HTS

SUSTAINABLE MANAGEMENT PLAN

Huntington Tri-State Airport (HTS) | Huntington, West Virginia

DRAFT FINAL

June 2015

CHA

SUSTAINABLE MANAGEMENT PLAN

Huntington Tri-State Airport (HTS) | Huntington, West Virginia

TABLE OF CONTENTS

APPENDICES

THIS PAGE LEFT INTENTIONALLY BLANK

Section 1.0
INTRODUCTION

GATE
1

WELCOME TO
TRI-STATE AIRPORT
MILTON J. FERGUSON FIELD

1.0   INTRODUCTION

The Tri-State Airport Authority (Authority) is taking a holistic approach to the management of its assets and resources. This is being done to ensure the operational viability of the Huntington Tri-State Airport (HTS) and its service to the traveling public well into the future. To that end, the Authority has developed this Sustainable Management Plan to incorporate the principles of sustainability into the everyday operation and long-term planning of the Airport.

1.1   WHAT IS SUSTAINABILITY?

The global sustainability movement has emerged in response to concerns about the unintended social, environmental, and economic consequences of rapid population growth, economic growth and consumption of natural resources. There may be as many interpretations of "sustainability" and "sustainable development" as there are groups trying to define it; however, all definitions are founded on the overarching principal of sustainability as identified by the United Nations' Brundtland Commission in the early 1980s (Report of the World Commission on Environment and Development: Our Common Future, **http://www.un-documents.net/our-common-future.pdf**).

... development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

From this, the concept of sustainability has progressed and many organizations have adopted management philosophies that go beyond the traditional measures of financial performance and integrate the environmental and social dimensions of *Economic Growth*, *Social Responsibility* and *Environmental Stewardship*. These are also commonly referred to as the three pillars of sustainability, or **People**, **Planet**, and **Prosperity**.

From an organizational management perspective, implementing sustainability encompasses a wide variety of practices that are aimed at:

- Promoting "social progress" and ensuring organizational goals are achieved in a way that is consistent with the needs and values of the local community – **People**

- Protecting of the environment by reducing impacts and conserving natural resources – **Planet**

- Maintaining high and stable levels of economic growth and employment – **Prosperity**

"Social progress" is the capacity of a society to meet the basic human needs of its citizens, establish the building blocks that allow communities to enhance and sustain the quality of their lives, and create the conditions for all individuals to reach their full potential.

–SocialProgressImperative.org

1.2 SUSTAINABILITY AT AIRPORTS

Previously, government agencies acted primarily as environmental watchdogs, striving to ensure that industries met legal requirements to control pollution. Today, these agencies are developing tools, theories and practices to move from controlling pollution to preventing it. These efforts draw on advances in science and technology to protect human health and the environment, and promote innovative green business practices. To that end, the U.S. Federal Government enacted the following regulations:

- Executive Order 13423: *"Strengthening Federal Environmental, Energy, and Transportation Management"* of 2007 set policy and specific goals for federal agencies to "conduct their environmental, transportation, and energy-related activities under the law in support of their respective missions in an environmentally, economically and fiscally sound, integrated, continuously improving, efficient, and sustainable manner."

- Executive Order 13514: *"Federal Leadership in Environmental, Energy, and Economic Performance"* of 2009 enhances EO 13423 "to establish an integrated strategy towards sustainability in the Federal Government and to make reduction of Greenhouse Gas (GHG) emissions a priority for federal agencies."

Even prior to these initiatives, airports that receive funding from the Federal Aviation Administration (FAA) have been responsible for developing their facilities in accordance with the National Environmental Policy Act (NEPA). In addition to upholding the regulatory requirements of NEPA, the FAA previously

initiated, and currently maintains, some sustainability oriented environmental programs. These include the "Part 150" Noise Compatibility Planning Program (started in 1984) and the Voluntary Airport Low Emissions Program (VALE) (started in 2005). In response to the more recent federal directives, the FAA embarked on an Environmental Management System program (in 2007) and a Sustainability Master Plan Pilot Program (in 2010).

The Sustainability Master Plan Pilot Program began with the purpose of making sustainability a core planning and management objective and not a secondary activity. Since the introduction of the program, the FAA has funded sustainability studies at numerous airports across the United States. As part of the pilot program, the Tri-State Airport Authority received a grant from the FAA to develop this **Sustainable Management Plan** as a companion study to its *2014 Master Plan Update.*

1.3 SUSTAINABILITY PLANNING PROCESS

Over an 18-month period, the Authority prepared this Sustainable Management Plan with the following objectives in mind:

- Identify achievable actions that will have the greatest return on investment to the People, Planet and Prosperity

- Engage the various stakeholders and tenants to build awareness of, and commitment to, sustainability of the Airport

- Develop a sustainability program that is easy to implement and that provides mechanisms for monitoring performance and opportunities for continued improvement

- Develop a culture of sustainability within the Airport organization

The process began with an assessment of the existing airport facilities and operations, and working with a group of stakeholders to identify current sustainable (or "green") activities being performed at the Airport and within the neighboring communities. This information was used to identify resources of concern, potential issues, and opportunities for improvement. From those findings, strategic goals and focus areas to be addressed in the plan were identified. Objectives for each of the focus areas were established and baseline assessments were performed. This included an Energy Efficiency Assessment (or Energy Audit) of the 20 airport buildings owned and maintained by the Authority. It also included an inventory of GHG emissions related to automobile and aircraft activity, as well as the equipment used to service the airlines and maintain the airfield. Actions that would support achieving the objectives and overarching sustainability goals were identified and prioritized based on their total benefit, investment payback period, and ease of implementation. This resulted in an action plan and performance targets being established for each of the focus areas. Finally, a process for monitoring plan performance was established. This programmatic process is depicted in **Figure 1-1** and will be periodically revisited to ensure that the Airport's **Sustainable Management Plan** remains relevant and effective, and that the Authority is continually improving its programs and processes.
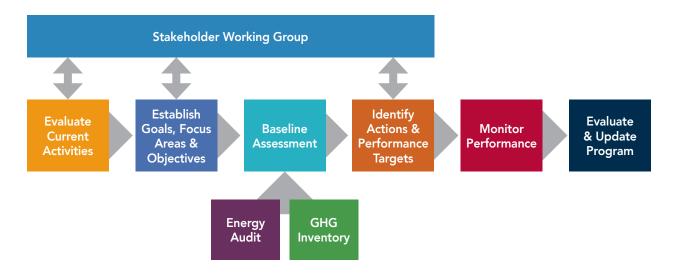
Figure 1-1: Sustainability Planning Process

1.4   INTEGRATION WITH AIRPORT MASTER PLAN INITIATIVES

As mentioned previously, this **Sustainable Management Plan** was prepared as a companion study to the Airport's *2014 Master Plan Update*. The Master Plan is a comprehensive evaluation of the airside and landside facilities needed to meet public air travel demand over a ±20-year planning horizon. These two (2) strategic planning studies are distinctly interrelated—sharing baseline information and building upon the Master Plan's earlier findings. Each study also had a stakeholder involvement program that shared some members, thereby adding to program continuity and fuller community integration. Cumulatively, these studies have created a long-term development vision for the Airport that provides flexibility to adapt to changing market conditions and reflects the operational, social, economic, and environmental factors that will lead to a sustainable future.

Section 2.0
ABOUT THE HUNTINGTON TRI-STATE AIRPORT

2.0　ABOUT THE HUNTINGTON TRI-STATE AIRPORT

In 1948, Cabell County, Wayne County, the City of Huntington, the Town of Ceredo, the City of Kenova, and the Huntington Industrial Corporation joined together to form th Tri-State Airport Authority. After three (3) years of land acquisition, design and construction, HTS was opened in 1952 to serve as the main airport of the Tri-State Region. The Airport opened with a 4,600' paved runway which was subsequently extended in 1956, 1973, and again in 2010 resulting in the current 7,017' length. A 3,007' crosswind runway was constructed in the 1970's to serve the smaller private aircraft but was closed in 2009. The ±100 acre graded site of the previous crosswind runway is now available for aviation and non-aviation related development. The passenger terminal building was dedicated in 1961, expanded in 1979, and partially renovated in 1995 and 2013. Throughout the years, additional taxiway, apron, and navigational aid improvements have been implemented to enhance operational efficiency and meet the needs of the FAA and the traveling public. Hangars, office space, and support facilities have also been developed in response to tenant and local business needs.

2.1　EXISTING CONDITIONS

Today, the Airport encompasses approximately 1,154 acres of property within Wayne and Cabell counties. The Airport provides facilities and services capable of accommodating numerous aircraft operators, including private piston-engine aircraft, corporate jets, commercial airlines, air-cargo and military aircraft. The Tri-State Airport connects the region to the global transportation network and plays a significant role in the nation's air travel system. The Airport predominately draws customers from the Huntington Metropolitan Statistical Area (MSA), which

includes the counties of Wayne, Cabell, Lawrence, Greenup, and Boyd. Passenger traffic tripled between 2006 and 2010, due mostly to route expansion and the introduction of Allegiant Airlines. In 2010, the Airport enplaned approximately 117,000 passengers. Despite a decrease in activity through 2012, due to airline mergers and route changes within the airline industry, further growth in passenger and aircraft activity is projected over the 20-year planning horizon.

To meet the needs of these travelers and maintain the highest levels of safety and cost effectiveness, the 2014 airport master planning process identified several recommended facility improvements. The improvements focus on enhancing customer service and operational efficiency by:

- Expanding and rehabilitating the terminal facilities

- Improving taxiway configuration and airfield circulation

- Providing additional paved automobile parking

- Centralizing general aviation facilities on the south side of the airfield and commercial aviation facilities on the north side

- Consolidating HAZMAT storage facilities

- Promoting compatible land use, both on and off airport property, including the development of general commercial and business land uses

2.2   VISION, MISSION AND CORE VALUES

The Authority's vision is to establish an "aviation ecosystem" that is anchored by a leading-class airport facility surrounded by prospering aeronautical and non-aeronautical organizations and businesses. To achieve this, the Authority's management philosophy and mission are built around the needs of its customers and the community as stated below:

> *"The mission of the Tri-State Airport is to plan, operate, maintain, develop and promote a premier air transportation facility in the best interest of the citizens of the Tri-State Region. We shall strive to provide and improve commercial air service and other aeronautical and related services essential to the economic development and vitality of the community; and to be the preferred airport for both business and leisure travelers."*

The following core values define what matters most to the Authority and airport staff and helps guide the way they conduct business and perform their duties. Staying firmly rooted in these core values will enhance the Airport as a self-sustaining enterprise and allow the Authority to capitalize on opportunities as they arise in the future.

CORE VALUES	Ethical → Professional → Visionary
	Accountable → Respectful → Service with a "Can Do Attitude"
	Transparent → Responsive → Sustainable
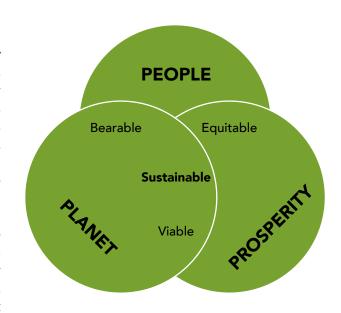
MANAGING SUSTAINABILITY AT THE TRI-STATE AIRPORT

3.0 MANAGING SUSTAINABILITY AT THE TRI-STATE AIRPORT

Sustainable development is achieved when the *Economic Growth*, *Social Responsibility* and *Environmental Stewardship* components of sustainability are in balance. The Authority views this Sustainable Management Plan as a strategic endeavor to leverage the Airports full potential and benefit to the community. The effort is also necessary to safeguard and enhance the public's investment in the Airport.

The Authority's vision, mission and core values form the foundation of this Plan. To anchor the fundamentals of sustainability into the Airport's management structure, the Authority has made a commitment to implementing sustainable practices and has identified several overarching programmatic goals.

PEOPLE

Bearable   Equitable

Sustainable

PLANET   Viable   PROSPERITY

3.1 COMMITMENT TO SUSTAINABILITY

The Authority is dedicated to conducting business in a way that meets the needs of today without compromising the ability of future generations to meet their own

needs. As a key transportation hub and economic driver, they understand that the long-term well-being of the community and of their employees, the health of the environment, the prosperity of the region, and the continuing success of the Airport depends on their commitment to a sustainable environment. The Authority will become a leader in sustainable practices for airports and for the region.

From an airport management perspective, the Authority's sustainability program will focus on actions that support the following goals:

- Promote social progress
- Enhance the customer experience
- Protect and conserve natural resources
- Reduce the Airport's carbon footprint
- Increase efficiency and reduce operational and maintenance costs
- Promote local and regional economic growth

3.2   ORGANIZATIONAL STRUCTURE

The Airport is managed by a full-time Airport Director, a Director of Operations and Maintenance, Police Chief, Financial Director, Marketing Director, Airline Station Manager, Human Resources Coordinator, and a support staff of approximately 45 full-time and part-time people. In late 2013, the senior staff began implementing changes to some of their internal policies and procedures to incorporate green practices. The role of Recycling Coordinator was assigned and subsequently tasked with expanding recycling activities on the Airport and providing resources to the various tenants to do the same. These activities began the shift towards a culture of sustainability at HTS.

3.3   SUSTAINABILITY WORKING GROUP

In the preparation of this **Sustainable Management Plan**, a stakeholder working group was assembled to help guide the study and identify internal and external factors that could influence the Airport's ability to become more sustainable. The group included airport staff, the airlines, various tenants, local universities, the Metropolitan Planning Organization (MPO) KYOVA Interstate Planning Commission, and representatives from local town and county governments.

At the outset of the study, the working group participated in an evaluation of the Airport's strengths, weaknesses, opportunities and threats relative to the efficient and long-term operational sustainability of the facilities (i.e. S.W.O.T. analysis). Sustainable (or green) activities taking place at the Airport and in the surrounding communities were identified and the group provided insight as to what the Airport was doing well, what topics of concern there may be, and what could be improved upon to enhance overall efficiency and customer experience at the Airport. The group acknowledged the Authority's dedication to providing a high level of customer service and traveler convenience. They also acknowledged the Authority's dedication to fiscal responsibility by maintaining low operational and maintenance costs. While a variety of other programs and issues were discussed, several topics emerged as common

priorities for all stakeholders. These included alternative energy, solid waste and recycling management, energy efficiency, and advancing sustainability within the state of West Virginia.

3.4   STRATEGIC FOCUS AREAS AND OBJECTIVES

Information gathered from the working group, combined with guidance from the FAA and industry best practices, was used to identify the most relevant sustainability topics, or "focus areas" that this Plan should address. Objectives aimed at supporting the overarching sustainability goals were also identified for each of the focus areas. The focus areas, associated objectives, and how those objectives support the sustainability goals are identified in the following table.

THIS PAGE LEFT INTENTIONALLY BLANK

FOCUS AREA GOALS AND OBJECTIVES

Overarching Sustainability Goals

Focus Areas	Objectives	Social Progress	Customer Experience	Protect and Conserve Natural Resources	Reduce Carbon Footprint	Reduce O and M Cost	Economic Growth
ADMINISTRATION	➤ Integrate sustainable approaches and practices into the internal policies, business processes, written agreements, day-today operation, and long-term planning of the Airport	✈	✈	✈	✈	✈	✈
	➤ Provide opportunities and incentives to improve the health and well-being of the employees	✈				✈	
	➤ Develop the HTS workforce through proper recruitment, training, retention and diversity	✈	✈			✈	✈
WASTE MANAGEMENT AND RECYCLING	➤ Minimize the amount of solid waste generated and disposed of in local landfills			✈	✈	✈	
	➤ Maximize collection and re-use of recyclable materials			✈	✈		
	➤ Ensure that hazardous materials are properly stored and handled and do not pose a threat to the environment or human health	✈		✈	✈		
ENERGY MANAGEMENT	➤ Maximize energy efficiency and minimize energy consumption within buildings and airport property			✈	✈	✈	
	➤ Evaluate and implement alternative energy procurement programs and renewable source generation			✈	✈	✈	✈
WATER RESOURCE MANAGEMENT	➤ Maximize water conservation and minimize potable water use within Airport facilities			✈	✈	✈	
	➤ Protect regional water quality through effective stormwater management and pollution prevention initiatives	✈		✈	✈		
AIR QUALITY	➤ Minimize greenhouse gas emissions associated with airport activities	✈		✈	✈		
	➤ Develop and operate airport facilities in accordance with federal NEPA provisions for criteria air pollutants			✈	✈		
GREEN CONSTRUCTION	➤ Integrate sustainable approaches and practices into the design and construction and of facilities on the Airport			✈	✈	✈	
COMMUNITY CONNECTION	➤ Promote compatible on- and off-airport land uses that support continued airport operations and minimize impacts to the surrounding communities	✈		✈			✈
	➤ Strengthen partnerships with local government, educational and community organizations						✈
	➤ Engage the public through dedicated outreach, education, and involvement in the long-term planning for the Airport	✈	✈				✈
	➤ Foster intermodal transportation options to and from the Airport	✈	✈	✈	✈		

THIS PAGE LEFT INTENTIONALLY BLANK

Section 4.0
FOCUS AREA EVALUATIONS

TRI-STATE AIRPORT
HUNTINGTON · W · VA

4.0   FOCUS AREA EVALUATIONS

4.1   ADMINISTRATION

The success of any program, including this **Sustainable Management Plan**, depends on the strength of its organizational structure and the commitment of its participants. The Authority has committed to implementing environmentally and socially responsible business practices throughout the Airport. Effective oversight of this program, however, will require a focused effort by key airport staff members. Implementation will rely on the cooperative efforts of all staff, tenants and several of the stakeholders.

Sustainability objectives related to the administration of the Airport are:

- Integrate sustainable approaches and practices into the internal policies, business processes, written agreements, day-to-day operation and long-term planning of the Airport

- Provide opportunities and incentives to improve the health and well-being of the employees

- Develop the HTS workforce through proper recruitment, training, retention and diversity

The following addresses several administrative items that relate to the ongoing management of the Airport and identifies opportunities for advancing the sustainability initiative and garnering the greatest benefit to the **People**, **Planet** and **Prosperity**.

