

# **Airport Environmental Sustainability**

An overview of sustainability and sustainable efforts at aviation facilities in North Central Texas.

February 2011

**AIRPORT ENVIRONMENTAL SUSTAINABILITY**

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## A. GLOSSARY

This section defines acronyms and abbreviations used throughout the document.

<b>Term</b>	<b>Description</b>
AAAE	American Associates of Airport Executives
ACC	Airports Consultant Council
ACI	Airports Council International
ACRP	Airport Cooperative Research Board
ADS	Addison Airport
AFW	Fort Worth Alliance Airport
AIA	American Institute of Architects
ATA	Air Transport Association
CFC	Chlorofluorocarbons
CFL	Compact Fluorescent Lights
CPT	Cleburne Municipal Airport
CR	Climate Registry
CRRC	Cool Roof Rating Council
DFW	Dallas/Fort Worth International Airport
DOE	United States Department of Energy
EMS	Environmental Management Systems
EONS	Economic viability, Operational efficiency, Natural resource conservation, and Social responsibility
EPA	United States Environmental Protection Agency
FAA	Federal Aviation Administration
FSC	Forest Stewardship Council
GA	General Aviation
GEI	Greenguard Environmental Institute
GHG	Greenhouse Gas
GKY	Arlington Municipal Airport
GLE	Gainesville Municipal Airport
GPM	Grand Prairie Municipal Airport
GRI	Global Reporting Initiative
GSA	U.S. General Services Administration
HCFC	Hydrochlorofluorocarbons
HFC	Hydrofluorocarbons
HVAC	Heating, Ventilation, and Air Conditioning
IAQ	Indoor Air Quality
LED	Light-emitting Diode
LEED	Leadership in Energy and Environmental Design
LNC	Lancaster Regional Airport

<b>Term</b>	<b>Description</b>
LUD	Decatur Municipal Airport
MWL	Mineral Wells Airport
NCTCOG	North Central Texas Council of Governments
O&M	Operating & Maintenance
RAMP	Routine Airport Maintenance Program
RBD	Dallas Executive Airport
ROI	Return on Investment
SAGA	Sustainable Aviation Guidance Alliance
SEP	State Energy Program
System Plan	North Central Texas General Aviation and Heliport System Plan
T57	Garland/DFW Heloplex
TRB	Transportation Research Board
U.S.	United States
UST	Underground Storage Tanks
VALE	Voluntary Airport Low Emissions Program
VOC	Volatile Organic Compound

## B. INTRODUCTION

As part of the North Central Texas Council of Government's (NCTCOG) General Aviation and Heliport System Plan (System Plan), this report is intended to assist the region in understanding how the general aviation (GA) system, including vertical flight facilities, may view sustainability and what sustainable initiatives have been initiated within the region.

The definition and goals of sustainability may be vastly different depending upon the entity seeking to implement sustainable practices. Currently, there are no standard measurements upon which each facility can base its progress, and there is no single definition. Sustainability is believed, by many, to be a way of ensuring natural resources are available for future generations. For some organizations, this "green" movement goes beyond being environmentally conscious to include economic viability and social responsibility. Several applicable definitions include:

- The Brundtland Commission states that sustainability is: "*...development that meets the needs of the present without compromising the ability of future generations to meet their own needs.*"
- The Airport Cooperative Research Board (ACRP) defines airport sustainability as "*A broad term that encompasses a wide variety of practices applicable to the management of airports.*" It refers to the protection of the environment, including conservation of natural resources, social progress that recognizes the needs of all stakeholders, and maintenance of high and stable levels of economic growth and employment.
- The "Triple Bottom Line" is referred to by organizations such as the United Nations and U.S. Green Building Council (USGBC) and includes Economic Growth, Social Responsibility, and Environmental Stewardship.
- The Airports Council International (ACI) goes beyond the "Triple Bottom Line" definition by incorporating operations of the airport, "*...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.*"

An aviation facility may review all of the available resources and develop a definition that meets the goals of its unique facility. It may choose to follow the environmental, economic, and social aspects, or only one or two of these. In some cases, a single practice will fall under multiple aspects. As time continues, a more unified definition may be adopted by the public.

