already accomplished?

Current Sustainability Initiatives

Multi-Modal Station Planning

NFRA is actively participating in discussions regarding the planning of a multi-modal station at the Airport, which would include train and bus service.

How will we reach our goals?

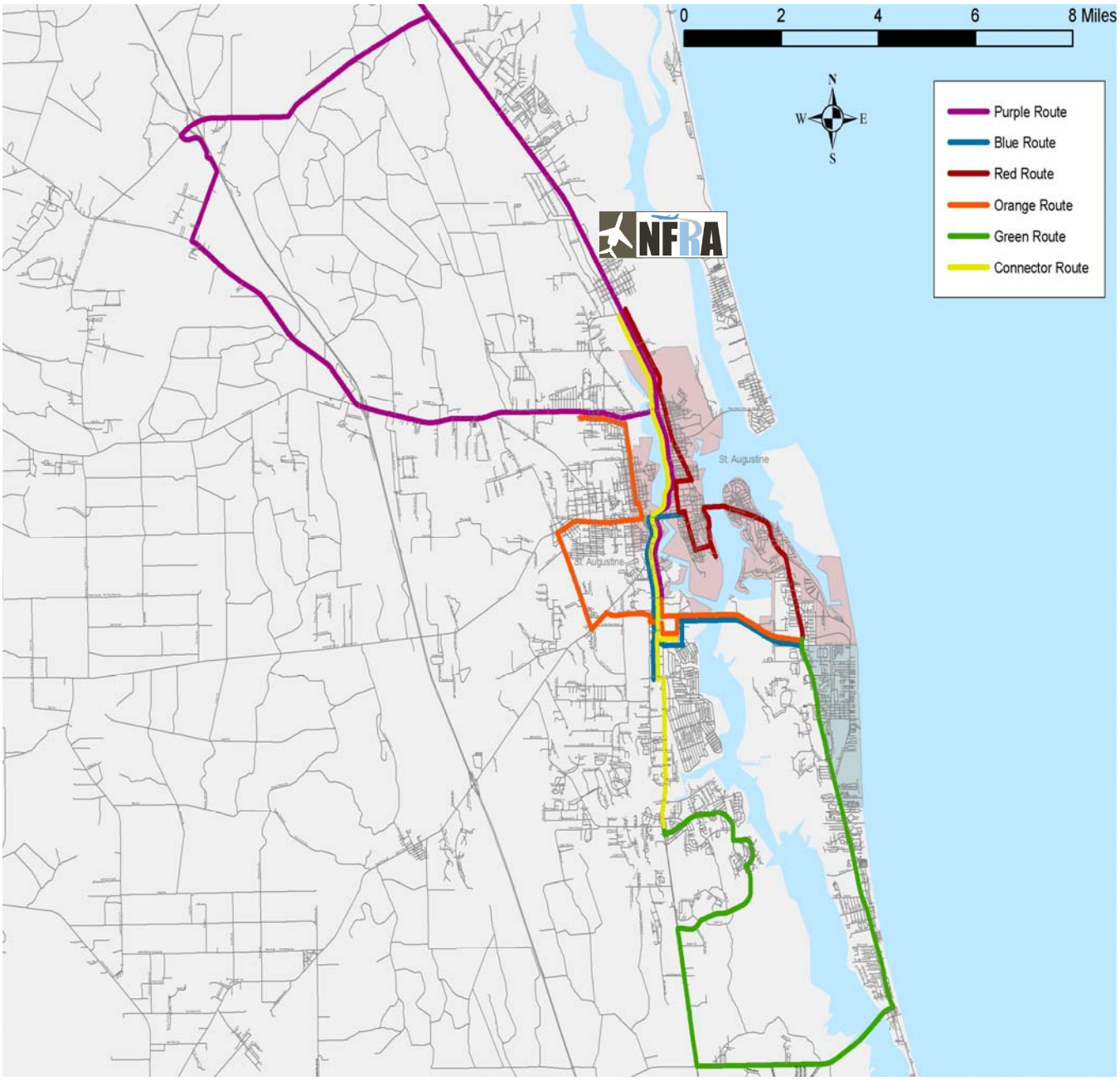
Recommended Sustainability Initiatives

The Airport has identified a number of potential initiatives in an effort to meet its transportation connectivity goals and objectives. These initiatives differ in their type, degree of effectiveness, and cost. In addition, some of these initiatives are new, derived from industry best practices, internal Airport brainstorming, and public and stakeholder visioning, whereas other initiatives represent enhancements of current initiatives. The following sections identify potential sustainability initiatives which can be used by the Airport to meet its goals and objectives. NFRA will pursue as many of these initiatives as is feasible, given staffing and financial limitations.

1 Jacksonville Transportation Authority. Northeast Florida Commuter Rail Feasibility Study. Final Report, July 2009: **http://www.jtafla.com/JTAFuturePlans/Media/PDF/JTA%20-%20NE%20Florida%20Commuter%20Rail%20Feasibility%20Study%20-%20FINAL%20Report%20(July%202009).pdf**

FIGURE 1

Current Bus Public Transportation Network

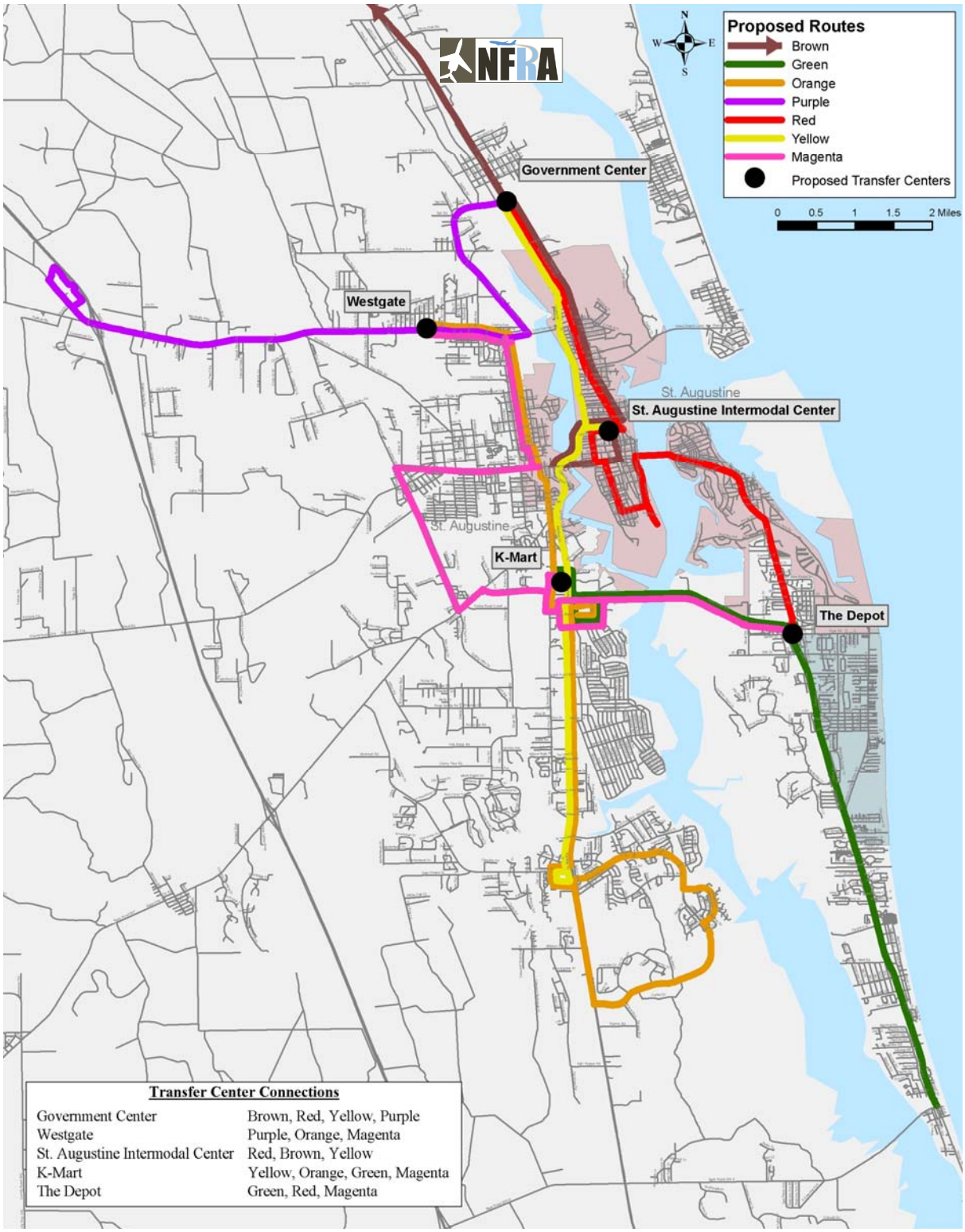


Source: St Johns County Transit Development Plan 2007-2016▲

▲ University of South Florida. St Johns County Transit Development Plan 2007-2016. Prepared for St. Johns County **http://www.co.st-johns.fl.us/BCC/growth_management/planning/Transportation_2_Concurrency/index.aspx**

FIGURE 2

St Johns County Transit Development Plan Recommended Route Network (FY 2007-2016)



Source: St Johns County Transit Development Plan 2007-2016 (Figure 7-2)[▲]

[▲] University of South Florida. St Johns County Transit Development Plan 2007-2016. Prepared for St. Johns County **http://www.co.st-johns.fl.us/BCC/growth_management/planning/Transportation_2_Concurrency/index.aspx**

Each initiative is categorized according to strategy type, and cost and manpower needed to implement and maintain.

The initiative strategy types and associated icons are:

Icon	Strategy type
	Stand-Alone Strategy
	Building Design Element
	Construction Practice
	Coordination
	Environmentally Preferable Purchasing
	Purchasing
	Reporting/Monitoring
	Tenant and Staff Education
	Policies
	Planned Development Criteria

Costs range from low $ to high $$$ relative to current Airport expenditures. Manpower estimates also range from low to high and are relative to the number of current Airport staff.

Potential Short-Term Sustainability Initiatives

The following potential sustainability initiatives focus on strategies that are feasible to implement and can commence within a relatively short-term timeframe of approximately 1-5 years. During this period, it is expected that only relatively small-scale capital improvements and essential maintenance activities will be conducted at the Airport. The Short-Term Initiatives primarily consist of strategies that have the potential for high effectiveness while also being relatively low-cost and easy to implement.

Short-Term Initiative	Description	Strategy Type	Benefits	Costs
Advance multi-modal station planning at Airport, including FEC rail station *Enhancement of a Current Initiative*	The Airport will continue to work with the Florida Department of Transportation (FDOT) to promote rail connectivity at the airport. The Airport is conducting a cost benefit analysis to determine whether beneficial to have a rail and/or a bus station at the airport. The Airport has coordinated with the Jacksonville Transit Authority Bus System in the past.		• Support development within the region. • Facilitate access to the Airport. • Ensure Airport transportation connectivity needs are met.	$
Prioritize projects/ opportunities that improve airport connectivity	Given the number of different growth opportunities available to NFRA, Airport Management would develop a growth strategy that identifies key milestones and timing of each project. Some of these initiatives include: • Multi-modal airport station • Commercial barge (with the potential for cargo vehicle access) • Non-aeronautical development on airport property		• Enables Airport to effectively plan and obtain/allocate financing for these capital projects. • Enables communication of development plans to the community and local municipality. • Enables coordination with regional development activities.	$

Short-Term Initiative	Description	Strategy Type	Benefits	Costs
Coordinate commercial service flights with local bus service	Once regular commercial flight service begins, the Airport would engage commercial service flight operators to coordinate schedules with Sunshine Bus company to enable pick-ups and/or regular bus service. The Airport already currently coordinates with the Jacksonville Transit Authority Bus System.		• Facilitate access to the Airport. • Decrease air and greenhouse gas emissions associated with transportation to and from the airport. • Relieve parking demands. • Financial benefit to customers (no parking fees or gas costs).	
Advertise public transportation options to airport users	Promote transportation options once public transportation systems become available to Airport users. Potential media to advertise public transportation include: • Information on website • Airport signage • Coordinate with local transportation authority to promote service to the Airport		• Facilitate access to the Airport. • Decrease air and greenhouse gas emissions associated with transportation to and from the airport. • Relieve parking demands.	

Potential Long-Term Sustainability Initiatives

Planning for sustainability inherently implies planning for the long-term future. Some of the following potential "long-term sustainability initiatives" are associated with long-term Airport redevelopment, which is tied to increases in aviation activity and funding availability. Other strategies, however, may be dependent on future development in the region, which would not occur in the immediate future.

Long-Term Initiative	Description	Strategy Type	Benefits	Costs
Integrate the Airport with local and regional planning efforts *Enhancement of a Current Initiative*	Communicate and actively engage with local and regional transit authorities to advance multiple transit connection opportunities. An Airport Board member currently attends meeting with the First Coast Metropolitan Planning Organization (MPO) for the County in addition to meetings to plan for potential rail system.		• Ensure Airport transportation connectivity needs are met.	
Promote the use of public transportation and alternative transportation methods for airport and tenant employees	As the Airport grows and employs more people, and public transportation options become more available, the following transportation options should be promoted: • Public transport • Bicycle • Car/van pools		• Reduce traffic on area roadways. • Reduce auto parking congestion. • Enhance local air quality.	

NFRA's airplane tie-down area.

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Additional Airport Sustainability Resources

These additional resources provide further information on airport sustainability and were consulted in preparing this Plan:

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Welcome
Welcome
Welcome
to
St. Augustine

NFRA's seaplane ramp and lanes.

APPENDIX A:
Supporting Data

Chapter 1: Introduction

Aircraft Operations by Operator Categories (2009)	
	PERCENTAGE %
General Aviation	86
Military	9
Air Carrier	1
Air Taxi	1
Other	2

Source: FAA Operational Network (OPSNET) Database, 1/2009 through 12/2009, SGJ. Accessed May 10, 2010.