4.1.1   Sustainability Team

Day-to-day management and operation of the Airport is conducted by a team of approximately 45 Authority employees. This team is led by the Airport Director who is responsible for managing the Airport's annual operating budget, strategic planning, and Capital Improvement Program (CIP). The executive staff includes the Director or Operations and Maintenance, Police Chief, Financial Director, Marketing Director, Airline Station Manager, and Human Resource Manager. The remaining employees are distributed among the departments and provide a variety of services, including administration and marketing, operations management, line service, building maintenance, custodial duties, field maintenance, and Aircraft Rescue Fire Fighting (ARFF).

In early 2014, the Authority started emphasizing the importance of "greening" their daily activities and assigned the duties of a "recycling coordinator" to one of the current staff members. This **Sustainable Management Plan** is intended to be a living program that is easy to implement. It is not envisioned to be burdensome to the staff members charged with its oversight. To effectively manage this program along all levels of the organization and within all day-to-day operations, it is recommended that the Authority establish a Sustainability Oversight Team or Committee. This Team could be the executive staff previously described, or a smaller subset thereof. This group would act as the Airport's

ACTION
Establish an inter-departmental Sustainability Committee

sustainability champions and seek opportunities to integrate sustainable solutions and practices at HTS. They would be responsible for reviewing current policies, procedures and programs, and for making recommendations to the executive staff or Airport Director on ways to become more sustainable. They would also be responsible for coordinating any needed improvements, monitoring and reporting on the program's performance as described in **Section 5.2**.

ACTION
Develop an airport tenant Sustainability Working Group

To build partnership between the Authority and the various airport tenants, involvement in the Sustainability Working Group could be expanded to include a subgroup of tenants and service providers. This would provide the Sustainability Committee a broader perspective on sustainability issues and ease the implementation of green policies and procedures.

In conjunction with this, commitment from the tenant community could be strengthened by individual tenants becoming signatory to an "airport sustainability pledge" thereby acknowledging acceptance of the principles of sustainability in their business dealings and daily operations. While this approach would be considered a voluntary commitment, participation could be elevated through lease agreements by requiring tenants to establish their own corporate sustainability policy.

ACTION
Obain tenant commitment to sustainability

4.1.2   Awareness and Education Campaign

To build a culture of sustainability for the Airport, the Authority and its staff will need to disseminate program information or "spread the word" about sustainability. An effective communication program

will reach internal and external audiences and provide both education and awareness of sustainability issues and their intended benefits. Multiple channels of communication, some of which are already in place at HTS, could be utilized to reach the diverse group of airport stakeholders and garner the needed acceptance. A common theme within these communications should be identifying what individuals can do to contribute to the sustainability of the Airport and surrounding communities.

ACTION

Develop a multi-channel, sustainability awareness and education campaign that reaches staff, tenants and the general public

Some specific considerations when developing and implementing the awareness and educational campaign include:

- **Staff Training** – include sustainability education and staff expectations in the employee initiation process and any employee handbooks or manuals. Hold recurrent sustainability training events. Distribute a periodic sustainability oriented newsletter to staff (and possibly tenants).

- **Staff Incentives** – include a sustainability or "green" metric in the staff performance evaluation process. Spur staff adoption and creativity by recognizing, or incentivizing, personnel that bring implementable recommendations to the Sustainability Oversight Team. Personnel could also be recognized for any outstanding contributions they provide to the overarching sustainability goals for the Airport. Some sort of award program could be developed on either a contest or nomination basis.

- **Tenant Outreach** – build awareness of sustainability matters with the various tenant groups and identify how they can contribute to the sustainability objectives and what benefits they could expect from their participation. This could be achieved through regularly scheduled tenant meetings and/or newsletters similar to those items described for the staff training program. Incentivizing tenant participation through an awards or recognition program could also increase tenant acceptance and participation.

- **Best Sustainability Practices** – the Authority already has several programs in place that guide day-to-day activities and support the principles of sustainability. Examples include: maintaining a non-smoking facility; a Stormwater Pollution Prevention Plan (SWPPP); a Wildlife Hazard Plan; a Spill Prevention Containment and Countermeasures Plan (SPCC); and a recycling program. On many fronts, airport staff and tenants are already beginning to incorporate sustainable actions; however, there is always opportunity to improve the existing practices and expand the program to do more. In conjunction with the education and awareness campaign, each department could develop a list of best sustainability practices relative to their operational functions and area of responsibility. While these could evolve into more strict standard operating procedures or policies in the future, gradual implementation may ease acceptance. Items that could be included range from establishing default double sided printing and going "paperless", to increasing use of web-based video conferencing, to landscape procedures that avoid fertilizers and identifying no-mow zones (that do not create a wildlife hazard). Examples of numerous other practices can be found on the Sustainable Aviation Guidance Alliance (SAGA) database (**http://www.airportsustainability.org/database**). SAGA is broad volunteer coalition of aviation interests formed in 2008 to assist airport operators of all sizes in planning, implementing, and maintaining a sustainability program. The database is an extensive, searchable resource of

sustainability practices that can be tailored to the unique requirements of airports of all sizes and in different climates/regions in the United States.

- **Public Outreach** – promote sustainability awareness to the general public through the various information channels already used by the Authority. This can include the Airport's website, social media (Facebook, Twitter, etc.), signage and other publications. In addition to garnering local support, these channels can be used to acknowledge the Airport's sustainable achievements and report on the program's overall performance.

4.1.3   Operating Documents

ACTION

Review and incorporate sustainability clauses into the airport operating documents

An airport is a diverse collection of systems and tenants, providing an array of facilities and services to varied groups of users. In order to maintain the highest level of safety and quality of service to those users, the Authority has implemented several mechanisms to help govern tenant and user activities. These mechanisms also protect the interests of the Authority and ensure consistent and fair treatment of all tenants. These mechanisms are in the form of primary operating documents which include tenant leases, contracts, Rules and Regulations (April 2010), various policies, and other standard operating procedures. As described below, integrating sustainability concerns into these documents will support the long-term viability of the Airport.

- **Lease Agreements** – The Authority maintains a variety of leases, including terminal building and office space, airline space, food and retail concessions, rental car facilities, developed and undeveloped ground leases, and hangar and apron space. Landlord and tenants must work together to develop high-performance buildings and maintain healthy, productive work environments. Historically, property owners and tenants have had difficulty integrating sustainability into the lease process due to differences over responsibilities and cost-sharing arrangements. The lease plays an important role by laying the groundwork and ensuring a win-win outcome with the tenants.

  The Authority is encouraged to build clauses into new, modified or renewed lease agreements that improve sustainability on many fronts such as reducing external environmental impact and resource consumption while improving the indoor environment and health and productivity of the occupants. Examples include requiring the establishment of a corporate sustainability policy, allowing cost-sharing for energy-saving improvements, ensuring tenants build offices to green standards, sharing access to energy use information and encouraging cooperation on airport environmental programs (e.g. Sustainability Team, recycling program). It must be acknowledged that many of the existing leases are long-term agreements, and it will likely take several years for sustainability clauses to be integrated into all of them.

  The commercial real estate industry has prepared substantial amounts of guidance, based on case studies and lessons learned, regarding the implementation of sustainable practices into the development, leasing and maintenance of commercial properties. Industry resources with guidance on preparing "green leases" include the Institute for Market Transformation (**http://www.greenleaselibrary.com/winners.html**), the U.S. Green Business Council "Green Office

Guide" (**www.gcbi.org**), and Core Net Global (**http://sustainability.corenetglobal.org**). The Airport Cooperative Research Program (ACRP) also provides airport specific lease and contract guidance in their Synthesis 42 report Integrating Environmental Sustainability into Airport Contracts (**http://www.trb.org/Publications/Blurbs/169023.aspx**).

- **Contracts** – The Authority procures a variety of services including professional consulting, engineering design, advertising, and construction. While the current contracts may broadly require compliance with any local, state and federal environmental requirements, there is opportunity to integrate language that will help drive sustainability both at the Airport and within the community. Two (2) resources providing guidance and examples of integrating sustainability clauses into standard contracts include:

  — *ACRP's Integrating Environmental Sustainability into Airport Contracts* (**http://www.trb.org/Publications/Blurbs/169023.aspx**)

  — *American Institute of Architects (AIA) Sustainable Projects Contract Documents* (**http://www.aia.org/contractdocs/aiab093903**).

- **Rules and Regulations** – The 2010 *Tri-State Airport Authority Rules and Regulations* apply to all users, tenants and employees of the Tri-State Airport. These were established to ensure the peace, health, good management, welfare, security and safety of all persons using the Airport and its facilities. The Rules and Regulations also incorporate by reference the requirements of the Airport's SWPPP, SPCC Plan and any other "environmental regulation", "airport policy" and "Minimum Standards" as adopted by the Authority. Within this document, or as adopted by reference in other airport policy documents, there may be opportunity to more directly incorporate sustainability considerations.

- **Minimum Standards** – The 2011 *Minimum Standards for Commercial Aeronautical Activities* at the Airport work in concert with the Rules and Regulations and identify the basic requirements for any person or entity desiring to provide aeronautical services to the public at HTS. In accordance with FAA requirements, these standards are intended to be reasonable, non-discriminatory, and ensure that no operator is afforded an exclusive right of activity. Like the *Rules and Regulations,* adherence to the *Minimum Standards* is a condition of the lease agreement and includes provisions that the service providers meet all safety, regulatory, and environmental requirements as mandated by the local, state and federal agencies. While these provisions are intended to protect the health and safety of people and the environment, as well as promote fair competition and economic sustainability, there may be the opportunity to incorporate and advance the sustainability initiative.

- **Airport Development Guidelines** – As of 2014, the Authority has not established any specific guidelines or requirements governing the physical development of Authority or tenant facilities on airport property. Should it become warranted in the future, establishment of such guidelines would help define the Authority's project review process and include consideration of FAA standards, airspace protection, compatible land use, stormwater management, utility connections, environmental protection, aesthetics, and safety. Within this document there would be opportunity to directly incorporate sustainability considerations, such as energy and water conservation, green design, low impact development, and renewable materials.

4.1.4   Green Procurement

"Green Procurement" is a method where environmental and social considerations are given equal weight to the price, availability, and performance criteria used to make purchasing decisions. Also known as "environmentally preferred purchasing", particularly within US federal government agencies, green procurement is intended to minimize negative environmental and social effects through the use of environmentally friendly products and by purchasing goods and services from manufacturers and vendors who share a commitment to the environment.

By adopting a "Green Procurement" policy, Authority staff would strive to:

- Minimize the consumption of non-replaceable natural resources by specifying durable, long lasting materials and finishes to extend material life and reduce maintenance requirements (i.e. avoid products that require frequent replacement or regular maintenance).

- Seek alternatives to products and processes that are detrimental to the environment by using more "environmentally friendly" products and processes (e.g. cleaning supplies, bleach-free paper products).

- Minimize waste, including: any packaging, waste produced by the product (or service) in questions, and waste generated by the eventual disposal of the product.

- Maximize the reuse and recycling of materials.

- Stimulate demand for "environmentally friendly" products by letting manufacturers and suppliers know the environmental performance expected in products.

Generally speaking, the preference would be to specify, to the greatest extent practicable, recycled content products and environmentally preferable products and services unless such products do not perform satisfactorily and/or are unreasonably expensive. Guidance on identifying and evaluating environmentally preferred products and services include the U.S. Environmental Protection Agency's (EPA) Environmentally Preferable Purchasing Program (**http://www.epa.gov/oppt/epp/**), and the Green Seal non-profit organization (**http://www.greenseal.org**).

ACTION
Develop and implement a Green Procurement Policy and associated processes

4.1.5   Employee Health and Well Being

As of 2014 the Authority's human resources function is managed by the HR Manager/Administrative

ACTION
Evaluate the feasibility of providing employee education, health and well-being programs

Assistant. Many of the administrative employees perform multiple duties and field and operations personnel are cross-trained in airport rescue and firefighting. This lean staffing philosophy affords opportunity for strong team building and increased responsibility. At this time, due primarily to number and composition of part-time versus full-time staff, there are no official employee education benefits or health and well-being programs established. It should be noted that the Authority has

instituted a reward program that recognizes employees for their meritorious contributions and actions with "on-the-spot" gift cards.

4.1.6   Staff Development and Recruitment

In addition to in-house training and on-the-job mentoring, providing formal education and training opportunities to the Airport staff can result in employee retention, enhanced competency, increased efficiency, and improved morale. Developing partnerships with the local business community and universities can expand and diversify the employee candidate pipeline. The following development and recruitment activities are currently being performed by the Authority:

- Job opportunities are directly communicated with Marshall University, Mountwest Community and Technical College, and Ashland Community and Technical College.

- Community service opportunities at the Airport are offered through the local welfare program which provides eligible participants the means of maintaining welfare support and provides supplementary no-cost labor to the Authority.

- On a case-by-case basis, the Authority provides financial assistance for the educational advancement of its up-and-coming employees.

While these actions all support *social progress* and can ultimately result in improved customer/traveler satisfaction, the Authority is seeking additional ways to improve staff development and recruitment processes. As of 2014, the Authority is exploring the opportunity to provide college internships in collaboration with the American Association of Airport Executives (AAAE). Under this program, financial incentives may also be available through AAAE.

ACTION

Explore methods to provide additional education and internship opportunities

4.1.7   Green Business Certification

Being a leader in airport sustainability takes commitment, creativity, time and effort. There are numerous environmental, community and aviation industry resources available for guidance on developing and maintaining a sustainability program. Many of these resources are governmental agencies, non-profit organizations, or a joint partnership between the two. Collectively, these resources provide a community of knowledge and support. The Authority's involvement with these types of organizations could provide the Sustainability Oversight Committee with the most current issues, best practices and data relevant to the ongoing operation and maintenance of the Airport. Many of these organizations also

ACTION

Participate in "green" certification programs

have programs to motivate and acknowledge sustainability achievements through various "green" certifications or accreditations. While there are several readily acknowledged green certifications related to energy efficient buildings (refer to **Section 4.3**), the following are couple of organizations that could be applicable to the Airport and may be worth further consideration. Some form of "green business

certification" could also be leveraged by the Authority in its ongoing outreach, marketing, and community connection campaigns.

- **Green Plus** – is recognized as a university backed, third-party certification of an organizational process (as compared to a product or building certification). Green Plus also provides member businesses with education and networking resources to help improve their bottom line through sustainability initiatives. The certification process begins with a self-administered diagnostic survey and costs less than $600. (**http://gogreenplus.org/sustainable-busines-certification/**)

- **Green America** – is a not-for-profit membership organization founded in 1982 (previously "Co-op America" until 2009). They certify businesses that are committed to the principles of social justice and environmental sustainability. This includes evaluating the way businesses source and market their products, take care of their employees and customers, and strive to continually improve their sustainability performance. (**http://www.greenamerica.org/greenbusiness/certification.cfm**)

4.1.8   "Sustainable West Virginia"

The West Virginia Department of Environmental Protection (WVDEP) created a developmental program called 'Sustainable West Virginia'. The program works statewide to integrate sustainability concepts and principles in business practices among all entities within the state; this includes government, municipal, county, and public and private agencies. The WVDEP provides leadership, guiding principles, development, and oversight of the Sustainable West Virginia program.

ACTION

Become an participating member of the WVDEP Stewardship Action Council

> *"This program engages members regarding methods and technologies to reduce waste, save energy, conserve water, reduce greenhouse gas emissions, increase environmental awareness and act in an environmentally, economically, and socio-culturally responsible manner."*

This provides the Airport with an opportunity to be a part of the WVDEP's Sustainability Partnership programs that provides grants, incentives, and other partnership opportunities within the community and region to promote awareness and reduce its impacts on the environment. (**http://www.dep.wv.gov/sustainablewv/Pages/default.aspx**)

4.1.9   Stewardship Action Council

This partnership program also includes the Stewardship Action Council (SAC). The SAC organization is dedicated to improving social and environmental performance. The Mission of the Stewardship Action Council is:

> *Raising the level of social, environmental, and economic performance through shared responsibility and collaboration among business, non-governmental, academic, and government organizations.*

4.2   WASTE MANAGEMENT AND RECYCLING

Waste generated at the Tri-State Airport comes from a variety of sources, including the airlines, airport operations and maintenance, passengers, tenants, and the restaurant/retail concessionaires. The volume of waste generated is most directly related to the number of passengers and the amount of aircraft activity. As described in the 2014 Master Plan Update, continued growth in both passenger enplanements and aircraft operations is anticipated. This will result in greater volumes of airport waste that will need to be collected, stored and disposed.

Recycling is probably the most tangible means of reducing the operational costs and environmental impacts associated with traditional waste disposal. This has become a focal point for many airport operators. The FAA Modernization and Reform Act of 2012 (FMRA) included expanded Airport Improvement Program (AIP) funding eligibility for "developing a plan for recycling and minimizing the generation of airport solid waste, consistent with applicable State and local recycling laws, including the cost of a waste audit."The FAA is developing additional guidance on this topic, including Program Guidance Letter 12-08 (9/14/12).

Sustainability objectives associated with the management of waste materials at the Airport include:

- Minimize the amount of solid waste generated and disposed of in local landfills

- Maximize collection and re-use of recyclable materials

- Ensure that hazardous materials are properly stored and handled and do not pose a threat to the environment or human health

From a program management perspective, there are several administration type actions that the Authority and sustainability team can pursue to increase the effectiveness of the current recycling program. As described in **Section 4.1** these include but are not limited to:

- Incorporating recycling topics into the staff and tenant awareness and education campaign

- Establishing policies and/or standard operating procedures for staff that promote waste reduction

- Incorporating recycling requirements in the Airport operating documents (e.g. leases, minimum standards). The Authority could also provide incentives or inspection to encourage tenants and vendors to use alternate means of waste disposal.

- Including consideration for low-waste, or limited-packaging products in a "green procurement policy"

- Partnering with local or community based sustainability outreach and awareness programs

The following describes the Airport's current solid waste, recycling, and hazardous material programs and identifies reasonable opportunities for enhancement.

4.2.1   Solid Waste

ACTION
Incorporate recycling into administrative programs

In general, trash from the Airport is removed by a local waste company that utilizes landfills for disposal. As of 2014, the Authority has a contract with the Rumpke Waste & Recycling Company which currently provides only trash disposal services at the Airport. The Rumpke Company maintains two (2) eight-cubic yard (CY) dumpsters located on the Northwest side of the Airport property. The Airport currently collects trash in bins located on the ramp side of the terminal building adjacent to the baggage area and off the east end of the building adjacent to the restaurant. These bins are then removed by airport and/or restaurant staff and taken down to the dumpster site located on the west side of the Airport and placed in a compactor for disposal. The Authority is charged a flat $528 monthly fee which includes bi-weekly collection of all waste on the Airport, as well as additional collection if needed due to higher than normal volume. In 2014, the Airport generated approximately 100-150 CYs of trash per week. With an estimated total of 5,800 CYs of trash and 98,296 enplanements[1] in 2013, this equates to 0.059 CYs per enplanement.