The sustainability movement has become one of the top priorities in the nation, as well as the world. While regulations and funding sources have been a large force behind implementing sustainable practices, public opinion is becoming a stronger driver. The public is insisting that each person and company take responsibility for the environmental consequences of their actions. There are also barriers to implementing sustainable practices, including lack of support and funding as well as knowledge on behalf of the airport staff of what steps can be taken. However, not every community supports green initiatives or policies, which can impact funding for sustainable projects.

While commercial airports surveyed for this study listed sustainability as one of their top priorities, most GA airports named other priorities such as self-sufficiency through economic and revenue growth as being more important. While it may seem that commercial airports, such as Dallas/Fort Worth International (DFW), have more opportunities and resources to implement sustainability practices, there are numerous practices that GA facilities can easily implement for

minimal or reasonable costs. Many GA airports may not realize some of their existing policies would be considered sustainability, a topic that is discussed further in Section D of this report.

### C. ORGANIZATIONAL DATA

Several organizations throughout the world contribute research or guidance on the practice of sustainability. For aviation, these primary organizations include:



Sustainable Aviation Guidance Alliance (SAGA) is, in part, made up of ACI, AAE, ACI, FAA, and ATA. From its website, SAGA is: “A broad volunteer coalition of aviation interests formed in 2008 to assist airport operators of all sizes in planning, implementing, and maintaining a sustainability program.” SAGA has developed an online sustainability database, which consolidates a variety of airport sustainable practices sources into one resource. Over 1,000 practices are listed in the database which is expected to continue growing. The initiatives can be sorted by practice category (i.e., administration, ground transportation), subcategory (i.e., community outreach, roadway design), and functional area (i.e., offices, nav aids). This greatly streamlines the process of searching, evaluating, and implementing sustainable practices. The database can be used as a resource for facilities that have a project planned, are considering improvements, have already begun construction, or desire to improve day-to-day operations and maintenance (O&M). SAGA also offers the *Sustainable Aviation Resource Guide*, which is intended to provide guidance on the planning, implementation, and maintenance of sustainability programs at airports.



The Airport Cooperative Research Program (ACRP) has been developed by the Transportation Research Board (TRB) as a method to conduct applied research on problems shared by several airport operating agencies but are not sufficiently addressed by existing federal research programs. *ACRP Synthesis 10 – Airport Sustainability Practices* was published in 2008 to inform airport operators, stakeholders, and policy makers about the range of airport sustainability practices gathered from their efforts. It conducted a survey of 25 airports worldwide to collect valuable data that at that point was spread across several entities and unevaluated.



American Associates of Airport Executives (AAAE) started a weekly brief entitled “Environmental Watch” in 2009, which provides a listing of articles from around the world that highlight environmental efforts, including sustainable practices and concerns that pertain to the aviation industry. AAE also provides training and promotes awareness through workshops and conferences.



The Federal Aviation Administration (FAA) provides support through funding certain programs that have been in place for years, including Voluntary Airport Low Emissions Program (VALE) and Environmental Management Systems (EMS), as well as standalone projects. It has also funded sustainable practices when they are part of a larger project or integrated into the infrastructure design. The integration of sustainability into the planning process is encouraged. Some facilities have included sustainability assessments and alternatives in their master plans or developed standalone documents that focus solely on developing a sustainability plan.



Air Transport Association (ATA) represents the nation’s leading airlines, playing a major role in the significant governmental decisions regarding

aviation. ATA assists with environmental initiatives such as water and air quality, noise, fuel management, aircraft drinking water, and alternative fuels.



As a representative of international airports, Airports Council International (ACI) provides assistance to many research programs, develops guidance manuals on Greenhouse Gas (GHG) Emissions, and promotes training through workshops and conferences.