Profile of Northeast Florida Regional Airport at St. Augustine		
FAA-defined (NPIAS▲) Role	General Aviation Reliever Airport	
Airport Area (approximately)	750 acres	
Runways		
13/31	8,001 feet	
6/24	2,701 feet	
2/20	2,610 feet	
Seaplane Lanes		
12W/30W	5,000 feet	
17W/35W	12,000 feet	
18W/36W	15,000 feet	
Based Aircraft (est. 2009)	269	
Annual Operations (est. 2009)	92,860	
Total Commercial Tenants	26	
Major Commercial Tenants	Florida Aviation Career Training School	Northrop Grumman
	Florida Flyers European School	Ring Power Corporation
	Galaxy Aviation (Fixed Base Operator)	S.K. Logistics (Air charter)
	Infinity Aviation	Southeast Aero Services
	Luhrs Corporation	
Total Airport Staff	11	

▲ FAA's National Plan of Integrated Airport Systems, 2011-2015

Chapter 3: Economic Vitality

NFRA Financial Snapshot (2008, 2009)

	2008	2009
Operating Expenses	$4,545,945	$4,694,550
Operating Revenues	$2,975,643	$2,779,767
Non-operating Revenues	$6,646,638	$6,882,209

Source: St. Augustine – St. Johns County Airport Authority. Audit Report. September 30, 2009, and 2008. Prepared by Davis Monk & Company.

Breakdown of Operating Revenues (2008, 2009)

	2008	2009
Parking and Concession Fees	$274,419	$98,707
Self Fuel Sales, Flowage Fees, and Surcharges	$754,042	$558,733
Lease Revenue	$1,947,182	$2,122,327

Source: St. Augustine – St. Johns County Airport Authority. Audit Report. September 30, 2009, and 2008. Prepared by Davis Monk & Company.

NFRA T-Hangar Lease Rates▲

T- HANGAR TYPE	AREA (SQ. FT) PER HANGAR	MONTHLY LEASE RATE ($)●	MONTHLY LEASE RATE/AREA ($/SQ. FT)
Port-a-Port Units	846	$185.00	$0.22
Standard T-Hangars	1,181	$219.00	$0.19
Premium T-Hangars with electric Bi-Fold Doors	1,012	$246.00	$0.24
Large T-Hangars (Light Twin-Engine)	1,353	$271.00	$0.20

Source: NFRA Website
Note: Does not include Corporate Hangars
▲ As advertised on the NFRA website as of July 2010
● Does not include taxes

T-Hangar Lease Rates Comparison

Category	COMPARATIVE AVERAGE▲	NFRA
Average Area (sq. ft.)	1,331	1,098
Average Monthly Lease Rate	$386.38	$230.25
Average Monthly Lease Rate/Area	$0.29	$0.20

Source: Florida Airport Hangar Survey, January 2008
▲ Average areas and lease rates are based on an aircraft hangar survey distributed to twenty Florida Airports in January 2008.

Chapter 5: Energy

Electricity Use per square foot by Facility (2009)	
Facility	ELECTRICITY USE/AREA
General Aviation Building	29 kWh
Administration	13 kWh
Maintenance Facility	11 kWh
Building B	9 kWh
U.S. Customs Facility	10 kWh

Source: NFRA Utility Bills for 2009

Fuel Consumption by Source (2009)	
Source	FUEL CONSUMED
GSE Diesel	8,614 gallons
GSE Gasoline	6,903 gallons
Auxiliary Power Units (APU)	2,413 gallons
Airport Vehicles	1,097 gallons

Source: NFRA and Tenant Surveys

Chapter 6: Air Quality

2009 CRITERIA POLLUTANT EMISSIONS INVENTORY FOR NFRA

Emission Source	Pollutant[a] (tpy)					
	CO	VOCs	NOx	SO_2	$PM_{2.5}$	PM_{10}
Aircraft[b]	718	42	16	3.4	0.5	0.5
GSE/APUs[c]	7	<1	1	<0.1	<0.1	<0.1
Motor Vehicles[d]	2	<1	<1	<0.1	<0.1	<0.1
Fuel Facilities[e]	--	<1	--	--	--	--
Totals	727	45	18	3.6	0.7	0.7

Source: KB Environmental Sciences, Inc., 2010.
Tons = short ton = 2,000 lbs.

a. CO – carbon monoxide, NOx – nitrogen oxides, VOC – volatile organic compounds, SOx – sulfur oxides, PM10/2.5 – particulate matter equal to, or less than, 10 and 2.5 microns in diameter, respectively.
b. Aircraft includes ground-based start-up, taxi-in and out; and within the LTO cycle.
c. GSE/APUs – Ground Support Equipment/Auxiliary Power Units.
d. Airport-related (e.g., passengers, employees, cargo) motor vehicles on the internal roadway network and parking facilities.
e. Fuel storage facilities for jet fuel, av gas, and motor vehicle fuel.

Chapter 6: Air Quality (continued)

2009 GREENHOUSE GAS EMISSIONS INVENTORY

Emission Source	Greenhouse Gases (MT CO_2e)[a]	% of Total
SCOPE 1/DIRECT (NFRA OWNED/OPERATED)		
Motor Vehicles[b]	8	<0.1
Subtotal	8	<0.1
SCOPE 2/INDIRECT (NFRA OWNED/OPERATED)		
Electricity[c]	775	8.8
Subtotal	775	8.8
SCOPE 3/INDIRECT & OPTIONAL (TENANT OWNED/OPERATED & PUBLIC)		
Aircraft[d]	7,450	84.7
GSE/APUs[e]	188	2.1
Motor Vehicles[f]	325	3.7
Stationary Sources[g]	<1	<0.1
Electricity[h]	51	0.6
Subtotal	8,015	91.2
Total Emissions	**8,798**	**100**

Source: KB Environmental Sciences, Inc. 2010.
a. MT - metric tons of CO2 equivalents (1 MT = 1.1 Short Tons = 2,200 lbs.).
b. Motor vehicles owned and operated by NFRA.
c. Electricity generated off-site and purchased and used for NFRA occupied buildings and facilities.
d. Aircraft includes ground-based start-up, taxi-in and out; and the LTO cycle.
e. GSE/APUs – Ground Support Equipment/Auxiliary Power Units.
f. Airport-related (e.g., passengers, tenant, cargo) motor vehicles on the internal roadway network and parking facilities.
g. Small generator(s), etc.
h. Electricity generated off-site and purchased and used for tenant occupied buildings and facilities.

Chapter 7: Natural Resources Management

General Airport Land Use	ACRES
Wetlands	220
Developed Land	480
Undeveloped Land (non-wetlands)	85

Source: Northeast Florida Regional Airport at St Augustine. Environmental Assessment for Taxiway C Replacement, RSA Compliance, and Approach Lighting System, June 2010

Natural Areas by Type	ACRES
Saltwater Marshes	125
Streams & Waterways	63
Shrub & Brushland	29
Mixed Rangeland	29
Hardwood-Coniferous Mixed	27
Non-vegetated Wetlands	19
Mixed Wetland Hardwoods	9
Reservoirs/Treeless Hydric Savanna	4

Source: Northeast Florida Regional Airport at St Augustine. Environmental Assessment for Taxiway C Replacement, RSA Compliance, and Approach Lighting System, June 2010

Chapter 8: Water Quality and Conservation

Total Annual Rates of Water Use by Facility.

	$ PER SQUARE FOOT
Administration Building	36.73
Maintenance Facility	10.62
Air Traffic Control Tower	7.96
Building B (including Flight School)	6.21
General Aviation Facility (4900 US Hwy 1N)	34.86

Source: NFRA Water Utility Bills, 2009

Potable Water Use for Irrigation

	GALLONS
January	0
February	300
March	600
April	1200
May	600
June	1100
July	800
August	600
September	800
October	200
November	200
December	200
Total	**6,600**

Source: NFRA Water Utility Bills, 2009

Water Use by Facility (Gallons)

	ADMINISTRATION BUILDING	MAINTENANCE FACILITY	BUILDING B (INCLUDING FLIGHT SCHOOL)	AIR TRAFFIC CONTROL TOWER
January	600	5300	7400	3300
February	3000	2000	7700	3700
March	25,700	1,900	10,100	2,800
April	4,400	2,500	7,500	1,700
May	5,600	3,300	8,900	1,900
June	5,100	3,500	9,400	6,500
July	4,300	3,700	11,100	2,000
August	2,100	4,300	13,500	2,100
September	19,000	3,200	8,500	1,400
October	9,200	5,100	6,200	1,800
November	31,100	4,200	7,700	9,500
December	5,900	2,200	6,600	1,400
Total	**88,000**	**41,200**	**104,600**	**38,100**

Source: NFRA Water Utility Bills, 2009

Chapter 11: Community Relations

Racial and Ethnic Composition of St. Johns County

	PERCENT %
White	92.0
Black	6.0
Asian or Pacific Islander	2.0
American Indian/Alaskan Native	0.4
Some Other Race	1.0
Two or More Races	1.0

Source: St. Johns County Chamber of Commerce, 2008. Demographic Detail Summary Report
Note: Percentages may not total 100 due to racial/ethnicity overlaps

Economic and Income Data for St. Johns County and the State of Florida

	ST. JOHNS COUNTY	STATE OF FLORIDA
Median Household Income (2007)	$63,728	$47,804
Per Capita Income (1999)	$28,674	$21,557
Persons Below Poverty Level (2007)	6.7%	12.1%

Source: U.S. Census Bureau, 2009

Gender Ratio in St. Johns County (2008)

	PERCENT %
Male	49
Female	51

Source: St. Johns County Chamber of Commerce, 2008. Demographic Detail Summary Report

Monthly Noise Complaints (Feb 2009 - Sept 2010)

	COMPLAINTS
February '09	6
March	1
April	2
May	7
June	7
July	3
August	3
September	2
October	5
November	1
December	1
January '10	3
February	5
March	5
April	6
May	3
June	1
July	0
August	0
September	0

Source: NFRA Noise Complaints Database, February 2009 through September 2010

✈ NFRA tenant securing an electric tug.

APPENDIX B:
NFRA Air Quality Criteria Emissions and Greenhouse Gas (GHG) Report (October 18, 2010)

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1.0 Introduction and Purpose

This report contains the Criteria Air Pollutant and Greenhouse Gas Emissions Inventories for Northeast Florida Regional Airport at St. Augustine (NFRA). Both existing (2009) and future-year (2019) conditions are included.

2.0 Overall Approach and Methodology

This section provides an overview of the approach, methodology and data sources used to prepare the emissions inventories. Supporting information, data and other materials too voluminous to be included are contained in the Appendix.

2.1 Approach

The overall approach to preparing the emissions inventories for NFRA is based on the following:

- Use of representative of the emission sources and conditions at the airport in 2009 and 2019;
- Use of the most up-to-date and currently available data;
- Use of the most current version of the FAA Emissions and Dispersion Modeling System (EDMS5.1.2) [FAA, 2009]; and
- Consistency with Federal Aviation Administration (FAA) guidelines for quantifying airport-related emissions [FAA 2004].

Under the category of "criteria" pollutants, the emissions inventory included the following: carbon monoxide (CO), nitrogen oxides (NOx), volatile organic compounds (VOC), sulfur oxides (SOx), and particulate matter up to 10 and 2.5 microns in diameter, respectively ($PM_{10/2.5}$).[1]

In the case of greenhouse gases (GHG), the emissions inventory followed recommendations recently issued by the Transportation Research Board (TRB) Airport Cooperative Research Program (ACRP); specifically, the *Guidebook on Preparing Airport Greenhouse Gas Emission Inventories (ACRP Report 11)*.

2.2 Sources of Emissions

The primary sources of emissions associated with NFRA are shown in **Table 1.** These include aircraft operating within the landing/takeoff (LTO) cycle[2]; ground support equipment (GSE) and auxiliary power units (APUs); an assortment of stationary sources; and motor vehicles operating on the internal roadways and parking facilities.

For the most part, the emissions from these sources arise from the combustion of fossil fuels (i.e., jet fuel, avgas, diesel, gasoline, natural gas, etc.) and are by-products contained in the engine exhausts. In the case of GHG, emissions associated with the consumption of electricity at the airport (but generated elsewhere by the burning of coal, oil, and natural gas) were likewise included.

TABLE 1:
Sources of Criteria Pollutant and GHG Emissions

Sources	Characteristics of Emissions
Aircraft	Exhaust products of fuel combustion that vary depending on aircraft engine type (i.e., turbo-jet, turbo-prop, etc.), fuel type (Jet-A, avgas), number of engines, power setting (i.e., taxi/idle, take-off), and amount of fuel burned.
Ground service equipment /Auxiliary Power Units	Exhaust products of fuel combustion from aircraft service trucks, tow tugs, belt loaders, and other portable equipment. Emissions are also emitted by APU used to furnish power to some aircraft when the main engines are off.
Motor vehicles	Exhaust products of fuel combustion from passengers, employee and cargo motor vehicles moving about the airport site. These include automobiles, vans, trucks, and buses. Emissions vary depending on vehicle type (i.e., gasoline, diesel, etc.) and the amount of fuel consumed.
Stationary sources and fuel facilities	Exhaust products of fossil fuel combustion in boilers for space heating and emergency generator units. Evaporative emissions from fuel storage and transfer facilities are also included.
Electrical consumption	Emissions associated with the production of electricity at off-site utilities that use coal, oil, or natural gas.

Source: KB Environmental Sciences, Inc. 2010.

1 Criteria pollutants are those for which the U.S. Environmental Protection Agency has established National Ambient Air Quality Standards. However, because the criteria pollutant ozone (O_3) cannot be calculated directly, the "precursor" emissions of NOx and VOCs are used as surrogates.

2 The landing/take-off (LTO) cycle includes aircraft approach, landing, taxi-in, taxi-out, take-off and climb-out up to an altitude of about 3,000 feet. For greenhouse gases, aircraft emissions of aircraft (Scope 3) are based on fuel throughput records and therefore also include aircraft emissions that occur beyond the LTO.

2.3 Information, Data and Assumptions

The data used to prepare the 2009 emissions inventory was obtained from NFRA records; derived as a function of 2009 and future-year aircraft operational and enplanement levels; and other information, data and assumptions collected and developed in support of the assessment.

2.4 Terms and Concepts

The term "criteria pollutants" means those pollutants (or their precursors) for which the U.S. Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS). These include carbon monoxide (CO), nitrogen oxides (NOx), sulfur oxides (SOx), and particulate matter equal to, or less than, 10 and 2.5 microns in diameter ($PM_{10/2.5}$), respectively. Because ozone (O_3) is formed from the precursors of NOx and volatile organic compounds (VOCs), these two pollutants serve as surrogates.