A more relevant means for measuring the success of reducing solid waste and increasing recycling waste would be a comparison of the solid waste to recycling ratio as a more robust recycling program is implemented. This effort would necessitate Airport personnel to monitor, estimate, and record trash/recycling volumes. This action may be initiated as a part of the previously discussed administrative policies and procedures evaluated in **Section 4.1**.

The Authority recognizes the importance of recycling, though does not currently have an extensive recycling program. In 2014, the position of Recycling Coordinator was assigned with the objective of expanding the Airport's recycling practices which currently consists of paper and limited other recyclable paper materials. The Authority has placed bins around the terminal building and in the administrative offices that provide the means to dispose of paper products. The Authority has a contract with Pace Enterprises that collect the recycling bin materials for a flat fee of $49 per month. The vendors and other tenants within the terminal participate in recycling to varying degrees. Some have specific operational requirements for all employees and activities, others have general recommendations, and others may have negligible contributions.

This provides an opportunity for the Authority to develop a more expansive recycling program and further reduce the amount of airport generated solid waste that is disposed in the local landfills. In addition to the previously described administrative actions, other potential recycling activities the Authority could consider include:

- **Waste and Recycling Audi**t – To optimize the level of waste reduction and recycling, this detailed type of assessment would help characterize and quantify the solid material and recyclable waste streams at the Airport. The audit would help establish more accurate targets

---

1 Tri-State Airport Authority Passenger Activity Statistics

and metrics for monitoring recycling performance. A comprehensive waste stream analysis would require an investment of both time and money, and would best be performed by a waste management consultant. The current provider of trash disposal at the Airport, Rumpke Waste & Recycling, performs waste and recycling audits and should be considered for such an analysis.

ACTION
Conduct a
Waste and Recycling Audit

- **Collect Additional Types of Recyclable Materials** – The Authority's current recycling collection contract is for paper products. Pace Enterprises only collects paper; however, Rumpke has the capability to accept plastic, glass and metal containers as regular recycling products. Providing the staff, tenants and public with additional collection bins for these types of material could help reduce the volume of solid waste disposed of as trash.

- **Additional and/or Centralized Recycling Facilities** – Expanding the recycling program throughout the Airport campus, and increasing the ease in which staff, tenants and the public can collect and dispose of recyclable materials, will further reduce the volume of trash entering the local landfills.

ACTION
Expand the solid waste
recycling program
throughout the Airport

— By placing additional recycling bins in the terminal building, ideally next to every regular trash bin, passengers and employees would have a higher propensity to properly discard recyclable material simply out of convenience.

— While the terminal is the largest trash generator, providing additional conveniently located recycling bins or dumpsters for use by all tenants and on-airport businesses would likely increase the amount of recyclable materials being collected from the Airport as a whole.

— While additional recycling dumpsters could be placed throughout airport property, a centralized recycling facility may be the most effective means of collection. The *2014 Master Plan Update* identified an area along the western, general aviation hangar line as a potential consolidated Hazardous Waste storage facility. This site could be developed to include a central recycling facility. Opening such a "recycling center" to the local public, even on a periodic basis, would expand the Airport's positive environmental effect further into the local community.

ACTION
Develop a centralized
recycling facility

Recycling bin options provided by Rumpke Waste and Recycling

- **Partnering and Contract Renegotiation** – By combining waste removal and recycling programs with other airport tenants (e.g. rental car companies, airlines, restaurant, FedEx), there may be an opportunity to reduce operating expenses for all parties involved. Consolidating collection points and renegotiating trash and recycling removal contracts may provide economies of scale that could result in reduced service costs. The savings could then be reflected in future, or renegotiated lease rates as appropriate. As the volume of collected recyclables increases, there may eventually be an opportunity to gain revenue from, instead of paying for its removal.

ACTION

Monitor for opportunities to sell collected recyclable material

ACTION

Renegotiate or consolidate waste disposal contracts

  — Enterprise Rent-a-Car has practices that involve the collection of recyclable materials left behind in rentals, from office activities, and taking those to the local recycling center for disposal. Partnering with Enterprise may provide the Authority with a means of disposing at least a portion of their collected recyclables (paper, bottles, and cans). This would be at no cost to the Authority, and Enterprise would get credit under their corporate recycling program. At this point, however, Enterprise's recycling process may not have the capacity to handle substantial additional volume (i.e. airport wide collections).

- **Recycling Grants** – WVDEP established a Recycling and Litter Grant Program under the Rehabilitation Environmental Action Plan (REAP) to provide incentives to any county, municipality, public and private entities in West Virginia to reduce the amount of waste contribution to state landfills. Next round of grants anticipated in July 2014. (**http://www.dep.wv.gov/dlr/ reap/grantprograms/Pages/default.aspx**)

ACTION

Apply for State funded Recycling Grants to assist with the implementation of the Airport's recycling program

- **Surplus Food Donation** – Currently, surplus prepared and stored food waste from the Airport (restaurant and airlines) is disposed of through the traditional solid waste stream. This creates an opportunity to reduce the amount of food being discarded as trash by donating surplus food to a local charitable organization. The Facing Hunger Food Bank (**http://facinghunger.org/**), previously the Huntington Area Food Bank, collects non-perishable food donations and distributes them through various programs in West Virginia, Kentucky and Ohio. At this time, the restaurant does not generate enough material for donation, and the food bank does not provide pick-up service. This may be a more viable waste reduction option at some point in the future. It could however, provide an opportunity for the Authority to sponsor a community focused food drive event.

ACTION

Consider sponsoring community food event

- **Non-Disposable or Reusable Restaurant Ware**s – the restaurant concessionaire currently uses disposable plastic flatware and Styrofoam food containers for both in-restaurant and take-away service. The "greenness" of reusable metal or eco-friendly biodegradable flatware as compared

to disposable plastic flatware is dependent on many variables including the manufacturing process, packaging, shipping, and dishwashing equipment. Reusable flatware must be washed which consumes water and energy. Plastic and biodegradable cutlery must be trucked away to a landfill in the regular solid waste stream. Once there, traditional plastics will never decay, bio-plastics will break down over an extremely long period, and wood products will breakdown rather quickly. The wood and bio-plastic materials will create some amount of carbon dioxide and methane gas during their decay process. Costs of the various types of flatware are estimated to range from: plastic 3-12 cents per set, bio-plastic 15-30 cents, wood 16-50 cents, and metal 60 cents to $1.00. The restaurant does utilize and wash glass and ceramic service ware for their banquet room and catered events. While this presents an environmental stewardship opportunity for the daily operation of the restaurant, the decision to incorporate reusable or biodegradable service ware may be more of a "green statement" decision rather than an economic or measurable benefit decision.

ACTION

Evaluate the use of environmentally friendly restaurant wares

4.2.2   Hazardous Waste Oils and Petroleum Products

The storage, use and disposal of hazardous materials are necessary and inevitable components of the Airport's daily operation. There are several types of hazardous material waste products generated at HTS including: waste oil from aircraft and machinery; waste or contaminated fuel (automobile gasoline, diesel, AVGAS, jet fuel); hydraulic fluids; and used cooking oil from the restaurants.

The Authority generates petroleum based waste material from the maintenance and repair of service vehicles and ground support equipment (e.g. aircraft deicing trucks, snow removal equipment, ARFF vehicles, etc.). Acting as the Fixed Base Operators (FBO), the Authority also generates petroleum waste from the servicing of based and transient aircraft. Typical materials include used or contaminated Jet A/100LL fuel, motor oil, lubricants, and hydraulic fluid. To support these activities, the Authority maintains two (2) 250 gallon petroleum waste tanks. One is located at the fuel farm and stores waste aviation fuel. It has a 55 gallon reclaim tank attached that separates fuel from water and particulates and sumps the usable fuel back into the system. According to airport staff, this reclaim system has decreased the amount of wasted fuel by approximately 80 percent. The second tank is located near the maintenance shop for comingled waste petroleum products, such as hydraulic fluid, diesel, transmission fluid, motor oil, etc.

As of 2014, the Heartland Group Holdings Company is contracted by the Authority to empty and dispose of/recycle the waste oil contents. Pick-up typically occurs twice a year unless needed in the event of excess activity. As part of this contract, the disposal contractor pays the Authority approximately $1.20 per gallon for the collected waste material. On average, the collected waste material pick-up ranges from 220-230 gallons amounting to $528-$552 of revenue per year (based on bi-annual collection). Currently, various tenants on the airfield (RJ Corman, FedEx, etc.) maintain their own waste oil storage tanks.

As activity increases over time, there will be higher volumes of waste oil/fuel generated at the Airport. Since the collection and disposal of most of these waste products are regulated in some form, the opportunities for sustainable enhancement revolve around efficiency of collection and maximizing

revenue generated from the recycling of those materials. The Authority receives revenue from its collected waste petroleum products. The various airport tenants pay for the disposal of their hazardous waste products. A centralized hazardous material storage facility maintained by the Authority, as identified in the *2014 Master Plan Update*, and/or renegotiating the waste collection agreements, could benefit everyone on the airfield. These actions could result in collecting larger sums of waste oil/fuel, reducing tenant operating expenses, and increasing Authority revenue. Initially, the Authority could take on the responsibility of the existing waste oil containers, and should maintenance or volume demands warrant, a centralized facility could be pursued in the future

The food and restaurant concessionaires are currently responsible for the collection and disposal of their own grease and used cooking oil. They dispose of these waste products in one container located adjacent to the restaurant on the east side of the Airport. Collection typically occurs once every month and the restaurant pays a flat monthly fee for disposal of the waste oil. This provides the Airport with an opportunity to potentially combine with Authority service contracts. However, most food waste oil removals are not available for revenue generation. Considerations for the Airport can be made to include the waste oil removal as part of the tenant operating documents and worked in as part of the monthly lease agreement.

To protect the environment, and for human health and safety, the Authority maintains a SPCC plan (last updated in 2009 by Kimley-Horn and Associates, Inc.). The SPCC plan addresses the containers, oil-filled operational equipment, facilities, and associated infrastructure regulated or required under Title 40 Code of Federal Regulations (CFR) Part 112 "Oil Pollution Prevention". The Authority's SPCC plan covers the equipment and activities exclusively operated by the Authority. As required by those regulations, other tenants on airport property may maintain their own SPCC plans. Additionally, the Authority has a contract with the Marathon Petroleum company to treat all of the Airport related large oil and fuel spills and the materials associated with those spills (i.e., the oil-dry material used to soak up the spill) and the removal of the waste. This service is on-call and the amount charged is dependent on the size of the spill. The Airport handles smaller scale spills internally maintaining a contract with Crystal Clean who collects and disposes of all associated materials.

4.2.3   Glycol Waste, Storage, and Reuse

Proper de-icing and/or anti-icing of aircraft (hereafter collectively referred to as "deicing"") is critical to ensuring safe flight operations during winter weather. Prior to take-off, liquid deicing agents are sprayed onto aircraft while at the terminal gates, on the apron, or on designated deicing pads. The application is commonly performed by "deicing trucks" with high-pressure spray booms. The spent deicing fluid from overspray and runoff from the aircraft is then collected, stored, disposed or recycled. Most airports store the collected glycol and stormwater runoff in tanks until it is either collected by third-party contractors for transfer to recovery and recycling plants or released gradually through the sanitary sewer to the local waste water treatment facilities. In other cases, at airports with low amounts of deicing activity, the deicing fluid/stormwater effluent is discharged through surface drainage channels with the outfalls monitored for water quality relative to regulatory compliance.

The main component of aircraft deicing fluid is *propylene glycol* or *ethylene glycol*, which are manufactured

organic compounds that function as antifreeze by lowering the freezing point of water. Typical aircraft deicing fluids are a mixture of 55% glycol and 45% water along with some other ingredients, such as thickening agents, surfactants (wetting agents), corrosion inhibitors, and colored, UV-sensitive dye. Glycols are considered a potentially hazardous material due to the toxic effect they may have on people and animals, and the harmful effects it can have on water quality. The largest environmental concern

with the use of glycol-based deicing agents is that of contaminated stormwater runoff (i.e., excess precipitation or snow melt that does not soak into the ground or evaporate creating pooled or flooded water potentially carrying contaminants from the surface). Glycols have a high level of Biochemical Oxygen Demand (BOD) as they breakdown in the surface waters. In other words, large quantities of dissolved oxygen in the water column are consumed when naturally occurring microbial populations decompose the glycol. This process can adversely affect aquatic life by consuming oxygen needed by aquatic organisms for survival.

With the priority of safe public travel, the FAA has implemented strict standards for the performance characteristics of the deicing products and for their application. To minimize the effect of these glycol-based materials on the environment, the EPA has classified them as a regulated "industrial process" wastewater under the NPDES 40 CFR Part 122 "National Pollutant Discharge Elimination System" (i.e. NPDES permitting program). As a result, disposal of spent aircraft deicing fluid has become both an environmental and economic liability to airport sponsors.

The deicing fluids used by the Authority/FBO for line service operations are stored in two (2) 3,000 gallon tanks (Type I) and typically two (2) 250 gallon totes (Type IV). Mobile aircraft deicing trucks, like the one pictured above, are used to deice aircraft on ramp. The Authority has a vacuum truck to collect the excess waste glycol which can then be transferred to a separate storage tank where the deicing fluid/stormwater mix would be slowly released into the sanitary sewer lift station; however, as of 2014, the vacuum truck is in need of significant repair and is not effectively functional.

The un-captured deicing fluid/stormwater mix from the ramp is routed by sheet flow into natural and man-made drainage swales that drain to the tributaries of Twelvepole Creek to the north which ultimately empties into the Ohio River located approximately two miles north of the Airport[2]. The stormwater runoff is discharged to Twelvepole Creek under NPDES General Water Pollution Control Permit No. WV0111457. Consistent with the NPDES permit and other FAA requirements, the Authority maintains a SWPPP to help prevent degradation of the local water quality. The SWPPP defines a program to manage deicing contaminated stormwater including a drainage area map, an evaluation of runway and aircraft deicing operations, and measures used to control deicing contaminated stormwater. Per the requirements of this permit, the effluent is monitored on a bi-annual basis and there have been no known permit violations or water quality issues to date.

While there are no practical opportunities to reduce the amount of glycol used (i.e. mechanical or infrared deicing), there is the opportunity to reduce the amount of glycol that gets released into the environment. Repair of the vacuum truck, and possibly of the storage tank and sanitary sewer release valves, would be needed.

ACTION

Repair and maintain exsiting deicing fluid recovery, storage and release equipment

---

2 Tri-State Airport SPCCC Plan, Kimley-Horn and Associates, 2009

Section 4.0 – Focus Area Evaluations

There may also be an opportunity to develop a glycol recovery and recycling program which could ultimately reduce the Airport's operating and maintenance costs. Glycol recycling systems can recover usable glycol from spent deicing fluid/stormwater mix at concentrations as low as 1%. The recycling process consists of several steps including filtration, reverse osmosis, and distillation to recover glycol from spent deicing fluid. The recovered glycol may be sold and reused for other commercial applications (e.g. vehicle antifreeze); the value of recovered glycol depends on the type of glycol and its concentration and purity. While the deicing fluid/stormwater mix could be dewatered and sold to a third party "refiner", ongoing technology developments have made on-site recycling successful at smaller airports; however, the volume of fluid used at very small airports may still be insufficient to make recycling economically viable.

ACTION

Monitor and evaluate feasibity of glycol recovery and recycling program

4.3 ENERGY MANAGEMENT

Electricity and natural gas are two (2) of the larger operating expenditures at the Airport; therefore, conservation initiatives that can economically be undertaken will not only have a positive environmental effect, but will also have a strong positive impact to the Airport's operating budget. The following addresses the current usage of these energy sources and identifies opportunities for reducing their rate of consumption and/or reducing the costs associated with their procurement. The feasibility of developing alternative or renewable energy sources for the Airport is also addressed.

Sustainability objectives related to energy management at the Airport are:

- Maximize energy efficiency and minimize energy consumption within buildings and airport property

- Evaluate and implement alternative energy procurement programs and renewable source generation
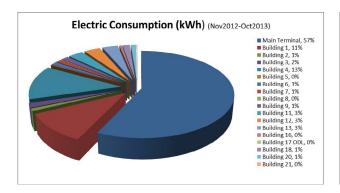
4.3.1 Electricity and Natural Gas Consumption
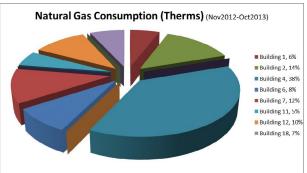
Of the 30 or so buildings on airport property, the Authority owns and maintains 20 of them. These include the passenger terminal, the FBO/ARFF building, the FedEx hangar, the old National Guard armory, multiple maintenance shops and several aircraft storage hangars. Many of the hangars are leased to private companies or individuals. The other buildings are owned and maintained by either the National Guard or the FAA. In early 2014, an *Energy Efficiency Assessment*, or energy "audit", was performed for the 20 Authority buildings and fuel farm. This report was done under separate cover and is available from the Airport upon request..

For the 12-month period of November 2012 through October 2013, the 20 buildings used 1.78 million kilowatt-hours (kWh) of electricity at a cost of $145,400. It should be noted that the airfield lighting is routed through the terminal's main electrical vault and is included in these figures. The buildings also used 54,200 therms of natural gas at a cost of $42,170. The passenger terminal (including airfield lighting) is by far the largest energy consumer representing 57% of the total electricity used. The second largest

energy consumer is the FedEx hangar which represented 13% of the electricity and 38% of the natural gas consumed. Over the same period of time, the Airport enplaned 91,800 commercial passengers[3]. As a comparative metric, this equates to 19.39 total kWh and 0.59 therms per enplanement.

