JOURNEY TO »

SUSTAINABILITY

ECONOMIC | ENVIRONMENTAL | SOCIAL

SUSTAINABILITY
MANAGEMENT PLAN

MKE

GENERAL MITCHELL
INTERNATIONAL AIRPORT

Journey to Sustainability

Milwaukee County's General Mitchell International Airport

Sustainability Management Plan

2018

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MKE SUSTAINABILITY VISION

MKE is the airport of choice for Wisconsin and beyond. Striving for sustainable operations, we will:

- Provide the best customer service experience by minimizing waiting times, creating a comfortable environment for travelers and supporting the success of our staff and tenants
- Provide exemplary service at the lowest possible expense with the least possible waste of resources, materials and time and minimal impact on the environment
- Be the best possible neighbor to our community and Lake Michigan
- Link Milwaukee to the world.

Sustainability means managing to meet our current needs without compromising the ability of future generations to meet theirs. More than just "going green," sustainability for airports means planning ahead, thinking broadly about the social, economic, environmental, and operational consequences of providing air transportation.

For years, Milwaukee County's General Mitchell International Airport – MKE – has been working to lower costs and reduce its environmental footprint. Journey to Sustainability, the airport's Sustainability Management Plan, documents an effort to prioritize and coordinate those activities, helping MKE actively support the social, environmental, and economic well-being of its customers, its employees and all of southeastern Wisconsin region.

The Sustainability Management Plan, or SMP, attempts to build a "holistic approach to managing an airport to ensure the integrity of the economic viability, operational efficiency, natural resource conservation and social responsibility of the airport." The MKE Sustainability Management Plan was developed with an iterative process that integrated stakeholder values to determine the sustainability elements to be measured, evaluated, and prioritized.

To develop the Sustainability Management Plan, MKE:

1. Developed a sustainability vision;
2. Identified sustainability Focus Areas;
3. Invited stakeholder and community participation;
4. Completed a baseline inventory of current performance in each focus area;
5. Established goals to improve sustainability performance;
6. Identified and prioritized specific actions to achieve those goals.

SUSTAINABILITY VISION AND FOCUS AREAS

A successful sustainability management plan is built on a foundation of shared values and priorities. For the MKE plan, that foundation was developed through a comprehensive stakeholder involvement program including contributions from airport staff and management, regulatory agencies, tenants, airlines, travelers and airport neighbors. To initiate the process, stakeholders came together to develop a sustainability vision statement; it describes a future MKE that is focused on environmental, economic, and social sustainability. The vision statement guided all future planning steps.

Next, stakeholders and travelers identified 11 Sustainability Focus Areas for detailed investigation. The Focus Areas include those environmental, social, or economic issues airport stakeholders consider opportunities of elevated importance to improve sustainability. The Focus Areas serve as the basis for evaluating current performance (the baseline evaluation) and the development of goals and actions that the airport will implement to improve sustainability.

MKE is committed to doing its part to create a more sustainable future for Southeastern Wisconsin.

MKE'S SUSTAINABILITY BASELINE

The baseline analysis provides a snapshot of MKE's performance across each of the 11 Focus Areas. Quantitative and qualitative data present a picture of the airport's resource consumption, greenhouse gas generation, contributions to the region's economy, social engagement, and customer and employee relationships. The data were gathered from airport staff and records, public sources and through intensive "deep dives" – including site visits – into Focus Areas such as Waste Management, Energy Management and Air Emissions.

In addition to a detailed evaluation of the airport's financial, environmental and social performance, the baseline analysis revealed that MKE has access to the data necessary to monitor its performance across of a number Focus Areas. It provides a basis for monitoring improvements in the future, and also reveals areas with the greatest potential for change across the entire range of sustainability factors. These include energy usage, waste management and overall operational efficiency, as well as focusing on improving the quality and variety of vendors to further raise customer satisfaction.

SUSTAINABILITY GOALS AND ACTIONS

Following the completion of the baseline analysis, a set of actions were identified and evaluated to enable MKE to improve performance and progress toward realizing the airport's sustainability vision. These actions were developed for each Focus Area, along with a set of high level goals. The sustainability actions are the heart of the SMP, the blueprint for enabling MKE to reduce its environmental footprint and positively contribute to the region's social and economic well-being.

First, a broad list of nearly 1,000 potential actions was identified, drawn from aviation industry best practices, airport staff suggestions and a survey of Milwaukee travelers and businesspeople. These actions represented both the cutting edge of industry practice internationally and ideas specific to MKE, generated by the people most familiar with the airport. Following an evaluation of applicability and potential effectiveness, ideas on the large list were combined and categorized, refined by stakeholders and finally assembled into a list of 18 goals, 37 broad actions.

The actions were ranked based on their ability to help the airport reach its sustainability goals, readiness for implementation, and other factors. Through the ranking process, 13 key actions were identified as priorities for MKE. Together, they have the potential for effectively reducing the airport's environmental footprint, improving efficient operations, and raising customer and employee satisfaction.

Each action is supported by a set of tactics – smaller initiatives that incrementally support the implementation of the overall action. These include everything from creating MKE-branded water bottles to reduce the use of disposable plastic bottles to including energy conservation targets in the leases signed by airport tenants and devoting space in the terminal for the display of work by local artists to create a unique sense of place at the airport.

Finally, the Sustainability Management Plan includes a set of implementation activities to guide the airport in carrying out the sustainability initiatives. The Implementation Plan features estimates of time and costs to implement each action, identifies internal champions and their responsibilities, notes how progress may be monitored and lists potential barriers to implementation.

THE FUTURE OF SUSTAINABILITY AT MKE

This report documents the process undertaken to produce the airport's Sustainability Management Plan. It details all findings and includes the list of sustainability actions and implementation plan. It is supported by attachments with baseline data, a sustainability performance monitoring tool developed specifically for MKE, and details on survey results and other stakeholder involvement efforts. It is also accompanied by a short animated video for use in conveying the airport's efforts to become more sustainable.

MKE is committed to doing its part to create a more sustainable future for Southeastern Wisconsin: minimizing the airport's environmental footprint, building the economy of the region and bringing communities together as MKE links Milwaukee to the world.

More than just "going green," sustainability means planning ahead and thinking holistically about the social, economic, environmental, and operational elements of how the airport goes about doing its business.

SUSTAINABILITY PLANNING AT GENERAL MITCHELL INTERNATIONAL AIRPORT »

In 2016, Milwaukee County's General Mitchell International Airport – known as MKE – embarked on the development of a Sustainability Management Plan. Supported by a Federal Aviation Administration grant, the SMP details a proactive and holistic approach to improving the sustainability of operations at MKE, integrating sustainability into the overall development strategy for the airport. This report documents the results of that effort. Sustainability means managing to meet current needs without compromising the ability of future generations to meet their own needs. Sustainable management will help the airport contribute to the social, environmental and economic well-being of its customers, its employees and the Milwaukee region. More than just "going green," sustainability means planning ahead and thinking holistically about the social, economic, environmental, and operational elements of how the airport goes about doing its business.

This report includes five chapters:

1 **Sustainability at General Mitchell International Airport.** An introduction to the development of MKE's Sustainability Management Plan (called the SMP in this document), outlining the background, process, intended outcomes, and work products.

2 **Sustainability Program Foundation.** An overview of the process and results of the effort to articulate a vision for sustainability at the airport and to determine the SMP's technical focus areas.

3 **Sustainability Baseline.** Details on the effort to create a snapshot of MKE's existing performance across economic, environmental and social focus areas.

4 **Sustainability Goals and Actions.** A prioritized list of initiatives to improve the airport's performance in the selected focus areas.

5 **Implementation Plan.** A table of sustainability actions with recommendations for implementation timing, phasing, funding and expected results.

SUSTAINABILITY PLANNING FRAMEWORK FOR AIRPORTS

General Mitchell International Airport is a medium hub facility serving southeastern Wisconsin and northeastern Illinois as its primary markets. With more than 6 million enplanements in 2016, the airport is a key transportation hub for the region, as well as a major generator of economic activity. The airport is owned and operated by Milwaukee County. MKE has been implementing sustainability initiatives for decades, but has never created a guiding methodology for developing, prioritizing and implementing these efforts. The Sustainability Management Plan uses an established plan development framework

for systematically evaluating actions to improve sustainability at airports, based in local priorities and supported by local input.

There are numerous working approaches to understanding sustainability. This plan is based in the widely accepted "triple bottom line" definition:

- **Social Aspects:** Fair and beneficial practices for employees and the community and region in which an organization conducts its business; participation by a variety of stakeholders in plan development and implementation.
- **Economic Aspects:** Economic benefits are to be enjoyed by the organization and its stakeholders; use a whole of life perspective in understanding economic benefits of actions.
- **Environmental Aspects:** Use resources wisely and reduce direct and indirect impacts on the natural environment from products and services; enhance the natural environment through the organization's actions.

More specifically to airport management, the SMP is grounded in the Airports Council International-North America "EONS" definition of airport sustainability:

A holistic approach to managing an airport so as to ensure the integrity of the Economic viability, Operational efficiency, Natural resource conservation and Social responsibility (EONS) of the airport.

This working definition opens a wide range of potential topics in sustainable operations that may be explored in a Sustainability Management Plan. Typical airport SMPs focus on some subset of the following types of (in many cases overlapping) factors.

Economic Viability. Initial cost, life cycle or total cost, grant funding eligibility, financial benefits.

Operational Efficiency. Passenger convenience, congestion, intermodal transfers, air travel delay, customer service, energy conservation.

Natural Resources. Air quality and greenhouse gas emissions, noise abatement, water quality, wildlife management, landscape management, waste and recycling, renewable energy.

Social Responsibility. Neighboring land use compatibility, community relations, employee welfare, diversity and environmental justice, public outreach.

The MKE Sustainability Management Plan is grounded in this framework, developed with a process that allowed stakeholders to drive the elements to be considered and evaluated based on regional priorities and values.

SUSTAINABILITY MANAGEMENT PLANNING PROCESS AT MKE

The Sustainability Management Plan is an operational framework to improve sustainability at MKE and foster ongoing programs and assessment to reduce the airport's environmental footprint, improve customer and employee satisfaction and contribute to the economic health of southeastern Wisconsin.

To develop the Sustainability Management Plan, MKE identified key focus areas of sustainability impact, assessed baseline sustainability performance, established goals and identified opportunities for performance improvement. The SMP was developed consistent with Federal Aviation Administration (FAA) requirements for projects of this type. It included six basic elements:

1. Development of a sustainability vision, mission, or policy statement along with a description of how it will be communicated to stakeholders
2. Identification of sustainability categories, or focus areas
3. Public participation and community outreach
4. Baseline inventory of performance for each sustainability focus area
5. Establishment of goals or targets to improve sustainability performance
6. Identification of specific initiatives to improve the airport's sustainability performance and achieve the established goals or targets.

The SMP development process was iterative, with frequent opportunities for review by internal and external stakeholders; each activity was built on the results of the foregoing efforts. The key product of the SMP is a list of actions that can be undertaken by the airport to improve performance across all four airport sustainability factors. These actions are refined and prioritized, providing a roadmap for creating measurable improvements in the sustainability of airport operations.

Economic Viability
Operational Efficiency
Natural Resources
Social Responsibility

The key product of the SMP is a list of actions that can be undertaken by the airport to improve performance across all four airport sustainability factors.

MILWAUKEE SUSTAINABILITY MANAGEMENT PLAN SUPPORTING PRODUCTS

The General Mitchell International Airport Sustainability Management Plan includes multiple supporting documents. They include detailed analyses, supporting information, data sources, analytical tables and charts for Chapters 2 through 5. These are incorporated to clarify assumptions and provide detail about the planning process, stakeholder participation and analyses.

In addition to technical information, there are supplemental work products intended to support the development of an ongoing sustainability management program at MKE. These include an executive summary document summarizing the project and its outcomes in a graphic and user-friendly format to be used as a communications tool for non-technical audience; a performance monitoring tool allowing MKE and Milwaukee County staff to track operational improvements and cost savings as they implement sustainability actions to meet the airport's goals; a link to an animated video to be hosted on the MKE website and for use in the airport's social media outreach program, providing a summary of sustainability activities at MKE and linking viewers to SMP documents and opportunities for continuous stakeholder involvement.

By incorporating the views, priorities and creative thinking of a broad spectrum of internal and external stakeholders, the SMP can address issues that are of critical importance for MKE's success.

SUSTAINABILITY PROGRAM FOUNDATION »

To develop the SMP, MKE identified key focus areas of sustainability impact, assessed baseline sustainability performance, established goals and identified opportunities for performance improvement. The SMP was developed consistent with FAA requirements for projects of this type, including:

1 Development of a sustainability vision, mission, or policy statement along with a description of how it will be communicated to stakeholders

2 Identification of sustainability categories, or focus areas

3 Public participation and community outreach

4 Baseline inventory of performance for each sustainability focus area

5 Establishment of goals or targets to improve sustainability performance

6 Identification of specific initiatives to improve the airport's sustainability performance and achieve the established goals or targets.

This chapter summarizes development of the first elements of the SMP. These elements address in whole or in part items 1, 2 and 3 above; they establish a direction for the project and provide a framework for the SMP and sustainability program at MKE. The elements described in this chapter include:

- Development and initial implementation of a stakeholder involvement program
- Development of a draft sustainability vision statement
- Identification of sustainability focus areas.

STAKEHOLDER INVOLVEMENT PLANNING

Effective stakeholder and public involvement is a key element of the SMP process. By incorporating the views, priorities and creative thinking of a broad spectrum of internal and external stakeholders, the SMP can address issues that are of critical importance for MKE's success. A stakeholder and public involvement plan was developed to provide ample and effective opportunity for engagement. Key elements of the plan that were implemented over the course of the project include:

- Regular convening of a technical advisory group (TAG), comprised of key internal stakeholders, to guide the planning process
- Regular convening of a stakeholder advisory group (SAG), comprised of internal and external stakeholders, to enable focused representation by a broader cross section of community and business interests

- Staff interviews to capture ideas for improvement from a cross section of airport employees, tenants and staff at all levels
- A speakers bureau
- Public meeting
- Creative outreach to travelers, area businesses and the public, including electronic surveys, social media and smartphone interactions.

A table summarizing the stakeholder involvement plan elements and coordination with the larger SMP process is attached to this report as Attachment 1. Attachment 1 also includes a list of members for both the TAG and SAG.

DRAFT SUSTAINABILITY VISION/ MISSION STATEMENT

The sustainability vision/mission statement communicates purpose to stakeholders and outlines aspirations for MKE as it relates to sustainability and operations. It serves as a guide for current and future decisions. Elements of the plan will describe a strategy to achieve the vision/mission, along with goals and objectives to measure progress.

During a meeting at the airport on August 1, 2016, members of the TAG participated in a visioning workshop and contributed to the development of a draft sustainability vision/mission statement. To frame the discussion, airport sustainability was defined using the Sustainable Aviation Guidance Alliance formulation: "A holistic approach to managing an airport so as to ensure the integrity of the economic viability, operational efficiency, natural resource conservation and social responsibility of the airport." The draft vision/mission statement was developed in three steps, summarized below:

1 The TAG participated in a group exercise in which members identified actions that MKE is taking to become more sustainable along with reasons for undertaking those actions. The TAG was also invited to answer this question: "In 20 years, the thing I will be most proud of at MKE is _____."