According to the TRB/ACRP *Guidelines on Preparing Airport GHG Emissions Inventories,* emissions of individual GHG carbon dioxide (CO_2), nitrous oxide (N_2O) and methane (CH_4) are the most ubiquitous of airport-related GHG, and hence are calculated in this inventory. Additionally, the ACRP Guidelines state that the "boundaries" of the GHG inventory should be set based upon emission source "ownership" and "control." From this, the three following categories have been established and used for this inventory:

- **Scope 1/Direct** – GHG emissions from sources that are owned and controlled by the reporting entity. These include on-airport owned and controlled stationary sources (e.g., boilers, emergency generators, etc.) and airport-owned GSE and fleet motor vehicles.
- **Scope 2/Indirect** – GHG emissions associated with the generation of electricity consumed by the reporting entity.
- **Scope 3/Indirect & Optional** – GHG emissions that are associated with the activities of the reporting entity, but are associated with sources that are neither owned nor controlled by NFRA. These include aircraft-related emissions, emissions from airport tenant's activities, as well as ground transportation to and from the airport.

3.0 Emissions Inventory Results

The results of the 2009 and 2019 criteria pollutant and GHG emissions inventories for the NFRA are presented in this section.

3.1 Criteria Pollutant Emissions

To date, the EPA has established National Ambient Air Quality Standards (NAAQS) for the pollutants carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O3), respirable particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), and sulfur dioxide (SO_2). The NAAQS are set to ensure that levels of these pollutants in the outdoor air do not exceed levels thought to be detrimental to human health or environmental welfare, based on the available scientific evidence.

A geographic area possessing ambient concentrations of an EPA-regulated pollutant in excess of the NAAQS is considered "nonattainment" of that NAAQS and an area possessing ambient concentrations below the applicable NAAQS is considered "attainment". Importantly, although the St. John's County area is currently designated "attainment" of all NAAQS, EPA is in the process of revising the NAAQS for O_3 to a lower level, and based on monitoring data provided by the Florida Department of Environmental Protection (FDEP), the area could become "nonattainment" for O_3 in the near future. Should this come to pass, the General Conformity provisions of the federal Clean Air Act could apply to airport actions in the future.

Preparing an emissions inventory of airport activities can help NFRA gauge compliance with pertinent air quality regulations that will apply in the event that the St. John's County area becomes nonattainment for O_3 or any other pollutant regulated under the NAAQS. Accordingly, emissions inventories for CO, NOx, VOC, SOx, and $PM_{10/2.5}$ are listed in **Tables 2** and **3** by source type (i.e., aircraft, GSE/APU, etc.).3 As shown, CO is emitted in the greatest quantities followed by VOCs, NOx, etc. and aircraft represents the largest sources followed by GSE/APUs motor vehicles and fuel facilities.

3 NOx and VOC are considered precursors to O_3 formation, and are commonly evaluated as surrogate pollutants in emissions inventories in order to assess the air quality impacts on O_3.

TABLE 2:

2009 Criteria Pollutant Emissions Inventory for NFRA

Emission Source	Pollutant[a] (TPY)					
	CO	VOCs	NOx	SO_2	$PM_{2.5}$	PM_{10}
Aircraft[b]	718	42	16	3.4	0.5	0.5
GSE/APUs[c]	7	<1	1	<0.1	<0.1	<0.1
Motor Vehicles[d]	2	<1	<1	<0.1	<0.1	<0.1
Fuel Facilities[e]	--	<1	--	--	--	--
Totals	**727**	**45**	**18**	**3.6**	**0.7**	**0.7**

Source: KB Environmental Sciences, Inc., 2010.
Tons = short ton = 2,000 lbs.

a. CO – carbon monoxide, NOx – nitrogen oxides, VOC – volatile organic compounds, SOx – sulfur oxides, PM10/2.5 – particulate matter equal to, or less than, 10 and 2.5 microns in diameter, respectively.
b. Aircraft includes ground-based start-up, taxi-in and out; and within the Landing/Take-off (LTO) cycle.
c. GSE/APUs – Ground Support Equipment/Auxiliary Power Units.
d. Airport-related (e.g., passengers, employees, cargo) motor vehicles on the internal roadway network and parking facilities.
e. Fuel storage facilities for jet fuel, av gas and motor vehicle fuel.

TABLE 3:

2019 Criteria Pollutant Emissions Inventory for NFRA

Emission Source	Pollutant[a] (TPY)					
	CO	VOCs	NOx	SO_2	$PM_{2.5}$	PM_{10}
Aircraft[b]	830	49	19	3.9	0.6	0.6
GSE/APUs[c]	2	<1	<1	<0.1	<0.1	<0.1
Motor Vehicles[d]	2	<1	<1	<0.1	<0.1	<0.1
Fuel Facilities[e]	--	<1	--	--	--	--
Totals	**834**	**52**	**21**	**4.1**	**0.8**	**0.8**

Source: KB Environmental Sciences, Inc., 2010.
See Table 2 for footnotes.

TABLE 4:

2019 Criteria Pollutant Emissions Inventory with Increased Commercial Service

Emission Source	Pollutant[a] (TPY)					
	CO	VOCs	NOx	SO_2	$PM_{2.5}$	PM_{10}
Aircraft[b]	857	53	79	10	1.3	1.3
GSE/APUs[c]	3	<1	<1	<0.1	<0.1	<0.1
Motor Vehicles[d]	2	<1	<1	<0.1	<0.1	<0.1
Fuel Facilities[e]	--	<1	--	--	--	--
Totals	**862**	**56**	**81**	**10.2**	**1.5**	**1.5**

Source: KB Environmental Sciences, Inc., 2010.
See Table 2 for footnotes.

By 2019, emissions of most of the U.S. EPA criteria air pollutants (and their precursors) associated with NFRA are expected to increase slightly due to the corresponding increase in aircraft operational levels at the airport over this timeframe.

In addition, a separate scenario was prepared to assess the effects of potential increased passenger service operations on criteria pollutant emissions in 2019. For this scenario, it was assumed that an additional 8,760 annual LTO's, of the Airbus A320, the Boeing 737-700 and the Boeing MD-81 would occur. **Table 4** summarizes this 2019 criteria pollutant emissions inventory, reflecting the assumption of additional commercial passenger service at NRFA. As shown, the largest expected increases in criteria pollutant emissions under this scenario are associated with NOx, SO_2 and PM. However, these increases in criteria pollutant emissions are not unexpected and the amounts are typical for airports with this level of commercial operations.

3.2 Greenhouse Gas Emissions

The 2009 and 2019 GHG emissions inventories for the NFRA are summarized in **Tables 5** and **6,** respectively. The 2019 GHG emissions inventory was also adjusted to reflect the potential increased passenger service scenario at NFRA, the results of which are summarized on **Table 7**. For consistency with standard reporting methods for GHG, the results are expressed as CO_2-equivalents (CO_2e).[4]

As mentioned, according to the ACRP Guidelines for Preparing Airport GHG Emissions Inventories, the three primary GHG of interest that comprise CO_2e are CO_2, CH_4 and N_2O. Individual emissions of these three gases are converted to CO_2e using Global Warming Potentials (GWPs) developed by the Intergovernmental Panel on Climate Change (IPCC).

A GWP is a unitless conversion factor that is applied to an individual GHG that describes how efficiently it is thought to warm the atmosphere relative to CO_2 during a specific time interval (i.e. time horizon), which is the most ubiquitous man-made GHG. So, a GWP of fifty means that the gas is fifty times as effective in warming the atmosphere as CO_2. For this analysis, the 100-year time horizon GWP's developed by the IPCC were applied, and correspond to 1 for CO_2, 25 for CH_4, and 298 for N_2O. After adjustment using the GWPs, the resulting totals of CO_2, CH_4 and N_2O are summed to obtain CO_2e.

Following the ACRP Guidelines for Preparing Airport GHG Emissions Inventories, the results are also subdivided into three categories: Direct/Scope 1, Indirect/Scope 2 and Optional/Scope 3, which are further expressed as percentages of the overall total.

As shown, Scopes 1 and 2 GHG emissions (i.e., those for which the NFRA has some ownership and control over represent 783 metric tons or about nine percent of the overall total. By comparison, Scope 3 emissions (i.e., aircraft, GSE/APUs, etc.) comprise the vast majority – 8,168 MT, or roughly 91 percent of the total. These findings are typical for airports of similar size and function as NFRA.

As with the criteria pollutant emissions inventory results, by 2019, GHG emissions associated with NFRA are expected to increase slightly due to the corresponding increase in aircraft operational levels at the airport over this timeframe.

Table 7 displays the GHG emissions inventory results that may occur in 2019 if the airport accommodated an additional 8,760 commercial passenger service annual LTO's. These results indicate that GHG emissions from aircraft, GSE and APU would increase. However, these increases in GHG emissions are not unexpected and the amounts are typical for airports with this level of commercial operations.

References

ACRP, 2009, *Guidelines for Preparing Airport GHG Emissions Inventories*, April 2009.

FAA, 2004, *Air Quality Procedures for Civilian Airports & Air Force Bases*, Addendum, Federal Aviation Administration.

FAA, 2009, *Emissions and Dispersion Modeling System User's Manual with Supplements*, and EDMS Version 5.1.2, *Federal Aviation Administration*, November 2009.

4 CO_2equivalents - The universal unit of measurement to indicate the global warming potential for different GHG. Represented by the symbol CO_2e, these values range from "1" for CO_2 to "25" for CH_4 to "298 " for N_2O.

TABLE 5:

2009 Greenhouse Gas Emissions Inventory

Emission Source	Greenhouse Gases ($MT CO_2e$)[a]	% of Total
SCOPE 1/DIRECT (NFRA OWNED/OPERATED)		
Motor vehicles[b]	8	<0.1
Subtotal	8	<0.1
SCOPE 2/INDIRECT (NFRA OWNED/OPERATED)		
Electricity[c]	775	8.8
Subtotal	775	8.8
SCOPE 3/INDIRECT & OPTIONAL (TENANT OWNED/OPERATED & PUBLIC)		
Aircraft[d]	7,450	84.7
GSE/APUs[e]	188	2.1
Motor vehicles[f]	325	3.7
Stationary Sources[g]	<1	<0.1
Electricity[h]	51	0.6
Subtotal	8,015	91.2
Total Emissions	**8,798**	**100**

Source: KB Environmental Sciences, Inc. 2010.

a. MT - metric tons of CO2 equivalents (1 MT = 1.1 Short Tons = 2,200 lbs.).
b. Motor vehicles owned and operated by NFRA.
c. Electricity generated off-site and purchased and used for NFRA occupied buildings and facilities.
d. Aircraft includes ground-based start-up, taxi-in and out; and the Landing/Take-off (LTO) cycle.
e. GSE/APUs – Ground Support Equipment/Auxiliary Power Units.
f. Airport-related (e.g., passengers, tenant, cargo) motor vehicles on the internal roadway network and parking facilities.
g. Small generator(s), etc.
h. Electricity generated off-site and purchased and used for tenant occupied buildings and facilities.

TABLE 6:

2019 Greenhouse Gas Emissions Inventory

Emission Source	Greenhouse Gases ($MT CO_2e$)[a]	% of Total
SCOPE 1/DIRECT (NFRA OWNED/OPERATED)		
Motor vehicles[b]	8	<0.1
Subtotal	8	<0.1
SCOPE 2/INDIRECT (NFRA OWNED/OPERATED)		
Electricity[c]	775	7.8
Subtotal	775	7.8
SCOPE 3/INDIRECT & OPTIONAL (TENANT OWNED/OPERATED & PUBLIC)		
Aircraft[d]	8,614	86.2
GSE/APUs[e]	222	2.2
Motor vehicles[f]	325	3.3
Stationary Sources[g]	<1	<0.1
Electricity[h]	51	0.5
Subtotal	9,213	92.3
Total Emissions	**9,996**	**100**

Source: KB Environmental Sciences, Inc., 2010.
See Table 4 for footnotes.

TABLE 7:

2019 Greenhouse Gas Emissions Inventory with Increased Commercial Service

Emission Source	Greenhouse Gases ($MT CO_2e$)[a]	% of Total
SCOPE 1/DIRECT (NFRA OWNED/OPERATED)		
Motor vehicles[b]	8	<0.01
Subtotal	8	<0.01
SCOPE 2/INDIRECT (NFRA OWNED/OPERATED)		
Electricity[c]	775	3.2
Subtotal	775	3.2
SCOPE 3/INDIRECT & OPTIONAL (TENANT OWNED/OPERATED & PUBLIC)		
Aircraft[d]	22,273	93.2
GSE/APUs[e]	445	<0.1
Motor vehicles[f]	325	<0.1
Stationary Sources[g]	<1	<0.01
Electricity[h]	51	<0.01
Subtotal	23,095	96.7
Total Emissions	**23,878**	**100**

Source: KB Environmental Sciences, Inc., 2010.
See Table 4 for footnotes.

Appendix B1: Emissions Estimation Methodologies and Detailed Results

The following materials contain further, and more detailed, explanations of the methods, models, data, and assumptions used in the development of the Northeast Florida Regional Airport at St. Augustine (NFRA) emissions inventories. It outlines the methodology, assumptions and data sources used to develop the base case (year 2009) and future case (year 2019) draft emissions inventories of EPA "criteria" pollutants, pollutant precursors, and greenhouse gases (GHG). **Table A-1** details the usage data and emissions factors employed in the GHG emissions inventories. The detailed results of these inventories are also presented in **Tables A-2** and **A-3.**

Aircraft

Aircraft emissions and fuel consumption within the Landing-Take-off Cycle (LTO), representing the taxi, take-off, climbout and approach operational modes, were computed using the latest version of the Federal Aviation Administration (FAA) required model, the Emissions and Dispersion Modeling System (EDMS) version 5.1.2. Emissions from engine startup are also included in the inventory for International Civil Aviation Organization (ICAO) certified engines only. The EDMS aircraft inputs were developed based on the fleet mix and operational activity levels documented in the FAA Aviation Performance System Metric (ASPM) database for 2009. Further, year 2019 aircraft operational activity at NFRA was estimated using the FAA Terminal Area Forecast (TAF). Overall, NFRA aircraft activity constituted 46,431 LTO's in 2009 and 53,607 LTO's in 2019 based on this information. Lastly, to account for a scenario where potential increased passenger service may occur at NFRA, an additional 8,760 LTO's were added to the 2019 operational levels, flown by Airbus A320, Boeing 737-700 and Boeing MD-81 aircraft, for a total of 62,367 LTO's.