Beyond assisting with the SAGA database and guidebook, Airports Consultant Council (ACC) provides training and promotes awareness through workshops and conferences.

There are additional non-aviation specific organizations that may have applicability to aviation, though they are intended as a guide to other industries, including:



State Energy Program (SEP) provides grants to states and directs funding to state energy offices from technology programs in the U.S. Department of Energy's (DOE) Office of Energy Efficiency and Renewable Energy. Special projects funded through DOE may include airport projects, when eligible. Eligible applicants are limited to State or Territorial Energy Offices or other agencies responsible for administering the SEP. Partnerships are encouraged.



Global Reporting Initiative (GRI) has adopted the Brundtland Commission's definition of sustainability and has established protocols for the development of sustainability plans.



The Climate Registry (CR) is a nonprofit collaboration among North American states, provinces, territories and Native Sovereign Nations that sets consistent and transparent standards to calculate, verify and publicly report greenhouse gas emissions into a single registry. CR works in partnership with organizations to support climate change initiatives and to develop jointly consistent and effective activities addressing GHG emissions.



American Institute of Architects (AIA) is a trade organization that offers green design education resources and grant programs which assist local design and civic organizations in producing innovative programming to increase the public's understanding and appreciation of architecture (including "green" buildings).



Leadership in Energy and Environmental Design (LEED) is an internationally recognized green building certification system. LEED was developed by the U.S. Green Building Council's (USGBC) to provide a framework and ratings system that assist designers, operators and contractors in coordinating the verification that a building or community was designed and built using practical and measurable green building

solutions. Aviation typically utilizes LEED as a base standard for design and construction of buildings, especially terminals.

Sustainable certifications for specific materials to be used in a project are available. These include:



Forest Stewardship Council's (FSC) purpose is to coordinate the development of forest management standards throughout the different biogeographic regions of the U.S., to provide public information about certification and FSC, and to work with certification organizations to promote FSC certification. The FSC certification is applied to wood materials.



Energy Star is a government sponsored program that certifies appliances that meet strict energy efficiency guidelines set by the U.S. Environmental Protection Agency (EPA) and DOE.



The GREENGUARD Certification Program is an industry-independent, third-party testing program for low-emitting products and materials, to ensure that their chemical and particle emissions meet acceptable Indoor Air Quality (IAQ) pollutant guidelines and standards. The Greenguard Certification was developed by the Greenguard Environmental Institute (GEI) and applies to materials for IAQ, children and schools, and building construction.



The Cool Roof Rating Council (CRRC), created in 1998, develops accurate and credible methods for evaluating and labeling the solar reflectance and thermal emittance (radioactive properties) of roofing products.

#### **D. POTENTIAL SUSTAINABILITY INITIATIVES FOR GA FACILITIES**

As mentioned in Section B, there are several sustainability initiatives that can be implemented for moderate to no cost, and/or within the design of a facility to be constructed. In some cases special funding or energy rebates are available for specific sustainability projects. While the following is not an exhaustive list of sustainable practices, it provides an overview of initiatives which GA facilities can implement based upon their goals, policies, and funding options.

##### Office / Employee:

- Change printers to automatically print double-sided.
- Provide airport management material online.
- Use electronic filing systems to minimize printing needs. Use recycled paper for all remaining printing needs.
- Develop and implement a recycling program for day-to-day airport operations geared toward employees, passengers, and concessions.
- Provide compost areas for grass cuttings.
- Develop employee rideshare programs / enhance connections to public transit / offer subsidized van pools, etc.

- Conduct an Energy Audit of buildings.
- Utilize environmentally friendly cleaning supplies.