2 The results of that exercise were analyzed to identify the values and desired outcomes related to airport sustainability. Those values were crafted into a draft vision/mission statement in the general form: "In order to [demonstrate values], MKE will [achieve outcome]." The value words provided by the TAG included:

OPPORTUNITY	EFFECTIVENESS	REQUIREMENTS	COMMUNITY
GOOD NEIGHBOR	RIGHT THING	EQUITY	ALTRUISM
EMPLOYEES	COST	EFFICIENCY	LAKE MICHIGAN
SUPPORT	WATER	EXPERIENCE	RIGHT THING

OUTCOMES

- MKE IS THE AIRPORT OF CHOICE
- MORE SERVICE
- MINIMUM DELAYS
- MAXIMUM SATISFACTION AND HAPPINESS
- LOWEST POSSIBLE COSTS
- LEAST POSSIBLE WASTE
- RESOURCES
- MATERIALS
- TIME

REASONS TO IMPROVE

- TO REFLECT WHAT'S IMPORTANT TO MILWAUKEE
- TO BE A PORTAL TO THE CITY
- TO SUPPORT OUR COMMUNITY
- TO DO THE RIGHT THING FOR EACH OTHER, FOR MILWAUKEE AND FOR LAKE MICHIGAN

Using these words and the other input from the TAG, the key words were arranged into a list of outcomes and reasons for seeking those outcomes:

Draft vision/mission statement language was circulated to the TAG for comment. The vision/mission statement was also compared to the vision statement developed for MKE's Master Plan Update in 2008. Many common elements were found in both statements, including a focus on customer satisfaction, easy access, relationships to neighbors, safety and efficiency and generating regional economic benefits, including an explicit vision of the airport maximizing employment potential to support the region's residents. However, the MKE Master Plan Update vision statement does not explicitly refer to environmental impacts. The SMP vision/mission statement was developed to be consistent and aligned with the previous vision exercise, complementing and enhancing those efforts in the sustainability framework. The sustainability vision/mission statement developed for the SMP is consistent with aspirations that have been important to MKE stakeholders for the better part of a decade.

The current MKE sustainability vision/mission statement is:

MKE is the airport of choice for Wisconsin and beyond. Striving for sustainable operations, we will:

- *Provide the best customer service experience by minimizing waiting times, creating a comfortable environment for travelers and supporting the success of our staff and tenants*
- *Provide exemplary service at the lowest possible expense with the least possible waste of resources, materials and time and minimal impact on the environment*
- *Be the best possible neighbor to our community and Lake Michigan*
- *Link Milwaukee to the world*

This sustainability vision/mission statement establishes a platform for MKE to take a leadership position in the community and among peer airports with its commitment to improving sustainability outcomes.

SUSTAINABILITY FOCUS AREAS

A critical step in developing a Sustainability Management Plan is the identification of sustainability categories or focus areas. Sustainability focus areas include those environmental, social, or economic areas or issues airport stakeholders consider opportunities of elevated importance to improve sustainability outcomes now and into the future. The focus areas serve as the basis for evaluating current performance (i.e., the baseline effort) and the development of goals and actions that the airport will implement to improve sustainability outcomes. The selection of focus areas involves balancing the vital role of the airport in a regional transportation network, the opportunities and challenges related to sustainability and feedback received from engaging the airport's stakeholders and community.

Put another way, the focus areas should be those areas that are material to the airport or "that reflect the organization's significant economic, environmental and social impacts; or that substantively influence the assessments and decisions of stakeholders."[1]

Furthermore, the SMP should balance local priorities with industry-wide opportunity areas. The process of defining sustainability focus areas for MKE is discussed in the following sections.

FOCUS AREA LIST

Since the focus areas play a crucial role in the SMP project and sustainability at the airport, a range of potential focus areas were identified to allow stakeholders to think broadly about sustainability. To do this, the Project Team suggested an extensive list of sustainability topics divided in three categories: environmental, social and economic. The list of potential areas was inspired by several sources, such as the Global Reporting Initiative[2], Airport Operators Sector Disclosure[3] and FAA sustainability guidance[4], but tailored to the needs of MKE.

The initial list of potential focus areas presented to the TAG for consideration included:

ECONOMIC

Impact on Local Economy	**Operational Efficiency/ Optimization**	**Sustainable Procurement**
Passenger and Cargo Volume	**Revenue Generation**	**Energy Resiliency**
Business Continuity/ Infrastructure Resiliency	**Financial Success of Tenants/ Concessions**	**Industry Engagement and Participation**
Market Positioning and Branding	**Sustainability Disclosure/ Marketing**	**Add-in/ Other**

1. Global Reporting Initiative definition of material topics.

2. https://www.globalreporting.org/Pages/default.aspx

3. Global Reporting Initiative, G4 Sector Disclosures, Airport Operator Sector Supplement, 2014. Retrieved at https://www.globalreporting.org/resourcelibrary/GRI-G4-Airport-Operators-Sector-Disclosures.pdf

4.https://www.faa.gov/airports/environmental/sustainability/

ENVIRONMENTAL

Water Quality	Alternative Fuels	Natural Resource Conservation
Stormwater Management	Air Quality	Preserving Ecosystems and Habitats
Water Consumption/ Conservation	Greenhouse Gas Emissions and Reduction	Biodiversity
Energy Consumption/ Conservation	Climate Change Adaption	Land Management
Renewable Energy	Improving Tenant/ Concession Performance	Solid Waste Management
Public Transportation	Materials Use Optimization and Reduction	Hazardous Materials
Low Emission Vehicles	Compliance and Liability	Landfill Diversion/ Recycling
Intermodal Transportation	Sustainable Infrastructure/ Green Building	Add-in/ Other

SOCIAL

Concessions/ Support Tenants/ Local Businesses	Employment Programs and Benefits	Noise
Passenger and Community Accessibility	Equal Opportunity/ Diversity/ Retention	Community Engagement
Passenger Experience/ Customer Service	Health and Safety	Arts and Culture
Employee Relations	Training and Education	Add-in/ Other

Prioritizing MKE Focus Areas

During a meeting at the airport on August 1, 2016, the members of the TAG participated in an exercise to review the focus areas included in the initial list and rank their importance. This was done through a facilitated exercise led by the project team. Each potential focus area was discussed in detail to ensure a common understanding of what each encompassed. Participants were additionally asked to add any missing areas for consideration. Next, the TAG ranked the potential focus areas to reflect the priorities each member felt could most benefit MKE. This ranking and prioritization was also important to manage the number of sustainability topics in order to maintain the necessary focus and depth of analysis. Each attendee ranked two focus areas as a high priority, two as a medium priority and two as a low priority. The project team counted "votes" and for each low priority vote assigned a "1," for each medium priority vote assigned a "2," and for a high priority vote assigned a "3."

Of the initial 48 potential areas (which included two write-ins), 34 received a score of at least one point. The following steps were taken to further refine the list:

> Sustainability focus areas include those environmental, social, or economic areas or issues airport stakeholders consider opportunities of elevated importance.

1 The 13 highest ranked topics were selected, in addition to those with a lower score but with significant overlap or complementary issues to them. Twelve clusters of related topics were formed to create groups that could potentially be merged under a broader, more general focus area.

2 The groups were renamed to reflect the broader scope and reflect all of the subtopics.

This process narrowed the list down to 12 focus areas to be considered for more detailed analysis in the SMP. The 12 focus areas attempted to capture regional priorities and to assemble groupings of related topics.

As shown in the figure on page 17, the list of 12 focus areas was further refined to allow for in-depth analysis by determining applicability to the SMP, correlation with industry priorities and the effort to complete detailed analyses within the SMP schedule and framework. Ultimately, some focus areas were enhanced, removed or qualified based on these considerations:

- **Economic Prosperity.** Economic prosperity is a key Focus Area of the SMP and one of the triple bottom line approaches to sustainability. It was addressed by exploring readily available information such as airport financial statements

and other key elements of MKE's financial performance. Existing economic studies will be included if available. Baseline performance and trends will be identified to enable future metrics on the airport's impacts on this factor.

- **Operational Efficiency.** This topic is often included in a master plan. MKE will be developing an updated master plan in the next few years, so a more comprehensive analysis of this area will likely be completed at that time. This Focus Area overlaps with others, providing with others additional input and basis for the other Focus Areas and adding value to the overall analysis and plan. A central component to this Focus Area is the Cityworks program - MKE's repository for work management, operational and safety data, including the new FAA Safety Management System and FAA-mandated Part 129 reporting.
- **Sustainable and Resilient Buildings and Infrastructure.** This Focus Area addresses how existing buildings, infrastructure and overall airport planning have been developed with sustainability and resilience in mind.
- **Water Management.** Water quality and conservation is a key topic for the region given the proximity to Lake Michigan; the TAG likewise expressed interest in this topic. A comprehensive baseline evaluation with potential metrics and initiatives allowed MKE to identify strategies for the future. The water management Focus Area included both potable water and stormwater management
- **Energy Management.** Energy is a critical area to address in the SMP given its economic and environmental implications. This topic was covered with a greater level of detail through baseline investigation.
- **Air Emissions and Climate Change.** Carbon related issues are a common topic in airport SMPs and these issues are of significant concern for the industry. This Focus Area did not score particularly highly in the TAG prioritization exercise, but was considered a key topic for this SMP, particularly due to the alignment with energy/cost savings and the carbon emissions associated with air travel. For these reasons, it was evaluated in some detail for the MKE Sustainability Management Plan.
- **Waste Management.** The waste management Focus Area was considered to be a critical topic by MKE management and therefore was addressed in the SMP, despite being scored relatively low in relation to other Focus Areas among the TAG. The topic covered many different aspects of waste management including recycling, solid waste and hazardous materials.

- **Customer Experience.** Customer experience was identified as a very important topic to airport stakeholders and covers several themes related to economic, social and environmental sustainability. Delivering high quality passenger experience is a critical factor for airports to succeed and measuring customer satisfaction is a major undertaking that can guide operational and design initiatives for an airport. For the SMP, available data (including existing passenger survey data) was compiled and trends identified.
- **Employee Engagement.** This topic is of high priority in the Milwaukee region generally, and that interest was reflected in the TAG's prioritizing exercise. Therefore, the Project Team developed a baseline for this topic, allowing MKE to set goals and key performance indicators (KPIs) to track progress in the areas of employee engagement.
- **Community Engagement.** This topic considered existing programs and initiatives and investigated success in engaging the community. This included an evaluation of the ways the community interacts with the airport, as travelers and neighbors.
- **Health and Safety.** Occupational and passenger health and safety are a critical aspect of airport plans but operational procedures are more effectively addressed in programs or initiatives other than an SMP. MKE is addressing health and safety in its Safety Management System, managed in the Cityworks system, as well as other emergency, risk and response plans. For this reason, only basic health and safety information was included in the baseline assessment.
- **Airport Accessibility.** This Focus Area would mainly cover transportation issues and overall access for MKE passengers, employees and the Milwaukee community, ground transportation and connection options, along with an assessment of available data on accommodating travelers and employees with disabilities. This topic is typically included in a Master Plan and as MKE is undertaking a Master Plan this topic was deferred to that effort.

ALL TOPICS

POTENTIAL TOPICS / FOCUS AREA	TAG RANK TOTAL
Customer Service/ Passenger Experience	32
Operational Efficiency/ Optimization	31
Energy Consumption/ Conservation	17
Health and Safety	13
Passenger & Cargo Volume	12
Revenue Generation	11
Community Engagement	9
Green Building/ Sustainable Infrastructure	7
Business Continuity / Infrastructure Resiliency	7
Financial Success of Tenants / Concessions	6
Passenger & Community Accessibility	6
Diversity / Equal Opportunity / Retention	6
Water Consumption / Conservation	5
Compilation & Liability	5
Market Positioning & Branding	5
Energy Resiliency	5
Water Quality	4
Stormwater Management	4
Intermodal Transportation	4
Other (Reduce airport debt)	4
Support Tenants / Concessions / Local Business	4
Training & Education	4
Air Quality	3
Recycling / Landfill Diversion	3
Industry Engagement & Participation	3
Employment Programs & Benefits	3
Public Transportation	2
Alternative Fuels	2
Improving Tenant / Concessions Performance	2
Arts & Culture	2
Land Management	1
Employee Relations	1
Noise	1
Other (Job Opportunities Community)	1
Renewable Energy	0
Low Emission Vehicles	0
Greenhouse Gas Emissions & Reduction	0
Climate Change Adaption	0
Materials Use Optimization & Reduction	0
Natural Resource Conservation	0
Preserving Ecosystems & Habitats	0
Biodiversity	0
Solid Waste Management	0
Hazardous Materials	0
Impact on Local Economy	0
Sustainability Disclosure / Marketing	0
Sustainable Procurement	0

REFINED LISTS

REFINED TOPICS	FINAL FOCUS AREA
Materials Use Optimization & Reduction Operational Efficiency / Optimization Other (Reduce Airport Debt)	Operational Efficiency
Passenger & Cargo Volume Revenue Generation Financial success of Tenants/ Concessions Support Tenants / Concessions / Local Business	Economic Prosperity
Business Continuity / Infrastructure Resiliency Green Building / Sustainable Infrastructure	Sustainable & Resilient Buildings & Infrastructure
Water Consumption / Conservation Water Quality Stormwater Management	Water Management
Energy Consumption / Conservation Energy Resiliency Renewable Energy	Energy Management
Air Quality Greenhouse Gas Emissions & Reduction Climate Change Adaption	Air Emissions & Climate Change
Solid Waste Management Hazardous Materials Recycling / Landfill Division	Waste Management
Intermodal Transportation Public Transportation Passenger & Community Accessibility	Airport Accessibility will be addressed as a topic in the upcoming Master Plan so was not selected as a final Focus Area for the SMP.
Diversity / Equal Opportunity / Retention Training & Education Employment Programs & Benefits	Employee Engagement
Health & Safety	Health and Safety
Customer Service / Passenger Experience	Customer Experience
Community Engagement	Community Engagement

Environmental Focus Areas

Economic Focus Areas

Social Focus Areas

Not included in list of refined topics

FINAL FOCUS AREAS

After further refinement by MKE management, the TAG and the project team, the final list of Focus Areas was determined. The following table describes factors by which the sustainability performance of each Focus Area was considered for evaluation.

FOCUS AREA	SUB-TOPICS
OPERATIONAL EFFICIENCY	Resource use reduction
	Debt reduction
	Cost savings
ECONOMIC PROSPERITY	Financial performance/ revenue generation
	Passenger and cargo volumes
	Concessions/ local business/ tenants
EMPLOYEE ENGAGEMENT	Training and education
	Employee programs and benefits
	Diversity and retention
CUSTOMER EXPERIENCE	Customer service
	Passenger experience
COMMUNITY ENGAGEMENT	Civic initiatives and programs/ Community
	Community and airport events
	Philanthropy
SUSTAINABLE AND RESILIENT BUILDINGS AND INFRASTRUCTURE	Green buildings
	Sustainable infrastructure
	Climate change resiliency
	Emergency preparedness
WATER MANAGEMENT	Water quality
	Conservation/ water consumption
	Stormwater management
ENERGY MANAGEMENT	Energy consumption and conservation
	Renewable energy
	Energy Resiliency
AIR EMISSIONS AND CLIMATE CHANGE	Air quality
	Greenhouse gas emissions and reduction
	Climate change adaption
WASTE MANAGEMENT	Solid waste management
	Recycling and landfill diversion
	Hazardous material
HEALTH AND SAFETY	Safety Management System
	Passenger and employee safety awareness
	Training and monitoring

These eleven Focus Areas were incorporated into the next phase of the SMP process – the sustainability baseline inventory.

SUMMARY AND CONCLUSIONS:

A successful sustainability management plan is built on a foundation of shared stakeholder values and priorities. For the MKE sustainability management plan, that foundation was developed through a comprehensive stakeholder involvement program including contributions from airport staff and management, regulatory agencies, tenants and airlines. The conclusions reached in this process include:

- A sustainability vision/mission statement to guide plan decision-making. This vision/mission statement is consistent with past airport visions.
- A list of priority Focus Areas for the SMP. These Focus Areas were explored in varying levels of detail in the sustainability baseline inventory.

Additional key outcomes associated with this phase of the MKE SMP were the development of a comprehensive stakeholder and public involvement plan and the development of a list of invitees for participation in a Stakeholder Advisory Group to be convened at three key milestones for the planning process.

This initial assessment of sustainability performance was used as a basis for goal and action development for the SMP, to create a snapshot of sustainability at MKE, and to promote overall understanding and awareness building with airport stakeholders.

SUSTAINABILITY BASELINE »

CHAPTER 3

SUSTAINABILITY BASELINE

REGIONAL SUSTAINABILITY CONTEXT

METHODOLOGY

ECONOMIC FOCUS AREAS BASELINE

ENVIRONMENTAL FOCUS AREAS BASELINE

SOCIAL FOCUS AREAS BASELINE

PERFORMANCES SUMMARY & PEER COMPARISON

This chapter presents the results of the collection and compilation of data and information to generate a sustainability baseline for the airport across the 11 selected Focus Areas. Information was collected from the airport, Milwaukee County and other public sources. Additionally, current rates (and historic rates, where available) of resource consumption were calculated and compiled, and the information was summarized in terms relevant to the airport and the SMP. This initial assessment of sustainability performance was used as a basis for goal and action development later in the project and for overall understanding and awareness building with airport stakeholders.