Because FAA reports no formal information on aircraft taxi times at NFRA, taxi times were derived from aerial photograph measurements of taxi distances between airport facilities (i.e. terminal, Northrop Grumman and other tenants) and the airport runway ends, assuming an aircraft taxi speed of 17 miles per hour. The resulting average taxi-in and -out times input into the EDMS corresponded to 3.67 minutes each, respectively, for both the 2009 and 2019 conditions.

Fuel consumption estimates developed using the EDMS were factored against fuel-specific GHG emissions rates provided by the U.S. Energy Information Administration (EIA) to compute carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O) emissions for all operational modes under consideration.[5] Further, emissions of these gases were normalized to CO_2 equivalency (CO_2e) using 100-year time horizon global warming potentials (GWP) contained in the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report, corresponding to 1, 25, and 298 for CO_2, CH_4 and N_2O, respectively.

As shown on **Table A-2**, 2009 aircraft emissions total 718.56 tons of CO, 42.01 tons of VOC, 16.15 tons of NOx, 3.35 tons of SOx and 0.49 tons of PM_{10} and $PM_{2.5}$, respectively. Further, 2009 CO_2e emissions total 7,641.83 metric tons. According to **Table A-3**, 2019 aircraft emissions comprise 829.78 tons of CO, 48.62 tons of VOC, 18.68 tons of NOx, 3.87 tons of SOx and 0.56 tons of PM_{10} and $PM_{2.5}$, respectively. CO_2e aircraft emissions equal 8,835.58 metric tons in 2019. **Table A-4** indicates that aircraft emissions in 2019, accounting for the potentially elevated passenger service levels, total 857.12 tons of CO, 52.87 tons of VOC, 79.08 tons of NOx, 10.08 tons of SOx, and 1.3 tons of PM_{10} and $PM_{2.5}$, respectively. Moreover, under this scenario, CO_2e emissions from aircraft would total 22,271.82 metric tons.

Auxiliary Power Units

EDMS contains "default" information regarding aircraft auxiliary power units (APU), including airframe-specific equipment assignments and generalized running times. For the purposes of this analysis, the EDMS default APU equipment assignments for the NFRA fleet mix were retained. However, for the NFRA analysis it was assumed that APU would only be running 3 minutes on departure to account for APU warm-up, and 1 minute on arrival to account for APU cool-down. This assumption was applied for both analysis years.

GHG emissions were computed for APUs using the same methodology and data employed when analyzing aircraft GHG emissions.

5 United States Energy Information Administration Voluntary Reporting of Greenhouse Gases Program (Fuel and Energy Source Codes and Emission Coefficients, 2010, accessed at **http://www.eia.doe.gov/oiaf/1605/coefficients.html**

Based on the EDMS default information for APUs, APU emissions in 2009 would constitute 0.11 tons of CO, 0.01 tons of VOC, 0.05 tons of NOx, and 0.01 tons of SOx, PM_{10} and $PM_{2.5}$ respectively, as shown on **Table A-2.** Moreover, 23.26 metric tons of CO_2e would be emitted from APUs given the EDMS default information. 2019 APU emissions constitute 0.13 tons of CO, 0.01 tons of VOC, 0.05 tons of NOx, 0.01 tons of SOx and 0.01 tons of PM_{10} and $PM_{2.5}$, respectively, as shown on **Table A-3.** In addition, 30.94 metric tons of CO_2e would be emitted by the APUs in 2019. If the airport were to accommodate potential passenger service operations as discussed above, APU would generate 0.71 tons of CO, 0.05 tons of VOC, 0.54 tons of NOx, 0.08 tons of SOx, and 0.7 tons of PM_{10} and $PM_{2.5}$, respectively. CO_2e emissions from APU in this scenario would constitute 222.3 metric tons. This information is summarized on **Table A-4.**

Ground Support Equipment

In the same fashion as APUs, EDMS invokes "default" information with respect to ground support equipment (GSE) assignments, fuel types and running times. This information was not employed in the analysis. Instead, only the GSE referenced in the NFRA tenant surveys was applied to aircraft in EDMS, and even then only for those aircraft tagged in EDMS as "passenger" or "business" purpose aircraft. Moreover, it was assumed that the assigned GSE would operate only one minute per applicable LTO cycle.

Based on the provided information and assumptions with respect to GSE, GSE emissions in 2009 would constitute 6.87 tons of CO, 0.28 tons of VOC, 1.16 tons of NOx, 0.03 tons of SOx, 0.04 tons of PM_{10} and 0.03 tons $PM_{2.5}$ respectively, as shown on **Table A-2.** CO_2e emissions from GSE would total 164.49 metric tons in 2009. 2019 GSE emissions constitute 1.79 tons of CO, 0.08 tons of VOC, 0.25 tons of NOx, 0.01 tons of SOx, 0.01tons of PM_{10} and 0.01 tons of $PM_{2.5}$, as shown on **Table A-3.** The decrease in GSE emissions for the future year condition is attributable to EDMS assumptions that GSE technology will improve with respect to air quality in the future. CO_2e emissions from GSE in 2019 are expected to total 191.17 metric tons. When considering potential increased passenger service at the airport in 2019, GSE emissions total 2.09 tons of CO, 0.09 tons of VOC, 0.29 tons on NOx, and 0.01 tons of SOx, PM_{10} and $PM_{2.5}$, respectively, as shown on **Table A-4.** Further, CO_2e emissions from GSE under this scenario total 222.94 metric tons.

Airport Patron Motor Vehicles

St. Johns County traffic counts for 2008 imply that the average annual daily traffic (AADT) occurring on the segment of US1 running tangent to the airport property, which is also the main access road to the airport facilities, constitutes 24,503 vehicles. It was assumed that 10 percent of this traffic uses the airport on an annual basis (i.e. 2,450 vehicles). Further, it was assumed that 50 percent of this traffic (1,225 vehicles) would access the airport via Estrella Avenue and 50 percent would use Gun Club Road. All vehicles using Gun Club Road on an annual basis were also assumed to follow on to the connecting Hawkeye View Lane to reach parking facilities. Of the 1,225 vehicles allocated to Estrella Avenue, it was assumed that 25 percent may access the surrounding local streets (Araquay Avenue, Casa Cola Way, Indian Bend Road and Pine Ridge Road). The traffic volumes summarized here were assumed to increase commensurately in 2019 with the projected increase in aircraft operations for 2019.

The traffic volume information and assumptions described above were factored against the lengths of the roadway segments (as measured using aerial photographs) to determine the annual vehicle miles of travel (VMT). "Criteria" pollutant emissions factors for passenger vehicles, in grams per vehicle mile, were generated using default fleet-average information contained within the U.S. Environmental Protection Agency (EPA) MOBILE6.2 motor vehicle emissions model, included in the EDMS. The emissions factors are specific to the assumed speeds on the roadway network, corresponding to 35 miles per hour on all segments except for US 1, which was assumed to be 55 miles per hour.

To estimate GHG emissions from this activity, fuel consumption was estimated using a fuel economy of 23.9 miles per gallon and factored against the appropriate CO_2 emissions rate (19.56 pounds of CO_2 per gallon of fuel) obtained from the EIA. 6 Because the EIA emissions rates for CH_4 and N_2O are reported in grams per mile, the VMT described above was applied to estimate emissions. Individual gas emissions were then normalized to CO_2e.

Table A-2 shows 2009 emissions resulting from this activity are nominal and comprise 0.01 tons of CO, and less than 0.01 tons each of the other criteria pollutants. Further, the corresponding CO2e emissions equal 2.22 metric tons.

6 Passenger vehicle fuel economy as reported in Inventory of U.S. Greenhouse Gases and Sinks: 1990-2006 (USEPA 2005)

According to **Tables A-3** and **A-4**, 2019 emissions total 0.01 tons of CO, less than 0.01 tons of the other criteria pollutants, and 2.56 metric tons of CO_2e.

Tenant Employee Motor Vehicles

Detailed information was provided by some tenants (i.e. Southeast Aero, Galaxy Aviation and SK Logistics) on the levels of employees and their commute distances to and from the airport. This information was used to develop an estimate of tenant employee VMT (855,842 in total), and emissions associated with this activity were computed in the same manner as was done for airport patron motor vehicles. Notably, emissions factors for this component were developed relative to an assumed commute travel speed of 55 miles per hour for all calculations. In addition, unlike the estimates of airport patron motor vehicles, it was assumed that the level of VMT would not grow in the future year 2019 condition.

As shown on **Table A-2**, 2009 emissions associated with tenant employee motor vehicle trips amount to 1.7 tons of CO, 0.04 tons of VOC, 0.02 tons of NOx, 0.01 tons of SOx, 0.02 tons of PM_{10} and 0.01 tons of $PM_{2.5}$. Additionally, 322.27 metric tons of CO_2e are associated with this activity. Because no growth was assumed for the 2019 condition with respect to this emissions category, the 2019 emissions reported on **Tables A-3 and A-4** are the same.

Electricity Usage

GHG emissions associated with electricity usage at NFRA, as reported by the Airport Authority and its tenants, were estimated for the 2009 condition. For 2009, the Airport Authority reported an annual total of 1,223,293 kilowatt-hours (kWh) of electricity purchases, while the tenants (i.e. Southeast Aero and SK Logistics) reported purchases of 79,966 kWh.[7] Based on this provided data, these usage values appear to be linked to power purchased to light and air condition the terminal buildings, hangars and other structures.

Notably, it was not assumed that the reported energy usage would increase in 2019 relative to the existing usage. The usage data provided by the airport and its tenants, in kWh, was factored against CO_2, CH_4 and N_2O emissions rates for electricity generation specific to the state of Florida.[8] The resulting estimates were normalized to CO_2e using the GWP described previously.

Table A-2 suggests a total of 774.48 metric tons of CO_2e attributable to the Airport Authority in 2009, and 50.63 metric tons attributable to the tenants, for a total CO_2e emissions level of 825.1 metric tons. Again, it was assumed that this level of usage (and emissions) would remain constant in 2019.

Other Fuel Usage

Miscellaneous fuel usage data was also reported by the Airport Authority as well as the respondents to the tenant surveys.

Galaxy Aviation reported 3,300 gallons of fuel usage attributed to their GSE holdings. This usage is assumed to be included in the fuel consumption estimates obtained from the EDMS based on the site-specific information applied.

SK Logistics reported 53,000 gallons of Jet A usage for 2009. To avoid "double counting" of the related fuel burn, it was assumed that this Jet A usage was already accounted in the aircraft activity modeled in the EDMS. However, the purpose of this usage should be confirmed with SK Logistics to ascertain whether this assumption is correct (e.g. does SK Logistics perform engine or run-up testing that would not be accounted in the FAA's records of airport operations used to estimate aircraft emissions in EDMS?).

Further, the Airport Authority and Southeast Aero reported a total of 155,221 gallons of aviation gasoline (AvGas) transacted/used in 2009. The AvGas usage computed by EDMS based on the FAA-reported aircraft activity during 2009 totaled 154,218 gallons. Because these two independent sources of fuel usage information show good agreement (i.e. a difference of only 1,003 gallons), it was assumed that the usage reported by the airport and its tenant are already included in the EDMS estimates of aircraft emissions. Hence, to avoid "double counting" of emissions, no further computations were made based on this reported usage.

Lastly, the Airport Authority provided gasoline usage for their ground access and maintenance vehicles, amounting to 889.42 gallons in 2009. It was assumed that this level of use would remain constant in the future year 2019 condition. Emissions associated with this usage were computed in the same fashion as the other categories of motor vehicle emissions. The resulting emissions as reported on **Table A-2** equal 7.69 metric tons of CO_2e.

7 Galaxy Aviation reported that their energy usage is included in the Airport Authority totals.

8 Updated State-level Greenhouse Gas Emissions Coefficients for Electricity Generation: 1998-2000, U.S. Energy Information Administration, April 2002

APPENDIX TABLE 1

2019 NFRA Emissions Inventory with Potential Increased Passenger Service

Source	Criteria Pollutant Emissions (tons)						Greenhouse Gas Emissions (metric tons)			
	CO	VOC	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
Aircraft										
Startup[1]	<0.01	5.24	<0.01	<0.01	<0.01	<0.01	249.64	<0.01	0.01	251.53
Taxi-Out	60.32	14.84	2.89	1.14	0.16	0.16	2,459.23	0.02	0.06	2,477.90
Take-Off[2]	88.00	1.09	38.86	2.98	0.40	0.40	6,467.33	0.06	0.16	6,516.44
Climb-Out[2]	151.49	1.44	21.06	1.90	0.24	0.24	4,105.79	0.04	0.10	4,137.19
Approach[2]	484.02	14.92	11.25	2.66	0.31	0.31	5,752.07	0.05	0.15	5,796.59
Taxi-In	73.30	15.33	5.02	1.41	0.19	0.19	3,068.86	0.03	0.08	3,092.16
Aircraft Subtotal	**857.12**	**52.87**	**79.08**	**10.08**	**1.30**	**1.30**	**22,102.93**	**0.20**	**0.55**	**22,271.82**
Auxiliary Power Units[4]	0.71	0.05	0.54	0.08	0.07	0.07	220.63	<0.01	0.01	222.30
Ground Support Equipment[4,5]	2.09	0.09	0.29	0.01	0.01	0.01	222.19	0.01	<0.01	222.94
Airport Patrons (private vehicles)[4]	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	2.53	<0.01	<0.01	2.56
Tenant Employees[3,6]	1.70	0.04	0.02	0.01	0.02	0.01	317.78	<0.01	0.01	322.27
Electricity Usage[3,6]										
Airport Authority	--	--	--	--	--	--	771.29	0.01	0.01	774.48
Tenants	--	--	--	--	--	--	50.42	<0.01	<0.01	50.63
Electricity Usage Subtotal	--	--	--	--	--	--	**821.71**	**0.01**	**0.01**	**825.10**
Other Fuel Usage[3,6]										
Airport Authority Vehicles	--	--	--	--	--	--	7.58	<0.01	<0.01	7.69
Other Fuel Usage Subtotal	--	--	--	--	--	--	**7.58**	**<0.01**	**<0.01**	**7.69**
GRAND TOTAL	861.63	53.04	79.94	10.18	1.40	1.39	23,695.35	0.22	0.58	23,874.69

Table Footnotes

1 Startup emissions of VOC and GHG calculated only for ICAO certified engines (as represented in EDMS).

2 Because NFRA cannot feasibly control aircraft emissions aloft, KBE acknowledges that NFRA may only want to include ground-based aircraft emissions in their sustainability plan.