Electric Consumption (kWh) (Nov2012-Oct2013)

- Main Terminal, 57%
- Building 1, 11%
- Building 2, 1%
- Building 3, 2%
- Building 4, 13%
- Building 5, 0%
- Building 6, 1%
- Building 7, 1%
- Building 8, 0%
- Building 9, 1%
- Building 11, 3%
- Building 12, 3%
- Building 13, 3%
- Building 16, 0%
- Building 17 ODL, 0%
- Building 18, 1%
- Building 20, 1%
- Building 21, 0%

Natural Gas Consumption (Therms) (Nov2012-Oct2013)

- Building 1, 6%
- Building 2, 14%
- Building 4, 38%
- Building 6, 8%
- Building 7, 12%
- Building 11, 5%
- Building 12, 10%
- Building 18, 7%

During terminal improvement projects in 2013-2014, the Authority has begun to better its energy performance through the installation of new, high efficiency Heating, Ventilation and Air Condition (HVAC) units. The efficiency assessment identified several potential Energy Conservations Measures (ECMs) that could be employed to further reduce energy consumption in the various Authority maintained buildings. These recommendations on which ECMs to implement were based on simple payback periods of less than 15 years and include improvements to the HVAC equipment and controls, lighting and appliance control systems, and building insulation. The following table summarizes the estimated investment and energy saving for each of the buildings. These recommendations do not include improvements to the airfield lighting systems.

ACTION

Implement short payback, energy efficiency improvements in the terminal, PSA hangar and new ARFF building

			Summary Short- Mid- and Long-Term Recommended Energy Conservation Measures (ECMs)		
Building	**ECMs**	**Estimated Cost**	**Annual Utility Savings**		**Payback Period**
		($)	**kWh**	**Therms**	**$**	**(years)**
Terminal	Insulation, convert to natural gas, programmable controls, lighting upgrades	335,517	815,409	-20,906	72,100	4.7
FBO/ARFF	Door seals, programmable controls, occupancy sensors	1,977	12,425	523	1,340	1.5
FedEx Hangar	Insulation, programmable controls, replace heaters, lighting upgrades	106,758	7,168	17,381	14,600	7.0
3 Maintenance Buildings	Replace heaters, lighting upgrades	17,259	11,443	1,216	2,020	8.5
7 Box Hangars	Door seals, replace heaters, programmable controls, lighting upgrades	90,822	64,660	12,111	8,460	10.7

---

3 Tri-State Airport, passenger statistics, **http://www.tristateairport.com/about-us/statistics/**, accessed June 2014

Summary Short- Mid- and Long-Term Recommended Energy Conservation Measures (ECMs)						
Building	**ECMs**	**Estimated Cost**	**Annual Utility Savings**			**Payback Period**
		($)	kWh	Therms	$	(years)
3 T-Hangars	Lighting upgrades	5,148	8,998	0	800	6.3
Fuel Farm	Lighting upgrades	825	1,603	0	150	5.7
Old National Guard Armory	Replace heaters, Lighting upgrades	18,095	2,254	1,829	1,580	11.5
Snow Removal Equipment Bldg.	Lighting upgrades	15,127	29,437	0	2,600	5.8
Car Wash Bldg.	Replace windows, lighting upgrades, replace heaters	11,620	9,570	315 Gal. LPG	1,700	6.8
Total		603,148	962,967	12,154	105,350	5.7

Refer to Energy Efficiency Assessment report in appendix for details.
Costs and savings based on 2013 rates.
Includes possible utility company incentives.

Based on this assessment, if all the recommended ECMs were implemented, electricity use could be reduced by approximately 54% and natural gas use by about 22%. The energy bill could also be reduced on the order of 56%. The approximately $603,000 investment to obtain these savings would likely take several years and several individual projects to achieve. By focusing on the largest energy consumers and shortest payback periods, improvement projects in the terminal, FBO/ARFF, FedEx hangar and a few other buildings with less than a two (2) year return on investment should be prioritized. Those recommended ECMs are summarized in the following table and would result in an 8% annual reduction in electrical use and a 24% reduction in natural gas use.

Summary Short-Term ECMs						
Building	**ECMs**	**Estimated Cost**	**Annual Utility Savings**			**Payback Period**
		($)	kWh	Therms	$	(years)
Terminal	Insulation, programmable controls, occupancy sensors	1,917	114,661	n/a	12,400	0.2
FBO/ARFF	programmable controls, occupancy sensors	1,600	12,425	473	1,300	1.2
FedEx Hangar	programmable controls, occupancy sensors	2,050	6,263	2,173	2,200	0.9
7 Box Hangars	Door seals, programmable controls, lighting upgrades	1,317	6,515	10,133	2,070	0.6
Old National Guard Armory	Lighting upgrades	95	2,254		180	0.5

Summary Short-Term ECMs						
Building	ECMs	Estimated Cost	Annual Utility Savings			Payback Period
		($)	kWh	Therms	$	(years)
Car Wash Bldg.	Replace windows	741		126 Gal. LPG	400	1.9
	Total	7,720	142,118	12,779	18,550	0.4

Refer to Energy Efficiency Assessment report in appendix for details.
Costs and savings based on 2013 rates.
Includes possible utility company incentives.

4.3.2 Alternative and Renewable Energy Sources

Developing or incorporating alternative sources of energy generation as a means of reducing a facility's utility costs and carbon footprint is of interest to many airport sponsors. To date, there have been varying degrees of implementation at airports, ranging from small scale wind and solar installations to campus wide solar farms and geothermal programs. For most commercial service airports, the largest electricity demand is related to the terminal building. Depending on the size and leasing structure of the terminal, it appears that the larger airports are more capable of structuring an alternative energy program that achieves financial payback in a reasonable timeframe. Often, these energy development programs are multi-stakeholder partnerships and capitalize on third-party incentives or grants.

Airports also have rather unique operational and safety concerns and not all "green energy" technologies are currently considered appropriate for use on or near an active airfield. Spurred by positive business models and increased acceptance, the energy industry is rapidly advancing technological innovation and market development. The FAA and various aviation organizations, including the ACRP, are continuing their evaluation of how to implement and capitalize on these burgeoning technologies. It is anticipated that these advancements will allow for greater incorporation of alternative energy sources at airport facilities.

While the use of alternative energy is an environmentally responsible pursuit, the business case for doing so must be balanced with financial practicality. The HTS Energy Efficiency Assessment (**complete under separate cover**) includes a preliminary feasibility evaluation of several alternative energy technologies for the Airport. Due in part to the facility size and utility demand characteristics, not all of these were deemed reasonable for implementation at the Airport. The ones that provide some level of plausibility, and may warrant further consideration, are summarized in the following paragraphs:

Indianapolis International Airport
Source: solarchoice.net

- **Solar Photovoltaic Array** – The amount of space available to construct an array determines how much electricity can be generated. Due to the steep terrain, and

hilltop setting of the Airport, there are a limited number of locations within HTS property that a solar array could readily be developed. With consideration of providing a southern exposure, there is an approximate 4-acre undeveloped site on the southeast corner of the Runway 12-30 / Taxiway B intersection. The 2014 ALP identifies this site for a potential future transient/ deicing apron. Utilizing the south facing slopes of the terrain near the Runway 12 end, or on the Airport property west of the runway between Old U.S. Route 2 and Highway 52, may also be a possibility. Although the terminal area is rather constrained, and located on the north side of the runway, solar panels could be installed on any future covered parking structure that the Authority may pursue.

Installation of an approximately 187,000 square foot solar array on the undeveloped 4-acre site would cost on the order of $5.1 million to construct and have a generation capability of roughly 1,270 kW or 1.6 million kWh per year. This would offset approximately 89% of the current annual electricity used by the 20 Authority controlled buildings. Based on 2013 rates, this could result in an annual savings of approximately $130,000. At this rate, the payback on investment would take approximately 39 years. Combined with the energy conservation measures described previously, a solar system of this size would likely accommodate 100% percent of the foreseeable electricity demand. At this time, there are no state incentive programs for the installation of solar arrays, and West Virginia does not participate in the Solar Renewable Energy Credit (SREC) program. The SREC program would allow the Authority to sell "credits" to other energy suppliers based on the amount of solar energy generated at the Airport, thereby creating a revenue stream to offset the construction and maintenance costs of the solar system. Unless additional third-party or grant funding becomes available, development of a solar array at the Tri-State Airport may not be financially prudent. Refer to **Section 5.0** for additional information on potential funding strategies.

ACTION

Pursue public-private partherships to evaluate and/or development solar energy systems

One concern with developing solar arrays near an airport is the potential effect of "glare" on pilots and air traffic controllers. In 2010, the FAA issued guidance on evaluating, measuring and mitigating any adverse effects of glare to aircraft operations. The FAA now requires a quantitative glare analysis, including an evaluation of potential visual impacts, prior to approving any new solar installations near an airport. The energy industry is responding to this concern by developing improved glare reducing materials.

- **Solar Thermal Hot Water** – Solar hot water systems are typically integrated to work alongside a conventional heating system that provides heat when solar resources are not sufficient. Solar collectors are usually placed on the roof of a building, and the sun's energy is then used to generate hot water. Hot water at the Airport is currently produced by electric water heaters; therefore, this type of system could offer an electric utility savings. Development of a passive solar hot water heating system for the terminal building would cost on the order of $82,000 and could result in annual utility savings $3,600. At this rate, the simple project payback would be over 22 years. As with the solar system described above, incorporation of solar hot water system into future building renovation or development projects may warrant further consideration by the Authority. Third party funding assistance may be instrumental in implementing any alternative energy sources at the Airport.

- **Wind Power** – The common vision of a wind turbine is a three-bladed rotor, connected to a generator, mounted atop a monopole. The size of the turbine, and the amount of wind experienced at the installation site, determine the amount of energy produced. On a scale of 1 (the lowest) to 7 (the highest), Class 3 and above wind speeds (13 mph or greater) are generally considered a "good wind resource". According to National Renewable Energy Laboratory (NREL), average wind conditions in the Huntington area are classified as Class 1 (at 50m height) meaning the site would not likely be a good candidate for commercial scale wind power.

East Midlands Airport, UK
Source: airport-int.com.com

There are also several concerns with the installation of commercial type wind turbines on or near an
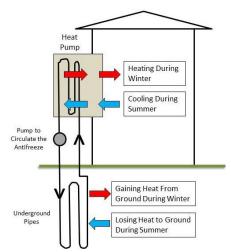
Boston Logan International Airport
Source: New York Times, 9/3/2008

airport. Considering that the largest commercial turbines can have diameters greater than 300 feet and heights near 500 feet, physical penetrations of navigable airspace, including Part 77 and TERPs protective surfaces, can become an issue. Large turbines can also cause turbulence to downstream air and can cause radar interference if located near transmitter/receiver equipment. These issues are the topics of ongoing agency evaluation.

While large scale wind energy generation for the Tri-State Airport may not practical, the opportunity does exist that smaller, architectural type systems could be incorporated into building renovation or new construction. These smaller systems could be used to augment traditional purchased electricity and could power specific systems within the buildings. The generation capability of these small-scale systems is growing and pending further study could result in a positive business case for the Airport. Small turbine systems have been installed at several airports including Boston Logan International Airport, Detroit Metro Airport, Honolulu International Airport, and Midway Airport.

- **Geothermal Heat Pumps** – A geothermal heat pump (or ground source heat pump) is a central heating and/or cooling system that uses the relatively constant ground temperature to transfer a building's heating and cooling loads. The earth is used as a *heat source* in the winter and a *heat sink* in the summer. These systems are very energy efficient and emit fewer pollutants than most other heating/cooling systems as there is no combustion process or associated heat transfer losses. Pumps are used to circulate water (or more commonly glycol) from an in-ground "bore" field to the building's heat pump loop. The size of the bore field is determined by the peak

heating and cooling loads of the building and the heat transfer properties of the ground. The depths of the bores (wells) are determined based on the economics of drilling and the available land, but typically range in the 300-400 foot depth for shale which is prevalent in the HTS area. To heat and cool the existing terminal building, an estimated 60 bores at 400 foot depth would be needed.

ACTION

Consider installing solar hot water heaters and/or small wind turbines into future building renovation or new construction projects
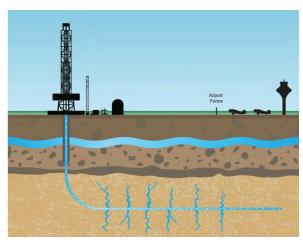
Geothermal systems tend to have relatively high first costs, especially for retro-fit applications due to the need for drilling multiple bores, installation of underground piping, installation of ceiling mounted heat pumps and associated ducting, piping and electrical work. A system for the existing terminal is estimated to cost $750,000 and could save approximately 311,800 kWh of electricity per year. This represents a 30% reduction in terminal building electricity usage. Based on 2014 rates, this could result in an annual savings of approximately $25,500, but the payback on investment would take about 30 years. There may be incentive programs that could help offset the implementation cost and reduce the payback period. Additional site evaluation and pursuit of third-party or grant funding would be needed to confirm the feasibility of developing this type of system at the Airport.

- **Oil and Gas Drilling** – Over the past decade, advances in oil and gas extraction methods have led to increased production and new well sites being developed throughout the nation's shale gas basins. The first advancement is *horizontal directional drilling* where the drill bit can be extended into the narrow gas reservoirs that lie parallel to the above-ground surface. The second advancement is *hydraulic fracturing* ("fracking") where water, sand and chemicals are pumped underground to break apart the rock and release the gas.

As depicted on the following page in **Figure 4.1** and **Figure 4.2**, HTS is located within the Marcellus Shale Gas Play with several intra/interstate natural gas transmission lines traversing the area[4]. A "Play" is the part of a shale gas basin where active gas exploration is occurring. This area is also considered a "tight gas play." Tight gas refers to natural gas reservoirs locked in hard rock, making the underground

Source: ACRP Report 108

formation extremely "tight." While a conventional gas formation can be relatively easily drilled and extracted from the ground, tight gas requires more effort. According to the WVDEP Oil and Gas Well Information[5], at this time the majority of active well sites are located east of the Airport and further into Pennsylvania.

The potential opportunity for the Authority lies in the ability to sell extraction rights to a natural gas company and/or utilized any gas mined from the property to power airport facilities. This

4 **http://www.eia.gov/state/maps.cfm?v=Natural Gas**
5 **http://tagis.dep.wv.gov/oog/**

could create an additional revenue stream or lower the utility costs. Other airports in West Virginia are pursuing this trend and in 2013, the Yeager Airport in Charleston, West Virginia received environmental approval from the FAA for the installation of two (2) well drilling pad sites on airport property.
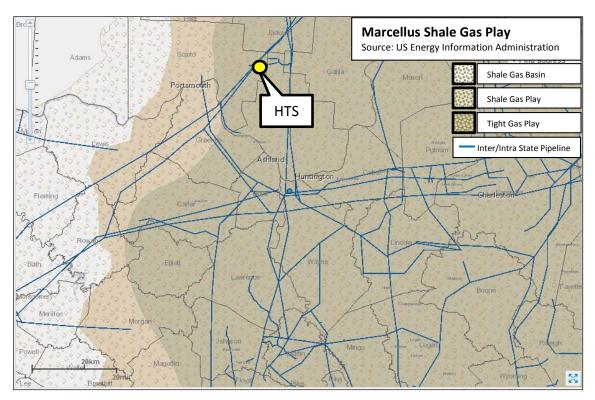
Figure 4.1: Marcellus Shale Gas Play
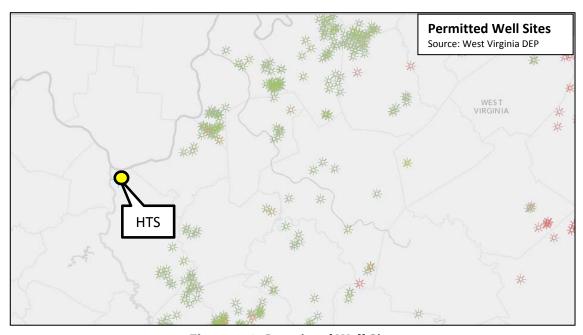
Figure 4.2: Permitted Well Sites

The potential issues with natural gas extraction on or near an airport include airspace protection, FAA obligated land use, and environmental concerns related to hydraulic fracturing. The physical equipment for well sites can include drill rigs, communication towers and storage tanks which all have the potential to penetrate protected airspace. These issues can be addressed during site design and agency coordination as with any other vertical development project near an airport. The FAA is also keenly interested in ensuring that any mining revenue collected and spent by the Airport sponsor is done so in accordance with the "Revenue Use Policy" and with the AIP Grant Assurances 24 and 25. These requirements apply to projects located on the surface of airport property (e.g. ground leases) and to projects that extend into subsurface grounds below airport property (e.g. directional drilling). The issue of "fracking" has divided many in the energy, environmental and scientific communities due to concerns related to the chemicals used in the mining process, the potential for ground water contamination, and seismic concerns. With these financial, regulatory and environmental issues in mind, the Authority should continue to evaluate opportunities as they arise.

- **Leasing Space for Others to Develop "Green" Systems** – Airport sponsors are always looking for opportunities for increased revenue to support their operations and improve their financial position. According to the *2014 Master Plan Update*, there is approximately 100 acres of property on the south side of the Airport available for mixed-use development. Leasing additional land to commercial tenants for the development of their own renewable energy systems may also be an opportunity for the Authority. Not only would this provide financial benefits, but the net energy use and carbon footprint of the Airport campus could be reduced.

The ability of the Authority to implement an alternative energy program at the Airport is influenced by regulatory, environmental and financial concerns. The energy demand characteristics of the Airport may not facilitate a positive business case for a large scale solar or geothermal project without third-party investment or grant assistance. Continued evaluation of the technical and financial feasibility of developing such an energy source at the Airport would be needed. The evaluation should include appropriate agency coordination and seek third-party partnerships to help perform the evaluation and fund the installation costs. The aviation related concerns of these energy technologies would also apply to any of the tenants pursuing development of their own alternative energy systems.

There may be opportunities to install solar hot water heaters and/or smaller architectural type wind turbines into future building renovation or new construction projects. Due to the unique aviation concerns associated with these technologies, coordination with the FAA during the design process would be needed.

While the natural gas market in West Virginia is apparently benefiting from the newer extraction methods, there appears to be little opportunity for the Authority to capitalize on this trend at this time. The Authority should continue monitoring local market conditions and FAA guidance regarding oil and gas extraction opportunities on or near the Airport. Should the opportunity for mining/gas extraction on or near the Airport materialize, additional environmental evaluation and FAA approval would be needed.