The sustainability baseline is organized by Focus Area under the three sustainability components that constitute the typical triple bottom line approach - Economic, Environmental and Social. 2015, the most recent year with fully available data, was identified as the baseline year for select Focus Areas and topics to serve as a reference point for evaluating current and projected sustainability impacts and initiatives. For some of the Focus Areas the assessment included data from previous years (2013 and/or 2014) and, where available, for 2016. This allowed showing the airport's historical performance and performing trend analysis that will be useful to inform the reduction goals and targets setting process.

The baseline inventory included passenger terminals, administrative buildings, technical areas such as maintenance shops and the Business Park area. Information included in this inventory is both qualitative and quantitative. In most cases, the quantitative data is aggregated; but for some of the Focus Areas (e.g., energy) the available data allowed for a more granular analysis.

LOCAL/ REGIONAL SUSTAINABILITY CONTEXT

Currently the airport does not have a formal sustainability policy or program. For this reason sustainability initiatives at MKE rely primarily on individual department led initiatives or on the guidance provided by Milwaukee County. Besides this, many other local and regional public entities have been addressing sustainability from a number of different perspectives and can provide a large information pool for MKE to use as reference in the future while developing and growing its own sustainability program.

MILWAUKEE COUNTY

Over the last decade, Milwaukee County has developed a sustainability program that has been driven by the increasing rates of natural resource consumption including non-renewable energy sources. The County has committed to appropriate staffing and funding of sustainability activities. This commitment to sustainability is reflected in the existence of a full time Sustainability Director position which was created in 2013. Prior to the full time Director position, the County had a part time sustainability position rolled into the County's Sustainability and Environmental Engineer, fulfilling many of the current Sustainability Director responsibilities, including coordinating and reporting on the implementation of the 2007 Green Print initiative, in addition to responsibilities as head of the County's Environmental Services Unit.

The Milwaukee County Office of Sustainability has had a fairly consistent budget since the full time Director Position was created in 2013. The amounts shown below (Table 1) represent the annual operating budget including the Sustainability Director salary and fringe benefits.

TABLE 1

MILWAUKEE COUNTY SUSTAINABILITY BUDGET

YEAR	ADOPTED BUDGET
2013	$131,888
2014	$155,879
2015	$154,415
2016	$162,530
2017	$141,119

Besides this dedicated budget, the County has planned several capital projects to upgrade or enhance County assets, such as MKE, highways, mass transit, and the zoo. While these are not explicitly called out as sustainability projects, they do touch on sustainability topics like energy efficiency, air emissions reduction, wildlife preservation and others. A full list of the Capital Budget and descriptions of the planned projects can be found in the "2017 Adopted Capital Budget" document[1].

GREEN PRINT

The key element of the program is the above mentioned Green Print resolution, which was approved in 2007[2]. Green Print covers several topics organized under three main areas:

- Sustainable Construction – In order to mitigate increasing energy costs, Milwaukee County has been upgrading the efficiency of its buildings by performing energy audits, implementing energy efficiency measures and entering into guaranteed energy savings performance contracts with local contractors to perform the energy retrofits. Also, future Milwaukee County construction projects are required to evaluate and implement, when appropriate, sustainable design and construction features that have been developed based on LEED.
- Resource Management – Water is a key focus area for Milwaukee County and for this reason a number of initiatives have been implemented around storm water management through the construction of detention basins, bio-infiltration basins, rain gardens, restoration of eroded streambanks and hill slopes and the development of storm water management plans for construction projects, and reduction of potable water consumption by installing more efficient fixtures and reducing irrigated areas. Also waste recycling and green purchasing are focus areas of the Green Print resolution.
- Education – Programs and initiatives have been put into place to support both homeowners and businesses saving money and resources by implementing energy and water efficiency initiatives, using green products and in general increasing awareness around sustainability.

1 http://county.milwaukee.gov/ImageLibrary/Groups/cntyDAS/PSB/Budgets/2017-Budget-/2017-Recommended-Budget-/2017CEXRECCAPITALBUDGET6_WEB_PRINTSECURED2.pdf

2 http://county.milwaukee.gov/sustain

Other relevant sustainability resources developed by the County and currently in place include:

- The Milwaukee County Parks Five year Strategic Plan 2015-2020
- The Land and Water Resource Management Plan 2012-2021.

The County also releases periodic updated information on sustainability initiatives using a newsletter and annual progress reports[3]. Finally, in 2017, the Milwaukee County Board of Supervisors passed a resolution committing the County to adhere to the principles and goals of the Paris Climate Accord and to continue to take steps to reduce the presence of greenhouse gases in the atmosphere[4].

CITY OF MILWAUKEE

In the last few years the City of Milwaukee (City) has been increasingly involved in the development of sustainability programs and initiatives. Just like the County, the City has a full time Sustainability Director position and a dedicated operating budget (Table 2) for the Sustainability Division that has been fairly consistent over the last three years:

TABLE 2
CITY OF MILWAUKEE SUSTAINABILITY BUDGET

YEAR	ADOPTED BUDGET
2014	$334,335
2015	$343,744
2016	$333,320

As one of the City's signature sustainability projects, the Environmental Collaboration Office (ECO) has developed a sustainability plan called ReFresh MKE[5] , published in 2013, which outlines what the City's goals and efforts will be over the next decade. In addition to the sustainability plan, many other initiatives have been developed ranging from energy efficiency and renewable programs to green building and sustainable manufacturing. The goal of these initiatives is to involve the community, have a positive impact on people and restore and conserve the natural resources of the city. Some of the most relevant achievements reached by the City of Milwaukee include:

- Milwaukee City Hall is a certified LEED Gold building for LEED Existing Buildings Operations and Maintenance (LEED-EBOM).
- With funding from the U.S. Department of Energy, the City of Milwaukee Office of Environmental Sustainability (OES) has created a robust portfolio of energy programs to support community energy goals. These programs include the Milwaukee Energy Efficiency program (Me2), ME3 Sustainable Manufacturing program, Milwaukee Shines solar program, and the Better Buildings Challenge[6].

MILWAUKEE METROPOLITAN SEWERAGE DISTRICT

The Milwaukee Metropolitan Sewerage District (MMSD) is the authority in charge of water and sewer management for the Milwaukee area. In the last five years, MMSD has been taking a proactive approach to sustainability by developing plans and research documents around water management, energy conservation, and climate change adaptation. All the initiatives of MMSD can be found on the webpage[7]. Some prime examples of the MMSD commitment to sustainability include:

- Development of a greenhouse gas (GHG) inventory for the years 2000-2007 released in 2010.
- Adoption in 2011 of MMSD's 2035 Vision that includes a sustainable bottom line to reach future goals.
- Development of the Sustainable Water Reclamation Plan (SeWeR) released in 2012, summarizing past and current efforts toward more efficient and sustainable water management that includes potable, waste and storm water.
- Publication in 2014 of a Climate Change Vulnerability Analysis to assess the potential impact of climate change on MMSD's facilities and operations.

3 http://county.milwaukee.gov/sustain
4 Resolution 17-506, September 2017
5 http://refreshmke.com/
6 http://city.milwaukee.gov/eco#.WXEIwE3rtoI
7 http://www.mmsd.com/sustainability

WISCONSIN INITIATIVE ON CLIMATE CHANGE IMPACTS

The Wisconsin Initiative on Climate Change Impacts (WICCI) is a collaboration project between the University of Wisconsin-Madison and the Wisconsin Department of Natural Resources (DNR). The work of this group focuses on studying the potential impact of climate change in Wisconsin, analyzing changes in historical weather patterns, assessing consequences and identifying adaptation measures that could mitigate potential damage. In 2011, the WICCI released its first comprehensive report, "Wisconsin's Changing Climate: Impacts and Adaptation"[8] with the goal to provide the Wisconsin community (businesses, public government, etc.) a resource to develop possible resiliency strategies.

More recently, in 2016, WICCI started a new series of publications titled "Climate Wisconsin 2050 – Scenarios of a State of Change"[9] each focusing on potential challenges such as stormwater management or heat emergencies – providing guidance on how Wisconsin's hundreds of municipalities, towns and counties can prepare themselves for some of the problems that might arise as the climate changes.

METHODOLOGY

The information necessary to develop this baseline inventory has been largely provided by airport and County staff based on a Request for Information (RFI) prepared by the AECOM team which included specific data requests for each of the Focus Areas to be analyzed.

Data / information was provided and collected in different formats, including:

- MS Excel spreadsheets used to track the required information
- Milwaukee County and MKE airport economic and technical reports
- Reports downloaded from management software (e.g. EnergyCAP)
- Bills and invoices
- Emails containing the requested information
- Publicly available documentation.

In addition to the above information sources, the AECOM Team organized site visits (September 28-30, 2016) at the airport during which subject matter experts in different areas, specifically air quality, GHG, energy and waste management, performed a walk-through of the facilities and met with airport staff to discuss current MKE operations. This gathering of first-hand information, in addition to other documentation provided in advance, allowed the AECOM Team to fill any gaps that could compromise the completeness of the baseline analysis and identify opportunities for improvements. Meetings were also held on November 30, 2016 with the Technical Advisory Group (TAG) and the Stakeholder Advisory Group (SAG) to gather further insight and background on current airport operations related to the selected Focus Areas. Information collected from the TAG and SAG members during the November 2016 meetings was then organized to inform subsequent work activities and deliverables. Feedback was evaluated in context of this baseline report and potential influence on goals/actions and incorporated where applicable.

Following the data collection process the information was analyzed using the most appropriate tools and methodologies based on the topic. In some cases existing resources were used (e.g., technical guidelines and protocols, public databases, etc.) and in other cases customized tools were developed (e.g., GHG and energy analysis spreadsheets).

The results are organized by Focus Area in this report and are summarized through text, tables and other graphics to support communication of the findings.

ECONOMIC FOCUS AREAS BASELINE

The Economic Focus Areas include Economic Prosperity, Operational Efficiency, and Sustainable and Resilient Buildings and Infrastructure. These Focus Areas reflect MKE's efforts to improve financial performance by reducing costs and enhancing revenue streams, improve operational efficiency, and run a more sustainable operation.

8 http://www.wicci.wisc.edu/report/2011_WICCI-Report.pdf

9 http://www.wicci.wisc.edu/news-climatewicommunities.php

ECONOMIC PROSPERITY

Economic Prosperity is included in the baseline to present the airport's impact in the regional economy and to underpin its role as critical infrastructure for transportation, commerce, and tourism in the region. This section relies on information provided by, or work completed by others, including:

- Airports Council International – North America (ACI-NA) Airport Performance Benchmark Survey Results for FY13, FY14, FY15
- Milwaukee County Financial Intranet System Fiscal Report for FY13, FY14, FY15
- General Mitchell International Airport Economic Impacts Report 2005[10]
- General Mitchell International Airport Economic Impacts Report 2010[11]

This section includes a summary of MKE's economic performance and economic impact. The direct economic value generated by the airport is reflected in indicators such as airport revenues, operating costs, number of jobs, and employee compensation. Indirect economic impact is also considered (such as local jobs of those who supply goods and services to the airport). To provide a deeper evaluation of the jobs created by the airport, how they benefit the community, and other employee characteristics, a dedicated section has been developed and is included in the social section, Employee Engagement Focus Area, found later in this report.

Some topics were not included in this sustainability baseline inventory for economic prosperity. These topics are primarily related to airport facility planning and business performance and often addressed as part of a master plan or other airport business plan or financial study. For example, this report does not include a discussion of occupancy at MKE or the Business Park (e.g., open tenant spaces, leasing activity, airline occupancy and gate use etc.) or assessment of financial/utilization indicators such as load factors.

ECONOMIC PERFORMANCE

In the 2015 fiscal year, MKE's financial performance included revenue earnings in excess of $124M and total expenditures above $101M. Total revenue exceeded total expenses by over $3M, exceeding the results from the previous two fiscal years (i.e., FY13 and FY14), even after accounting for significant contributed capital in FY15 ($19.5M). The following section summarizes select economic performance results for FY13 through FY15.

As shown in the following Table 3, in 2015 contributed capital accounted for almost 16% of airport revenue, whereas in FY14 and FY13, contributed capital accounted for a smaller portion of the revenue. In order to have an unbiased comparison and trend analysis, the remainder of this section does not include results or discussion based on contributed capital.
Based on a review of revenue distribution by source (Table 4), Service Fees and Charges are the main revenue source for MKE and substantially increased from FY13 to FY14 from $48M to close to $52M and remained constant in FY15. Also most of the other revenue sources, including the larger sources of revenue like rental and concessions, increased each year explaining the 11% increase ($10.5M) in total revenue from FY13 to FY15.

Parking fees represent the highest income source for the airport. In FY14 and FY15 they accounted for close to 52% of the total service fees and charges, up from 48% in FY13. Parking fees have increased from $25.9M in FY13 to $27.3M in FY15.

Total Expenses incurred by the airport show a slight reduction in FY14 from FY13 and then a 3.3% increase in 2015, which was mostly caused by higher capital expenditures, cross charges and other miscellaneous expenses (Table 5). Since FY13, Personal Services have been reduced by 7.5% ($2M) and "Commodities" expenditures have increased by 13.3% driven by higher utility (electricity, water and sewer) charges (Table 6).

Comparing MKE's revenue and expenses in relation to the number of enplaned and total passengers, it indicates that, even though the number of passengers remained relatively the same (~0.4%) there has been a consistent increase in revenue per passenger, while costs dipped in FY14 and had an increase in FY15 as shown in Table 7 below. Also utility expenditures per passenger have been consistently increasing since 2013 (+16% in 2015) in line with the overall utility spending that increased by 16.5%.

Based on these numbers, it appears MKE has been running an efficient operation in terms of revenue and cost, given the increase in per passenger revenue (10.8%) is greater than the increase in per passenger cost (2.4%).