3 Only considered with respect to GHG emissions. KBE can compute emissions from other pollutants if desired by NFRA.

4 Reflects FAA-forecasted increase in aircraft operations.

5 Includes EDMS assumption that GSE technology will be "cleaner" in the future.

6 Not expected to increase over 2009 levels.

APPENDIX TABLE 2

GHG Emissions Inventory Parameters and Emissions Factors

		Quantity				GHG Emissions Factors						
SOURCE	METRIC	2009	2019	2019 (WITH POTENTIAL INCREASED PASSENGER SERVICE)	UNITS	CO_2	UNITS	CH_4	UNITS	N_2O	UNITS	SOURCE
Aircraft - Jets	Fuel Burn	638,414	738,383	2,154,983	Gallons	21.095	pounds per gallon	0.0001877	pounds per gallon	0.0005198	pounds per gallon	United States Energy Information Administration Voluntary Reporting of Greenhouse Gases Program (Fuel and Energy Source Codes and Emission Coefficients), 2010
Aircraft - Piston		154,219	178,067	178,067		18.355						
GSE - Diesel		8,614	10,056	11,720		22.384		0.000534		0.0001928		
GSE - Gasoline		6,903	7,971	9,304		19.564		0.00055		0.0002		
APU		2,413	2,814	23,057		21.095		0.0001877		0.0005198		
Motor Vehicles	Miles Traveled	862,625	863,539	863,539	Miles	--	--	0.0036	grams per mile	0.0173	grams per mile	
	Fuel Burn	57,313	57,351	57,351	Gallons	19.564	pounds per gallon	--	--	--	--	
Electricity Usage	Kilowatt Hours (kWh)		1,303,259	1,303,259	kWh	1.39	pounds per kWh	0.000015	pounds per kWh	0.000018	pounds per kWh	Updated State-level Greenhouse Gas Emissions Coefficients for Electricity Generation 1998-2000, U.S. Energy Information Administration, April 2002

APPENDIX TABLE 3

2009 NFRA Emissions Inventory

Source	Criteria Pollutant Emissions (tons)						Greenhouse Gas Emissions (metric tons)			
	CO	VOC	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
Aircraft										
Startup[1]	< 0.01	2.02	< 0.01	< 0.01	< 0.01	< 0.01	115.65	< 0.01	< 0.01	116.52
Taxi-Out	43.59	12.39	0.69	0.37	0.11	0.11	822.24	0.01	0.02	828.51
Take-Off[2]	75.44	0.87	7.08	0.83	0.06	0.06	1,811.46	0.02	0.05	1,825.33
Climb-Out[2]	130.72	1.21	3.50	0.51	0.04	0.04	1,109.67	0.01	0.03	1,118.35
Approach[2]	414.32	12.72	4.00	1.21	0.17	0.17	2,604.22	0.02	0.07	2,624.79
Taxi-In	54.49	12.80	0.89	0.43	0.12	0.12	929.55	0.01	0.02	936.65
Aircraft Subtotal	**718.56**	**42.01**	**16.15**	**3.35**	**0.49**	**0.49**	**7,392.78**	**0.07**	**0.19**	**7,450.16**
Auxiliary Power Units	0.11	0.01	0.05	0.01	0.01	0.01	23.08	< 0.01	< 0.01	23.26
Ground Support Equipment	6.87	0.28	1.16	0.03	0.04	0.03	163.93	< 0.01	< 0.01	164.49
Airport Patrons (private vehicles)	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	2.19	< 0.01	< 0.01	2.22
Tenant Employees	1.70	0.04	0.02	0.01	0.02	0.01	317.78	< 0.01	0.01	322.27
Electricity Usage[6]										
Airport Authority	--	--	--	--	--	--	771.29	0.01	0.01	774.48
Tenants	--	--	--	--	--	--	50.42	< 0.01	< 0.01	50.63
Electricity Usage Subtotal	--	--	--	--	--	--	**821.71**	**0.01**	**0.01**	**825.10**
Other Fuel Usage[6]										
Airport Authority Vehicles	--	--	--	--	--	--	7.58	< 0.01	< 0.01	7.69
Other Fuel Usage Subtotal	--	--	--	--	--	--	**7.58**	**< 0.01**	**< 0.01**	**7.69**
GRAND TOTAL	727.25	42.34	17.37	3.39	0.55	0.54	8,729.06	0.08	0.21	8,795.20

APPENDIX TABLE 4

2019 NFRA Emissions Inventory

Source	Criteria Pollutant Emissions (tons)						Greenhouse Gas Emissions (metric tons)			
	CO	VOC	NOx	SOx	PM_{10}	$PM_{2.5}$	CO_2	CH_4	N_2O	CO_2e
Aircraft										
Startup[1]	< 0.01	2.33	< 0.01	< 0.01	< 0.01	< 0.01	133.61	< 0.01	< 0.01	134.62
Taxi-Out	50.38	14.35	0.80	0.44	0.12	0.12	951.57	0.01	0.02	958.82
Take-Off[2]	87.11	1.00	8.19	0.96	0.07	0.07	2,095.11	0.02	0.05	2,111.15
Climb-Out[2]	150.93	1.39	4.05	0.59	0.04	0.04	1,283.08	0.01	0.03	1,293.12
Approach[2]	478.40	14.72	4.62	1.39	0.20	0.20	3,008.91	0.03	0.08	3,032.68
Taxi-In	62.96	14.83	1.03	0.49	0.14	0.14	1,075.65	0.01	0.03	1,083.87
Aircraft Subtotal	829.78	48.62	18.68	3.87	0.56	0.56	**8,547.92**	**0.08**	**0.22**	**8,614.26**
Auxiliary Power Units[4]	0.13	0.01	0.05	0.01	0.01	0.01	30.71	< 0.01	< 0.01	30.94
Ground Support Equipment[4,5]	1.79	0.08	0.25	0.01	0.01	0.01	190.52	< 0.01	< 0.01	191.17
Airport Patrons (private vehicles)[4]	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	2.53	< 0.01	< 0.01	2.56
Tenant Employees[3,6]	1.70	0.04	0.02	0.01	0.02	0.01	317.78	< 0.01	0.01	322.27
Electricity Usage[3,6]										
Airport Authority	--	--	--	--	--	--	771.29	0.01	0.01	774.48
Tenants	--	--	--	--	--	--	50.42	< 0.01	< 0.01	50.63
Electricity Usage Subtotal	--	--	--	--	--	--	**821.71**	**0.01**	**0.01**	**825.10**
Other Fuel Usage[3,6]										
Airport Authority Vehicles	--	--	--	--	--	--	7.58	< 0.01	< 0.01	7.69
Other Fuel Usage Subtotal	--	--	--	--	--	--	**7.58**	**< 0.01**	**< 0.01**	**7.69**
GRAND TOTAL	833.42	48.74	19.00	3.90	0.60	0.58	9,918.74	0.10	0.24	9,993.99

The U.S. Customs facility at NFRA offers customs and border protection services related to general aviation international flights.

APPENDIX C:
Airports' use of Social Media

To support increased economic growth at the Airport, NFRA has initiated efforts to utilize social networks to promote its services and communicate with Airport stakeholders. This research, conducted as part of the NFRA Sustainability Management Plan, documents what social networking tools other airports are using and how airports are and managing using them, and provides an overview of some airports that have effectively used these tools to reach out to the public and airport users.

Social Networking Tools Currently Used

Airports now use a number of social networking tools to engage airport users. These sites include, but are not limited to (in order of popularity):

- Facebook pages
- customized YouTube homepages with airport-related videos
- blogs written and updated by various airport staff
- twitter accounts
- Flickr accounts (to share photos)
- LinkedIn pages, which are less commonly used than Facebook

These social media tools offer airports a forum to communicate general updates such as delays, weather, and fare sales, as well as share news about the airport, such as new development projects. In addition, airports can use these sites to receive feedback from airport users and respond to user complaints or questions. These social networking sites differ from traditional airport websites, in that airport users can communicate amongst themselves, developing an online community of airport followers.

Many airports large, medium, and small have facebook fan pages. Many of the largest airports don't have very high membership on their facebook pages, although these airports also have unofficial facebook pages, which scatter the airport's "fanbase" across multiple sites. Some of the most popular facebook pages are actually with medium and small airports.

Twitter is a website which allows its users to send and read messages called tweets, which are text-based posts of no more than 140 characters displayed on the user's profile page. These tweets are publicly visible by default and can easily be shared or "forwarded" to other users, allowing for quick spread of information.

Airport Uses of Social Networking

Airport uses of social networking vary widely from airport to airport. The most common uses include:

- Advertise fare sales for the airlines/charters that fly to the airport
- Notify people in real time of flight delays, severe weather, ground traffic re-routing, construction projects
- Post suggestions for making holiday traveling easier, and updated security directives
- Customer service portal to address complaints as people post them, or answer basic questions about the airport as people post them
- Solicit opinions for future projects and amenities, or how much something that already exists is used/liked by frequent travelers
- Keep the community up to date on attempts to attract new service, and find out what new service travelers want/need
- Create a little community buy-in for projects, or get airport supporters organized around a certain cause
- Contests and prizes to keep people excited and interested (also a good way to get people to friend the airport)
- Photo and video space for plane spotters to post to, and for airport employees to show their own photography/video

Management of Airport Social Networking Tools

Continually managing social networking sites is necessary to engage airport users and build momentum in the site's activity. Updating these sites, however, can prove time-intensive, especially for small airports. Some strategies airports have used to manage these social networking sites include:

- Assigning one of the office administrative staff to keep the sites current, posting updates, answering questions, uploading photos/video content etc.
- Creating a team of dedicated, young, and internet-savvy employees from a very diverse set of airport departments to commit to each writing a certain number of blog posts each month, and/or to manage the airport's other accounts
- Hiring a dedicated social networking coordinator or intern
- Assigning the duties to a member of the marketing or customer service team whose job will be to keep the accounts relevant and updated
- Noting on the site that the page is only updated within certain times, which helps to set expectations for the level of involvement of the Airport. Raleigh-Durham International Airport, for example, notes on its Facebook page: "This page is monitored M-F 8-5pm"

These management strategies differ based on the size and resources of the airport.

Airport-Specific Examples of Social Networking

The following presents a brief overview of how other Airports, small and large, are using Facebook and other social networking tools, with a focus on Facebook.

Small Airports' Use of Social Networking

Akron-Canton Airport has 17,000 people who "like" their facebook page, in addition to keeping a very active wall, with frequent updates from the airport itself. The Airport appears to use the wall to answer questions and address customer service issues. Akron-Canton Airport offers a prime example of how a small airport can utilize this social networking site.

Pensacola Gulf Coast Regional Airport uses Facebook to answer questions and advertise fare sales. This site offers a good example to NFRA of how another local Florida airport of similar size utilizes Facebook.

Another Airport of similar size to NFRA is **McGhee-Tyson Knoxville Airport, TN**, which has a following of 2400 people, 18 photo galleries, 2 videos, despite being a small airport.

Plattsburgh International Airport is another small Airport, like NFRA, that is in the process of attracting more commercial service. The Airport's Facebook page is fairly active, with participation from the local community, which allows the Airport gauge the needs of the community.

Shenandoah Valley Regional, Wichita Mid-Continent, Wellington, NZ, Princess Juliana St. Maarten, Chicago-Rockford, Huntsville, McAllen-Miller International, Tulsa, all have followings upwards of 2,000 people, which presents a marker for other small Airports that are developing Facebook sites.

Other Airports' Use of Social Networking

San Diego International Airport (SAN) demonstrates one of the more comprehensive and successful use of social networking. SAN's website provides 5 icons on its homepage, which link to the Airport's Facebook, twitter, YouTube, and Flickr sites as well as providing users the opportunity to sign up for text message alerts. The website also links to the Airport blog, which features many guest bloggers who are employees across departments at the Airport. An overview of SAN's social networking program, including a photo gallery is available here: http://www.examiner.com/airlines-airport-in-national/san-diego-airport-uses-innovations-and-social-networking-to-communicate

Harrisburg International Airport has a very popular Facebook page, a lengthy blog that has slideshows, (harrisburginternationalairport.blogspot.com) and a customized YouTube page called the Harrisburg Airport Observation Deck, which includes many of videos. Harrisburg is also one of the few airports with a LinkedIn page, intending it for "sharing travel experiences to/from HIA, receiving travel tips, updated airline service information, receiving updates on TSA regulations and policies, as well as providing members a forum with a direct connect to the marketing team at HIA." Harrisburg also has a Twitter page.

Cleveland-Hopkins Airport has 31,000 people who "like" their facebook page and they update it regularly, often many times a day, and have a very active "Wall", where users post photos, video, and notes (In total, the Airport has 12 photo albums, 5 videos, 76 photos posted by users, and 61 notes posted by users). They appear to use the wall to answer questions and address customer service issues. Cleveland is also one of the very few airports to have its own LinkedIn group, using it as a space to communicate about airport issues, questions, news, announcements.

Facebook Activity at Small U.S. Airports

The following table provides a summary of the number of followers (Facebook "Likes") at other small airports across the U.S. These "likes" are normalized by the number of total annual aircraft operations for each airport, providing a metric (Facebook Likes/ aircraft operation) for airports to use to measure the activity and engagement of airport users in airport-initiated social networking. The average of Facebook likes/ aircraft operation for all these airports is 0.020, usage that NFRA may seek to match.