ACTION

Monitor opportunities for oil/gas extraction at the Airport

4.3.3 Industry Certifications and Accreditations

ACTION

Evaluate the technical and financial feasibility of developing a solar and/or geothermal energy source at the Airport

Similar to the "green business" certifications described previously, there are several readily acknowledged green certification programs related to energy efficient buildings. The organizations listed below can provide a wealth of information related to the planning, development, and maintenance of high-performance green buildings that support the principles of sustainability. Whether striving for actual certification, or incorporating their best practices into Development Guidelines (**Section 4.1)**, or specific facility improvement project, participation in the following organizations should be considered for future participation by the Airport. Their resources and/or certifications would be expected to optimize energy efficiency, reduce operating costs, and help solidify the Authority's position as leader in airport sustainability.

- **US Green Building Council/Leadership in Energy & Environmental Design (LEED)** – is a fee-based, green building certification program that recognizes best-in-class building strategies and practices. Buildings are evaluated on topics, such as process, materials, access, energy, water efficiency, air quality and innovation. To receive LEED certification, building projects satisfy prerequisites and earn points to achieve different levels of certification (e.g. certified, silver, gold, platinum). There are five rating programs, for different project types, including :

  — New building construction or major renovation

  — Interior "fit-out"

  — Existing building operations and maintenance

  — Neighborhood development

  — Single, or multi-family residential homes

  Certification fees are based on the size of the building and for an existing terminal the size of HTS are estimated between $5,000 and $7,000. (**http://www.usgbc.org/leed**)

- **Green Globes** – is a fee-based, online green building rating and certification tool, similar to LEED and many other systems around the world. It has modules for both new construction and continual improvement of existing buildings. Green Globes is structured as a self-assessment to be done in-house using a project manager. Following a satisfactory self-assessment, third-party verification is performed by assessors with expertise in green building design, engineering, and construction, and facility operations. Buildings that successfully complete a third-party

ACTION

Incorporate LEED or GreenGlobes principles into a set of *Airport Development Guidelines*

assessment are assigned a rating of one to four Green Globes. Cost for the annual software subscription is approximately $1000 and the assessment and certification fees could be $7,000 or more. (**http://www.greenglobes.com/home.asp#**)

- **ENERGY STAR** – is a U.S. EPA program that certifies appliances, electronics, buildings and industrial plants that meet strict energy performance standards set by the EPA. ENERGY STAR certified buildings tend to use less energy, are less expensive to operate, and cause fewer greenhouse gas emissions than their peers.

  To be eligible for ENERGY STAR certification, a building must earn a score of 75 or higher on the EPA's free "Portfolio Manager" online tool for measuring and tracking energy use, water use, and greenhouse gas emissions. This score indicates that the building performs better than at least 75 percent of similar buildings nationwide. Information submitted in the certification application must be verified by a licensed Professional Engineer (PE) or Registered Architect (RA) to be eligible for approval. Certification is given on an annual basis, so a building must maintain its high performance to be certified year to year. Even if certification is not sought, Portfolio Manager can be used to monitor and benchmark a building's environmental performance. (**http://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/earn-recognition/energy-star-certification**)

4.3.4   Energy Procurement and Funding Methods

With the increased volume of sustainability actions and energy conservation measures, additional assistance to provide a funding source for these actions may be necessary. As such, there are numerous funding opportunities available via the FAA, Local organizations, negotiating energy procurement, etc. The following list outlines several of these options in greater detail:

- **Energy Procurement** – Many utility companies across the nation are deregulated, which enables building owners to choose a different third party electric and/or natural gas supplier while retaining their current local utility provider. Many times the local provider has the best price per kilowatt-hour or therms, but there are instances where the rates fluctuate greatly with the weather conditions and purchasing from a third party supplier is less expensive on an annual basis. There are hundreds of third party utility providers nationally and typically several available in each utility's service area. The building owner must continue to pay the transportation charge portion of their utility bill which covers the maintenance and expansion costs for wiring and piping infrastructure. The supplier portion is billed independently, typically on a monthly basis. If an owner opts to participate in an energy procurement plan, they should monitor the supplier's rates frequently as they can change from month to month and most third party contracts include an escalation clause. At this point, however, West Virginia remains a regulated state, and it does not appear that HTS could participate in an energy procurement plan from a third party supplier.

- **Power Purchase Agreement (PPA)** – These are a popular method of funding capital intensive alternative energy projects such as solar photovoltaic systems and wind turbines. These

technologies have a relative high first cost of ownership and are heavily subsidized with state and federal grants and tax incentives. There are several variations of PPAs but the concept is similar for all. A contractor provides the owner with a fully operational system on their property which is leased by the owner for typically 15 years. The contractor owns and maintains the equipment for the term of the lease after which, the contract is either terminated or renewed. If renewed, the old equipment is removed and upgraded with new technology. The owner is still connected to the utility power grid and continues to pay for electric transportation charges. During the term of the lease agreement, the owner pays the contractor a fixed monthly fee for electricity and the contractor/system provides the electrical needs for the building at a reduced rate than what the utility would charge. Any surplus electricity that is returned to the power grid is net metered is paid back to the contractor by the utility provider. Typically the tax benefits and available rebates are paid directly to the contractor. The benefits of this model are that the building owner gets renewable energy at little or no upfront cost, does not have to maintain the equipment and gets less expensive fixed price electricity.

- **Energy Performance Contracting (EPC)** – Otherwise known as Energy Services Contractor, (ESCO), is a procurement model that uses the anticipated dollars saved from proposed ECMs to fund the implementation costs of the ECMs (and other improvements). By leveraging the time value of money, every dollar of energy saved today will increase in value each year due to interest and the inflation rate of the cost of the energy. This annual savings basically creates a funding source that allows a performance contractor to finance the project typically for 15-18 years. Most performance contracts include a guaranteed savings clause that protects the owner from savings shortfalls, should they occur, as well as other clauses that account for increased energy consumption penalties due to building expansions or changes in use. The money saved each year from the energy improvements can actually create a surplus of cash each year that can be used for non-energy related projects such as roofing or site repairs. This is an attractive method of funding for building owners that have little capital available to make repairs and improvements. The drawback to a performance contract is that the energy savings are not only used to fund the project, but are also used to pay the performance contractor for their services and guaranty, which ultimately reduces the benefits of the energy savings verses an owner funded project.

  Performance contractors tend to be subsidiaries to HVAC and temperature controls vendors, such as Siemens, Johnson Controls, Honeywell, Trane, etc., and most performance contracts have some temperature controls component. Solicitations for performance contracting for projects considering using this model are typically performance based as well, requiring each contractor to prepare a proposal based on their estimate of maximum project savings based on an inspection of the facility.

- **Voluntary Airport Low Emission Program (VALE)** – Created in 2003 under the "Vision 100— Century of Aviation Reauthorization Act", VALE is a national program designed to reduce sources of airport ground emissions. This voluntary program provides financial and regulatory incentives for airport sponsors to be proactive in improving air quality at their facilities and reducing their reliance on petroleum based fuels. It is available to commercial service airports located in air quality "nonattainment" and "maintenance" areas as designated by the EPA.

  Through VALE, sponsors can use AIP funds, both entitlement and discretionary, and Passenger Facility Charges (PFCs) to help finance projects ranging from the purchase of low-emission

vehicles to major infrastructure improvements. Because VALE projects are funded by the AIP and PFC programs, there is no separate or dedicated VALE program budget. The VALE program does however expand traditional AIP and PFC eligibility guidelines to enable earlier implementation of low-emission projects. The eligibility requirements are quite specific and must be evaluated in detail to determine project applicability. VALE projects are approved and funded by the FAA on a case-by-case basis relative to prioritization with other funding eligible airport projects.

The VALE program also helps airport sponsors meet their state-related air quality responsibilities under the Clean Air Act. VALE projects are approved contingent upon assurance from the state's air quality agency that the sponsor will receive appropriate Airport Emission Reduction Credits (AERCs). These credits can be used for subsequent airport development projects where fewer options may remain to further reduce airport emissions.

Examples of projects eligible for the VALE program include:

— Gate electrification to provide preconditioned air and reduce the use of aircraft Auxiliary Power Units (APUs) and Ground Power Units (GPUs)

— Acquisition of alternative fuel or low-emission airport vehicles, Ground Support Equipment (GSE) and associated refueling or recharging stations

— Renewable and alternative energy generation or HVAC systems, such as solar, wind, geo-thermal, natural gas or co-generation

— Underground hydrant fueling systems to reduce the number and use of fuel trucks

— Public transit projects that reduce vehicles on airport roadways, such as people movers, public transit lines and intermodal facilities

4.4   WATER RESOURCE MANAGEMENT

Water is an essential natural resource that is vital to ecosystem health and human well-being. According to the U.S. Geological Survey (USGS), only 2.5 percent of the Earth's total water supply is fresh water and less than 1 percent of that is directly available for human use. This includes the surface water found in rivers, lakes, and reservoirs and underground aquifers that are shallow enough to be tapped at reasonable cost. Over the years, population and development pressures have stressed the natural water systems, resulting in increased federal regulation of both potable water and stormwater runoff.

Water use at the Airport touches almost every aspect of daily activities, including drinking water, food preparation, cleaning and maintenance, aircraft deicing, irrigation and sewage. Consistent with the environmental stewardship goals of protecting and conserving natural resources, the Authority has already identified the following water resource management objectives:

▪ Maximize water conservation and minimize potable water use within airport facilities

▪ Protect regional water quality through effective storm water management and pollution prevention initiatives

4.4.1   Potable Water Conservation

Water conservation is about reducing the amount of potable water consumed for daily activities. This in turn reduces the draw on natural freshwater resources. In addition to the environmental benefits of reduced water use, financial benefits can also be garnered. Each drop of potable water has to be moved, treated, stored and often heated. Each of these processes requires energy and infrastructure maintenance. By reducing the demand for treated water, both the end user and the supplier can save money. The associated reduction in energy use can result in further environmental benefit, particularly in areas where fossil fuels are used to generate energy. According to the U.S. Energy Information Administration (**www.eia.gov)**, in 2013 approximately 67 percent of the energy generated in the United States was fossil fuel based and 19 percent was nuclear.

Potable water is provided to the Airport through the City of Kenova public water supply system. The Authority has installed a sub-metering network to accurately gauge the amount of potable water consumed. This includes water used in the terminal building and the Jet Center facility. According to HTS records, these facilities consumed ±3.98 million gallons of water between June 2013 and July 2014. From January through July 2014, the Airport had used ±2.168 million gallons of water at an expense of $8,534.62 which equates to an average price of $0.00402 per gallon. The Terminal building accounts for ±1.692 million gallons or approximately 80% of the total water use of the Airport. Over that same period, the Airport enplaned 98,296 passengers which equates to 17.2 gallons of water used per enplanement.

Annual Water Use			
Month	**Usage**	**Cost**	**Cost per Gal.**
July	274,400	$1,100.14	$0.00401
June	302,300	$1,193.89	$0.00395
May	297,100	$1,176.42	$0.00396
April	302,700	$1,195.23	$0.00395
March	332,400	$1,295.02	$0.00390
February	390,900	$1,491.58	$0.00382
January	269,100	$1,082.34	$0.00402
December	254,300	$1,032.61	$0.00406
November	225,500	$935.84	$0.00415
October	262,800	$1,061.17	$0.00404
September	175,300	$767.17	$0.00438
August	256,800	$1,041.01	$0.00405
July	216,100	$904.26	$0.00418
June	429,400	$1,620.94	$0.00377
Total	**3,989,100**	**$15,897.62**	
Average	**284,936**	**$1,135.54**	**$0.00402**

An opportunity exists for the Authority to reduce its potable water draw even further by replacing the remaining outdated low-efficiency water fixtures within the terminal. The current water efficiency standards, according to the EPA and WaterSense Program, for commercial toilets and urinals are 1.6 and 1.0 gallons per flush (gpf) or less, respectively. The current standard maximum flow for faucets is 2.2 gallons per minute (gpm) or 0.25 gal per cycle. Comparatively, high-efficiency toilets use between 0.5-1.0 gpf and waterless urinals obviously don't use any water. High-efficiency faucets typically utilize occupancy sensors and higher pressure systems to use less water per cycle (0.15 gallons per cycle). Based on these factors, an evaluation of potential water and expense savings was performed using the following data, methodology and assumptions:

Data and Assumptions:

- Number of total fixtures
  - Faucets – 27
  - Urinals – 10
  - Toilets – 25

- Estimated use per fixture per day based on traffic volume and EPA Water Sense data:
  - Urinals – 50 Flushes per day per urinal
  - Toilets
    - Female – 75 Flushes per toilet per day

- Male – 35 Flushes per toilet per day
  - Faucet use was calculated by the number of total flushes (one use per passenger/flush)

- Upgrade costs including labor and materials for higher efficiency restroom fixtures (all estimates derived using RS Means Green Building Construction Cost Data)
  - $600 per Low-Flow Occupancy Sensor Faucet Fixture
  - $700 per Waterless Urinal
  - $800 per Low-Flow Toilet (Men's and Women's)

- Average cost per gallon based on Airport records ($0.00402 gal.)

Methodology:

- The annual total restroom water use is calculated by applying the total annual operational days with the average daily flushes per fixture and then multiplying by the EPA standard

- Estimated annual total cost calculated by applying total water use (faucet, urinal, toilet) with the average per gallon water expense for the Airport ($0.00402 gal.)

- New total use and annual water expense cost calculated similar to current water use, however used high-efficiency standards per individual unit

- Faucets – 0.15 gal per cycle

- Urinals – 0 gpf (waterless)

- Toilets – 0.75 gpf (average of 0.5-1.0 gpf)

- Water and operational cost savings derived from calculating the difference between the new and the old water use and expenses

- Return on Investment (ROI) calculated by dividing the cost to replace each unit by annual savings

The results of this analysis are provided in the following table. As depicted, the Authority could potentially reduce potable water use by ±995,000 gal, and reduce annual water expense by approximately $4,000. Based on those savings, and the cost to replace the fixtures in the restrooms, the Authority may begin to see an ROI within the 10-year project planning time period. To promote water conservation at the Airport, the Authority has an opportunity to install low-flow, or high-efficiency toilets, urinals, and faucets (e.g., variable flush, pressure-assisted aerators), and occupancy sensors on many of the fixtures within the terminal building restrooms. These improvements can be made as part of the larger terminal facility renovation/expansion discussed in the Master Plan; therefore, for the purposes of this study, it is recommended that any outdated, lower-efficiency fixtures be replaced with high-efficiency, low-flow, and waterless units as a proactive project.

ACTION

Evaluate the technical and financial feasibility of developing a solar and/or geothermal energy source at the Airport

Annual Water Use within Terminal Restrooms										
		Current EPA Standards		**High-Efficiency Standards**						
Fixture	**# of Units**	**Water Use**	**Annual Cost**	**Water Use**	**Annual Cost**	**Water Savings**	**Expense Savings**	**Upgrade Cost Per Unit**	**Total Upgrade Cost**	**ROI (Yrs.)**
Faucet	27	250,938	$1,008	150,563	$605	100,375	$403	$600	$16,200	40
Urinals	10	273,750	$1,100	0	$0	273,750	$1,100	$700	$7,000	6
Toilets	25	1,168,000	$4,692	547,500	$2,199	620,500	$2,493	$800	$20,000	8
Total	**62**	**1,692,688**	**$6,800**	**698,063**	**$2,804**	**994,625**	**$3,995**	**$2,100**	**$43,200**	**11**

Additionally, the installation of a consolidated water heater was also evaluated in terms of water conservation for restrooms and other facilities at the Airport. As mentioned in the Energy Efficiency Assessment, there are four (4) various sized electric water heaters located near point-of-use that serve the majority of restrooms in the terminal building. The other outlying, or remote, restrooms on the Airport are served by smaller gas-fired "tank" style water heaters (40 gal.) or point-of-use electric water heater. Based on current traffic levels, it was determined that replacing the existing point-of-use hot water heaters with a consolidated unit would not be reasonable or cost effective to constitute meaningful energy or water savings. However; in the future, during renovation projects or when the existing water heaters reach the end of their usable life, replacing the point-of-use heaters into one consolidated unit is still a recommended action.

4.4.2   Water Recycling and Reuse

Additional means of reducing the draw from a public water supply include rain water harvesting and gray water systems. These are two (2) methods of water recycling that could potentially be used as supplemental, non-potable water sources for use in toilets and urinals, vehicle washing, or landscape irrigation at the Airport.

Harvesting is the collection of rainwater from roof tops, large concrete areas, or other impervious surfaces and storing that water in cisterns for non-potable use. Cisterns can be placed above or below ground, and the collected water is pumped or gravity-fed into the appropriate plumbing system. HTS has no landscaping that requires irrigation, so the restrooms within the terminal building would be the most likely candidate for such a system. Washing of rental cars is another potential use of captured rainwater.

"IWS - watercache.com"; 5600 gallon commercial rainwater collection system for LEED Gold rated fire station in Denton, Texas

One potential means of water collection would be to capitalize on the existing terminal apron infrastructure. With the installation of a 5,000-10,000 gallon underground cistern, and retrofitting the collection drains the Airport could collect an average of 229,000 gallons of rain water per month from March through July (based on apron area and the average monthly rainfall according to US Climate Data). This could reduce the Authority's public water demand by over half (assuming the rainwater would be used for grey water purposes, detailed below) during the five-month rainy season and reduce the annual water cost by $3,000 (based on $0.00402/gallon).

ACTION

Consider the implementation of a rain water cistern during future terminal expansion or renovation

The difficulty and high cost of retrofitting the terminal's existing plumbing with a secondary rainwater system does make such a venture largely infeasible as the return on investment would likely be decades; however, during any future terminal renovations or expansions the integration of a rain water cistern system should be considered, as the costs for new construction would be expected to be much more reasonable.

ACTION

Evalaute potential for installing gray water to toilet/urinal systems

Gray water systems refer to the reuse of water drained from showers, faucets, sinks, dishwashers, wash bays, and other potable to waste water systems (excluding toilets and kitchen sinks). Gray water is of lesser quality than common tap water and is only recommended for use in toilets and urinals, car washes, and possibly irrigation. Because gray water systems vary from low-cost systems (e.g. one sink to one toilet) to higher complexity systems, additional research would be needed to evaluate the feasibility of retrofitting   the existing restrooms to use gray water as a supplement to the primary water supply. Though not as robust as a rainwater system, there is potential to reduce public water demand and operational expenses by converting the system for each individual restroom.