#### Maintenance / Minor Capital Improvements:

- Replace existing fixtures with energy efficient fixtures:
  - Lighting – energy efficient bulbs
  - Restrooms – Low Flush Toilets, Waterless Urinals
- Use low Volatile Organic Compound<sup>1</sup> (VOC) paint, carpets and adhesives.
- Use FSC-certified wood products.
- Purchase and install furniture systems that are Greenguard Certified.
- Purchase Energy Star compliant devices.
- Use native plantings / trees to minimize irrigation needs; minimize pesticide use.
- Use high-performance glazing on windows. Enhance use of natural light where feasible.
- Replace air filters with high-efficiency filters.
- Replace vehicles with clean / alternative fuel vehicles. (Participate in the FAA's VALE including funding for intermodal connections, underground fuel hydrants, alternatively fueled vehicles, etc.).
- Remove underground storage tanks (UST) no longer in use to minimize potential leakage.
- Replace existing heating, ventilation, and air conditioning (HVAC) equipment and appliances with those that do not use harmful refrigerants<sup>2</sup>.
- Perform vehicle and equipment maintenance indoors or in an outdoor designated pavement area with impervious concrete.
- Utilize biodegradable soap when washing aircraft and vehicles.



#### Major Renovations / New Building Construction:

- Consider requiring LEED Certification Level (Certified, Silver, Gold or Platinum) for all projects.
- Replace airfield lighting with light-emitting diode (LED) lighting.
- Create a sustainability review panel that includes designers, engineers, construction managers, and contractors to ensure green building design is utilized.
- Perform lifecycle costs for all proposed energy use. Consider alternative energy sources for long-term energy efficiency (ie. solar photovoltaic panels, geothermal well field, etc.).
- Establish and follow systems with requirements consistent with sustainable design to ensure optimal performance of systems.
- Install a CRRC rated roof product or an Energy Star cool roof with equivalent reluctance and emittance properties.
- Create detailed phasing plan for construction projects to minimize construction vehicle traffic.
- Recycle construction materials removed from site.



#### Management:

- Identify a "Sustainability Director" or other position to coordinate efforts.
- Evaluate O&M costs for each project.

- Quantify progress of sustainability program in an annual report. (i.e., energy savings, amount recycled).
- Use good employee hiring practices (i.e., equal opportunity or hire local).
- Incentivize employees and tenants to follow sustainability practices.
- Follow proper fueling procedures to avoid spills / contamination.
- Request that sustainable practices and designs be included in all planning and design projects to the extent possible (i.e., energy audits, sustainability assessments, sustainable master plan, etc).
- Allow tenants to pay bills online.

Community:

- Conduct a noise study, if local community is noise sensitive; develop and implement a noise abatement plan.
- Promote / reward community contribution (i.e., volunteering).
- Develop partnerships with community groups and local businesses to promote the goals of the airport, especially when they align with the local community.
- Provide opportunities for internships, school field trips, volunteer programs, and seminars to educate the public on airport activities and their importance.
- Promote airport community value and economic impact to local economy.
- Display airport as a sustainability centerpiece of the community.

Cost Effective Projects:

How effective sustainability projects are is usually measured by savings over time or as a Return on Investment (ROI). The ROI is a performance measure used to evaluate the efficiency of an investment or to compare the efficiency of a number of different investments. To calculate ROI, the benefit (return) of an investment is divided by the cost of the investment; the result is expressed as a percentage or a ratio.

$$ROI = \frac{\text{Gain from Investment} - \text{Cost of Investment}}{\text{Cost of Investment}}$$

This can then be reviewed by the number of years it will take to receive the full return. There are a number of cost effective projects with a very high ROI that are easily attainable with minimal capital cost and in a short timeframe, such as:

- Lighting upgrades or replacements – The simple act of changing bulbs from incandescent to compact fluorescent (CFL) can yield a ROI of less than one year in most cases.
- Waste stream reduction – By reducing recyclable materials from the waste stream, costs associated with waste trucking and disposal can be reduced. The most common material to remove from the waste stream is paper, then plastic and metal. At airports with a community recycling program, the ROI is immediate. ROI in other communities is still usually worth the investment depending on the market cost of recyclable materials.
- Maintenance reducing strategies – An airport must regularly mow the grass in the airfield for clearance; planting low-mow grass can be a solution. These types of vegetation require minimal maintenance, usually only needing mowing two to three times per



*Acanthaceae* – Native Plant to East Texas 10

year versus weekly or biweekly mowing for normal grass. This can significantly reduce manpower costs as well as fuel consumption. The planting of native vegetation will also reduce costs due to the decreased care needed.