Airport	City	State	# of Facebook "Likes"	Total Annual Aircraft Operations (2009)	Facebook "Likes" per Annual Aircraft Operation
South Bend Regional (SBN)	South Bend	IN	5,378	39,783	0.135
Yeager (Charleston/Dunbar) Airport (CRW)	Charleston	WV	4,802	62,047	0.077
Outagamie County Airport (Appleton) (ATW)	Appleton	WI	1,495	34,624	0.043
Chicago Rockford Intl Airport (RFD)	Rockford	IL	2,114	51,171	0.041
Shenandoah Valley Regional (SHD)	Weyers Cave	VA	1,078	26,268	0.041
McAllen-Miller Intl Airport (MFE)	McAllen	TX	2,092	52,623	0.040
Plattsburgh International (PBG)	Plattsburgh	NY	464	12,898	0.036
Huntsville Intl Airport (HSV)	Huntsville	AL	2,752	76,968	0.036
Eugene Airport (EUG)	Eugene	OR	1,802	73,930	0.024
Casper/Natrona County Intl Airport (CPR)	Casper	WY	741	37,653	0.020
Muskegon County Airport (MKG)	Norton Shores	MI	1,025	53,288	0.019
Ithaca Tompkins Regional (ITH)	Ithaca	NY	816	43,319	0.019
Rock Springs-Sweetwater County Airport (RKS)	Rock Springs	WY	231	14,075	0.016
Tri-Cities Regional (TRI)	Blountville	TN	874	54,109	0.016
Evansville Regional Airport (EVV)	Evansville	IN	991	63,534	0.016
Pensacola Gulf Coast Regional (PNS)	Pensacola	FL	1,429	96,515	0.015
Central Illinois Regional Airport at Bloomington (BMI)	Bloomington	IL	420	28,593	0.015
Roanoke Regional/Municipal (ROA)	Roanoke	VA	737	52,867	0.014
Tulsa International (TUL)	Tulsa	OK	1,413	117,736	0.012
Lehigh Valley Intl (Allentown/ Bethlehem) (ABE)	Allentown	PA	1,245	103,908	0.012
Newport News/Williamsburg Intl (PHF)	Newport News	VA	1,378	115,626	0.012
Poplar Grove Airport (C77)	Poplar Grove	IL	548	66,000	0.008
Bangor Intl Airport (BGR)	Bangor	ME	416	53,139	0.008
Asheville Regional Airport (AVL)	Fletcher	NC	486	66,258	0.007
Concord Regional Airport (JQF)	Concord	NC	321	56,163	0.006

Airport	City	State	# of Facebook "Likes"	Total Annual Aircraft Operations (2009)	Facebook "Likes" per Annual Aircraft Operation
Syracuse Hancock Intl (SYR)	Syracuse	NY	499	93,853	0.005
Columbia Regional Airport (COU)	Columbia	MO	118	25,442	0.005
Austin-Straubel Airport-Green Bay (GRB)	Green Bay	WI	309	79,386	0.004
Columbus GA Airport (CSG)	Columbus	GA	104	33,252	0.003
Little Rock National Airport (LIT)	Little Rock	AK	328	132,625	0.002
Atlantic City Intl (ACY)	Egg Harbor City	NJ	226	99,665	0.002
Phoenix-Mesa Gateway Airport (IWA)	Mesa	AZ	420	188,415	0.002
Orlando Sanford Intl Airport (SFB)	Sanford	FL	435	220,207	0.002
Northeast Florida Regional Airport (SGJ)	St. Augustine	FL	128	92,597	0.001
Flint-Bishop Intl Airport (FNT)	Flint	MI	45	59,368	0.001
AVERAGES	N/A	N/A	**1,076**	**70,797**	**0.020**

Sources: Facebook (accessed January 2011);
FAA Terminal Area Forecast, December 2010.

Airport Facebook and Twitter Sites

A select list of small Airports with Facebook pages include:

Airport	Web address
South Bend Regional (SBN):	http://www.facebook.com/FlySBN?v=info
Yeager (Charleston/Dunbar) Airport (CRW)	http://www.facebook.com/FlyCRW
Huntsville Intl Airport (HSV)	http://www.facebook.com/pages/Huntsville-AL/Huntsville-International-Airport/172077608486
Chicago Rockford Intl Airport (RFD)	http://www.facebook.com/FlyRFD
McAllen-Miller Intl Airport (MFE)	http://www.facebook.com/pages/McAllen-Miller-International-Airport/99420378496?v=info
Eugene Airport (EUG)	http://www.facebook.com/flyEUG
Outagamie County Airport (Appleton) (ATW)	http://www.facebook.com/ATWairportfan
Pensacola Gulf Coast Regional (PNS)	http://www.facebook.com/FlyPensacola?v=info
Tulsa International (TUL)	http://www.facebook.com/TulsaAirports
Newport News/Williamsburg Intl (PHF)	http://www.facebook.com/FLYPHF
Lehigh Valley Intl (Allentown/Bethlehem) (ABE)	http://www.facebook.com/FLYLVIA
Shenandoah Valley Regional (SHD)	http://www.facebook.com/FlySHD?v=info
Muskegon County Airport (MKG)	http://www.facebook.com/muskegonairport
Evansville Regional Airport (EVV)	http://www.facebook.com/EVVairport?v=info
Tri-Cities Regional (TRI)	http://www.facebook.com/TRIflight?v=info
Ithaca Tompkins Regional (ITH)	http://www.facebook.com/flyithaca?v=info
Casper/Natrona County Intl Airport (CPR)	http://www.facebook.com/CNCIA?v=info
Roanoke Regional/Municipal (ROA)	http://www.facebook.com/pages/Roanoke-Regional-Airport/317553150222
Poplar Grove Airport (C77)	http://www.facebook.com/pages/Poplar-Grove-Airport/149249669932?v=info

Syracuse Hancock Intl (SYR)	http://www.facebook.com/pages/Syracuse-Hancock-International-Airport/104199429633?ref=ts
Asheville Regional Airport (AVL)	http://www.facebook.com/FlyAVL?ref=ts
Plattsburgh International (PBG)	http://www.facebook.com/pages/Plattsburgh-International-Airport/51853141830
Orlando Sanford Intl Airport (SFB)	http://www.facebook.com/pages/Orlando-Sanford-International-Airport-SFB/128587715488?v=info
Phoenix-Mesa Gateway Airport (AZA)	http://www.facebook.com/PhoenixMesaGatewayAirport
Central Illinois Regional Airport at Bloomington (BMI)	http://www.facebook.com/pages/Central-Illinois-Regional-Airport/185940755374?v=info
Bangor Intl Airport (BGR)	http://www.facebook.com/pages/Bangor-International-Airport/146233101856
Little Rock National Airport (LIT)	http://www.facebook.com/pages/Fly-Little-Rock-National-Airport/367390933019
Concord Regional Airport (JQF)	http://www.facebook.com/pages/Concord-Regional-Airport/75214058569
Austin-Straubel Airport-Green Bay (GRB)	http://www.facebook.com/pages/Austin-Straubel-Airport-Green-Bay-WI/170879178502
Rock Springs-Sweetwater County Airport (RKS)	http://www.facebook.com/RockSpringsAirport?v=info
Atlantic City Intl (ACY)	http://www.facebook.com/atlanticcityinternationalairport?v=info
Columbia Regional Airport-FlyMidMo (COU)	http://www.facebook.com/FlyMidMo
Columbus GA Airport (CSG)	http://www.facebook.com/pages/Columbus-Airport-GA/116740328386233
Flint-Bishop Intl Airport (FNT)	http://www.facebook.com/pages/Flint-Bishop-International-Airport/127978140554231

The following list provides an overview of some U.S. and international airports that have active twitter accounts:

U.S. Airport Twitter Accounts

- Atlanta Hartsfield-Jackson Airport, GA (ATL) – http://twitter.com/atlanta_airport
- Baltimore-Washington International Airport, BD (BWI) – http://twitter.com/BWI_Airport
- Boston Logan International Airport, MA: (BOS) - http://twitter.com/BostonLogan
- Cedar Rapids-Eastern Iowa Airport, IA (CID) – http://twitter.com/crairport
- Eugene Airport, OR (EUG) - http://twitter.com/flyEUG
- General Mitchell International Airport, WI (MKE) - http://twitter.com/MitchellAirport
- Grand Forks Airport, ND (GFK) – http://twitter.com/gfkairport
- Harrisburg International Airport, PA (MDT) - http://twitter.com/HIAairport
- Houston – Hobby Airport, TX (HOU) – http://twitter.com/HOU
- Kansas City Airport, MI (MCI) - http://twitter.com/KCIAirport
- Los Angeles International Airport, CA (LAX) - http://twitter.com/LAX_Official
- Manchester-Boston Regional Airport, NH (MHT) - http://twitter.com/flymanchester
- Melbourne International Airport, FL (MLB) – http://twitter.com/MelbourneAirprt
- Minneapolis-St. Paul International Airport, MN (MSP) - http://twitter.com/mspairport
- Orlando International Airport, FL (MCO) – http://twitter.com/MCO

- Phoenix-Mesa Gateway Airport, AZ (IWA) – http://twitter.com/phxmesagateway
- Richmond International Airport, VA (RIC) – http://twitter.com/Flack4RIC
- San Diego International Airport, CA (SAN) - http://twitter.com/SanDiegoAirport
- San Francisco International Airport, CA (SFO) - http://twitter.com/SFOgal
- Tri-City (TN) Regional Airport (TRI) – http://twitter.com/triflight
- Tucson International Airport, AZ (TUS) - http://twitter.com/TucsonAirport

International Airports

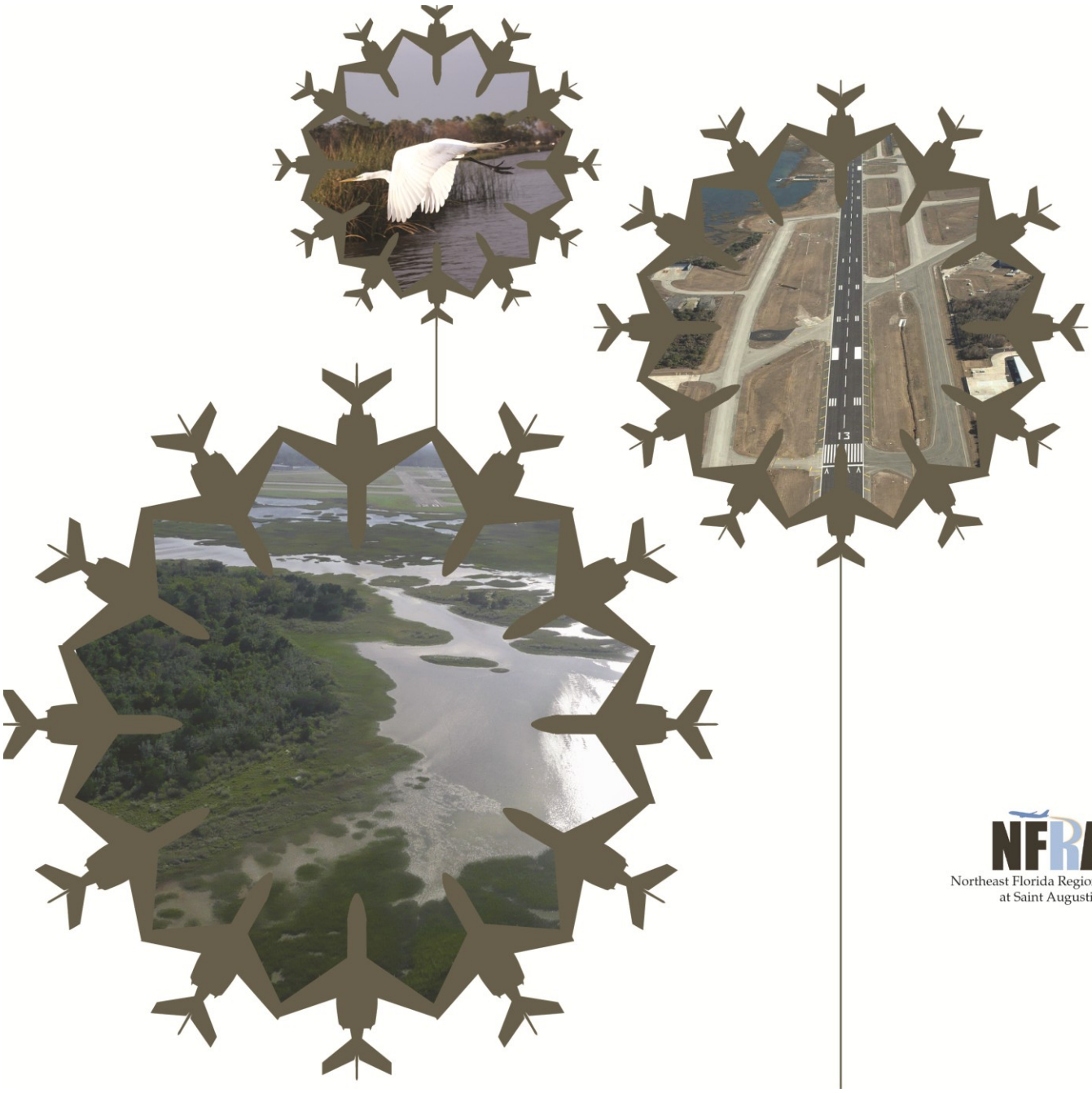
- Amsterdam Schiphol International Airport (AMS) – http://twitter.com/schipholairport
- Bristol International Airport, United Kingdom (BRS) – http://twitter.com/bristolairport
- Farnborough Airport, United Kingdom (FAB) – http://twitter.com/FarnboroughApt
- Manchester International Airport, United Kingdom (MAN) – http://twitter.com/man_airport
- Paris Charles de Gaulle (Roissy) Airport, France (CDG) -http://twitter.com/CDG
- Toronto Pearson International Airport, Canada (YYZ) – http://twitter.com/YYZ

Landscape filler grass used in NFRA's Nature Education Area.

APPENDIX D:
Report Card Outline

NFRA ANNUAL SUSTAINABILITY REPORT CARD

(TEMPLATE USING 2009 DATA)



NFRA
Northeast Florida Regional Airport
at Saint Augustine

NFRA Sustainability Mission Statement

To maintain and enhance Northeast Florida Regional Airport as a vibrant asset that serves the needs of Northeast Florida residents and businesses, promotes economic growth in the region, and operates in an economically and environmentally sustainable manner that conserves natural resources and protects the environment.