10 "The Local and Regional Economic Impacts of Milwaukee County's General Mitchell International Airport" prepared by Martin Associates in cooperation with Breitenbach Weiss, Inc. (2005)

11 "The Local and Regional Economic Impacts of Milwaukee County's General Mitchell International Airport" prepared by Martin Associates and Weiss & Company Marketing Communications, LLC (2011)

FIGURE 1

MKE REVENUE AND EXPENSES, FY 15

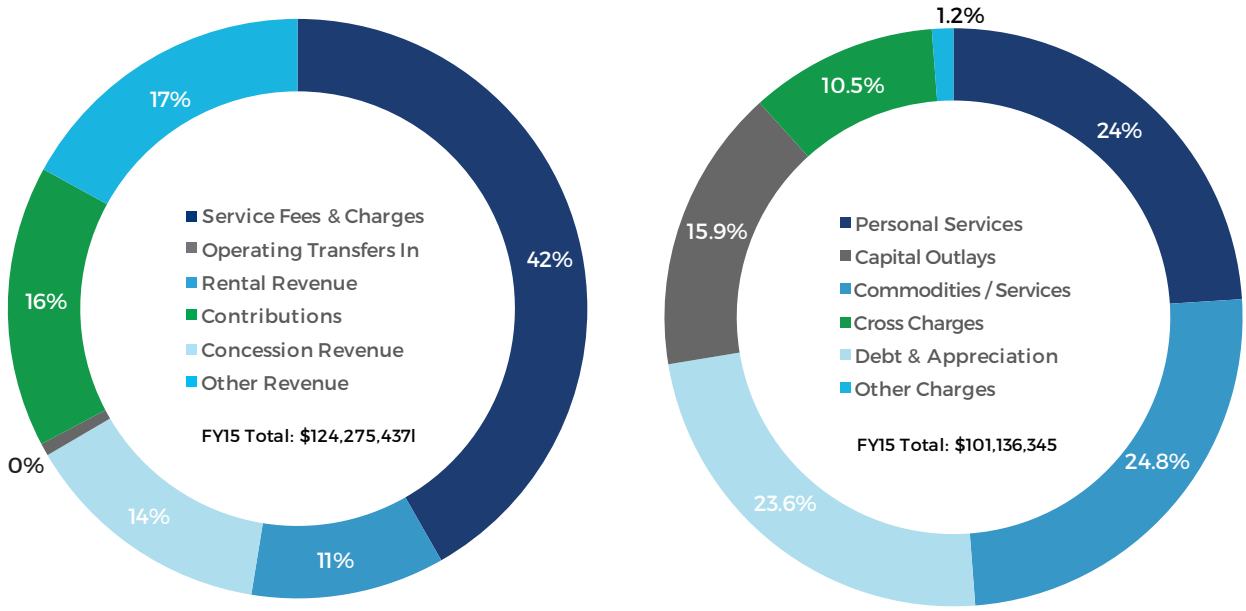


TABLE 3

REVENUE WITH CONTRIBUTIONS

REVENUE W CONTRIBUTIONS	FY13 REVENUE		FY14 REVENUE		FY15 REVENUE	
Service Fees & Charges	47.40%	$48,045,420	52.60%	$51,945,606	41.70%	$51,835,416
Rental Revenue	11.80%	$11,960,437	12.50%	$12,363,971	10.80%	$13,473,377
Concession Revenue	16.20%	$16,426,371	16.70%	$16,500,603	14.00%	$17,337,995
Operating Transfers In	-5.60%	($5,648,283)	0.00%	$825	0.70%	$923,176
Contributions	7.00%	$7,083,116	-2.30%	($2,280,551)	15.70%	$19,527,210
Other Revenue	23.10%	$23,396,111	20.40%	$20,141,038	17.00%	$21,178,263
Total	100.00%	$101,263,172	100.00%	$98,671,492	100.00%	$124,275,437

TABLE 4

REVENUE WITHOUT CONTRIBUTIONS

REVENUE W/O CONTRIBUTIONS	FY13 REVENUE		FY14 REVENUE		FY15 REVENUE	
Service Fees & Charges	51.00%	$48,045,420	51.50%	$51,945,606	49.50%	$51,835,416
Rental Revenue	12.70%	$11,960,437	12.20%	$12,363,971	12.90%	$13,473,377
Concession Revenue	17.40%	$16,426,371	16.30%	$16,500,603	16.60%	$17,337,995
Operating Transfers In	-6.00%	($5,648,283)	0.00%	$825	0.90%	$923,176
Other Revenue	24.80%	$23,396,111	20.00%	$20,141,038	20.20%	$21,178,263
Total	100.00%	$94,180,056	100.00%	$100,952,043	100.00%	$104,748,227

ECONOMIC IMPACTS

The airport is a significant contributor to the local and regional economy, generating direct and indirect economic impacts for Milwaukee, the greater metropolitan area, and the state of Wisconsin. The airport has also experienced challenging macroeconomic and industry conditions that have impacted the airport's financial performance over the last decade. Several regional, national, and larger economic factors that are out of the control of MKE have impacted passenger, tenant and cargo activity at the airport. Key factors that have contributed to the reduction in passengers and cargo activity include: airline consolidation, economic recession, and closure of the 440th Airlift Wing in 2005.

TABLE 5
EXPENSES

EXPENSES	FY13 EXPENSES		FY14 EXPENSES		FY15 EXPENSES	
Personal Services	26.60%	$26,223,778	24.80%	$24,266,924	24.00%	$24,255,127
Commodities / Services	22.50%	$22,126,378	26.20%	$25,671,574	24.80%	$25,079,414
Debt & Appreciation	23.40%	$23,039,515	24.40%	$23,891,396	23.60%	$23,887,360
Capital Outlays	18.70%	$18,383,226	15.00%	$14,679,056	15.90%	$16,063,910
Cross Charges	10.40%	$10,209,676	10.10%	$9,919,732	10.50%	$10,636,162
Other Charges	-1.60%	($1,550,164)	-0.60%	($549,616)	1.20%	$1,214,373
Total	100.00%	$98,432,408	100.00%	$97,879,066	100.00%	$101,136,345

TABLE 6
UTILITIES

UTILITY	FY13	FY14	FY15	% CHANGE 2013-2015
Electricity	$3,624,936.13	$3,710,836.35	$4,280,530.70	18.09%
Natural Gas	$585,122.54	$905,640.91	$578,888.80	-1.07%
Sewer	$120,609.72	$149,132.80	$160,058	17.63%
Water	$74,730.89	$90,825.95	$111,322.75	13.31%
Total	$4,405,399.28	$4,856,436.01	$5,019,477.97	13.94%

TABLE 7
PASSENGERS ACTIVITY

PASSENGERS ACTIVITY	2013	2014	2015	% CHANGE 2013-2015
Enplanements	3,266,309	3,278,820	3,277,356	0.34%
Deplanements	3,258,872	3,275,332	3,271,997	0.40%
Total	6,525,181	6,554,152	6,549,353	0.37%
Cost per Enplanement	$30.14	$29.85	$30.86	2.40%
Revenue per Enplanement	$28.83	$30.79	$31.96	10.85%
Cost per Passenger	$15.09	$14.93	$15.44	2.37%
Revenue per Passenger	$14.43	$15.40	$15.99	10.81%
Utility Cost per Passenger	$0.78	$0.86	$0.90	16.05%

In 2010, intense competition between several airlines at MKE resulted in extremely low fares and high service levels that were unsustainable. Passenger counts spiked, but airlines were losing money. This was exacerbated by record-high fuel prices. As a result, airlines quickly consolidated and/or significantly reduced their share of the MKE market. Milwaukee also lost an airline that had been headquartered locally.

Because MKE no longer serves as a hub for an airline, very few connecting passengers are routed through MKE. In 2010-11, 21% of passengers simply changed planes at MKE and did not leave the airport where they would spend money at area hotels, shops, restaurants or attractions. Today, more than 97% of MKE passengers begin and/or end their journeys in Milwaukee, which provides a greater economic boost to our local economy.

Nearly all FAA-classified Medium-hub U.S. airports like MKE have experienced declines in passenger traffic over the last decade. MKE also faces pressure from a competitor airport in the region that has seen an increase in flights from ultra-low cost carriers.

As a result of these factors, passenger enplanements peaked in 2010 and have remained below pre-2010 values (Figure 2). Freight / cargo values have also remained below historic peak values; however, besides a significant dip (-57%) in 2014, these values have been relatively steady in the last several years and the airport has suffered a less significant reduction compared to passenger volumes (Figure 3).

OPERATIONAL EFFICIENCY

Operational Efficiency as a Focus Area is broad, emphasizing the operation, management, and maintenance of the airport while focusing on the role sustainability can play in this context. It can further be thought of as the ability and means by which the airport runs the operation in the most effective and efficient manner while providing the same, or improved, level of service and function, and encompasses those procedures and activities that help reduce costs and resource and labor inefficiencies and improve organizational effectiveness. This section provides additional information on MKE's management for efficient operations and use of management systems.

EFFICIENT OPERATIONS

MKE has emphasized efficiency in several operational and environmental areas and continues to do so, with managers and employees identifying and implementing actions to run airport operations in a more efficient and sustainable manner. The Airport Division, part of Milwaukee County, is organized so that the Operations Department, which includes maintenance and environmental, has primary oversight of sustainable and efficient operations. A larger group of stakeholders in the Airport Division, including Finance and Properties, likely have interest in these topics as well for reporting, communication and other purposes. However, while there is an overall commitment to efficiency as an operational priority, currently there is no policy mechanism or formal management system in place to address efficiency.

FIGURE 2
HISTORICAL PASSENGER VOLUME TREND

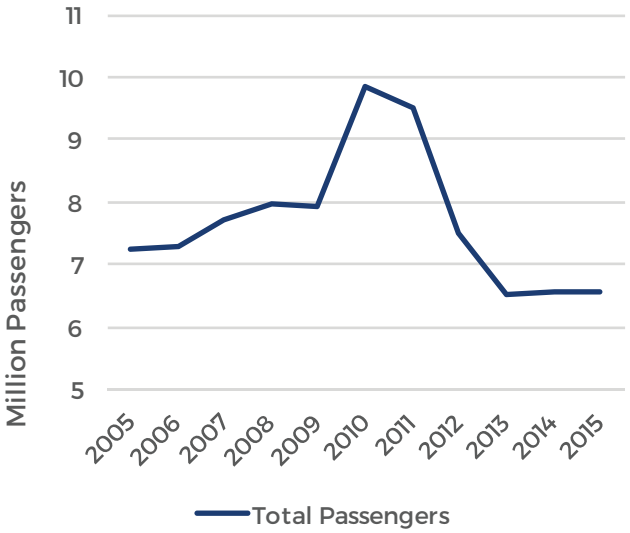
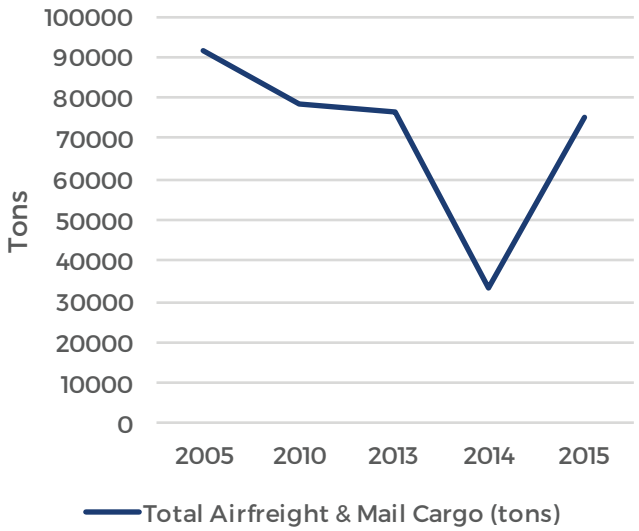


FIGURE 3
HISTORICAL AIR CARGO / FREIGHT VOLUMES



Therefore, actions are either driven by norms, manager-led initiatives, unwritten procedures or ad-hoc, driven by individual employees or circumstances. Fortunately, MKE and Milwaukee County have staff committed to efficiency and sustainability, including Milwaukee County's Sustainability Director and airport staff with partial responsibility of efficiency and sustainability topics, including the Maintenance Manager, Environmental Manager, Managing Engineer, and Noise/Air Quality Manager. The airport's results and progress in realizing sustainability gains through efficient operations – such as improved energy efficiency and conservation and reducing waste volumes – are included in the individual Focus Areas in this report.

A primary driver of many of the airport's efficiency initiatives is controlling and reducing airport costs. Cost savings benefits can come from operational initiatives, such as the recently completed energy retro-commissioning project, or capital projects, such as the recently completed Baggage Claim Renovation project, which integrated energy and water efficiency and other green building design and construction strategies. The cost savings can directly and proportionally impact the airport's expenditures on utilities and other areas such as waste disposal. Like most operations, utilities represent a sizeable component of the airport's overall expenditures but they are also manageable costs that can benefit from sustainability initiatives. However, the actual cost benefits from any specific action may be unavailable or not able to be calculated if there is insufficient data. Additional information on operating and utility expenses can be found in the Economic Performance section of this report.

As a result of the baseline/inventory assessment, additional metrics have also been developed. Metrics that may be managed or evaluated for operational efficiency can include many of the topics found throughout this baseline report. Some of the metrics that are discussed in other sections of this report include:

- Utility expenses (electricity, natural gas, water/sewer) and related metrics (total utility costs/passenger) – discussed in Economic Prosperity.
- Operating costs and related metrics (operating costs/passenger) – discussed in Economic Prosperity.
- Energy consumption and expenditures and efficiency metrics (MBtu/passenger) – discussed in Energy Management.
- Greenhouse gas emissions and intensity metrics (mtCO2e/passenger) – discussed in Air Emissions and Climate Change.
- Solid waste generated and diversion rate – discussed in Waste Management.
- Water consumption and efficiency metrics (gal/passenger) and water / sewer expenditures – discussed in Water Management.

A table summarizing these key baseline number and metrics can be found in the Summary and Conclusions section of this report.

MANAGEMENT SYSTEMS

MKE has also invested significant time and resources into the management of key operations at the airport including the development of management systems for select areas. A central component to operations management at the airport is the Cityworks program, which is an enterprise-level, Computerized Maintenance Management System (CMMS) used for asset and work management. Cityworks serves as the primary management system for three critical areas: 1) work flow management, 2) operations, and 3) safety, including the new FAA Safety Management System (SMS) and FAA-mandated Part 139 reporting. The system is GIS-based and includes all airport assets under management. It is used as a digital logbook to catalogue and store entries on nearly everything that occurs at MKE that affects operations. MKE is regularly adding to the system to cover more areas of management / operation and currently has over 60 individual users across multiple departments. Additional facts and points pertaining to the MKE Cityworks program include:

- Allows work orders to be tracked and grouped and provides data and insight into operations, such as areas of repeated maintenance and maintenance heat maps.
- Data can be conveyed via graphics and charts, exported for analysis, or used for reporting.
- Examples of current reports include: engine run-ups, charter flight landings, security issues, wildlife issues / strikes, equipment outages, employee labor, accounting reports, billing reports.
- Currently used to manage the airport SMS documenting hazards, assessments and corrective actions and manages a variety of safety metrics.
- Used for Part 139 reporting, a major advancement in Part 139 reporting in the industry.

SUSTAINABLE AND RESILIENT BUILDINGS AND INFRASTRUCTURE

EXISTING GUIDELINES, FRAMEWORKS AND RATING SYSTEMS

A sustainable building and infrastructure program can play a vital part in airport capital improvement programs, infrastructure development projects and sustainable asset management. The programs can directly require or stipulate green building and infrastructure standards and rating systems or incorporate these requirements on a project or program basis. The green building and infrastructure standards and rating systems currently being considered and used more consistently in the airport industry are:

- Leadership in Energy and Environmental Design, (LEED). LEED is a green building certification program that is administered by the United States Green Building Council (USGBC). The LEED system includes multiple green building rating systems that can be used for different building types at different stages of construction or operation of the building. The green building rating systems that could be applicable for airport projects include Building Design and Construction (for new buildings and major renovation projects), Interior Design and Construction (for interior projects not involving a building core and shell) and Building Operations and Maintenance (for existing building focusing on sustainable operations). Currently, sixty (60) airports in North America have developed at least one LEED project for a total of close to 150 projects ranging from the LEED Certified Level up to LEED Platinum.

- Envision Sustainable Infrastructure Rating System. The Envision Sustainable Infrastructure Rating System (Envision) is a relatively new program that was developed by the Institute for Sustainable Infrastructure (ISI), founding member organizations American Council of Engineering Companies (ACEC), American Public Works Association (APWA), and American Society of Civil Engineers (ASCE), and the Zofnass Program for Sustainable Infrastructure at Harvard University[12]. The Envision system was developed for the purpose of integrating sustainability into more traditional infrastructure projects, such as roads, bridges, pipelines, water/wastewater infrastructure, and other civil infrastructure projects. Currently only four airport projects in North America have received the Envision certification:

    - San Diego airport received Platinum level for a terminal and landside development project
    - T.F. Green airport in Providence, RI received Gold level for a runway extension project
    - Detroit Metropolitan Wayne County Airport received Silver level for runway and taxiway reconstruction project
    - Nashville airport received Silver level for a geothermal project

In addition to LEED and Envision there are several other ratings and frameworks that have been developed either specifically for airports or in general for green buildings and infrastructure. These systems are emerging or lesser known and are gaining less attention and uptake than LEED and Envision. However they should still be considered as possible alternatives to consider for future projects. Below is a list of the most established systems:

- Sustainable Airport Manual[13]. The Sustainable Airport Manual was developed by the Chicago Department of Aviation with the first full version (Version 1.0) released in August 2009. The Sustainable Airport Manual builds on the structure of the LEED certification program and rating systems but was specifically developed to have an airport-specific green building rating system. Like LEED, airports can implement various design and construction strategies identified in the Sustainable Airport Manual.