4.4.3 Protecting Water Quality

Airport activities have the potential to effect local water quality. Transportation and storage of fuels, de-icing of aircraft and pavement, and general indirect pollution can lower the quality of watersheds and water bodies near an airport. For this reason, the management of stormwater runoff (i.e., precipitation in the form of rainwater or snow melt that "runs off" over the land instead of seeping into the ground) is highly regulated through the NPDES permit program, created in Section 402 of the 1972 Clean Water Act (CWA). The NPDES permit program is designed to prevent stormwater runoff from washing harmful pollutants and excess silt into local surface waters, such as streams, rivers, lakes or coastal waters.

The Tri-State Airport requires permit coverage for stormwater discharges from its daily "industrial" operations and construction activities. Industrial activities, including deicing operations, are monitored under individual NPDES permits. Individual permits are to be renewed every 5 years. Most of HTS's construction activities are monitored under the General Permit for Storm Water Discharges from Small and Large Construction Activities. The current General Construction Permit is No. OHC000004 expiring April 20, 2018. The WVDEP has been renewing it every 5 years. The General Permit covers discharges that will have a minimal effect on the environment. Additionally, in accordance with the requirements of these permits, HTS maintains a SWPPP which identifies the people, processes and practices that airport staff must follow to prevent and mitigate stormwater pollution.

As part of the Authority's ongoing environmental planning efforts, the *2014 Master Plan Update* identified necessary updates to the Airport's stormwater management controls in place at the Airport, as well as, future recommended controls to accommodate anticipated facility growth. As the various areas of the Airport are planned and developed, the Authority will need to comply with the NPDES permit requirements at that time and implement the latest strategies and practices available as stormwater management technologies continue to evolve.

ACTION

As airport development occurs, update and expand the current stormwater controls and SWPPP accordingly

The EPA describes Low Impact Development (LID)[6] as:

> *...an approach to land development (or re-development) that works with nature to manage stormwater as close to its source as possible. LID employs principles such as preserving and recreating natural landscape features, minimizing effective imperviousness to create functional and appealing site drainage that treats stormwater as a resource rather than a waste product. There are many practices that have been used to adhere to these principles such as bio retention facilities, rain gardens, vegetated rooftops, rain barrels, and permeable pavements. By implementing LID principles and practices, water can be managed in a way that reduces the impact of built areas and promotes the natural movement of water within an ecosystem or watershed. LID has been characterized as a sustainable stormwater practice by the Water Environment Research Foundation and others.*

6 U.S. EPA, **http://water.epa.gov/polwaste/green/**

ACTION

Incorporate LID strategies into the Airport's "Development Guidelines"

To proactively reduce the ecological effects of continued airport development, while meeting the needs of the traveling public and local communities, LID strategies should be employed throughout airport property where applicable and feasible. This can be promoted by integrating LID concepts into the Authority's *Development Guidelines (Architectural, Engineering and Aesthetic Control)* which apply to all tenants on leased airport property. An extensive list of LID resources can be found on the EPA website at **http://water.epa.gov/polwaste/green/**.

4.5   AIR QUALITY

The EPA, under the influence of the Clean Air Act, has set National Ambient Air Quality Standards (NAAQS) for pollutants considered to be harmful for public health and the environment. The NAAQS identifies six (6) principal pollutants, known as 'criteria' pollutants, which include carbon monoxide (CO), sulfur oxides (SOx) lead (Pb), nitrogen dioxide (NO 2), ozone (O3), and particulate matter less than 10 microns in diameter (PM10) and particulate matter less than 2.5 microns in diameter (PM2.5). Under the CAA, each state is responsible for classifying areas with respect to compliance or degree of noncompliance with the NAAQS. These designations include "attainment", "non-attainment" and "maintenance". An area with air quality better than the NAAQS is designated as attainment, while one with air quality worse than the NAAQS is designated as non-attainment. Non-attainment areas are further classified as extreme, severe, serious, moderate, and marginal. A maintenance area is one previously designated non-attainment but re-designated as a maintenance area because air pollution levels have improved above levels that would place the area in non-attainment status. According to the U.S. Environmental Protection Agency, Wayne County is designated as a maintenance area for PM2.5.

Another class of air pollutants has been receiving increased attention in recent years, namely GHG. GHG is the general term for a number of gases that are instrumental in controlling the temperature of the earth. The most common GHGs include water vapor, carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), and ozone, but there are many others. Excess amounts of these GHGs can lead to increases in the earth's near-surface temperature, which is part of the debate on world climate change. GHGs are generated both by natural and man-made sources, including stationary and mobile sources. Relative to airports, the GHG of primary importance is the CO2 generated from the burning of fuels.

On April 17, 2009, EPA's Administrator signed an Endangerment Finding, which found that the current and projected concentrations of the six (6) key GHGs in the atmosphere have an effect on the planet. The GHG emissions generated directly and indirectly by an entity, such as a federal agency, can be classified into "scopes," based on the source of the emissions:

- **Scope 1** emissions are <u>direct</u> emissions from sources that are owned or controlled by the reporting entity. For an airport, these emissions are those associated with ground vehicles owned and operated by the Airport and stationary sources.

- **Scope 2** emissions are <u>indirect</u> emissions from the generation of purchased electricity consumed by the Airport.

- **Scope 3** are also <u>indirect</u> emissions from sources not owned or directly controlled by the entity but related to the entity's activities. Scope 3 are typically the largest quantity of emissions at an airport, as they include aircraft-related emissions, emissions from all tenant-related activities, as well as the public's travel to and from the Airport.

Sustainability objectives associated with Air Quality at the Airport include:

- Reducing the carbon footprint of the Airport

- Decrease the amount of emissions generated associated with HTS both on- and off-Airport

- Improve the air quality of the surrounding region

4.5.1   Baseline Assessment

In 2014, an inventory of GHG emissions was completed for the Airport utilizing guidance provided in the Airport Cooperative Research Program Report 11 – *Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories* (ACRP, 2009) (see **Appendix A)**. As such, the baseline assessment was prepared to identify the emissions of the six (6) principal greenhouse gases, which are CO_2, N_2O, CH_4, sulfur hexafluoride (SF_6), hydrofluorocarbons (HFC), and perfluorocarbons (PFC). The basis of the inventory assessment was to identify quantifiable emissions generated at HTS and categorize those emissions to recognize opportunities and practices that can be implemented to reduce the total emissions for the Airport. Typically, emissions that are associated with an airport occur from the following activities:

- Aircraft operations

- Ground support equipment (GSE)

- Ground access vehicles (GAV)

- Stationary sources (i.e., natural gas uses in buildings on airport property and emergency generators)

- Electricity use

It is common that the majority of emissions and particulate pollution generation at airports is primarily from aircraft operations. The emissions from aircraft include Landing and Take-Off (LTO) and Cruise operations. These categories encompass the various phases of operations; 1) on the Airport (run-up, taxi, take-off queue, etc.); and 2) within the vicinity of the Airport (LTO operation is defined as all activities taking place below 3,000 feet). Emissions data from these operations were based on fuel consumption factors from the FAA's Emissions and Dispersion Modeling System (EDMS) model (FAA, 2009). These factors were then applied to current activity levels (total operations) at the Airport for the base year to calculate total emissions. The base year used in this assessment was 2012.

After aircraft operations, the largest contributors to airport emissions are daily Ground Access Vehicles (GAV) operations that operate in the vicinity of the Airport. (i.e., vehicles used to transport people/goods to and from the Airport). These are considered to be aircraft owners/operators (FBOs, employees, etc.), the general public (passengers, pickup/drop-off, rental car, etc.), and public transit systems that serve

HTS (parking shuttle, shuttle buses, bus line, taxi, etc.) For the purposes of this assessment an average trip distance of 30 miles was assumed along with daily passenger car traffic estimates at 800 trips to and from the Airport.

The remaining sources do generate emissions; but, at a rate much less than the previous two sources. This includes the GSE on the airfield, electricity use (terminal, FBO, tenant, etc.), and stationary sources (boilers, furnaces, water heaters, generators, etc.). These factors were measured based on the size of the engines in the equipment and by the amount of energy (electricity, natural gas, etc.) needed to power the equipment. The total number of hours were taken for GSE and applied to the EDMS similar to operations.

The following table details the total emissions (in metric tons) for the various sources of GHG emissions. As noted in the table, the total GHG emissions (CO2-equivalent) for HTS are estimated to be 21,489 metric tons per year.

2012 Baseline Green House Gas Emissions (Metric Tons)			
Activity	**CO2**	**CH4**	**N2O**
Aircraft Operations (Total)	13,113	0.79	0.28
Aircraft Operations (LTO)	3,472	0.19	0.08
Aircraft Operations (Cruise/APU)	9,641	0.60	0.21
Ground Support Equipment	141	0.01	0.004
Ground Access Vehicles	6,533	0.26	0.14
Stationary Sources (Total)	330	0.03	0.002
Natural Gas Use	291	0.03	0.001
Emergency Generators	39	0.002	0.001
Electricity Use	1,212	0.01	0.02
Total Emissions	**21,328**	**1.10**	**0.45**
Total Emissions (CO2-equivalent)		**21,489**	

4.5.2   Airport Operations

As expected, the most significant source of emissions associated with HTS is attributed to fuel combustion from aircraft operations. Of the total 21,489 metric tons of CO2e emissions, approximately 61% of these are from aircraft fuel combustion. It is very common for airport emission outputs to be dominated by aircraft operations. The challenge is the evaluation and developing procedures to reduce the associated emissions. For commercial service airports, it is common to accumulate delays, both on the ground and in the air. These delays are the result of several factors (carrier delays, departure congestion, airborne operations causing ground delays, etc.) that cause extended periods in which the Airport generates excess emissions. This includes extended taxiing times, delayed aircraft gate push-back/run-up, increased departure queue times (aircraft sitting idle waiting to take-off), and other extended engine run times. Taxiing procedures are typically categorized as taxi-out and taxi-in (i.e., from the gate to the runway and vice versa). Flight operations associated with emissions at a specific airport are defined as any time flight operations occur within the vicinity of the origin or destination facility.

Based on the level of activity at the HTS and the relatively low peak hour events, airfield congestion is not a concern. The Master Plan does predict a 44.3% growth in overall operations during the next 20 years; however, when comparing current operations (17,095) with the projected growth (24,673), congestion will remain a non-issue; therefore, it is recommended that the Airport implement new sustainable airfield practices and procedures to find alternate ways to mitigate aircraft emissions.

ACTION

Develop new airfield practices and procedures to reduce engine run times

By implementing new taxiing and gate/parking hold procedures, the Airport could alleviate a portion of the projected emissions associated with increased operations. The following are opportunities the Airport may consider for future implementation.

- Single Engine Taxi – Taxiing on reduced engines (one engine on two engine aircraft, two engines on four engine aircraft, etc.)

- Aircraft Tow-outs – Towing the aircraft (also referred to as dispatch towing) from the gate to position for departure near the runway

- Gate Shut Down – Implementing a policy that all aircraft must use alternate forms of power outside of engine run during gate holds/passenger loading

ACTION

Consider adopting specific practices to taxiing procedures to minimze unneccessary emissions

4.5.3   Ground Support Equipment

Similar to operations, GSE activity also contributes to airport emissions, albeit in a much lower capacity then aircraft operations. GSE equipment at HTS is owned and operated by various sources including individual airlines (US Airways, Air Wisconsin, Piedmont), FBO (Attitude Aviation, Jet Center), and the Airport (GSE and Airport vehicles). Various types of GSE operated at the Airport include aircraft tugs, baggage equipment, fuel and de-icing trucks, GPUs, and other airport vehicles. These vehicles and support equipment can either be powered by diesel engines or fully electric motors. In addition to airline operated equipment, the Airport also has GSE vehicles equipped with gas/diesel powered engines.

ACTION

Consider adopting specific practices to taxiing procedures to minimze unneccessary emissions

In an effort to reduce pollution and promote environmental awareness, airlines have begun to convert their equipment from diesel and gas powered engines to electric powered motors. At HTS, US Airways has begun taking part in this effort on a national level. This provides the Airport with an opportunity to assist the airlines by supporting their conversion in other ways, including terminal upgrades providing electrical power and retrofitting terminal gates and working with the Jet Center to convert equipment to electric power, and purchasing new equipment (GPUs, Mobile Station, etc.).

In addition to the terminal upgrades and retrofitting to provide additional power supply for GSE from the terminal, the Airport has an opportunity to reduce emissions further by electrification of the terminal gates. As an aircraft begins its run-up procedures and the boarding of passengers at the terminal gate,

it is necessary for the aircraft to utilize the APU of the aircraft. The APU is an engine power unit on the aircraft used to provide electrical power functionality for the aircraft on the ground (electrical systems, conditioned or forced air, lighting systems, etc.) while the engines are not in use. As such, the APU uses fuel for power and creates emissions when utilized.

The electrification of terminal gates essentially outfits the gate with additional electrical power to support aviation activity at the gate. This includes retrofitting passenger loading bridges with centralized pre-conditioned air for the aircraft, charging stations for electrical ground equipment, and the installation of additional electrical ports for stationary charging (charging while equipment is not in use).

ACTION

Upgrade old terminal with power supply and electrify any new gates during terminal expansion

HTS currently does not have any electrified gates connected to the terminal building. This existing condition provides the Airport with an opportunity to enhance its terminal and assist the airlines by providing fully electrified gates to include PC air units for heating and cooling and power (400Hz) sources at each gate. The Master Plan identifies future terminal expansion, which includes upgrading existing ground level gates to second floor boarding impacting three (3) gates.

4.5.4 Ground Access Vehicles

The second largest contributor, approximately 30% of the total emissions generated at HTS, are Ground Access Vehicles (GAVs). GAVs includes passenger vehicles (including pick-up and drop-off), airport shuttles, limos, taxis, buses, and other means or transportation to and from the Airport.

In a general sense, the mitigation of emissions generated from GAVs is a challenge for airports from the standpoint that aviation growth leads to an increase in passengers which as a result increases the amount of vehicle activity to and from the Airport. However, there are several strategies and opportunities to mitigate the relative amount of emissions by implementing environmentally responsible policies and procedures.

One of these improvements, identified in the Master Plan, is the reconfiguration of access roadways to the terminal building, which would mitigate congestion occurring along the terminal curbside. Improvements to the access roadways will increase efficiency of roadway traffic, improve way-finding, resulting in shorter vehicle run times therefore reducing emissions. In addition to the proposed roadway improvements, the Master Plan also recommended the Airport adopt and implement new traffic management policies to encourage shorter wait times, an increase in cell phone lot use, and other traffic management monitoring and procedures.

ACTION

Adopt traffic management policies, improve way-finding, and encourage cell lot use

In addition to the diesel GSE, the Airport also owns and maintains several diesel and regular gas powered maintenance and airport vehicles. Along with the conversion of the GSE, it is

ACTION

Convert/retro fit Airport owned vehicles to alternative energy sources

also recommended the Airport discuss proposals to convert/retrofit the authority fleet to alternative fuels and hybrid vehicles.

4.5.5   Stationary Sources

A secondary source for emissions at Airports comes in the form of stationary sources. These sources can include everything from gas powered water heaters to emergency and non-emergency generators, furnaces and other gas powered utilities within the terminal and other airport facilities.

Although these sources are classified as Scope 1, or controlled by the Airport, the generation of stationary source emissions is much lower than other contributors; however, the Airport does have an opportunity to reduce or eliminate emissions associated with these sources. As mentioned in **Section 4.3** and **Section 4.4,** the Airport can replace or convert gas powered utilities to alternative fuel (CNG) or fully electric powered equipment.

Because of the relatively low emissions output from these sources, the comparative outcome in emissions reduction will nevertheless be negligible and a benefit costs analysis should be completed before considering further action.

4.5.6   Electricity Use

The quantity of electrical energy consumed at the Airport is directly related to the level of passenger activity. As such, when the level of passenger activity increases, the aggregate sum of electricity spent will also rise. Additionally, as the Airport expands the terminal building more electrical power will be necessary to power the new portion of the building.

Electrical emissions are, generally speaking, not equivalent to fuel powered emissions as they are considered to be Non-Point Source (NPS) emissions. NPS emissions are defined as pollutant sources that are diffuse and do not have a point of origin or are not introduced to the environment from a standard outlet. Electricity is derived from a power source off-Airport and provided for the region, thus decreasing energy use on the Airport will reduce the draw from regional energy use, reduce reliance on off-site power generation and fossil fuels, and improve the regional air quality.

4.6   GREEN CONSTRUCTION

HTS encompasses 1,100 acres of land that is home to numerous commercial, government and private tenants. While some tenants represent Fortune 500 companies, others represent small-business or personal interests. The facilities for these tenants vary greatly in size and complexity and include both aeronautical uses that require airside access, and non-aeronautical uses that do not need direct access to the airfield. The *2014 Master Plan Update* identified approximately 30-40 additional acres of airport property available for general commercial/industrial and aeronautical development.

Of the 30 or so buildings on airport property, the Authority owns and maintains 20 of them, including the Passenger Terminal, FBO/ARFF Building, Various Hangars, FedEx Hangar, Old National Guard Building and

other miscellaneous buildings on the airfield. The Terminal was updated in 2012, with improvements to the insulation and lighting in the Terminal building, restaurant/concessions and other public amenities. These improvements included the installation of higher efficiency lighting and insulation to reduce the amount of energy and heat needed to power the building.

In addition to the likely growth in tenant facilities, the 2014 Master Plan Update also identified a near-term development program and long-term vision for the Airport facilities needed to meet the growing public air-travel demands. Future infrastructure improvements are anticipated to include rehabilitation and expansion of the passenger terminal; access road and parking lot reconfiguration, including a structured garage; additional and reconfigured taxiways; and apron expansions. All development and facility expansion on the Airport, including the airfield, Authority, and tenant assets, are undertaken in concurrence with the FAA approved ALP.

Any new construction and facility rehabilitation at HTS should be as "green" as practical; therefore, the current Airport Development Guidelines should be expanded into "Sustainable Design and Construction Guidelines." These revised guidelines could provide a list of recommended practices to ensure that development projects are executed in a sustainable or environmentally friendly manner. The list or menu of items could be developed from the Sustainable Aviation Guidance Alliance (SAGA) Database (**http://www.airportsustainability.org/database**) or the LEED "Credit Library" (**http://www.usgbc.org/credits**). The developer could be directed to these resources, or the Authority's sustainability team could identify the specific practices that are most appropriate for facilities at HTS. Sustainable practices could be identified for several areas of facility design and construction including:

> **ACTION**
>
> Develop "green" standards or guidelines for all new construction and facility rehabilitation

- **Engineering and architecture staff** – Promote the use of LEED-accredited professionals on project design teams.