Sustainability Goals

***Economic Vitality**: Enhance growth and ensure the Airport's long-term financial sustainability by providing an innovative, competitive, and commercially viable airport that contributes to regional economic vitality.*

Community Relations: *Continue to cultivate a positive relationship with the local and regional community and communicate with the public so the Airport is viewed as a shared asset.*

***Planned Development:** Incorporate sustainability initiatives into future Airport development plans to minimize lifecycle costs and adverse environmental and social impacts of future projects.*

***Energy**: Minimize the Airport's rate of energy consumption and increase use of renewable energy sources.*

***Air Quality:** Minimize NFRA's emission of air pollutants and greenhouse gases.*

***Natural Resource Management:** Minimize unavoidable impacts to natural areas and continue to protect local biodiversity.*

***Water Quality and Conservation:** Minimize water consumption and continue to protect water quality.*

***Materials and Waste Management:** Minimize the generation and impacts of waste through materials reuse and recycling, and purchase of environmentally preferable materials.*

***Airport Connectivity:** Strengthen the Airport as a transportation hub by enhancing multi-modal transportation connectivity within the region.*

NFRA Commitment to Sustainability

This section would contain a letter from the Airport Board Chair / or Airport Director discussing how sustainability has featured in the Airport's activities within the last year.

Looking Ahead

WHERE ARE WE NOW?

Economic Vitality

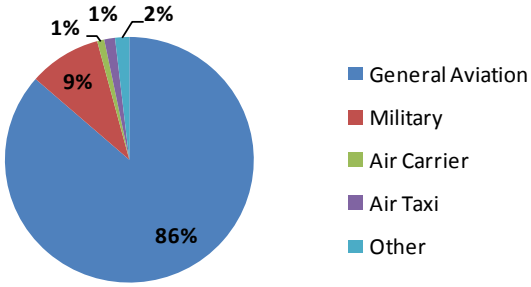
Objectives:

- *Seek financial self sufficiency.*
- *Develop and maintain commercially-viable air service to support the regional economy.*
- *Capitalize on aeronautical and non-aeronautical assets at the Airport.*
- *Develop and price facility lease rates to provide an acceptable Return on Investment (7-9% ROI).*

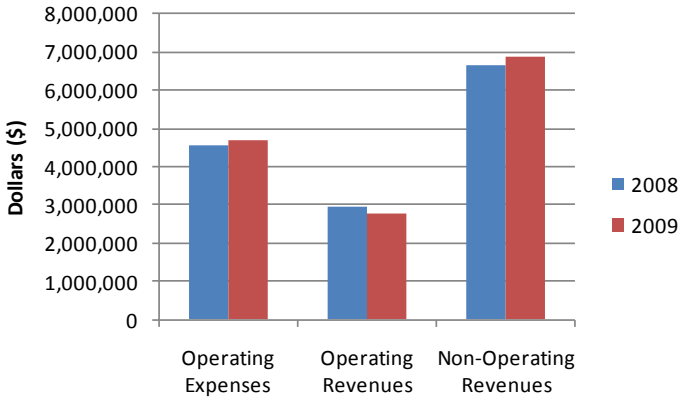
Performance Metrics:

❖ ***Markets Served***
2009: N/A

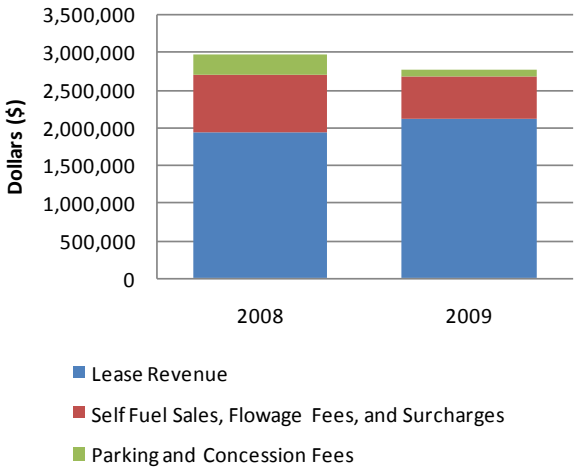
❖ ***Average Daily Aircraft Operations Breakdown***



❖ ***Expenses and Revenues***



❖ ***Operating Revenues Breakdown***



Activities & Accomplishments

Non-Aeronautical Facilities

A new multi-purpose building (the "Airport Conference Center") was designed and completed in 2010 to enhance non-aeronautical revenue generating potential. The building provides the Airport with a unique additional source of revenue from rental space on the first floor (office space) and on the second floor (meeting spaces). These rental facilities are available for public and private use such as wedding receptions, corporate functions, small convention meetings, and other gatherings for any duration.

South Hangar Development Area

The Airport recently invested in the construction of six new premium hangars with additional hangar development and associated structures in planning stages. As described in Chapter 4, these hangars were designed to minimize impacts to old-growth trees. As a result, these hangars are surrounded by existing old oak trees, offering a unique physical environment for airport hangars.

Community Relations

Objectives:

- *Increase communication with the public through various media*
- *Increase participation in community events*
- *Support aviation or airport-related educational initiatives.*
- *Promote the Airport's value to the business community and public*
- *Increase use of local vendors and suppliers*
- *Track and address noise complaints and educate pilot community about surrounding noise sensitive areas.*
- *Provide forum for the public to express concerns or provide feedback to the Airport*
- *Ensure continued well-being of Airport employees*
- *Ensure equitable Airport employment opportunities*
- *Engage all communities neighboring the Airport*

Performance metrics:

❖ ***Community Outreach***

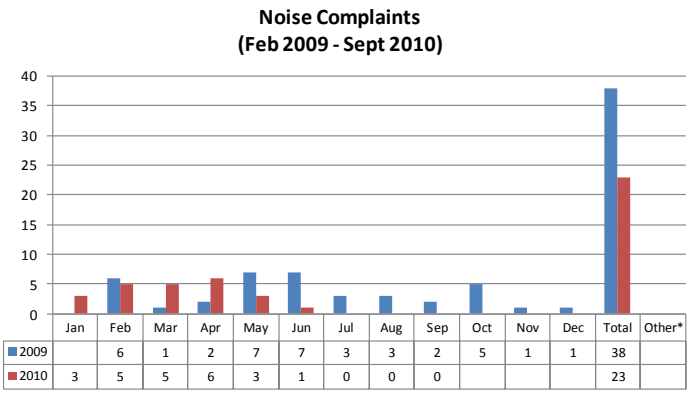
	2009	***2010***
# of community events at Airport		
# of community outreach activities		
# of media contacts/press releases		
Number of Airport tours conducted		
Number of people on tours(average/tour)		

❖ ***Social Networking***

	2009	***2010***	***Industry Average (2009)****
# of Facebook "likes"	***128***		***1,076***
# of Facebook "likes" / operations	***0.001***		***0.02***

* Compared to airports of similar size to NFRA

❖ ***# noise complaints***



* Other non-noise complaints

Activities & Accomplishments:

Partnerships with Local Schools
NFRA partners with local schools, such as the St. Johns County Aerospace Academy at St. Augustine High School and Jacksonville University (Davis School of Business), offering internships and classroom involvement with airport projects.

Airport Tours
Airport staff voluntarily provides airport tours to interested parties and community groups.

Open Meeting Policy
NFRA makes all Airport Authority meetings open to the public. In addition, some projects also have public meetings.

Press Releases
The Airport issues press releases to communicate major airport events.

Involvement in Community Affairs
Airport staff actively participate in a number of community-oriented groups, including the Airport Citizens Group, St. Augustine Airport Pilots Association (SAAPA), the Public Relations Committee, and the Park Committee.

Local Vendors
NFRA sources materials and services from local vendors and suppliers, whenever feasible, even if the costs are greater, than alternatives (while remaining competitive).

Ground Run-up Enclosure
The Airport has installed a ground run-up enclosure to minimize noise from aircraft engine run-up activity. The enclosure is used primarily by one of NFRA's largest tenants, Northrop-Grumman.

Complaint Mechanism
The Airport website provides an electronic form for the public to log noise (or other) complaints.

Community Relations (cont.)

Activities & Accomplishments (cont.):

Coordination with Neighborhood Organization
The Airport has coordinated with an organized neighborhood group concerned primarily with aircraft noise issues. This coordination has been effective in educating the group and addressing issues community proactively.

Local Volunteer Efforts
The Airport actively works with local volunteer networks such as Angel Flights, Pilots N Paws, Veterans Groups, Multiple Sclerosis Fund Raiser (MS bike ride).

Natural Buffer
NFRA's "eco-park" was designed and is being constructed partially by local youth groups in conjunction with Airport staff to promote environmental education, wellness, and natural resources protection. The park is used for passive recreation and aviation viewing/education, and also acts a natural buffer between the airport and residential land uses.

Employee well-being
A number of initiatives described in other chapters also have benefits to Airport employees. These include indoor air quality improvements such as the use of citrus-based cleaning products; integrated pest management techniques that minimize use of chemical-based fertilizers and pesticides; and designing buildings with environmentally friendly features, such as maximizing natural light, that enhance employee health and productivity

Planned Development

Objectives

- *Design new facilities and upgrade existing facilities using principles of environmental sustainability and low-impact development.*
- *Plan for rising sea levels, considering the 200-year to 500-year flood in airport development plans and rehabilitation projects, depending on the durable life of the infrastructure.*
- *Design projects to consider future airport growth scenarios.*

Performance metrics:

N/A

Activities & Accomplishments:

Land Use Compatibility Coordination
The Airport coordinates with local planning agencies to ensure that land developed contiguous to the Airport is compatible with the airport operations. Key considerations include local zoning and municipal land use planning and policies.

Low-Impact Hangar Development Project
When planning a hangar development project in a previously forested area on airport property, NFRA implemented a policy to design the hangars around the existing trees and vegetation to conserve these old growth trees and maintain local biodiversity. In cases where avoidance was not feasible, the Airport opted to relocate the trees. This project won an industry award for its outstanding commitment to protecting the environment.

Sustainable Construction Measures

The Taxiway B Rehabilitation project incorporated sustainable construction measures such as construction material reuse and waste minimization techniques. A modification of FAA Design Guidelines was issued to allow a shorter spacing length between the lights and the total length of the light array. Spoil material resulting from excavation for the taxiway extension is being used as base material to stabilize the RSA thereby reducing costs associated with new fill and fuel for spoil transport.

Energy Efficient Design of Multi-Purpose Building

The Airport designed a new multi-purpose building that incorporates energy efficient design elements as well as water efficient fixtures. In addition, this building combines several uses (office space, Airport Authority boardroom, and Airport Conference Center) into one facility, which minimizes the Airport's development footprint.

Enhancement of Facilities' Durable Life

The Airport primes and paints hangar steel beams and uses durable construction materials (despite increased expense), to extend the durable life of buildings, thereby reducing the natural resource use and saving operating and maintenance costs.

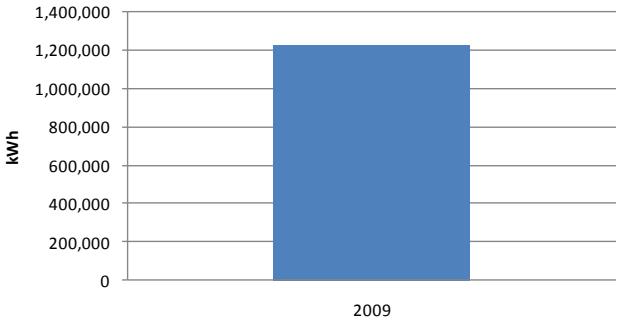
Energy

Objectives:

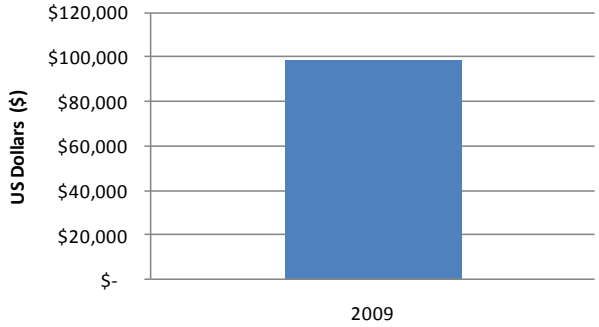
- *Enhance energy efficiency as the Airport develops.*
- *Actively pursue financially feasible generation of renewable energy sources.*

Performance metrics:

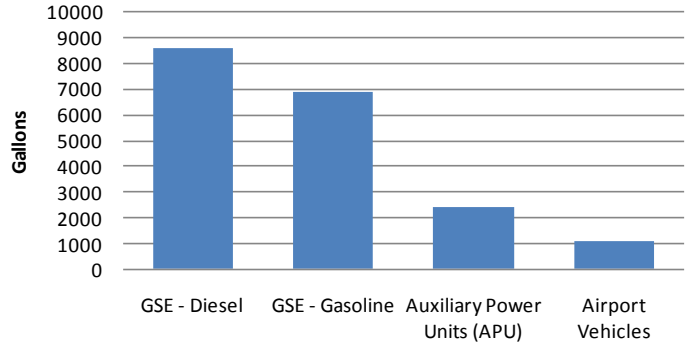
❖ ***Total Airport Electricity Usage (kWh)***



❖ ***Total Airport Electricity Costs ($)***

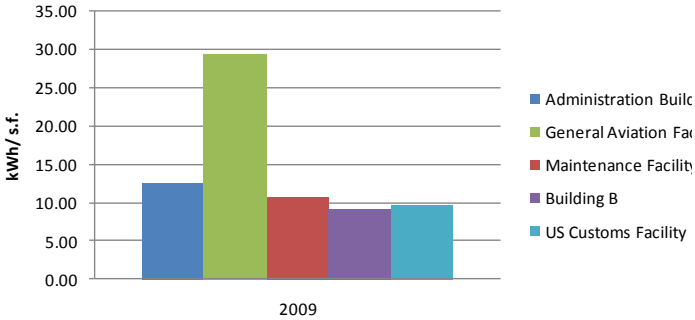


❖ ***Fuel consumption by source (gal)***



Note: Does not include Aircraft fuel use

❖ ***Energy Use of Regularly Occupied Buildings (kWh/s.f.)***



Note: 2010 data will include usage data for the conference center

Activities & Accomplishments:

Airport Policy to Purchase Energy Efficient or EnergyStar-rated Appliances

When replacing or purchasing new products, the Airport installs EnergyStar or other high energy efficiency-rated appliances.