- Green Globes[14]. Green Globes is an online green building rating and certification tool that is used primarily in Canada and the USA. Green Globes is licensed for use by BOMA Canada (Existing Buildings) and the Green Building Initiative in the USA (New and Existing Buildings). There are Green Globes modules for:

12 The Envision website can be found here: https://sustainableinfrastructure.org/

13 More information on the Sustainable Airport Manual can be found at: http://www.airportsgoinggreen.org/documents/CDASAMv3.2.pdf

14 More information on the Green Globes rating system can be found at: http://www.greenglobes.com/home.asp

The Economic Focus Areas reflect MKE's efforts to improve financial performance by reducing costs and enhancing revenue streams, to improve operational efficiency, and run a more sustainable operation.

- New Construction/Significant Renovations
- Commercial Interiors (i.e., primarily office fit-ups)
- Existing Buildings (offices, multi-residential, retail, health care, light industrial)
- The Green Globes New Construction assessment can be used for a wide range of commercial, institutional and multi-residential building types including offices, schools, hospitals, hotels, academic and industrial facilities, warehouses, laboratories, sports facilities and multi-residential buildings.
- SITES[15]. SITES is a sustainability-focused framework primarily for landscape development that was developed by the Sustainable Sites Initiative. It provides guidance to landscape architects, engineers and others toward practices that protect ecosystems and enhance the numerous benefits they provide

15 More information on the SITES rating system can be found at: http://www.sustainablesites.org/

our communities, such as climate regulation, carbon storage and flood mitigation. The SITES framework is a culmination of years of research and development by professionals in the fields of soil, water, vegetation, materials and human health. SITES-certified landscapes help reduce water demand, filter and reduce stormwater runoff, provide wildlife habitat, reduce energy consumption, improve air quality, improve human health and increase outdoor recreation opportunities.

- WELL[16]. The International WELL Building Institute developed the WELL standard to allow the design, constructions and maintenance of buildings that impact positively the life of occupants. The WELL Building Standard uses innovative, research-backed strategies to advance health, happiness, mindfulness and productivity in buildings and communities. The standard takes into account several aspects of a building including water, air quality, light, fitness, comfort, mind, innovation and nourishment. Similar to LEED, projects can be registered and pursue WELL certification (Silver, Gold, or Platinum) if they meet certain standards.

CURRENT STATUS OF GREEN BUILDING POLICIES

Over the last decade Milwaukee County has started working towards sustainable buildings and infrastructure. Several initiatives have been promoted and policies developed including:

- Green Print (2007). The County implemented the Green Print resolution, an environmental and conservation initiative, which among other aspects requires county-supported buildings to achieve LEED certification, to consider the use of efficient technology and renewable energy when applicable, reduce the use of resources, educate County staff around environmental stewardship and adopt green procurement guidelines. Green Print represents the main reference for sustainability initiatives in Milwaukee County.
- Sustainable Design Guidelines (2009). The County developed these guidelines with the intent to assist Milwaukee County project managers in implementing sustainable design practices on their projects, furthering the goals of Milwaukee County's Green Print Initiatives. These guidelines are based on LEED standards for Existing Buildings since the majority of Milwaukee County funded work occurs on existing structures. The guidelines have never been officially adopted and remain a sort of pilot project. Nonetheless they still provide a reference for County projects and are in some case used in the development of project specifications.
- County Ordinance – Chapter 21 (2016). This new ordinance requires that recipients of direct financial assistance aimed at developing real estate projects be certified under the LEED green building rating system or other national certification. The ordinance is dated September 2016 and as a relatively new ordinance, there is little information available on adoption and enforcement of the rule within the County.

Currently, the airport does not have a separate green building policy or green building design or construction standards for operational or capital projects. It refers for the most part to the various County initiatives described above.

However, MKE has completed green building and sustainability initiatives including several energy conservation projects in recent years with additional energy projects on the books (e.g., retro-commissioning, LED lighting, boiler replacement) as well as other fuel and water conservation initiatives. More details regarding these projects are provided in the Environmental Focus Areas and Energy Management section.

A prime example of MKE's commitment to sustainable building is the Baggage Claim Renovation project. Completed between September 2013 and July 2015, the project recently achieved LEED Certification under LEED Building Design & Construction v2009 and was the first Milwaukee County owned building to reach this goal. Key highlights of this project include:

- Achieved 45 out of 114 credits (LEED Certified level)
- 43% of steel and concrete sourced within 500 miles
- Over 90% of the construction materials were recycled, exceeding MKE's 75% diversion goal
- Installed a green roof (~4900 sq ft) which contains 18 different plant species

16 More information on the WELL certification system can be found at: https://www.wellcertified.com/

- Includes a variety of other water and energy efficient features and green building operations approaches, such as water efficient landscaping, touchless faucets, high efficient flush and flow fixtures, energy efficient LED lighting, occupancy sensors, natural lighting and lighting controls, and green cleaning

RESILIENCY

Green building programs are also seen as a way to integrate infrastructure resiliency into design and construction projects and in some cases 'harden' infrastructure against increasingly unpredictable external impacts. In terms of airport infrastructure, hardening and resiliency can be described as follows[17] :

- Hardening means to physically alter airport infrastructure to protect it from damage from extreme wind, flooding, debris and other unplanned events. Overall this makes infrastructure more durable or stable and able to withstand impacts of natural events without sustaining major damage.

- Resiliency, or resilience, is the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, and processes. For airports, resiliency is about the ability of airport infrastructure and operations to absorb disturbances from various impacts or events and continue, or retain, airport processes and operations.

Strategies to harden and increase the resiliency of airport infrastructure and operations can vary depending on the asset or process being considered. Currently, the airport does not have a policy or design or construction guidance that distinctly includes resiliency. Similar to green building, the airport can expand consideration of infrastructure resiliency for applicable operational and capital projects and integrate those considerations into design and construction contracts, as warranted. While MKE has not adopted a resilience policy to date, MKE management acknowledge that resilience strategies for airport infrastructure are becoming a necessary consideration for the future development and operation of the airport. MKE recently completed a project to create a redundant energy feed and are currently evaluating layout and use / expansion of emergency generators and back-up power. More details regarding these energy resiliency projects are provided in the Energy Management section.

ENVIRONMENTAL FOCUS AREAS BASELINE

The Environmental component of sustainability addresses a variety of aspects of traditional environmental management and compliance as well as the management and use of natural resources and implementation of conservation programs. The purpose of the environmental section is to understand the airport's current environmental impact, identify existing policies, programs and goals and evaluate how this fits within the context of local and regional environmental issues. This information supports the definition of goals and development of actions for each Focus Area. The Focus Areas discussed in this section include Energy Management, Air Emissions and Climate Change, Waste Management and Water Management.

ENERGY MANAGEMENT

Energy is one of the primary areas of importance at MKE because of the direct economic impact on the airport and impact of energy consumption on the environment. For this reason a more detailed and thorough assessment was conducted of this Focus Area. The results include an evaluation of the overall energy use, analysis of utility bills and related trends, evaluation of implemented energy efficiency initiatives and identification of possible areas of improvement.

The full report of the Energy Survey can be found in Attachment 2. This section provides a summary of the information included in the Energy Survey, including utility data, description of current systems and implemented energy efficiency initiatives which provide a baseline for energy use and management at the airport.

The energy assessment was conducted by completing

17 Definitions modified from various sources. A summary of airport resiliency considerations, including a list of adaptation / resiliency terminology, can be found in ACRP Synthesis 33, Airport Climate Adaptation and Resilience.

three main activities:

- Airport walkthrough
- Evaluation of implemented energy efficiency initiatives and other projects
- Utility data gathering and analysis

AIRPORT WALKTHROUGH

As part of the Energy Survey a walkthrough was conducted at the airport to review the existing conditions, talk with airport staff, and identify potential energy conservation measures (ECMs) that could be implemented following further investigation. The airport walkthrough was conducted by AECOM's energy efficiency consultant with the support of MKE staff.

The walkthrough included the following locations; the Main Terminal Building, Concourses C, D, & E, the parking garage and skywalks, the central plant / operations building, and the International Arrivals Terminal. The Business Park was not included; however the utility information for the Business Park was reviewed (see Utility Data Analysis section below).

COMPLETED ENERGY MANAGEMENT PROJECTS

Several energy related projects have been completed in recent years with the goal of reducing airport energy use through energy efficient design, energy efficiency upgrades, and correction of operational issues. A list of these completed energy projects is below.

- The airport completed a renovation of the baggage claim area which achieved LEED Certification, becoming the first building owned by Milwaukee County to become LEED certified. To achieve certification under LEED, a project must be more energy efficient than the applicable energy code. The baggage claim project incorporated daylighting controls and energy efficient lighting and HVAC systems. The project was completed in 2015 and became LEED certified in 2016.
- A retro-commissioning project was completed for the main terminal building including the concourses and skywalks. The project was aimed at the air side systems (air handling units [AHUs], exhaust and relief fans, outside air, building pressurization) in order to identify deficiencies and areas of improvement on corrective actions. The report identified several deficiencies and facility improvement measures. The project was completed in 2014; however follow-on commissioning recommendations continued past 2014.
- One of the deficiencies identified in the above retro-commissioning report was that finned tube radiant heaters and hot water unit heaters in concourse C were not equipped with control valves. As a result, whenever hot water was being produced these areas were heating even if not needed. Because the central hot water plant serves the domestic hot water system, it runs continuously throughout the year which means that even in summer the above systems were operating. Since this study was completed this has been corrected by adding control valves to these systems so they only operate when needed, reducing heating energy use.
- Finally there are ongoing lighting upgrade projects in several locations to install more energy efficient lighting fixtures (either high efficient fluorescent or LED). Partial lighting upgrades have been completed for the parking garage, site lights, and the airfield lights.

In addition to energy efficiency measures, energy resiliency and renewable energy have been considered by the airport and actions have been taken to advance these topics.

Renewable Energy. In 2015 the airport commissioned a feasibility study for a solar photovoltaic (PV) system[18]. The study included an analysis of sites within the airport boundaries that could stage a 1 MW solar PV system while fulfilling all the necessary technical requirements. The study also included a financial and regulatory assessment of the possible scenarios for the project. Although 13 sites were considered suitable for the development of the solar PV system, the project financials were not considered sufficiently favorable for MKE. In addition, the State of Wisconsin does not have clear regulation regarding Power Purchase Agreements (PPA). This contractual arrangement may represent the only way to allow for the project to be profitable for the parties involved. This lack of clear guidance and track record of other similar projects in the state creates a significant obstacle for project implementation. As a result of these issues, the solar PV initiative was put on hold.

18 GMIA Solar Energy Feasibility Study Task 1 Report: Airport Land Use and Technical Analysis, Task 2&3 Report: Financial and Legal Issues. Prepared by HMMH (2015)

Despite the aforementioned obstacles, solar PV projects are still viewed with interest at MKE. The airport may consider implementing renewable energy projects in the future, following further analysis and with the right kind of partnership (e.g., public/private) and project circumstances. In addition to airport staff, renewable energy is also being evaluated by other MKE tenants. A large building owner near the airport is currently evaluating the development of a solar PV system on their property, which is located within the MKE boundary.

Energy Resiliency. In December 2014 MKE completed a project to increase energy resiliency at the airport and avoid potential problems to the airport energy supply. The project, which was driven by security and reliability concerns, consisted of the addition of a second utility feed that can provide continued power supply to the airport in the case of potential power outages, system malfunctions, and for maintenance interventions without affecting normal airport operations.

Prior to the redundant utility feed project, the airport was supplied by only one substation. With two feeds derived from two separate substations, both capable of providing the entire load demand of the airport, MKE benefits from additional level of resiliency and preparedness.

In addition to the redundant utility feed project, airport staff is currently evaluating circuits / specific areas of the airport which are tied to emergency generators with the goal to expand emergency back-up power at the airport.

UTILITY DATA ANALYSIS

AECOM was provided overall utility data from the County's utility billing management system (EnergyCAP) for the airport and MKE Business Park for review and analysis. The data covered a period from the beginning of 2013 through the middle of 2016 and included both electricity and natural gas use and cost data. There is incomplete sub-metered data beyond this level, as select electrical services and tenants have sub-meters and other areas do not have sub-meters. AECOM did not evaluate data at the sub-meter level for the baseline assessment.

For the overall airport complex and MKE Business Park, the airport accounts for approximately 90% of the total combined energy use (electricity and natural gas) and the MKE Business Park accounts for the remaining 10% of energy use. Separating and comparing natural gas and electricity consumption, the airport uses 91% of the total electricity use and approximately 85% of the natural gas use with the MKE Business Park accounting for the remainder.

TABLE 8
AIRPORT SUMMARY (MBTUs)

YEAR	ELECTRICITY	NATURAL GAS	TOTAL	ELECTRICITY	NATURAL GAS
2013	134,367	102,470	236,837	57%	43%
2014	135,180	104,176	239,356	56%	44%
2015	133,883	93,874	227,757	59%	41%

TABLE 9
BUSINESS PARK SUMMARY (MBTUs)

YEAR	ELECTRICITY	NATURAL GAS	TOTAL	ELECTRICITY	NATURAL GAS
2013	12,798	15,830	28,628	45%	55%
2014	13,713	17,822	31,535	43%	57%
2015	13,208	14,198	27,406	48%	52%

TABLE 10
TOTAL ENERGY USE (MBTUs)

YEAR	ELECTRICITY	NATURAL GAS	TOTAL	ELECTRICITY	NATURAL GAS
2013	146,599	117,199	263,798	56%	44%
2014	149,005	120,747	269,752	55%	45%
2015	147,708	107,038	254,745	58%	42%

The combined utility use of the airport and Business Park is split with approximately 55% of the total energy being electricity and the other 45% being natural gas (Table 10). In 2015 the utility portions shifted with electricity usage accounting for 58% of the total. This aligns with the overall decrease in airport natural gas use in 2015 (Table 8) as well decrease within the Business Park (Table 9).

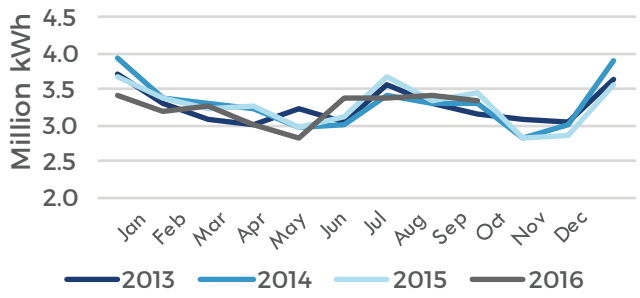
Since the airport complex consumes significantly more energy than the MKE Business Park and was the focus of the site walk through, the remainder of the utility analysis will concentrate on energy use trends and electricity and natural gas use at the airport.

Airport electricity use has been fairly stable from 2013 through 2015 and the data included for the first half of 2016 indicates electricity use to be similar. From 2013 through 2015, the total electricity use was between 39 and 40 million kilowatt-hours (kWh) at a cost between $3.0 and $3.5 million dollars per year. The year to year variations were minor (i.e., within one percent).