- **Stomwater management** – Provide strategies or Best Management Practices (BMPs) that promote infiltration and address stormwater rate and quantity, treatment, pollution prevention, erosion and sediment control during construction.

- **Low Impact Development (LID)** – Refer to **Section 4.4 C**

- **Water efficiency** – Reduce potable water usage through high efficiency fixtures, graywater reuse, or rainwater collection and use.

- **Energy performance** – Promote energy efficient design, systems and processes to reduce energy use related to lighting, HVAC, insulation, and system controls. This could include maximizing the use of natural light and Energy Star rated appliances and equipment.

- **Renewable or alternative energy** – Promote the use of green energy where appropriate, including

Coastal Treated Products Company

solar, geothermal, wind, etc. This could also address the use of alternative fuel vehicles (electric, compressed natural gas) and associated fueling/charging facilities.

- **Landscaping** – Promote the use of vegetation that is indigenous, low maintenance, drought resistant and non-wildlife attracting. Also address community screening and aesthetics.

- **Heat island reduction** – Incorporate reflective materials for pavements, roadways, parking lots, sidewalks, plazas and roofs to reduce potential "heat island" effects. Heat islands are built up areas that are hotter than nearby rural, vegetated or undeveloped areas. Heat islands can affect communities by increasing summertime peak energy demand, air conditioning costs, air pollution and greenhouse gas emissions, heat-related illness, and water quality.

- **Pavement design and construction** – Where appropriate, specify warm mix asphalt which allows for lower temperatures at which the material is mixed and placed. This temperature reduction has the benefit of cutting fuel consumption and decreasing the production of greenhouse gases. Additional engineering benefits include better compaction, the ability to haul paving mix for longer distances, and extending the paving season by being able to pave at lower temperatures.

- **Construction materials** – Maximize the use of low maintenance and high recycled content materials and products. Where appropriate, promote the "deconstruction" of facilities, as opposed to "demolition" and the development of construction waste management plans that sort and reuse construction wastes, including concrete, asphalt and other building materials. Forest Stewardship Council (FSC) certified wood products could also be promoted. The FSC certification indicates that the wood products come from a forest is managed responsibly, including protecting fragile ecosystems, respecting native cultures and economies, restricting clear cutting and pesticide use, and preventing illegal logging. Reuse or repurpose existing building materials and building demolition materials where feasible.

- **Indoor air quality** – Enhance public and employee health through ventilation design and easily cleanable ductwork, and the use of low-VOC emitting materials, products and finishes within the occupied spaces.

- **Clean construction equipment** – Promote the use of well maintained, low emission construction equipment and vehicles consistent with the U.S. EPA's latest non-road diesel emission standards. Include consideration for the use of recycled oils and lubricants and provide effective dust control within the construction sites.

- **Topsoil management** – Topsoil is that uppermost layer of soil capable of supporting vegetation. The nutrient- and organic matter-rich topsoil has become a commodity that contractors often strip and sell if it is not needed to stabilize the final project site. Over-manipulation and compaction of the topsoil can alter its vegetation growth capabilities. If there is not sufficient or viable topsoil at the project site, it must be trucked in from other locations, which can increase a project's construction budget. The use of native topsoil, or that from the same general site, is also known to have better resistance to invasive species growth. According to the AASHTO Center for Environmental Excellence, general environmental stewardship practices for earthwork and soil management include:

— Minimize the extent of disturbance and impact to soil outside the project's construction limits.

— Mitigate construction-related soil compaction in vegetation restoration areas by ripping the soil to loosen its structure.

— Stockpile and reuse native soils where practical.

— Minimize erosion potential and weed species invasion by establishing a healthy plant cover.

— When stockpiling topsoil, mound soil no higher than 1.3 m (4 feet) high for less than 1 year and preferably less than 6 months. Cover to prevent soil erosion and contamination by weeds.

— Avoid walking, operating equipment or driving vehicles on planting areas after soil preparation is complete.

▪ **Bids and contracts** – Provide sample bid and contract language, or templates, for construction projects based on the provisions of the "Sustainable Design and Construction Guidelines."

These expanded sustainability guidelines could be implemented as either "requirements" or "recommendations" depending on the level of flexibility and/or control desired by the Authority. The Authority could provide detailed technical specifications for sustainability items, or they could designate a specific achievement level, performance standard, or target goal that any development must or should attain. Such standards could be set for individual items, such as "tenant must achieve a 50% recycling rate"; which states a level of performance, but how the tenant achieves it – is for them to determine. A broader standard could also be set, such as "the highest LEED® level practical", regardless of whether or not LEED certification is actually pursued. These types of "performance based" requirements tend to leverage market innovation to reduce development costs.

Application of the guidelines could also be "tiered" where they are a "standard" for any Authority owned and maintained buildings and "encouraged" for privately developed facilities. Many organizations, including some airports within the United States, have set LEED "Silver" as the design goal/standard. Out of a total 69 LEED points available for new construction projects, Silver status is achieved with 33-38 points as compared to "Certified" with 26-32, "Gold" with 39-51 and "Platinum'" with 52-69. The larger the building or facility, the more financially prudent opportunities there are to implement sustainable features. For that reason, some organizations will set a threshold, such as 7,500 square feet, for the "standards" to apply.

For relatively small, inexpensive, or simple projects, calculating the "simple payback" may be sufficient to make a sound decision. Particularly effective for projects that reduce energy or resource usage, simple payback is how long it will take for the cumulative savings (as compared to standard or non-green actions) and other benefits to equal or "payback" the initial investment. For projects that are more costly or complicated in nature, a full "Life-Cycle Cost Analysis" (LCCA) may be needed to make a well-informed decision. An LCCA measures the "total cost of ownership" over the lifetime of the project. When comparing development alternatives, an LCCA could indicate which might provide a better ROI. LCCA is used to measure the total cost of a green building project through the lens of the project's entire useful life. The LCCA measures the opportunity cost of one investment vs. another alternative and

provides data as to which might provide a better ROI. Compared to a simple payback analysis, an LCCA includes the initial cost of a project, as well as the anticipated maintenance, operation, financing, useful life and any ultimate salvage value that the project may have. With consideration of these future factors, the LCCA then calculates a present value of the future investment using a discount rate percentage that is typically equal to the investor's required rate of return.

In determining whether a simple payback analysis or a more in depth LCCA should be used, a developer/investor would typically start with a simple payback analysis. Considering that investors want the quickest return possible, if that analysis indicates the project would require, for example, more than five (5) years to produce a return, an LCCA may needed. At this point, particular attention must be paid to the anticipated lifespan of the finished project. For many organizations, a 10 or 15 year payback period is considered the threshold. As previously described, the Energy Efficiency Assessment used a simple payback ROI of 15 years.

ACTION

Incorporate Life-Cycle Cost Analysis into the "green" decision making process

A source of information on LCCA and the pros cons, when to apply can be found on the Northwest Energy Efficiency Alliance "Better Bricks" program website at: **http://www.betterbricks.com/graphics/assets/documents/BB_CostAnalysis_WWW.pdf**.

And the U.S. Green Building Council's LEED website at: **http://www.green-buildings.com/content/78446-leed-life-cycle-cost-analysis**.

4.7   COMMUNITY CONNECTION

If sustainability is about balancing the environmental, financial and social needs of a community, a symbiotic relationship between an airport and the various groups it interacts with must be established. Airport sponsors need to educate and keep the public informed as to the importance and benefits of their airport. Community input and "buy-in" is needed for the Airports to be successful. The success and growth of those airports, in turn, support economic health and quality of life within the community. Three key components of the Authority's efforts to be an integral part of the community are promoting land use compatibility, outreach and engagement, and the donation of time and resources.

4.7.1   Compatible Land Use

The long-term viability of any airport is dependent upon effective land use planning, both on airport property and in the surrounding communities. With compatible land use plans in place, airports can ensure safe and efficient aircraft operations and are better able to meet future needs of the communities they serve. Alternatively, the encroachment of non-compatible land uses can limit economic development, reduce quality of life for airport neighbors and increase safety risks to aircraft and persons on the ground.

Through the years, the Authority has worked closely with the City of Huntington and Wayne and Cabell Counties to ensure that land uses surrounding the Airport are compatibly planned for in their respective

Comprehensive Land Use Plans and Zoning Ordinances. The areas surrounding the Airport include a mix of industrial, recreational, public and residential uses. Although residential uses are not typically considered compatible with airports, the residential areas nearest to HTS are generally separated by general surrounding landscape or roadway buffers and are not directly under the "close-in" aircraft approach or departure paths.

At HTS, there are no cell towers, wind turbines or buildings that are known to be a hazard to air navigation and no land uses that currently cause visual obstructions from the production of smoke, dust, steam or sun glare. There are a few areas of concern related to vegetative obstructions (i.e. tree growth) and the Airport's Part 77 Airspace Protection Surfaces. As of late 2014, the FAA has not determined these to be a hazard to air navigation, however, the *2014 Master Plan Update* has proactively recommended a mitigation program to remedy future concerns.

4.7.2   Outreach and Engagement

Going beyond the necessary "marketing" of the Airport and its services, the Authority dedicates resources to public outreach and community involvement. Connection points with the Airport users, stakeholders and various community interests include:

- Regularly updated, interactive and informative website (**www.tristateairport.com**)

- Extensive social media including Facebook, Twitter, and email newsletters

- Stakeholder, user and community working group participation in major   airport planning studies such as the *2014 Master Plan Update*, and this **Sustainable Management Plan**

- Civic and industry speaking events by airport leadership

- Engagement of local, state and federal elected officials several times a year

- Open and proactive media relations to inform the public at large of significant airport events, activities or issues

HTS is viewed as a regional leader in community outreach and engagement. Airport staff has shared their experiences and best practices with others in the Airport industry and regional business and municipalities.

4.7.3   Giving Back

The Authority, and airport staff, also "give back" to the community through the donation of time, money and other resources, including:

- Support of the "Honor Flight Network" which transports America's veterans to Washington, D.C. to visit the memorials dedicated to honor their service and sacrifices. HTS is the preferred airport in the State of West Virginia for Honor Flights. (**http://www.honorflight.org/**)

- Guest speaking at the local universities and colleges and providing internship opportunities for their students.

- Charitable giving to programs such as the Make-A-Wish Foundation (**www.wish.org**)

- Sponsorship of local Little League baseball and local clubs

- The Airport manager serves on various Boards and Foundations and local Business clubs including:

  — Member of the Ceredo, Kenova, and Ashtland Area Business Boosters

  — Serves on the Board of Directors for Ashland and Huntington Chamber of Commerce

  — Serves on the Board for Ashland Economic Development Corporation

  — Chairman of the Foundation for Our Lady of Bellefonte Hospital

  — Serves on the Foundation Board for MountWest Community and Technical College

  — Serves on the Board for KYOVA Metropolitan Planning Organization

  — Serves on the Board for Cabell/Wayne Port Authority

  — Member of Ashland Rotary Club

While incredibly active on these fronts, there are still more organizations and activities in which Airport staff would like to participate. Balancing these activities with the manpower needed to maintain the core facilities and operational activities of the Airport becomes a limiting factor. This is particularly true with the lean and efficient staffing structure. Airport staff will continue to pursue these outreach and community connection opportunities as time and manpower allow. Two potential opportunities to enhance the connection with the local communities include expanding internship programs with the universities/colleges and supporting employees volunteering and/or charitable giving efforts.

THIS PAGE LEFT INTENTIONALLY BLANK

Section 5.0

IMPLEMENTATION AND MONITORING

5.0   IMPLEMENTATION AND MONITORING

As part of this Sustainability Management Plan, it is important for HTS to adopt a plan which implements and monitors the goals discussed and identified throughout this document. This section describes the steps for implementing and tracking the performance metrics relative to each goal and objective. However, it is also essential to recognize how this plan will fit contextually with other financial and project plans (PFC Programs, ACIP, etc.) the Airport is obligated to. At any given airport, there are various annual financial programs that should be considered when implementing the initiatives detailed in this plan.

This section provides HTS with a general timeline of various sustainable actions and objectives accompanied with information necessary to determine, at the Airport's discretion, the timing and scope of each action. Essentially, the implementation plan is a menu list of items/actions, formatted such that the Airport can choose from a range of items in short (0-5 years), mid (5-10 years), and long-term (10-20 years) programs. The implementation and monitoring plan outlines the seven "focus areas" presented in previous sections. Each focus area has an implementation schedule, measurable for the short-, mid-, and long term, and a monitor plan to record progress.

The short-term sustainable objectives were compiled using the "low-capital" objectives. These actions and recommendations have very little initial cost, but provide a range of return on investment from short- to long-range returns. Some of the sustainable objectives do not have any financial return on investment because they are not driven by potential cost savings, rather there initiatives are driven by environmental or social benefits and were given equal consideration. By implementing a plan with low capital/quick investment return objectives in the short-term allows HTS the flexibility to apply the cost savings towards high-capital/high-return objectives in the mid- and long-term time periods.

Some initiatives identified in this study could be incorporated into future AIP eligible projects already identified in the Airport's Master Plan. The FAA has recently expressed a willingness to include sustainable components in AIP-eligible projects. They have acknowledged that if an AIP-eligible project includes certain sustainability components, than those are also eligible for funding. The airport currently has limited annual funds available to begin many of the initiatives identified; however, they remain fully committed to moving forward with as many as possible.

The data and assumptions used to determine a recommended implementation schedule for this plan may change over time and /or become obsolete. Therefore, a sustainability initiative that requires a review of the plan annually is recommended. The implementation schedule presented in this study is meant to be a framework for the airport to use as they begin to implement this sustainability management plan. It is recognized and understood that it may not be feasible that every action will be implemented according to the recommended schedule.

5.1 IMPLEMENTATION PLAN

The following tables provides a summary of objectives HTS is considering for the short term (0-5 years), mid-term (6-10 years), and the long-term (10+ years) implementation at the Airport. The tables also show what sustainability goals (people, planet, prosperity) are applicable to each objective.
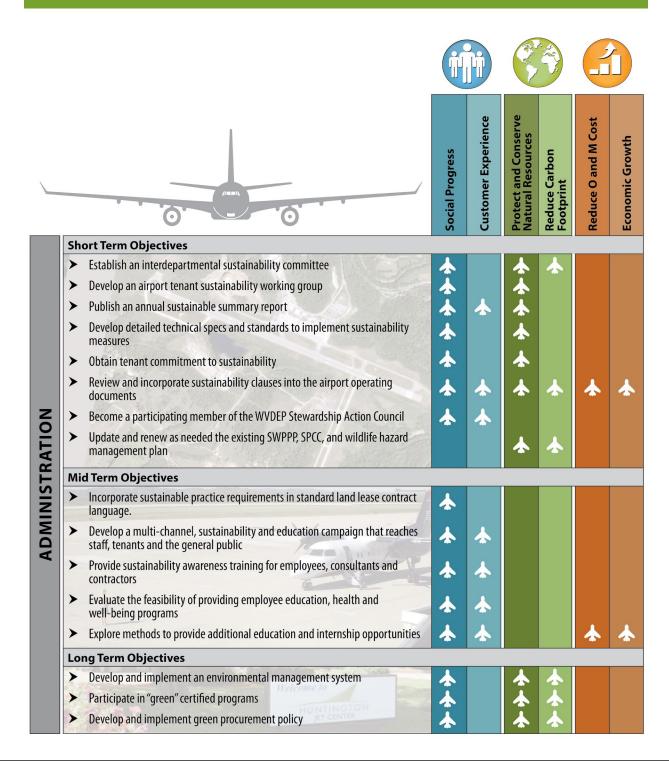
Additionally, the Overarching Sustainability Goals (detailed in **Table 3-1**) that the implementation initiatives for each focus area are based on are also provided for reference.

5.1.1 Administration Implementation Plan

Overarching Administration Sustainability Goals

⊙ Integrate sustainable approaches and practices into the internal policies, business processes, written agreements, day-today operation, and long-term planning of the Airport

⊙ Provide opportunities and incentives to improve the health and well-being of the employees

⊙ Develop the HTS workforce through proper recruitment, training, retention and diversity

ADMINISTRATION	Social Progress	Customer Experience	Protect and Conserve Natural Resources	Reduce Carbon Footprint	Reduce O and M Cost	Economic Growth
Short Term Objectives						
➤ Establish an interdepartmental sustainability committee	✈		✈	✈		
➤ Develop an airport tenant sustainability working group	✈		✈			
➤ Publish an annual sustainable summary report	✈	✈	✈			
➤ Develop detailed technical specs and standards to implement sustainability measures	✈		✈			
➤ Obtain tenant commitment to sustainability	✈		✈			
➤ Review and incorporate sustainability clauses into the airport operating documents	✈	✈	✈	✈	✈	✈
➤ Become a participating member of the WVDEP Stewardship Action Council	✈	✈				
➤ Update and renew as needed the existing SWPPP, SPCC, and wildlife hazard management plan			✈	✈		
Mid Term Objectives						
➤ Incorporate sustainable practice requirements in standard land lease contract language.	✈					
➤ Develop a multi-channel, sustainability and education campaign that reaches staff, tenants and the general public	✈	✈				
➤ Provide sustainability awareness training for employees, consultants and contractors	✈	✈				
➤ Evaluate the feasibility of providing employee education, health and well-being programs	✈	✈				
➤ Explore methods to provide additional education and internship opportunities	✈	✈			✈	✈
Long Term Objectives						
➤ Develop and implement an environmental management system	✈		✈	✈		
➤ Participate in "green" certified programs	✈		✈	✈		
➤ Develop and implement green procurement policy	✈		✈	✈		

5.1.2 Solid Waste and Recycling Implementation Plan

Overarching Solid Waste and Recycling Sustainability Goals

- Minimize the amount of solid waste generated and disposed of in local landfills
- Maximize collection and re-use of recyclable materials
- Ensure that hazardous materials are properly stored and handled and do not pose a threat to the environment or human health.