Airport Policy to Install Energy Efficient Heating, Ventilation, and Air Conditioning (HVAC) Systems

The Airport has constructed new buildings with high-efficiency HVAC units. Old units are replaced with high-efficiency units when existing units reach the end of their durable life.

Use of Alternative Fuel Vehicles

The Airport owns one hybrid-electric vehicle and one electric golf cart. In using hybrid electric vehicles, NFRA estimated that it saved approximately 321 gallons of gasoline in 2008, corresponding to approximately $891, and 80 gallons of gasoline in 2009, or $207. Reduced savings in 2009 was attributed to decreased frequency of driving, compared to 2008.[1]

1 This calculation used average fuel consumption data for 2008 and 2009, as reported by the Bureau of Transportation Statistics division of the U.S. DOT: http://www.bts.gov/publications/national_transportation_statistics/html/table_04_23.html

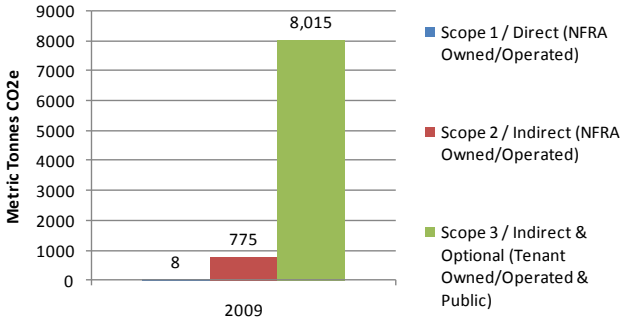
Air Quality

Objectives:

- *Seek to reduce greenhouse gas emissions from authority-controlled activities (operational emissions from aircraft are not included in this objective).*
- *Improve indoor air quality in Airport-managed facilities*
- *Encourage use of low emission vehicles, equipment and supplies*

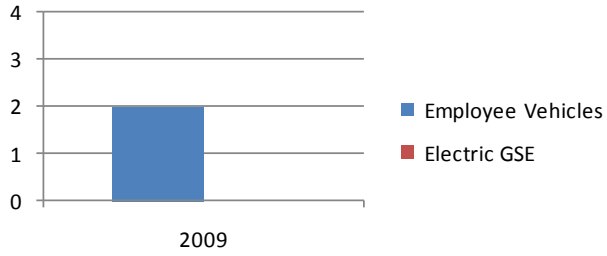
Performance metrics:

❖ ***Greenhouse Gas Emissions Inventory (Scopes 1, 2, 3)***

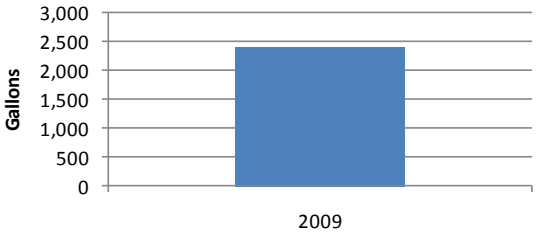


Note: NFRA's Greenhouse Gas Emissions Inventory will be conducted every 5 years

❖ ***# of Alternative Fuel Vehicles (Airport+ Tenant GSE)***



❖ ***APU Usage***



Activities & Accomplishments:

Alternative-fuel Vehicles

The Airport purchased and utilizes one electric powered golf cart in addition to the Airport's hybrid electric vehicle.

Greenhouse Gas Inventory

The Airport has conducted a GHG inventory that identifies direct (NFRA owned and operated emissions sources – motor vehicles and electricity) and indirect and operational (tenant/public owned and operated) sources.

Full Runway Access

There are currently no taxiways accessing Runway 31 at its full length. The Airport is extending Taxiway B to be fully parallel to Runway 31 thereby providing access to the full length of Runway 13-31 and reducing aircraft idling time (less emissions) for take offs on Runway 13-31.

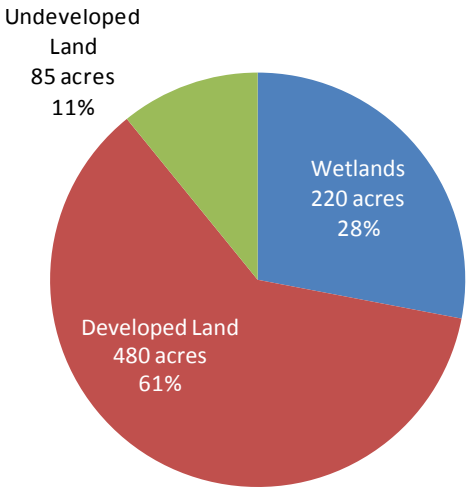
Natural Resources Management

Objectives:

- *Develop on-Airport natural areas to promote education, awareness, and conservation, while providing a natural buffer to neighboring land uses.*
- *Identify on-airport mitigation areas associated with protecting specific flora and fauna, while maintaining consistency with the Airport's Wildlife Hazard Assessment and Management Plan.*
- *Maximize water use efficiency within buildings and reduce potable water consumption and wastewater outflow as opportunities become available.*

Performance metrics:

❖ ***Airport Land Use***



❖ ***Wildlife Strikes***

Of 26 total wildlife strike incidents in 2009, 25 were birds, 1 was White Tailed Deer

Wildlife Strikes	2009
Unknown Bird- Small	12
Unknown Bird- Medium	1
Unknown Bird	1
Vulture	1
Red-Tailed Hawk	1
Brown Pelican	1
Canada Goose	1
Sandpiper	3
Killdeer	1
Gull	2
Short Billed Dowitcher	1
White-Tailed Deer	1

Activities & Accomplishments:

Airport "Eco-Park"

NFRA's park and nature trail were designed and constructed by staff and local youth groups to promote environmental education, wellness, and natural resources protection. The park is used for passive recreation and aviation viewing/education, and also acts a natural buffer between the airport and residential land uses.

On-Site Nursery

All of the Airport's open spaces are planted with items grown in NFRA's on-site nursery. This avoids transport costs and associated emissions and demonstrates the Airport's care and connection to its natural landscape.

Reduced Fertilizer/Pesticide Use

Airport has reduced fertilizing from three times annually to once per year. The Airport also utilizes integrated pest management to minimize insecticide use.

Landscape Management

The Airport regularly evaluate existing vegetation, irrigation, and maintenance frequency to ensure optimum efficiency. When planting, NFRA chooses vegetation that does not attract wildlife. In areas where trees are undesirable, NFRA favors long-term vegetation management by planting meadow or shrubs over periodic tree cutting.

Water Quality and Conservation

Objectives:

- *Maximize water use efficiency within buildings and reduce potable water consumption and wastewater outflow as opportunities become available.*
- *Continue to educate tenants on Airport Storm Water Pollution Prevention (SWPP) practices, beyond what is required*
- *Minimize development of new impervious surfaces*

Performance metrics:

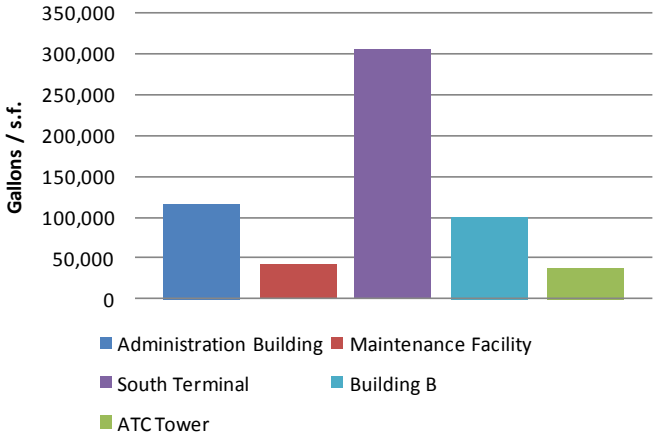
❖ ***Total Annual Airport Water Use***

	2009
Total Annual Airport Water Use	743,700
Total Annual Airport Water Costs	$6,039

Source: NFRA Water Utility Bills, 2009

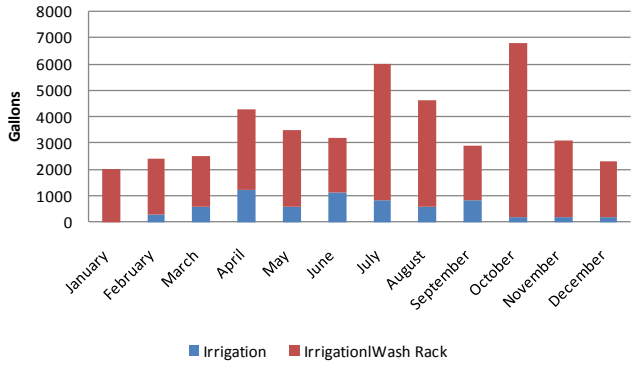
Note: 2010 data will include usage data for the conference center

❖ ***Rates of Potable Water Use for Regularly Occupied Facilities (gal/s.f.)***



Source: NFRA Water Utility Bills, 2009

❖ ***Potable water used for irrigation***



❖ ***Hazardous Material Spills***

Category	2009
Hazardous Material Spills	n/a

Activities & Accomplishments:

Water Conservation

Drip Irrigation

The Airport is transitioning to a drip irrigation system that includes rain gauges to conserve water.

Water-Efficient Fixtures

NFRA designs new buildings with low-flow toilets and motion sensor faucets contributing to the Airport's water conservation efforts.

Water-Efficient Landscaping

Wherever possible, the Airport plants drought-tolerant, native plants that are adapted to the local environment..

Artesian/Groundwater Wells

NFRA draws 90% of its irrigation water from artesian/ groundwater wells, reducing its reliance on municipal supply.

Surface Water Quality

Wash Rack Use

A wash rack has been constructed to minimize water consumption and reclamation, with strict training requirements.

Spill Containment

The Airport provides spill containment measures for its fuel farm to minimize impacts of spills, if/when they occur.

Pervious Pavement Use

Pervious pavement was installed within a portion of the terminal parking area.

Natural Stormwater Management System

NFRA has a stormwater management system that consists of ponds, ditches, and aeration systems.

Pollution Prevention Education

NFRA conducts training on spill prevention and storm water pollution prevention annually to Airport staff and tenants.

Sump Fuel Recycling

The Airport distributes an educational pamphlet on sump fuel recycling to pilots that use their facilities.

Materials and Waste Management

Objectives:

- ***Evaluate the financial and technical feasibility of providing recycling options to all airport tenants***
- ***Apply the principles of "Reduce, Reuse, Recycle, Resell"***
- ***Reduce quantity of waste generated by the Airport***
- ***Minimize hazardous materials use and hazardous waste generation wherever practicable.***

Performance metrics:

❖ ***Solid waste generated annually (cy and $)***

Note: quantity of waste disposed in 2009 was not tracked.

❖ ***Waste Diversion Rates (%)***

	2009
Municipal Solid Waste	n/a
Landscape Waste (composted)	n/a
Construction Waste	n/a
Total Waste Diversion	**n/a**

n/a – data not available

Activities & Accomplishments:

Oil and Used Battery Recycling
Airport tenants have established collection and recycling systems for oil and used batteries.

Pavement Millings
In order to reduce landfilled waste, NFRA incorporates used pavement millings into asphalt resurfacing projects.

Mulching Mowers
NFRA uses mulching mowers, which create grass clippings that remain on the lawn and serve as compost. In addition to reducing landscaping waste, this system also reduces the need for environmentally-harmful fertilizers as well saving labor costs.

Electronic Filing
NFRA has implemented an electronic file management system to reduce paper use. Airport staff scans all plans, documents, reports and require electronic project submittals. NFRA responds to all requests for documentation with electronic copies

Organic Waste Separation
The Airport's only concessionary tenant, the "Fly-By Café" recycles its restaurant grease.

Airport Connectivity

Objectives:

- *Increase multi-modal transportation options*
- *Reduce public transportation travel times to St. Augustine, Jacksonville, and Daytona Beach central business districts*
- *Promote rail transportation in the region*

Performance metrics:

Surface Transportation Activities

Surface Transportation Options	2009	
	Available at NFRA	Mode Share
Passenger Vehicle	✓	n/a
Taxi	✓	n/a
Shuttle	✓	n/a
Limousine	✓	n/a
Public Transportation (Bus)		
Rail		

n/a – data not available

Activities & Accomplishments:

Multi-Modal Station Planning
NFRA is actively participating in discussions regarding the planning of a multi-modal station at the Airport.

Continued Public Transportation Coordination
With the onset of commercial service, NFRA will coordinate with the Jacksonville Transit Authority to determine the feasibility of having renewed bus service at the Airport.

PERFORMANCE AT A GLANCE

This section Includes metrics reported in previous section, as well as other data of use the Airport. This table would be primarily for Airport internal use to review changes in performance in all areas "at a glance".

PERFORMANCE MEASURE	2009	2010
General Business		
Total Revenue		
Total Expenses		
# of Employees (FTE)		
Passenger Enplanements		
# of Operations		
# of Commercial Airlines using Airport		
# of Commercial markets served		
# of Based Aircraft		
Actual ROI of facilities		

PERFORMANCE MEASURE	2009	2010
Our People		
Training & skills		
Training days		
Employees receiving training (%)		
Health and safety		
Reportable accidents		
Employee lost time due to injuries		
Construction: reportable accidents		
Our Community		
# of contacts with community		
# of activities focused on community		
# of media contacts		
# of facebook "likes"		
# noise complaints		
# overall complaints		
Number of tours conducted		
Number of people on tours(average/tour)		

n/a – data not available

PERFORMANCE MEASURE	2009	2010

Environment		
Air Quality		
GHG Emissions (Scopes 1, 2, 3)		*Calculated every 5 years*
Scope 1		
Scope 2		
Scope 3		
# alternative fuel/hybrid vehicles*		
# electric GSE		
APU Usage(gal)		
Energy Use		
Total Airport Electricity Usage (kWh)		
Total Airport Electricity Costs ($)		
Recycling		
Solid waste generated annually (cy)		
Waste diverted from landfills (recycled, reused, or composted) (%)		
Construction waste recycled (%)		
Transportation		
Transportation mode share breakdown (if available)		
Water		
Total Airport Municipal Water Use (gal)		
Potable water costs ($)		
# of hazardous material spills		
Natural Resources		
% native tree plantings		
Acres of wetlands		

* Does not include tenant vehicles or electric GSE

n/a – data not available

NFRA

Northeast Florida Regional Airport
at Saint Augustine

Fly Smart!