A closer evaluation of monthly energy use trends indicates that energy use and cost show a consistent peak in

FIGURE 4 - MKE ELECTRICITY CONSUMPTIONS AND COST TRENDS

MKE AIRPORT ELECTRICITY USE



MKE AIRPORT ELECTRICITY COST

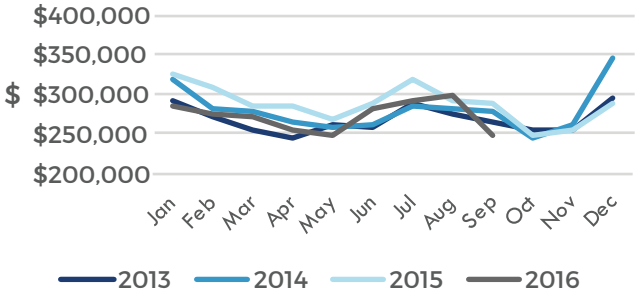
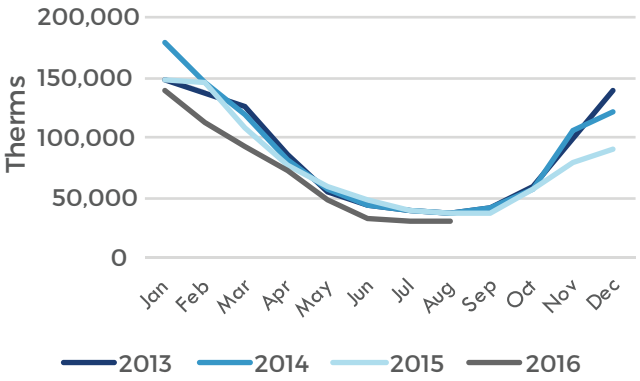


FIGURE 5 - MKE AIRPORT NATURAL GAS CONSUMPTION AND COST TREND

MKE AIRPORT NATURAL GAS USE



MKE AIRPORT NATURAL GAS COST

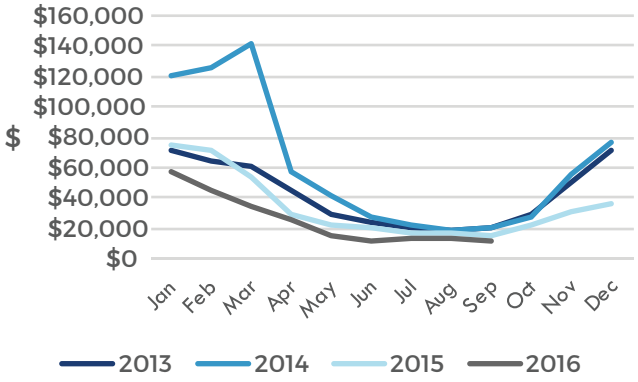
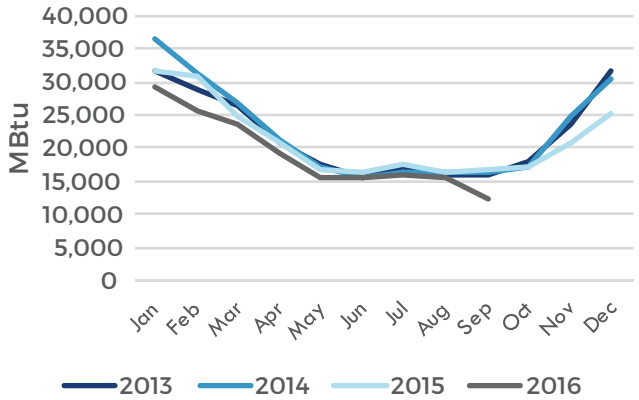


FIGURE 6 - MKE AIRPORT TOTAL ENERGY CONSUMPTION AND COST TRENDS

MKE AIRPORT TOTAL ENERGY USE



MKE AIRPORT TOTAL ENERGY COST

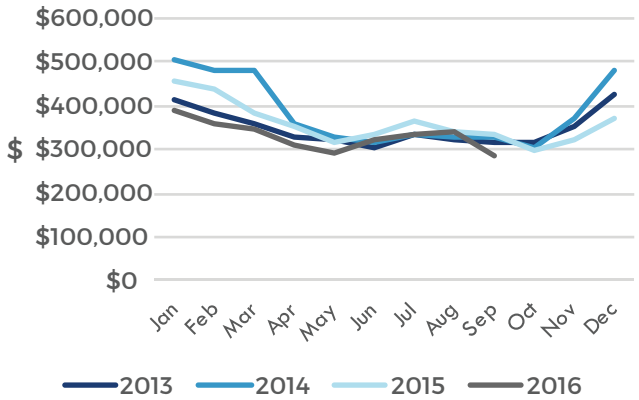


TABLE 11
COMPARISON BETWEEN METERED AND NORMALIZED ENERGY DATA

YEAR	METERED	NORMALIZED	Δ%
2013	265,464	264,713	-0.3%
2014	270,892	269,120	-0.7%
2015	255,163	254,480	-0.3%
2016	172,443	173,712	0.7%

TABLE 12
PASSENGER AND AREA BASED ENERGY INTENSITY FACTORS

YEAR	TOTAL PASSENGERS	TOTAL SQ FT	TOTAL ENERGY USE (MBTU)		ENERGY INTENSITY MBTU/PASSENGER		ENERGY INTENSITY MBTU/SQ FT	
2013	6,525,181	880,666	263,798		0.040	-	0.30	-
2014	6,554,152	880,666	269,752	2.3%	0.041	1.8%	0.31	2.3%
2015	6,549,353	880,666	254,745	-5.6%	0.039	-5.5%	0.29	-5.6%

electricity use in December and January with a second, slightly smaller peak, in July and August (Figure 4). This energy use profile is consistent across the time period of data evaluated (i.e., 2013 through mid-2016). Based on the electricity data and that electricity accounts for a majority of the overall airport energy use, there is a relatively large potential for reducing energy use by implementing ECMs that reduce the electricity use of the airport.

Natural gas use and cost was fairly stable from 2013 through October of 2015 (Figure 5); however, natural gas use has declined since then by 15% to 20% compared to the same month in the previous year. This reduction is likely due to the implementation of corrections to operational issues identified in the air side retro-commissioning report. In 2013 and 2014 the natural gas use was just over 1 million therms at a cost of just over $500,000 in 2013 and over $700,000 in 2014, with the cost increase in 2014 due to natural gas shortages. In 2015 the natural gas use was reduced to just fewer than 940,000 therms and just over $400,000. Based on data from the first half of 2016, natural gas use was on pace to be lower than 2015 (Figure 5).

The yearly natural gas use profile shows peak usage in the winter months with a minimum summer month use that is about 30% of the winter peak use. This yearly energy use profile is fairly typical of heating-driven natural gas use for a typical cold weather airport. That said, there is likely some potential to reduce the minimum summer use to a smaller percentage of the peak use by implementing select ECMs described in the next section even if some ECMs reduce the airport peak use in winter as well.

Combining the electricity and natural gas energy into a total airport energy use profile, the energy use was fairly stable in 2013 and 2014. However, in 2015 the total energy use was reduced by 4% compared to 2013 for a total use of just over 225 million British Thermal Units (MBtu), while the total energy cost for the airport in 2015 was just under $3.9 million (Figure 6). The yearly use profile shows a peak in the winter months of December and January and a flat use in the middle of the year from May through October. The winter peak is the result of the winter electricity peak which requires further investigation combining with the normal winter natural gas peak in winter. Meanwhile in the spring through fall months as the natural gas use decreases the electricity use increases leading to a flat overall profile. This minimum energy use is approximately 15 MBtu per month at a cost of around $300,000 dollars per month under current operating conditions. With implementation of energy conservation measures this minimum energy use can be reduced.

It is worth noting that year over year fluctuations in energy use do not appear to be significantly influenced by weather patterns. A comparison of the metered data with normalized data calculated through MKE's energy data management system (EnergyCAP) each year from 2013 to 2016 (up to September 2016) shows variations below 1% (Table 11).

The Environmental Focus Areas help planners understand the airport's current environmental impact, identify existing policies, programs and goals and evaluate how they fit in the context of local and regional environmental issues.

Further evaluation of these numbers was completed by putting them in relative terms (i.e., energy cost or consumption relative to a specific factor of interest). By evaluating the utility data in relation to number of passengers and total airport square footage it is possible to calculate results in relative terms, or intensity factors, by dividing energy consumption by either number of passengers or square footage.

The values in Table 12 show how percentage changes for intensity factors each year from 2013 to 2015 are aligned to those for total energy use. This is because square footage has remained constant and the number of passengers has also remained relatively consistent (slight changes of plus/minus 0.4% in passenger count). Consequently the increases or decreases of the intensity factors reflect the observed changes in energy use.

Further detail and discussion of the above findings and results can be found in the Energy Survey, provided in Attachment 2.

AIR EMISSIONS AND CLIMATE CHANGE

The Air Emissions and Climate Change Focus Areas establish a baseline of airport-generated emissions under the control of the Milwaukee County Airport Department, as well as the County's usage of electricity at MKE. For this effort, air emissions have been evaluated for the airport based on two overall areas:

- Compilation of a GHG inventory to set a baseline for MKE's carbon footprint. This included an evaluation of all GHG emissions under control, or influence, of MKE.
- Overview of existing regulations regarding criteria pollutants (e.g., ozone, PM2.5, NO2, SO2). This included a review of all required air quality permits and emission reduction projects implemented by the airport.

GREENHOUSE GAS INVENTORY

GHGs absorb infrared radiation (IR) in the atmosphere and radiate heat in all directions. GHGs from human activities are considered primarily responsible for the rise in temperature the earth is experiencing and other phenomena commonly referred to as climate change[19]. The primary GHGs, listed in order of abundance, include: water vapor, carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), and all fluorocarbons.

Typical GHG inventory results are presented in CO2-equivalent (CO2e) emissions, which is the common measurement used for reporting GHG emissions. Conversion to CO2e is done by multiplying the mass of emissions of a given GHG by its global warming potential (GWP). CO2e is a measurement used to account for the fact that different GHGs have different potential to contribute to the greenhouse effect. The GWP of a GHG is dependent on the lifetime of the gas molecule in the atmosphere and is a relative measure of how much heat a GHG traps in the atmosphere compared to the amount of heat trapped by a similar mass of CO2. For example, 1 metric ton of CH4 has the same contribution to the greenhouse effect as approximately 21 metric tons of CO2, so the corresponding GWP is 21. Therefore, CH4 is a much more potent GHG than CO2. The GWP for NO2 is 310, making it an even more potent GHG than CH4. The source for these GWP values is the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report published in 2007.

This section of the report focuses on the analysis of airport operation and associated GHG emissions. A GHG emissions inventory was prepared for years 2014 and 2015, with 2015 serving as the baseline year, and addresses the following emission categories:

- Scope 1 - Direct emissions from owned or controlled sources
    - Airport vehicle & ground support equipment (GSE) fuel usage (diesel, gasoline, and compressed natural gas [CNG])
    - Airport stationary sources such as natural gas boilers
    - GHG emissions associated with the use of refrigerants
    - Airport emergency generators (diesel).
- Scope 2 - Indirect emissions from the generation of purchased energy
    - For MKE this category includes only purchased electricity.

Select GHG sources were not included in the inventory. Scope 3 emissions, which are those associated with airport operations but generated by third parties such as tenants, airlines (i.e., aircraft) or the traveling public, were not included within the boundary of the study.

GHG emissions associated with waste generation were also not included in the inventory because typically they are considered Scope 3, and due to the insufficient quality and completeness of the waste data did not allow for an accurate accounting of the GHG emissions.

19 IPCC, 2007: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate ChangeMitchell International Airport" prepared by Martin Associates and Weiss & Company Marketing Communications, LLC (2011)

METHODOLOGY

Estimates of GHG emissions were developed for CO2, CH4, and N2O multiplying the amount of energy, fuels and other emission sources used by the airport by the appropriate emission rates and GWP. Sources for emission factors and GWPs are listed in dedicated tabs in the GHG inventory spreadsheet (Attachment 4). Other GHGs (e.g., fluorocarbons) were excluded from the inventory given the extremely small quantities associated with airport operations. Mass emissions (i.e., metric tons of emissions) of each GHG were calculated as well as CO2e emissions.

The airport GHG emissions inventory was prepared in accordance with the methodologies and approaches described in the Airports Council International (ACI) Airport Carbon and Emission Reporting Tool (ACERT)[20], the Airport Cooperative Research Program's (ACRP) Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories[21] and the GHG Protocol[22].

KEY ASSUMPTIONS AND CLARIFICATIONS

Below is a list of the key assumptions and clarifications for each source included in the inventory:

- The GHG inventory boundary included all passenger and cargo terminals, airfield and the other buildings within the airport boundaries such as the MKE Business Park.
- There are 20 diesel emergency generators located throughout the airport. The generators are tested regularly and are used for backup power during power outages; however, no diesel usage data was available for any of the emergency generators for 2014 or 2015. Given no emergency situation occurred requiring the use of emergency generators, the fuel consumption only included the periodic testing of the generators and was estimated based on nominal values for average consumption and hours of operation. In general, use of generators is not expected to contribute substantial emissions to the GHG inventory.
- Emissions from airport vehicles and GSE were calculated based on diesel, gasoline and CNG fuel usage records.
- Emissions from stationary sources in the terminal facilities and other buildings include natural gas consumption for boilers and were calculated based on information from the Milwaukee County utility billing management system.
- GHG emissions from refrigerants were calculated based on information collected on the use of refrigerants by the maintenance department in charge of the HVAC systems.
- CNG vehicles provide a way to reduce GHG emissions compared to traditional diesel or gasoline alternatives. MKE added some CNG vehicles to its fleet starting in 2003. Given the selected baseline year is 2014, unfortunately there is no way to quantify the benefit in terms of direct emission reductions on the overall MKE GHG inventory.
- In 2011 MKE completed an air emission reduction project, which was funded under the Voluntary Airport Low Emission Program (VALE). This kind of project increases the airport's electricity consumption contributing to higher Scope 2 GHG emissions, but at the same time it reduces Scope 3 GHG emissions coming from diesel generators used to provide energy to the aircrafts and improves air quality. Overall the environmental balance can be considered positive. The project is described in more detail in the Air Quality section of this report. Similarly to the CNG vehicles, given the project was implemented prior to the selected baseline year (2014), the benefits in terms of GHG emissions reduction has not been quantified within this analysis.
- In the case of MKE, the Scope 2 inventory component was calculated with a "location based" approach using the emission factor associated with the power generation in southeast Wisconsin. Specifically the emissions from purchased facility power were calculated using MKE electricity usage and electricity emission factors for the RFC West regional grid it falls under in the model from EPA's Emissions & Generation Resource Integrated Database (e-GRID) 10th edition (eGRID2012 released in 2014)[23]. In the future, if MKE participates in reporting frameworks such as the Airport Carbon Accreditation program, Scope 2

20 Airports Council International, Airport Carbon and Emissions Reporting Tool (ACERT). Retrieved from http://www.aci.aero/About-ACI/Priorities/Environment/ACERT

21 Airport Cooperative Research Program, ACRP Report 11, Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories, (2009 Transportation Research Board). Retrieved from http://onlinepubs.trb.org/onlinepubs/acrp/acrp_rpt_011.pdf

22 The Greenhouse Gas Protocol. Retrieved from http://www.ghgprotocol.org/standards/corporate-standard

23 https://www.epa.gov/energy/emissions-generation-resource-integrated-database-egrid

TABLE 13
GHG INVENTORY RESULTS

SUMMARY DATA	2014		2015		2014-2015% CHANGE
	m tons CO2e	% distribution	m tons CO2e	% distribution	
Scope 1 Emissions	7,110	20.6%	6,696	19.7%	-5.8%
Scope 2 Emissions	27,464	79.4%	27,225	80.3%	-0.9%
Total Emissions	**34,574**	**100%**	**33,921**	**100%**	**-1.9%**
Number of passengers	**6,554,152**		**6,549,353**		**-0.1%**
GHG Intensity Mtons CO2e/1000 *passengers	**5.28**		**5.18**		**-1.8%**

emissions will need to be calculated also through a "market based" approach by using emission factors provided by the utility serving MKE for the generation plants that provide electricity to the airport[24].

- GHGs may also be emitted through the use of certain chemicals during the de-icing process. The ACERT tool includes a GHG emission factor for the use of glycol in de-icing. Glycol is used at the airport for aircraft de-icing; however this is only by the commercial airline carriers and the associated GHG emissions do not fall under Scope 1 or 2 GHG emissions inventory calculations. The airport operations under MKE's control do not use glycol in de-icing applications; therefore, GHG emissions from de-icing operations were not included in the MKE emissions inventory.

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RESULTS

GHG emissions generated by MKE operations in 2014 and 2015 are shown in Table 13.

Results show that overall absolute GHG emissions were reduced in 2015 (compared to 2014) by roughly 2% with Scope 1 emissions showing a more substantial reduction (5.8%) over Scope 2 (0.9%).

Further analysis of GHG emissions by source (Table 14) provides some additional observations about MKE's carbon footprint:

- Electricity accounts for close to 80% of overall GHG emissions and showed a slight decrease from 2014 to 2015 (-0.9%).