### Sustainable Master Plans

A new FAA sponsored planning initiative is “Sustainable Master Plans,” which incorporates sustainability into the traditional master planning process by identifying goals and targets based on the sponsor’s needs and desires. Once the goals and targets are identified, a baseline assessment is conducted to determine how the airport is currently performing in the identified areas. From the assessment, goals for improvement are set, and procedures to achieve these goals are developed. In addition, each development alternative is reviewed against the goals and targets to ensure compatibility. Goals and targets can be subjects such as air quality, carbon emissions, waste management/recycling, noise abatement, surface transportation, water quality and conservation, facility operations and management, and many others.

### Sustainability Assessments

A sustainability assessment is a baseline to document the airport’s current resource consumption and to determine the status of sustainability or environmental initiatives. This is accomplished through an assessment of current policies, procedures, programs and initiatives coupled with a review of current airport facilities and operations. Baseline assessments allow airports to determine what areas they would like to improve upon as well as to provide data for future comparisons to track how well an airport has met its goals. Depending on the element assessed, the data can be tracked on a monthly, quarterly, or yearly basis and analyzed to determine factors that are affecting performance and how the program can be improved. These results can also be used as a promotional tool to the public for the airport and the local government; many airports use this data in their annual reports.

### Energy Screening Assessment

An energy screening assessment is conducted through a field investigation of the current airport building and facility operations, identification of energy conservation measures, and screening analysis of these measures to identify the order of magnitude of possible energy savings and implementation costs. This review is sometimes referred to as a “facility energy audit;” the assessment primarily includes airport buildings. However, a detailed review of airfield electric use for lighting, signage, and nav aids is also completed. The identified measures are assigned a rating based on estimated costs and potential payback (i.e. A – less than 3 years; B – 3 to 8 years; C – greater than 8 years). At the conclusion of this assessment, a summary report with a listing of potential energy conservation measures and their ratings is provided.

### Greenhouse Gas (GHG) Inventory

A GHG inventory identifies all sources of greenhouse gas emissions from airport activities and operations, prepared in a format that allows for third party verification. The GHG inventory is based on the estimated emissions for the six greenhouse gases in a selected base year. A projection of the GHG inventory through a future calendar year is determined and evaluated for sustainability.

### Additional Baseline Elements

Additional elements that may be assessed and analyzed include:

- Alternative energy usage
- Waste disposal volumes and destinations
- Recycling programs

- Water usage
- Stormwater discharges
- Indoor environmental quality issues
- Grass mowing
- Cleaning and maintenance programs

### Gaining Support from Airport Sponsors and the Greater Community

Airport Sponsors are a critical element in creating or enhancing the overall sustainability goals of individual or collective airports. Gaining their support and aligning the airport's sustainability goals with the sponsors can be a complex task. Airports which foster support from the greater community, and the elected officials who serve these communities, benefit greatly. Capital improvements and the general operating costs associated with sustainable initiatives, when endorsed by the community, are likely to be funded without opposition and rancorous debates in public meetings and in the media.

There are many activities that airport management should endorse and/or sponsor which serve to build community support. In as many situations as possible, local elected and appointed officials should be invited to be a part of these programs. Officials should include members of a city's airport advisory committee, mayors and city councils, county judges and county commissioners as well state and federal officials. In addition, their district office managers should be kept informed. As an example, a community open house should include on its schedule a "kick-off" or "welcome" ceremony attended by the media. Key officials should be invited to give remarks and all elected official who are present should be recognized.