WASTE MANAGEMENT AND RECYCLING

Objective	Social Progress	Customer Experience	Protect and Conserve Natural Resources	Reduce Carbon Footprint	Reduce O and M Cost	Economic Growth
Short Term Objectives						
Conduct a waste and recycling audit				✈	✈	
Derive a baseline for the total solid waste generated per year to monitor and track reduction to meet goals			✈	✈		
Develop a Terminal Solid Waste Management and Recycling Program	✈		✈	✈	✈	✈
Increase the amount of strategically located recycling receptacles next to trash receptacles and place signs directly adjacent that clearly identifies what can and cannot be recycled		✈	✈	✈		
Conduct awareness training for the janitorial staff to ensure that recyclables stay segregated from waste	✈	✈	✈			
Apply for State funded Recycling Grants to assist with the implementation of the Airport recycling program					✈	✈
Expand the solid waste recycling program throughout the Airport			✈	✈		
Implement solid waste reduction initiatives and incentives for airport employees, tenants, and vendors	✈				✈	✈
Develop an education training program on waste reduction for airport employees, tenants, and vendors	✈		✈			
Minimize the use of office printing materials			✈	✈	✈	✈
Maintain existing waste oil/fuel reclamation site			✈	✈		
Mid Term Objectives						
Renegotiate or consolidate waste disposal contracts					✈	✈
Require concessionaires to utilizes reusable products			✈	✈		
Join local programs that raise awareness (i.e., begin social networking programs, poster initiatives, recycling events)	✈	✈	✈			
Repair and maintain existing deicing fluid recovery, storage and release equipment			✈	✈		
Long Term Objectives						
Develop a centralized solid waste/recycling and hazardous waste facility			✈	✈	✈	✈
Develop and implement a surplus food program to benefit area food banks	✈					
Monitor for opportunities to sell collected recyclable material	✈				✈	✈
Consider sponsoring community food drive events	✈	✈				
Monitor and evaluate feasibility of glycol product recovery and recycling program			✈	✈	✈	✈

5.1.3 Energy Management Implementation Plan

Overarching Energy Management Goals

- ⊙ Maximize energy efficiency and minimize energy consumption within buildings and airport property
- ⊙ Evaluate and implement alternative energy procurement programs and renewable source generation

ENERGY MANAGEMENT		Social Progress	Customer Experience	Protect and Conserve Natural Resources	Reduce Carbon Footprint	Reduce O and M Cost	Economic Growth
Short Term Objectives							
	➤ Implement Short-Term Energy Conservation Measures defined in Short-Term ECM table in Section 4.3.1 for energy efficiency improvements in the terminal and other on-airport buildings	✈	✈	✈	✈	✈	✈
	➤ Incorporate LEED or GreenGlobes principles into a set of Airport Development Guidelines	✈	✈	✈	✈	✈	✈
Mid Term Objectives							
	➤ Implement Mid-Term Energy Conservation Measures (5-10 year ROI) defined in ECM table in Section 4.3.1 for energy efficiency improvements for all on-airport buildings	✈	✈	✈	✈	✈	✈
	➤ Monitor/Investigate opportunities for oil/gas extraction at the Airport			✈	✈	✈	✈
Long Term Objectives							
	➤ Use Energy Star Program to monitor energy performance and seek certification for the terminal	✈		✈	✈	✈	✈
	➤ Implement Long-Term Energy Conservation Measures (10-15 year ROI) defined in ECM table in Section 4.3.1 for energy efficiency improvements for all on-airport buildings	✈	✈	✈	✈	✈	✈
	➤ Pursue public-private partnerships to evaluate and/or develop solar energy systems			✈	✈	✈	✈
	➤ Evaluate the technical and financial feasibility of developing a solar and/or geothermal energy source at the Airport			✈	✈	✈	✈
	➤ Consider installing solar hot water heaters and/or small wind turbines into future building renovation or new construction projects			✈	✈	✈	✈

5.1.4 Water Resource Management Implementation Plan

Overarching Water Resource Management Sustainability Goals

- Maximize water conservation and minimize potable water use within Airport facilities
- Protect regional water quality through effective stormwater management and pollution prevention initiatives

WATER RESOURCE MANAGEMENT

	Social Progress	Customer Experience	Protect and Conserve Natural Resources	Reduce Carbon Footprint	Reduce O and M Cost	Economic Growth
Short Term Objectives						
➤ Incorporate LID strategies into the Airport's "Development Guidelines"			✈	✈	✈	✈
➤ Use low-volume, high pressure sprayer nozzles on water hoses used for vehicle washing, clean-up, regular use			✈	✈	✈	
Mid Term Objectives						
➤ Replace outdated terminal restroom fixtures and toilets with innovative high-efficiency units	✈	✈	✈	✈	✈	✈
— Install waterless urinals			✈	✈	✈	✈
— Install variable flush or pressure assisted toilet units			✈	✈	✈	✈
— Install low flow faucets			✈	✈	✈	✈
— Install automatic sensors or occupancy sensors on faucets, urinals, and toilets			✈	✈	✈	✈
➤ As airport development occurs, update and expand the current stormwater controls and SWPPP accordingly			✈	✈		
Long Term Objectives						
➤ Evaluate potential for installing grey water to toilet/urinal systems	✈	✈	✈	✈	✈	✈
➤ Consider the implementation of a rain water cistern during future terminal expansion or renovation	✈		✈	✈	✈	✈
➤ As terminal expansion continues, or current point-of-use electric water heaters age beyond their useful life, consolidate terminal water heaters into one large tank-style natural gas-fired water heater			✈	✈	✈	✈

5.1.5 Air Quality Implementation Plan

Overarching Air Quality Sustainability Goals

- ⊙ Minimize greenhouse gas emissions associated with airport activities
- ⊙ Develop and operate airport facilities in accordance with federal NEPA provisions for criteria air pollutants
- ⊙ Reduce the carbon footprint of the Airport

AIR QUALITY

	Social Progress	Customer Experience	Protect and Conserve Natural Resources	Reduce Carbon Footprint	Reduce O and M Cost	Economic Growth
Short Term Objectives						
➤ Develop new airfield practices and procedures to reduce engine run times	✈		✈	✈		
➤ Consider adopting specific practices to minimize unnecessary emissions pertaining to Airport owned vehicles	✈		✈	✈		
➤ Pursue VALE Grant to assist with gate equipment acquisition					✈	✈
➤ Adopt pedestrian traffic management policies, improve way-finding, and encourage cell lot use	✈	✈	✈	✈		
Mid Term Objectives						
➤ Purchase electrical GPUs with 400hz power and PC air units to encourage GSE conversion*			✈	✈	✈	✈
➤ Purchase additional alternative energy powered GSE units (baggage conveyors, electric tugs, baggage carts, etc.)		✈	✈	✈	✈	✈
Long Term Objectives						
➤ Upgrade old terminal with power supply and electrify any new gates during terminal expansion	✈	✈	✈	✈		
➤ Convert/retro fit Airport owned vehicles to alternative energy sources (Natural Gas/Electric)	✈		✈	✈	✈	✈

5.1.6 Green Construction Implementation Plan

Overarching Green Construction Sustainability Goals

◉ Integrate sustainable approaches and practices into the design and construction and of facilities on the Airport

GREEN CONSTRUCTION	Social Progress	Customer Experience	Protect and Conserve Natural Resources	Reduce Carbon Footprint	Reduce O and M Cost	Economic Growth
Short Term Objectives						
➤ Develop "green" standards or guidelines for all new construction and facility rehabilitation	✈		✈	✈	✈	✈
➤ Incorporate Life-Cycle Cost Analysis into the "green" decision making process			✈	✈	✈	✈
➤ Consider the use of warm mix asphalt for surface lot rehabilitation			✈			
➤ Implement LID principles in design and construction of the stormwater management system	✈	✈	✈	✈	✈	✈
Mid Term Objectives						
➤ Incorporate LEED guidelines and standards in terminal design and construction	✈	✈	✈	✈		
➤ Explore opportunities to repurpose building materials related to Terminal expansion			✈	✈	✈	✈
Long Term Objectives						
➤ Incorporate Energy Star and GreenGlobes principles in all future construction policies	✈	✈	✈	✈		

5.1.7 Community Connection Implementation Plan

Overarching Community Connection Sustainability Goals

- ⊙ Promote compatible on- and off-airport land uses that support continued airport operations and minimize impacts to the surrounding communities
- ⊙ Strengthen partnerships with local government, educational and community organizations
- ⊙ Engage the public through dedicated outreach, education, and involvement in the long-term planning for the Airport
- ⊙ Foster intermodal transportation options to and from the Airport

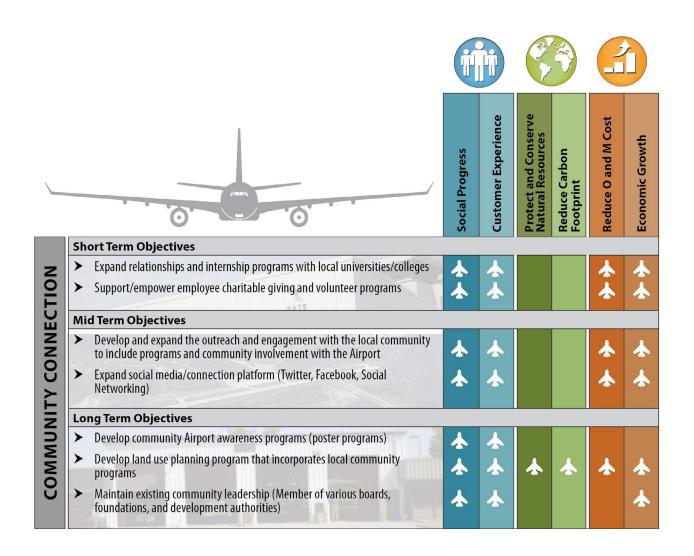| COMMUNITY CONNECTION		Social Progress	Customer Experience	Protect and Conserve Natural Resources	Reduce Carbon Footprint	Reduce O and M Cost	Economic Growth
	Short Term Objectives						
	➤ Expand relationships and internship programs with local universities/colleges	✈	✈			✈	✈
	➤ Support/empower employee charitable giving and volunteer programs	✈	✈			✈	✈
	Mid Term Objectives						
	➤ Develop and expand the outreach and engagement with the local community to include programs and community involvement with the Airport	✈	✈			✈	✈
	➤ Expand social media/connection platform (Twitter, Facebook, Social Networking)	✈	✈			✈	✈
	Long Term Objectives						
	➤ Develop community Airport awareness programs (poster programs)	✈	✈				
	➤ Develop land use planning program that incorporates local community programs	✈	✈	✈	✈	✈	✈
	➤ Maintain existing community leadership (Member of various boards, foundations, and development authorities)	✈	✈				✈

5.2 MONITORING PLAN

A key component to implementing sustainability at HTS is to track the performance over a period of time, record what progress has been made, and revise goals and objectives as HTS deems necessary. Defining performance initiatives and recording progress will allow HTS to determine what objectives are working and what objectives need modified. The following tables contain a monitoring report card and, when appropriate, a quantitative-based measurable. These tables will be used to monitor the progress of the objectives identified in the previous section. It is important to note that not all of the focus areas have measurable tables as not every area has a tangible measurement of success, such as baseline levels of quantity related to the focus area.

5.2.1 Administration Monitoring Plan

	Focus Year	Acheivement	Monitoring Initiative
ADMINISTRATIVE IMPLEMENTATION PLAN AND MONITORING REPORT	2016	Yes / No	Establish an interdepartmental sustainability committee
	2016	Yes / No	Develop an airport tenant sustainability working group
	2016	Yes / No	Publish an annual sustainable summary report
	2017	Yes / No	Obtain tenant commitment to sustainability
	2017	Yes / No	Review and incorporate sustainability clauses into the airport operating documents
	2017	Yes / No	Become a participating member of the WVDEP Stewardship Action Council
	2017	Yes / No	Publish an annual sustainable summary report
	2018	Yes / No	Update and renew as needed the existing SWPPP, SPCC, and wildlife hazard management plan
	2018	Yes / No	Develop detailed technical specs and standards to implement sustainability measures
	2018	Yes / No	Publish an annual sustainable summary report
	2021	Yes / No	Update Sustainability Plan Implementation Plan

5.2.2 Solid Waste and Recycling Monitoring Plan

	Focus Year	Acheivement	Monitoring Initiative
SOLID WASTE AND RECYCLING MONITORING REPORT	2016	Yes / No	Conduct a waste and recycling audit
	2016	Yes / No	Derive a baseline for the total solid waste generated per year to monitor and track reduction to meet goals
	2016	Yes / No	Develop a Terminal Solid Waste Management and Recycling Program
	2016	Yes / No	Increase the amount of strategically located recycling receptacles next to trash receptacles and place signs directly adjacent that clearly identifies what can and cannot be recycled.
	2016	Yes / No	Conduct awareness training for the janitorial staff to ensure that recyclables stay segregated from waste
	2016	Yes / No	Apply for State funded Recycling Grants to assist with the implementation of the Airport recycling program
	2017	Yes / No	Expand the solid waste recycling program throughout the Airport
	2017	Yes / No	Implement solid waste reduction initiatives and incentives for airport employees, tenants, and vendors
	2017	Yes / No	Develop an education training program on waste reduction for airport employees, tenants, and vendors
	2018	Yes / No	Minimize the use of office printing materials
	2019	Yes / No	Maintain existing waste oil/fuel reclamation site

Focus Year	Measurable	Baseline Year	Current Year
2016	Reduce solid waste stream ratio by 50% by 2021	100/0	
2016	Reduce solid waste volume by 25% from baseline	5,800 CY	
2016	Expand recycling program to include paper, plastic, glass, and metal materials	Paper	

5.2.3 Energy Management Monitoring Plan

ENERGY MANAGEMENT MONITORING REPORT

Focus Year	Acheivement	Terminal Monitoring Initiative
2016	Yes / No	Upgrade lights to high-efficiency lighting
2017	Yes / No	Add programmable thermostats to allow occupied/Unoccupied control set points
2018	Yes / No	Install vending machine occupancy sensors
2020	Yes / No	Improve building envelope by adding wall and roof insulation and replacing hangar doors
2021	Yes / No	Convert from electric to natural gas in terminal building

Focus Year	Acheivement	FBO/ARFF Building Monitoring Initiatives
2016	Yes / No	Replace door sweeps and seals
2017	Yes / No	Add programmable thermostats to allow occupied/Unoccupied control set points
2018	Yes / No	Install vending machine occupancy sensors

Focus Year	Acheivement	Building 2 Monitoring Initiatives
2017	Yes / No	Add programmable thermostats to allow occupied/Unoccupied control set points

Focus Year	Acheivement	Building 3 Monitoring Initiatives
2016	Yes / No	Replace door sweeps and seals
2017	Yes / No	Add programmable thermostats to allow occupied/Unoccupied control set points
2018	Yes / No	Replace radiant heaters with modulating radiant heaters

Focus Year	Acheivement	Building 4 Monitoring Initiatives
2017	Yes / No	Add programmable thermostats
2018	Yes / No	Replace radiant heaters with modulating radiant heaters

Focus Year	Measurable	Baseline Year	Current Year
2021	Reduce Airport electrical (kwh) energy use 10% by 2021	1.78 mil kwh	
2026	Reduce Airport Natural Gas (therms) use 20% by 2026	54,200 therms	
2031	Reduce total Airport energy (kwh/therms) use 25% by 2031	1.78 mil/ 54,200	

5.2.4 Water Resource Management Monitoring Plan

	Focus Year	Acheivement	Monitoring Initiative
WATER RESOURCE MANAGEMENT MONITORING REPORT	2016	Yes / No	Incorporate LID strategies into the Airport's "Development Guidelines"
	2016	Yes / No	Use low-volume, high pressure sprayer nozzles on water hoses used for vehicle washing, clean-up, regular use
	2019	Yes / No	Replace outdated terminal restroom fixtures and toilets with innovative high-efficiency units ➤ Install waterless urinals ➤ Install variable flush or pressure assisted toilet units ➤ Install low flow faucets
	2021	Yes / No	Install automatic sensors or occupancy sensors on faucets, urinals, and toilets
	2021	Yes / No	As airport development occurs, update and expand the current stormwater controls and SWPPP accordingly
	2021	Yes / No	Replace outdated terminal restroom fixtures and toilets with innovative high-efficiency units

Focus Year	Measurable	Baseline Year	Current Year
2021	Reduce water consumption on the Airport by 5%	3,559,700 gal	
2026	Reduce water consumption in the Terminal by 50%	3,559,700 gal	
2031	Reduce total water use on the Airport by 50%	3,559,700 gal	

5.2.5   Air Quality Monitoring Plan

	Focus Year	Acheivement	Monitoring Initiative
AIR QUALITY MONITORING REPORT	2016	Yes / No	Develop new airfield practices and procedures to reduce engine run times
	2016	Yes / No	Consider adopting specific practices to minimize unnecessary emissions pertaining to Airport owned vehicles
	2017	Yes / No	Pursue VALE Grant to assist with gate equipment acquisition
	2018	Yes / No	Purchase electrical GPUs with 400hz power and PC air units to encourage GSE conversion
	2019	Yes / No	Adopt pedestrian traffic management policies, improve way-finding, and encourage cell lot use

Focus Year	Measurable	Baseline Year	Current Year
2021	Decrease total airport GHG emissions 10% from baseline levels	21,489 MT	
2031	Decrease total airport GHG emissions 25% from baseline levels	21,489 MT	
2050	Decrease total airport GHG emissions 80%	21,489 MT	

5.2.6 Green Construction Monitoring Plan

<table>
<tr><th rowspan="9">GREEN CONSTRUCTION MONITORING REPORT</th><th>Focus Year</th><th>Acheivement</th><th>Monitoring Initiative</th></tr>
<tr><td>2016</td><td>Yes / No</td><td>Develop "green" standards or guidelines for all new construction and facility rehabilitation</td></tr>
<tr><td>2017</td><td>Yes / No</td><td>Incorporate Life-Cycle Cost Analysis into the "green" decision making process</td></tr>
<tr><td>2018</td><td>Yes / No</td><td>Consider the use of warm mix asphalt for surface lot rehabilitation</td></tr>
<tr><td>2019</td><td>Yes / No</td><td>Implement LID principles in design and construction of the stormwater management system</td></tr>
</table>

5.2.7 Community Connection Monitoring Plan

	Focus Year	Acheivement	Monitoring Initiative
COMMUNITY CONNCECTION MONITORING REPORT	2016	Yes / No	**Expand relationships and internship programs with local universities/colleges (2021)**
	2017	Yes / No	**Support/empower employee charitable giving and volunteer programs (2021)**

Appendix A
GREEN HOUSE GAS EMISSIONS INVENTORY