TABLE 14

GHG INVENTORY RESULTS - BREAKDOWN BY SOURCE

BREAKDOWN BY SOURCE	2014		2015		2014-2015% CHANGE
	m tons CO2e	% distribution	m tons CO2e	% distribution	
Electricity	27,464	79.4%	27,225	80.3%	-0.9%
Natural Gas (Boilers)	5,384	15.6%	4,931	14.5%	-8.4
Vehicle Diesel	835	2.4%	804	2.4%	-3.7%
Vehicle CNG	421	1.2%	452	1.3%	7.5%
Vehicle Gasoline	370	1.1%	409	1.2%	10.5%
Diesel (Emergency Generators)	89	0.3%	89	0.3%	0.0%
Refrigerants (HVAC Systems)	12	0.0%	12	0.0%	0.0%
Total Emissions	**34,574**	**100.0%**	**33,921**	**100.0%**	**-1.9%**

TABLE 15

GHG INVENTORY RESULTS - BREAKDOWN BY MAIN GROUP

BREAKDOWN BY MAIN GROUPS	2014		2015		2014-2015% CHANGE
	m tons CO2e	% distribution	m tons CO2e	% distribution	
Energy	32,937	95.3%	32,245	95.1%	-2.1%
Transportation	1,626	4.7%	1,665	4.9%	2.4%
Other	12	0.0%	12	0.0%	0%
Total Emissions	**34,574**	**100.0%**	**33,921**	**100.0%**	**-1.9%**

- Natural gas contributes roughly 15% to the GHG inventory and showed a decrease from 2014 to 2015 (-8.4%).
- Vehicle fuels account for roughly 5% of total GHG emissions. Comparing 2015 data with 2014, it is possible to observe how CNG (+7.5%) and gasoline (+10.5%) related emissions increased while those from diesel vehicles decreased (-3.7%).

Breaking down emissions in the main groups by function as shown in Table 15 (Energy, Transportation, Other sources including refrigerants) reveals how energy is the largest component of MKE's carbon footprint. Roughly 95% of the airport's GHG emissions are caused by energy use including electricity, natural gas and diesel for emergency generators.

Transportation related emissions (i.e., those from fossil fuels like diesel, gasoline and CNG used in fleet vehicles) account for the majority of the remaining GHG emissions (roughly 5%) while refrigerants, which are grouped under the "Other" category, account for a minimal contribution (0.1%). This GHG distribution is not too dissimilar from other airports. It is worth noting that, based on the significant contribution of GHGs, the 2.1% reduction in energy related GHG emission translated into a 1.9% reduction in MKE's overall carbon footprint from 2014 to 2015. The 2.4% increase in transportation-related GHG emissions is less significant because of the limited weight these emissions have compared to energy.

The "Other" category, which includes refrigerants, did not show any change in results from 2014 to 2015. Refrigerants are considered a relevant GHG source for the airport but only partial data on quantity and type of refrigerants was available. Therefore, GHG emissions associated with refrigerants should be considered a rough estimate. As these emissions contribute very little to MKE's GHG inventory (normal airport operations do not require large use of refrigerants) the value that was used should not skew the overall GHG inventory results.

AIR QUALITY

Under the Clean Air Act (CAA), the U.S. EPA sets National Ambient Air Quality Standards for pollutants. Data from Wisconsin's monitoring network is validated and reported to the EPA to demonstrate how well air pollution controls and programs are working to improve air quality and meet the federal standards. In addition, using continuous monitoring data, the DNR quickly informs the public when air pollution reaches unhealthy levels.

There is a statewide network of 31 ozone monitoring sites and 20 fine particle (PM2.5) monitoring sites to measure ambient air quality in Wisconsin. Milwaukee County, and consequently the airport, is included in both those lists so the values are continuously recorded and monitored.

In addition, the DNR monitoring network measures sulfur dioxide, nitrogen oxide and carbon monoxide. The DNR monitoring network is operated under a federally approved network plan, submitted and reviewed annually to ensure appropriate monitoring in all locations required by federal regulations.

Ground-level ozone is formed by the chemical interaction between oxides of nitrogen (NOx) and volatile organic compounds (VOCs) in the presence of sunlight. These pollutants are typically referred to as ozone precursors. PM2.5 can form directly or indirectly when gases emitted from power plants, industries, and mobile sources react in the air. Sulfur dioxide is emitted by combustion of fossil fuels.

In the last decade, in many areas, including Milwaukee County, air quality trends have significantly improved. Currently MKE is not required to have any air quality related permits besides the one for the central plant, which burns natural gas. More details on pollutant limits, existing regulations and historical trends for air quality in Milwaukee County can be found in the DNR website[25] and in particular in the annual air quality trend report released in December each year[26].

The airport is committed to reducing air emissions generated from its operations. Energy efficiency measures and the partial conversion of the MKE fleet to CNG all contributed to the improvement of local air quality. In 2011, through Milwaukee County, MKE completed an air emission reduction project financed under the Voluntary Airport Low Emission Program (VALE)[27]. The project consisted of the installation of electric pre-conditioned air (PCA) units used to supply heated and cooled air to aircrafts parked at passenger boarding bridges. When used simultaneously with a 400-hertz (Hz) or a 28 Volt ground power connection, these systems allow airlines to forego use of aircraft auxiliary power units (APUs) and/or portable diesel-powered PCA units ("heating/cooling equipment"). This provides a reduction in fuel consumption (gas or diesel) and associated emissions. The VALE project included nine (9) gates in Concourse E

25 http://dnr.wi.gov/topic/airquality/

26 WDNR, "Wisconsin Air Quality Trends – December 2016" retrieved at http://dnr.wi.gov/files/PDF/pubs/am/AM550.pdf

27 https://www.faa.gov/airports/environmental/vale/

TABLE 16
SUMMARY OF DISPOSAL RECYCLING SERVICES AND PROVIDERS

DISPOSAL / RECYCLING SERVICE	MANAGING ORGANIZATIONS	SERVICE PROVIDER (COMPANY NAME)
Antifreeze	Fleet Maintenance	County Fleet
Battery Recycling	Airfield Maintenance Procurement/Warehouse	Call2Recycle
Cardboard Recycling	HMSHost MKE	Waste Management
Coffee Grounds Composting	HMSHost	Give away to customers for composting
Commingled Recyclables (aluminum cans, glass bottles, plastic bottles, metal cans) Recycling	MKE	Advanced Disposal System
Construction & Demolition Waste	MKE	Contractor, WasteCAP (tracking tool)
Cooking Oil Recycling	HMSHost	Sani-Max
Electronic / Computer Recycling	Procurement / Warehouse	DP Electronic Recycling
Fluorescent Bulb Recycling	Procurement / Warehouse	LampRecyclers
Food Donation	HMSHost	Milwaukee Hunger Task Force
International Flight Waste Mulching	MKE	Stericycle
Landscaping Waste Mulching	Landscaping	Onsite at Oak Street Storage Area
Oils / Oil Filters / Lubricants	Fleet Maintenance	County Fleet
Pallet Reuse	Air Cargo HMSHost	Correa Pallets
Refrigerant Recycling	HVAC	Veolia
Scrap Metal Recycling	Airfield Maintenance	Midwest Forman Recycling
Solid Waste Disposal	Airport-wide	Waste Management
Tire Recycling	Fleet Maintenance	County Fleet
Toner Cartridge Recycling	MKE Offices Procurement/ Warehouse	Donate to school program
White Paper Recycling	MKE Offices HMSHost	Waste Management

and it aimed at reducing emissions of ozone precursors, particulate matter, and sulfur dioxide. More details regarding the technical specification of the project and the estimated emissions reductions can be found in the application for the grant submitted by MKE in August 2011[28]. Additional initiatives similar to the ones described are under consideration and may be implemented in the following years.

WASTE MANAGEMENT

Airport operations cause the production of significant amounts of waste of all sorts ranging from typical solid waste to hazardous waste and other substances that require special treatment for disposal. To address this Focus Area and analyze the current status of waste management practices at MKE several activities were conducted, including an on-site facility waste assessment.

The result of this waste assessment was the development of a waste stream inventory, estimation of the airport's waste diversion rate, collection of current waste management practices and identification of possible areas of improvement. The full Waste/Recycling Opportunities Assessment report can be found in Attachment 3. This section of the baseline report will primarily focus on data and information necessary to establish a baseline for MKE's waste management practices and performance.

METHODOLOGY

A solid waste and recycling site visit was conducted in September 2016. The site visit included the following activities:

- A waste assessment task kickoff meeting
- A tour of the facilities to observe waste and recycling accumulation points
- Collecting information to prepare a waste stream inventory
- Conducting interviews with personnel with waste/ recycling responsibilities.

Following the site visit, over 30 documents were reviewed[29]. Information collected during the site visit and document reviews were used to estimate quantities of solid waste generated and materials diverted for

28 VALE Application for Emission Reduction Project, Concourse E – Preconditioned Air/ Ground Power (2011)

29 For a complete list, see Attachments

FIGURE 7
SOLID WASTE COMPACTORS AT MKE LANDSIDE TERMINAL (TOP) AND AIRSIDE (BOTTOM)

FIGURE 8
TYPICAL RECYCLING COLLECTION POINT AT THE MKE TERMINAL

recycling and to prepare a Waste Stream Inventory. Using information included in the Waste Stream Inventory, waste streams were prioritized (i.e., high, intermediate, or low) to identify where recycling efforts should be improved based on a set of criteria. Findings and recommendations were developed based on the collected information, the recycling/solid waste calculations, and the inventory.

KEY ASSUMPTIONS AND CLARIFICATIONS

Below is a list of the key assumptions and clarifications:

- Estimates and inventory included all passenger and cargo terminals, the airfield and other buildings within the airport boundaries to the extent the information was available.
- When weight data was not available from invoices, weights were estimated using the number of containers, container size, content, pickup frequency, pickups per year, estimated percent full at pickup, and a weight conversion factor obtained from the U.S. Environmental Protection Agency Volume-to-Weight Conversion Factors and other sources[30].
- Waste streams on the inventory were prioritized (i.e., high, intermediate, or low) based on the following criteria: Not Currently Recycled, Marketable Quantity, Marketable Condition, Market Exists, and Market Location to the extent that information was available.

KEY ASSUMPTIONS AND CLARIFICATIONS
Solid Waste Management and Recycling Programs

A wide variety of activities that generate waste take place on airport property, including the terminal and airside operations, and numerous tenant operations. In addition, a future construction project is planned for a new international terminal.

MKE provides for its tenants and the general public dedicated trash and recycling receptacles strategically placed throughout the airport terminal to encourage the separation of recyclable materials that have market value. For airline tenants, MKE provides a dedicated recycling building containing receptacles for the accumulation of the following recyclable materials:

- Cardboard
- Mixed Paper
- Commingled glass bottles, aluminum cans, plastic bottles, and metal cans.

MKE's Maintenance Department collects and recycles all scrap metals used throughout the airport facility. Revenue generated from the recycling effort is placed into MKE's Operating Budget. The Maintenance Department also collects and recycles rechargeable batteries at no cost.

The Airport Fleet Maintenance Department recycles waste oil generated throughout the facility along with items such as automotive batteries. Items such as vehicle tires are properly disposed of through the City of Milwaukee waste collection sites.

Table 16 lists type of disposal/recycling service, managing organization, and service provider as of September 2016.

SOLID WASTE AND RECYCLING INFRASTRUCTURE

The Main Terminal loading dock is a central collection point for both solid waste (see compactor, Figure 7) and recycling (including baled cardboard, wood and plastic pallets, paper, glass, aluminum, plastic, and metal containers, and universal waste lamps). On MKE airside, there is a solid waste compactor (see Figure 7) and a Recycling Area that has a cardboard baler, two 2-cubic yard containers for glass, aluminum, and plastic bottles and storage space for baled cardboard and wood pallets. An open top roll-off container is located at the South Shops area for scrap metal.

Current public recycling containers are attractive and although they are the same color (silver) as trash containers, do display some visual cues to indicate that they are recycling containers. For example, the containers are labeled on the side with the chasing arrows recycling symbol in black and either a slot top (for newspaper) or a round hole (for bottles and cans). In addition, the bottle/cans recycling container is taller than the trash or newspaper containers. A typical MKE public recycling collection point container is shown in Figure 8.

Solid Waste Disposal Facility

Solid waste picked up from MKE is transported by Waste Management to the Metro RDF Management Facility located at 10712 South 124th Street, Franklin, Wisconsin (EPA ID# WID098547854, Solid Waste Landfill License #1099).

30 Sources include: Volume-to-Weight Conversion Factors, U.S. EPA, http://www.nmenv.state.nm.us/swb/doc/Conversiontable.doc, https://medasend.com/shop/?page_id=81, and https://www.reference.com/science/much-55-gallons-weigh-a2ef4c1473c9feef.

FINDINGS

The following findings are based on information obtained from interviews and observations made during the site visit, as well as documents provided by Milwaukee County and Internet research:

- A recycling program is in place and many wastes are being recycled; however, there is no written waste diversion policy or procedures.
- Data on quantity of waste disposed and recycled is maintained by many parties and is challenging to obtain. There is no centralized tracking system to use in monitoring quantities and progress.
- Waste Management does not provide data on quantities of waste picked up for disposal (although weights are typically available for compacted waste). This data is important for calculating and tracking percent diversion rate.
- Weights are not tracked for several recycled wastes (e.g., batteries recycled through the Call2Recycle Program; however, MKE could weigh the boxes before shipping and maintain/track the data). This data is also important for calculating and tracking percent diversion rate.
- Other than recycling container labeling, there is no promotion/training program in place to educate and encourage staff and passengers to recycle.

WASTE GENERATION

A spreadsheet was developed to estimate quantities of solid waste generated and materials diverted for recycling (see Attachment 3). The spreadsheet incorporates MKE data as well as conversion weights obtained from U.S. Environmental Protection Agency references. Table 17 presents the estimated annual quantities of recyclable materials and solid waste generated.

WASTE STREAM INVENTORY

During the site visit, AECOM collected information through interviews with Milwaukee County, MKE, and HMSHost staff, the primary concessions provider at MKE, on the types and management of waste streams generated at MKE. This information was compiled into a Waste Stream Inventory (see Attachment 3). The Inventory includes the following information:

- Waste stream name
- Locations that typically generate the waste
- Waste stream type (i.e., non-hazardous solid waste, universal waste, medical waste, or hazardous waste)
- Brief statement describing how the waste is generated
- Collection and storage methods
- Disposition (e.g., reused, recycled, or disposed; onsite or offsite).

Using information presented in the Waste Stream Inventory, waste streams were prioritized (i.e., high, intermediate, or low) based on the following criteria and a numerical rating from 0 (low) to 5 (high) was assigned to each criterion for each waste stream:

- Not Currently Recycled – waste streams that are not currently being recycled, but where a market exists, received a score of 5; waste streams that are currently being efficiently diverted from disposal via recycling or other means received a score of 0; and waste streams that are partially diverted or that currently have weak/nonexistent markets received scores between 1 and 4.
- Marketable Quantity – waste streams received scores based on their known or perceived quantity, a large quantity scored a 5 and a low quantity scored a 0; and waste streams with quantities in between received scores between 1 and 4.
- Marketable Condition – waste streams received scores based on the complexity of collecting/preparing the waste for vendor pickup, waste streams that are easy to collect/prepare received a score of 5, waste streams with complicated/labor intensive requirements scored a 0; and waste streams with condition needs in between received scores between 1 and 4.
- Market Exists – waste streams with a well-established market received a score of 5; waste streams with no currently known market scored a 0; and waste streams with markets in between received scores between 1 and 4.
- Market Location – waste streams with markets/vendors located near Milwaukee received a score of 5; waste streams with markets at a distance over 150 miles scored a 0; and waste streams with market locations in between received scores between 1 and 4.

The ratings for each waste stream were summed to calculate a total score. Waste streams with a total score less than 15 were designated as low priority candidates for recycling; waste streams with scores of 16-19 were designated as intermediate priority, and waste streams that scored >20 were identified as high priority target materials. Note that in the above assessment, "a large

quantity" is a qualitative not quantitative term and that the scores are based on professional judgment since each waste stream is different and typically does not have an actual (i.e., scale) associated weight. The Recycling Opportunity Assessment Prioritization, including ratings and total scores for each waste stream are shown in Attachment 3. The following waste streams received scores that qualified them as high priority target materials for recycling:

- Food Waste
- Solid Waste (recyclables not removed).