Frequent briefings of elected officials about the airport's successes and future challenges as well as opportunities are important. Officials do not want to be surprised by situations that ultimately come before them and appreciate knowing what is taking place among their constituents and the service providers in their jurisdictions. By becoming involved early in the planning process, they will often help shape the improvements and/or initiatives for which they will be asked to approve funding.

Specifically, in regards to sustainability practices, airport management should inform elected officials and the community at large about its interests and long term goals. Recycling programs, which are not costly overall, are ways to show officials the long term commitment to resource management and conservation.

## **E. REGIONAL INITIATIVES**

While there have been numerous airports around the world that have taken extensive steps to implement sustainable practices, this System Plan focuses on facilities in North Central Texas. The following is a listing of some of the initiatives and goals of these GA facilities, based on interviews and online research.

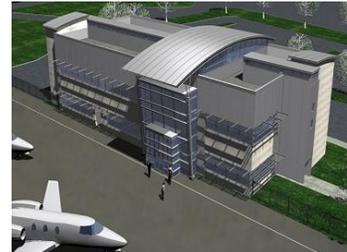
- **Addison (ADS)**  
The City of Addison is proactive in its sustainability program by providing a full guidebook on its website. The guidebook details the City's initiatives and provides ideas

for the public on topics such as recycling, green purchases, energy, air, water, parks, and transportation. The City has implemented initiatives in its facilities, vehicle fleet, information technology, recycling program, and development services.

ADS has implemented the policies as it is able with full support of the City and the airport's tenants. Therein, initiatives include participation in the City's recycling program, which includes using recycled paper, emailing documents, allowing tenants to pay bills online, and ensuring all tenants recycle to the extent possible. ADS has also purchased a hybrid vehicle for its operations agent, installed solar panels to power taxiway lights, and replaced underground fuel tanks with aboveground fuel tanks. Its goal is to have every tenant participate in the recycling program as well as to reduce all parties' overall water and energy consumption.

- **Arlington Municipal (GKY)**

The City of Arlington's biggest sustainability goal is maintaining infrastructure. GKY began constructing the first LEED certified building in the city in 2010; the new terminal building is expected to attain a gold certification. The City also has a city wide recycling program, in which GKY participates. Bike racks promote alternative modes of transportation.



- **Cleburne (CPT)**

In conjunction with the City of Cleburne, CPT seeks to operate efficiently while preserving and protecting the environment as well as cutting operating costs. It has undertaken several initiatives such as converting the lights in hangars and terminal buildings, installing low flush toilets, recycling paper and aluminum cans, and developing an extensive fueling program and waste disposal program that are environmentally responsible. The airport plans to participate in the City's future Annual Household Hazardous Collection and Electronic Recycling Events.

Airport staff also noted while the upfront cost of certain sustainable practices can be difficult to secure, they would like to have the resources to determine how they may further enhance their sustainability program.

- **Collin County (TKI)**

The City of McKinney's Office of Environmental Stewardship is committed to serving the public by fostering the responsibility to sustain care for our natural resources of land, water, air and wildlife. TKI attempts to meet this goal by implementing several sustainable initiatives in its terminal building, airport operations, and construction practices. In the offices, efforts are made to print double-sided and to encourage documents in electronic formats. Energy efficient light bulbs have been installed. An airport-wide recycling program is in place for paper, oil, tires, and batteries. Tenant materials are included with the City's economical recycling services. In addition, construction is being designed to be environmentally conscious and minimize costs; this includes utilizing existing resources and materials.



- **Dallas Executive (RBD)**

While both the City and RBD have implemented several sustainable initiatives, funding and other City priorities continue to be problematic. The airport's goals include promoting and revitalizing the facilities and monitoring O&M costs. To achieve these goals, RBD has constructed energy efficient buildings, practiced environmentally responsible management, including fueling operations, self-supporting financial operations, and promoted the Airport to the community.

- **Fort Worth Alliance (AFW)**

As a privately managed facility of the City of Fort Worth, high standards are set with the goal of keeping the airport in first class operating conditions. While funding can be a problem to implementing certain initiatives, the airport management team is secure that all of its sustainability goals are being addressed. Initiatives range from environmentally friendly office procedures such as double-sided printing to evaluating the O&M of projects to promoting the value of the airport to the local community.

- **Fort Worth Meacham (FTW)**

FTW states that the City of Fort Worth Aviation Department intends to develop a sustainability program in the near future which will identify goals; it can be assumed that these goals will affect AFW and FWS as well. The airport would ideally like to see a measurable sustainability program that can be utilized in their planning studies and construction designs. The airport plans to renovate the terminal building in the next few years to obtain LEED certification. The airport has already implemented practices such as printing on recycled paper, installing energy efficient light bulbs, and utilizing an electronic filing system and electric vehicles.



- **Fort Worth Spinks (FWS)**

FWS states that its goal through the City of Fort Worth Aviation Department is to protect the longevity of the airport surfaces, such as the runway and apron pavement. In order to accomplish this, daily inspections are completed on the infrastructure including the runway, taxiways, and lights.

- **Gainesville Municipal (GLE)**

GLE hopes to become economically self-sufficient as well as to reimburse the City of Gainesville for past operational costs. Becoming more energy efficient, thus reducing costs, is one of its main tactics to accomplish this goal. However, GLE has found that upfront costs can be prohibitive. So far, GLE has replaced light bulbs, started using a copier rather than inkjet printers for multiple copies, replaced air conditioning and heating units with energy efficient ones, reduced the heat and air conditioning usage at night, and shifted to the electronic distribution of materials.

In the future the airport hopes to install a wind generator to reduce the cost of electricity and to construct extra hangars to provide additional airport revenue.

- **Grand Prairie Municipal (GPM)**

Through GPM itself and the city administration, GPM has a broad based goal of making the airport more sustainable through various initiatives. While GPM has faced funding



difficulties when implementing initiatives, they have evaluated the O&M costs of projects, all quantifying the progress of their programs, focusing on good employee hiring practices, having a noise abatement procedure in effect, contributing to the community through volunteer programs, and promoting the airport's value and economic impact to the local community.

Plans are to replace the airfield lighting with LEDs to reduce operational costs and extend the lifespan of the lights. Airport management also hopes to implement basic office practices that reduce consumption, such as printing double sided, installing energy efficient bulbs, recycling, and using an electronic filing system. Future capital projects will focus on sustainability with the engineers applying sustainable practices at each step of the process.

- **North Texas Regional (former Grayson County) (GYI)**

With support from Grayson County and the Regional Mobility Authority, GYI has implemented several sustainable initiatives that increase energy efficiency, reduce costs, and provide for future development opportunities to become more environmentally friendly while expanding its economic potential.

GYI has developed its website to provide documents and information electronically, replaced almost all light bulbs with energy efficient ones, installed digital thermostats, added insulation to hangars during remodeling, replaced hangar roofs with steel, and used LED lights for airfield signage. Water and sewer lines have been put in place to the west side of the airport for future development.

GYI also has plans to enact compatible land use and zoning plans with its upcoming Master Plan Update. Removing and remodeling buildings that are not economically viable will continue, gaining energy efficiencies.

- **Lancaster Regional (LNC)**

LNC appreciates how the city officials are supportive of its sustainability programs, which include an oil recycling program and a stormwater prevention plan. Plans call for replacing the existing underground fuel tanks with aboveground tanks.

- **Mid-Way Regional (JWY)**

JWY has a yearly and five year maintenance plan in place to keep its pavement in good condition. It participates in TxDOT's Routine Airport Maintenance Program (RAMP), which provides funding to maintain pavement. Plans include sweeping and crack sealing.

- **Mineral Wells (MWL)**

The City of Mineral Wells would like to implement sustainable practices at MWL to reduce operational costs, but have not been able to do so due to upfront costs. Yet, the airport has taken the initiative to use recycled paper and energy efficient light bulbs as well as to plan for replacing the existing HVAC with a more energy efficient model.

From the survey data obtained, it appears that there are two main concerns about sustainability, funding and knowledge. Many of the airports are not able to obtain the funding for these projects, whether it is from lack of support from the local government or the funding source not being available to them. Many airports also cited that they are unsure what they can be doing to become more sustainable and how they would go about setting goals, obtaining funding, and

implementing the initiatives. Section F provides recommendations for overcoming these obstacles and improving the sustainability of the region as a whole.

## **F. RECOMMENDATIONS**

As sustainability is more widely understood and accepted in the future, even more information, procedures, and products will be available to airport sponsors and managers. Understanding and implementing sustainable practices when feasible is important to stay abreast of current issues as well as encourage support from the local community. Airport sponsors should expect sustainability to become tied to funding sources as the FAA and State agencies further embrace the concept. Proactive airports will benefit from investing the time and energy now into learning about how it can benefit their airport and community specifically.

It can be difficult to narrow the scope of a practical and achievable sustainability program. A definitive strategy is necessary to develop sustainability programs from both a regional and an individual facility perspective. The following recommendations are intended to assist in narrowing the focus of these efforts so an effective program can be developed.

Regionally:

1. Develop a regional task force to set achievable short-term and long-term sustainability goals for the aviation facilities.
2. Provide training and/or communication of the sustainable goals / requirements for facilities via workshops or online resources.
3. Monitor and update sustainability practices on an on-going basis with oversight by the task force.

Individual Aviation Facilities:

1. Identify staff to be responsible for monitoring and developing the facility's sustainability program.
2. Dedicate time for identified individuals to attend industry workshops, webinars / seminars, and conferences on a regular basis to stay informed about sustainability practices that are continually being enhanced.
3. Understand the special funding sources available for sustainable practices.
4. Meet with airport sponsors (i.e., elected officials, local governments, etc) to discuss sustainability, including goals, funding sources, cost effectiveness, etc.
5. Review local and regional sustainable policies and goals; dedicate staff and budgets as applicable to meet regional sustainability goals.
6. Develop facility-specific sustainability goals, in addition to those identified regionally.
7. Consistently track sustainability goals for progress and develop new goals as practical.
8. Publicize sustainability accomplishments.

## **G. SUSTAINABILITY RESOURCES**

1. Sustainability Database  
<http://www.airportsustainability.org/database>
2. Sustainable Aviation Resource Guide  
<http://www.airportsustainability.org/sites/default/files/SAGA%20Final2.pdf>
3. AAEE Environmental Watch  
<http://www.multiview.com/briefs/aaee/>

4. ACRP Synthesis 10 – Airport Sustainability Practices  
[http://onlinepubs.trb.org/onlinepubs/acrp/acrp\\_syn\\_010.pdf](http://onlinepubs.trb.org/onlinepubs/acrp/acrp_syn_010.pdf)
5. LEED Certification (USGBC)  
<http://www.usgbc.org/DisplayPage.aspx?CategoryID=19>
6. Greenguard Certification (GEI)  
<http://www.greenguard.org/>
7. Energy Star Certification  
<http://www.greenguard.org/>
8. Forest Stewardship Council (FSC)  
<http://www.fscus.org/>
9. City of Addison “Addison Green”  
<http://www.addisongreen.info/>

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<sup>1</sup> Volatile Organic Compound is used in reference to paint products; these compounds vaporize at normal room temps. A low VOC is better.

<sup>2</sup> Harmful refrigerants include Chlorofluorocarbons (CFC) - refrigerants that deplete the stratospheric ozone layer, Hydrofluorocarbons (HFC) - refrigerants that do not deplete the stratospheric ozone layer, but have high global warming potential, and Hydrochlorofluorocarbons (HCFC) - refrigerants that deplete the stratospheric ozone layer, but to a lesser extent than CFCs.