Food waste is being donated by HMSHost, but food waste that is not donated is currently not being recycled / composted. Therefore, source separation of recyclable items from the solid waste stream could be improved.

Although recycling opportunities for waste streams with low and intermediate scores were not evaluated under this project, these waste streams can be reconsidered in the future as changes in recycling markets, infrastructure, and technology occur that may affect waste stream prioritization scores and as MKE works towards establishing and then achieving its waste diversion goals.

WASTE DIVERSION RATE

The diversion rate equals the rate at which non-hazardous solid waste is diverted from disposal. The diversion rate is calculated using the following Equation 1:

EQUATION 1 - WASTE DIVERSION RATE

(R/(R+L))*100= PERCENT DIVERSION RATE

Where:

R equals the amount in tons of non-hazardous solid waste (and can include construction and demolition debris waste or a separate diversion rate can be used for this waste stream) that is diverted from disposal.

L equals the amount in tons of solid waste disposed.

Using data in the Solid Waste Estimated Annual Generation Rate spreadsheet (see Attachment 3); the MKE waste diversion rate was calculated to be 10.2 percent. This value is also captured in Table 17, under Recycled, Percent by Total Weight. The 10.2% diversion rate is low and does not accurately capture MKE's actual diversion rate as weight tracking data was not available for several recyclable commodities (e.g., batteries, oil, tires). Compared to other airports and industry clients the AECOM team has worked with, a 10% diversion rate is appropriate for facilities that may have a more basic recycling program or do not benefit from a robust local market or infrastructure for recyclables. As a facility finds ways to obtain actual/scale weights and track weight data and as local infrastructure improves and as vendor increase/improve service then the percent diverted can increase to 30% or more but may level out until other initiatives are implemented. Many airports also include construction and demolition debris (C&D) waste in diversion numbers, which typically has a positive impact as C&D is often easier to divert or recycle and may be more actively tracked if the project is a LEED, Envision or other sustainability project.

TABLE 17
ESTIMATED RECYCLED AND DISPOSED WASTE

	ESTIMATED TOTAL WEIGHT	PERCENT BY TOTAL WEIGHT (%)
Recycled	90.7	10.2%
Disposed	801.3	89.8%
TOTAL	892.1	100%

WATER MANAGEMENT

Water is a key resource and defining characteristic for the Southeast Wisconsin region. Milwaukee's proximity to Lake Michigan and the region's reliance on fresh water for tourism, industry, and identity elevates the importance of water to the community as well as the airport – as a gateway to the region.

Water was considered one of the priorities during the focus area identification process and is included in the baseline to address both water use and consumption and other aspects of water including storm water management. Like energy, the airport also has a water footprint that can be managed and evaluated for water reduction opportunities. Unlike energy, however, the data that would make up the footprint is incomplete. The following topics are discussed in this section:

- Water Consumption
- Water Efficiency
- Stormwater Management

WATER CONSUMPTION

Water consumption at the airport includes activities ranging from passenger use, terminal activity and

TABLE 18

WATER CONSUMPTION HISTORICAL TREND

MKE HISTORICAL WATER CONSUMPTION*			
YEAR	**HUNDRED CUBIC FEET CCF***	**GALLONS**	**Δ%**
2013	245,140	185,828,723	-
2014	267,437	202,730,810	9.1%
2015	314,872	238,689,420	17.7%
2016	317,058	240,346,289	0.7%

*Water consumption value is considered the same for potable use and sewer treatment volume

**Water consumption estimated by using water from expenditures (per County Financial Intranet) and the average annual rates ($/CCF, derived from MKE's MWW bills)

TABLE 19

WATER INTENSITY HISTORICAL TREND

MKE HISTORICAL WEATHER CONSUMPTION*				
YEAR	**# OF PASSENGERS**	**Δ%**	**INTENSITY GALLONS/ PASSENGER**	**Δ%**
2013	6,525,181	-	28.48	-
2014	6,554,152	0.4%	30.93	8.6%
2015	6,549,353	-0.1%	36.44	17.8%
2016	6,757,357	3.2%	35.57	-2.4%

TABLE 20

MKE WATER AND SEWER SPENDING HISTORICAL TREND

MKE HISTORICAL TREND FOR POTABLE WATER AND SEWER SPENDING						
YEAR	POTABLE WATER	Δ%	SEWER	Δ%	TOTAL	Δ%
2013	151,668	-	774,636		926,304	-
2014	158,055	+4.2%	844,424	+9.0%	1,002,479	+8.2%
2015	162,474	+2.8%	899,283	+6.5%	1,061,757	+5.9%
2016	161,858	-0.4%	942,831	+4.8%	1,104,689	+4.0%

TABLE 21

HISTORICAL TREND IN CHANGES TO SEWER TREATMENT RATES

WATER USAGE AND SEWER TREATMENT RATES*				
YEAR	POTABLE WATER RATE ($/CcF)	Δ%	SEWER TREATMENT RATE ($/CcF)	Δ%
2013	0.62	-	3.16	-
2014	0.59	-4.5%	3.16	-0.1%
2015	0.52	-12.7%	2.86	-9.5%
2016	0.51	-1.1%	2.97	+4.1%
*Sewer treatment rates estimated from potable water use and expenditures				

operations to airfield operations and maintenance to special uses like construction projects. Water is purchased through Milwaukee Water Works.

Water consumption data gathered through Milwaukee Water Works included usage and related cost for potable water and sewage for four full years (2013 through 2016). This data was further analyzed to develop historical trends for consumption and spending for both sewer and potable water.

Table 18 shows that a consistent year over year increase in water usage occurred in 2014 (+9.1%) and even more in 2015 (+17.7%) while in 2016 consumption remained relatively constant compared to the previous year (+0.7%). The significant increase in 2014 and 2015 is likely due to other uses besides routine operations and passenger activities, considering the number of passengers (Table 19) remained fairly steady over the four year period. Of particular note, during this time period there was construction activity, including the Baggage Claim Renovation project.

Table 19 shows how water use intensity, measured on a per passenger basis, follows a similar trend. This is not surprising given the limited changes in numbers of passengers that traveled through MKE. It is worth noting how the combination of an increase in total passengers and relatively steady water consumption in 2016 led to an improvement of 2.4% in water use intensity compared to 2015.

Analyzing the historical trend for MKE's spending for potable water and sewer (Table 20), provides some additional observations:

- Increase in overall spending in 2014 and 2015 was driven mostly by higher volume of potable water used and treated and not by the water and sewer rates that both decreased (Table 21).
- 2016 showed spending values aligned with changes in rates and consumption.

In general overall spending for water usage and sewer treatment is showing a positive trend with lower year over year increases. Any reduction in spending in future years will be influenced by potential water efficiency measures, changes in rates, number of passengers going through the airport, and any other construction activities using water connected to the MKE Milwaukee Water Works account. Finally, the above consumption and spend values show some inconsistencies between changes in usage and spending patterns (i.e., there is not a clear correlation between water consumption and spend). Some of the data was estimated and in the future it should be more readily available to allow improving water management. Having a clear understanding of water consumption and spending patterns, including the fixed and variable fee components, will support MKE in developing goals and tracking progress against water consumption performance targets.

WATER EFFICIENCY

Even though there is inconsistent water consumption data, MKE staff actively manage and implement water efficiency at the airport. The Maintenance Department has a dedicated procedure to identify technical specifications and models for water efficient fixtures and other plumbing related material such as pipes, valves, etc. MKE staff also keep a comprehensive inventory of fixtures in place at the airport (e.g., faucets, toilets, urinals, showerheads) with the associated water efficiency value (i.e., gallons per minute, per flush, etc.), organized by location.

Based on available information, an evaluation of water fixture efficiency in the terminal passenger areas was completed by comparing fixture flow levels with the Uniform Plumbing Code (UPC, 2006 edition), which is the plumbing fixture and fitting efficiency guidance used in the LEED green building rating system. Each type of fixture was categorized as "inefficient", "baseline level" or "efficient" based on whether the fixture flow value is below, equal to, or above, the flow value provided by the UPC guidance.

The following areas were included in the assessment:

- Main Concourse
- Concourses C, D, and E
- International Arrivals Terminal
- Ticketing
- Baggage claim
- Car rental area

The results indicate the airport passenger areas overall have water efficient fixtures, with 94% of fixtures either equal to or above the baseline water efficiency level provided in the UPC guidance. The International Arrivals Terminal, which only accounts for 6% of the fixtures in the airport, is the only passenger terminal area that still has inefficient fixtures. This result was expected since the International Arrivals Terminal is older than the other airport passenger areas. A new international terminal is planned for the airport and will be located in place of the current Concourse E. The new baggage claim area, which achieved LEED certification in 2016, included all high efficiency fixtures.

The following Table 22 summarizes the distribution of water fixtures in the passenger areas according to the fixture efficiency.

Note that restaurants, one of the larger users of water at the airport, and other retail spaces were not included in the assessment since information was not available for water fixtures in these spaces. Administrative buildings, service areas and other locations not open to the public (i.e., break rooms, maintenance shops, sheriff's office, TSA, etc.) were evaluated in a similar fashion to the passenger areas. The results indicate these areas overall have less water efficient fixtures, with only 53% of fixtures either equal to or above the baseline water level provided in the UPC guidance. However, these areas account for a much smaller number of fixtures (roughly 25% of the total) and consequently have a lower impact on the overall water usage efficiency of the airport. Table 23 summarizes the distribution of water fixtures in these areas.

Attachment 5 provides a more detailed breakdown of fixture efficiency and how the fixtures are distributed in the airport.

The fixture water efficiency assessment did not include the MKE Business Park as this information is currently unavailable. It is possible that, because of the age of these buildings, the majority of fixtures will be low efficiency, although certain areas may have been upgraded by tenants.

STORM WATER MANAGEMENT

MKE is located in the City of Milwaukee and is held to, and complies with, the City of Milwaukee Chapter 120 storm water requirements. Additionally, the airport is located in the Milwaukee Metropolitan Sewerage District (MMSD), specifically the Kinnickinnic (KK) River watershed and Oak Creek watershed[31]. MMSD is a regional government agency that provides flood management and water reclamation for 28 communities located in Southeast Wisconsin.

Storm water management at MKE is guided by the Comprehensive Storm Water Management Plan (SWMP). The plan discusses the storm water discharge network at the airport and includes information on potential pollutant sources, inspection areas, and best management practices. The MKE storm water management plan uses the MMSD's Volumetric Method for tracking storm water performance for the property. The SWMP was last updated in 2011[32].

MKE is divided into the KK River Watershed and the Oak Creek Watershed. Approximately 1,137 acres of the airport are tributary to the KK River Watershed and approximately 660 acres of the airport are tributary to the Oak Creek Watershed. There are a total of three discharge locations from airport property, including:

- 1,097 acres of the property discharge to the Wilson Park Creek (KK River Watershed)
- 40 acres of the property discharge to the City of Milwaukee Storm Sewer (KK River Watershed)
- 660 acres of the property discharge to the Mitchell Field drainage ditch (Oak Creek Watershed)

The current stormwater management plan is based on 2010 conditions modeled at the airport. Future projects at MKE will evaluate on a per job basis whether or not the project results in an increase or decrease in stormwater discharge compared to the 2010 baseline conditions. Future projects that increase stormwater discharge will be required to either remove impervious surface elsewhere within the drainage area or provide detention. Detention areas are usually dry ponds or underground storage and cannot be designed to attract water fowl, which is a safety concern for aircraft.

As MKE is located in the MMSD service area and nearby to Lake Michigan, stormwater management is an important issue and the airport is committed to reduce the amount, and improve the quality, of storm water. The airport is built on a swamp and/or fill with areas that fall within the 100-year FEMA flood plain. The KK River can back up at the airport during 100-year rain events. Storm sewer manholes are inspected annually. Video inspections of the storm sewer pipes are also conducted and repairs completed as needed.

MKE staff maintain a Wisconsin Pollutant Discharge Elimination System (WPDES) permit[33]. Each year MKE staff provide an annual report and presentation to the DNR about activities at the airport. MKE records and measures all snow practices, especially de-icing (i.e., glycol) practices. MKE continues to explore better efficiency and the latest best management practices with regards to

31 WDNR Watershed Boundary GIS map.

32 GRAEF USA, General Mitchell International Airport Comprehensive Storm Water Management Plan (2011, November)

33 WDNR – WPDES permit no. WI-0046477-05-0 (General Mitchell Airport)

TABLE 22

WATER FIXTURES EFFICIENCY DISTRIBUTION IN PASSENGER AREAS

FIXTURE	FLOW LEVEL	#	%
Inefficient Urinals	> 1 gpf	5	7%
Baseline level Urinals	1 gpf	63	88%
Efficient Urinals	< 1 gpf	4	6%
TOTAL		**72**	**100%**
Inefficient Toilets	> 1.6 gpf	11	6%
Baseline level Toilets	1.6 gpf	170	88%
Efficient Toilets	< 1.6 gpf	12	6%
TOTAL		**193**	**100%**
Inefficient Lavatory Sinks	> 0.5 gpm	10	6%
Baseline level Lavatory Sinks	0.5 gpm	0	0%
Efficient Lavatory Sinks	< 0.5 gpm	160	100%
TOTAL		**170**	**100%**
Total Inefficient Fixtures		26	6%
Total Baseline Level Fixtures		233	54%
Total Efficient Fixtures		176	40%
TOTAL		**435**	**100%**

TABLE 23

WATER FIXTURES EFFICIENCY DISTRIBUTION IN AREAS NOT OPEN TO PUBLIC

FIXTURE DESCRIPTION - AREAS NOT OPEN TO THE PUBLIC	FLOW LEVEL	#	%
Inefficient Urinals	> 1 gpf	8	47%
Baseline level Urinals	1 gpf	9	53%
Efficient Urinals	< 1 gpf	0	0%
TOTAL		**17**	**100%**
Inefficient Toilets	> 1.6 gpf	20	47%
Baseline level Toilets	1.6 gpf	23	53%
Efficient Toilets	< 1.6 gpf	0	0%
TOTAL		**43**	**100%**
Inefficient Lavatory Sinks	> 0.5 gpm	39	64%
Baseline level Lavatory Sinks	0.5 gpm	0	0%
Efficient Lavatory Sinks	< 0.5 gpm	22	36%
TOTAL		**61**	**100%**
Inefficient Showerheads	> 2.5 gpm	0	0%
Baseline level Showerheads	2.5 gpm	0	0%
Efficient Showerheads	< 2.5 gpm	20	100%
TOTAL		**20**	**100%**
Total Inefficient Fixtures		67	48%
Total Baseline Level Fixtures		32	23%
Total Efficient Fixtures		42	30%
TOTAL		**141**	**100%**

glycol use. MKE airport conducts significant stormwater monitoring, partnering with the Department of the Interior United States Geological Survey (USGS). MKE performs quarterly monitoring for glycol, total suspended solids (TSS), biological oxygen demand (BOD), and phosphorus.

GREEN INFRASTRUCTURE

In recent years, green infrastructure, an approach to water management that protects, restores, or mimics the natural water cycle, has been promoted and embraced as a viable solution to help manage stormwater. MMSD has an aggressive goal to create enough green infrastructure to capture up to 740 million gallons of water during each rain event, by the year 2035.

Recently, MKE has been incorporating green infrastructure into their planning and operations. The new baggage claim building has a green roof, which helps collect stormwater and reduce stormwater volumes during rainfall events. The airport has also been using xeriscaping to help reduce or eliminate the need for supplemental water from irrigation.

SOCIAL FOCUS AREAS BASELINE

The Social component of sustainability considers how the airport operates as a socially responsible business and considers stakeholders that are critical to airport activities, such as employees, passengers, and the local community. The Focus Areas discussed in this section include Employee Engagement, Health and Safety, Customer Experience and Community Engagement.

EMPLOYEE ENGAGEMENT

Airports are economic catalysts within a community -- not just in terms of enabling the movement of people and goods, but in generating direct (i.e., directly generated from airport/aviation activity) and indirect (i.e., indirectly generated from purchasing by businesses dependent upon airport/aviation activity) employment. MKE is a hub for employment in the region. From nearby hotels and restaurants to retail and freight handlers, thousands of jobs exist in proximity to the airport. This Focus Area examines the relationship of MKE and employees, in terms of the types of jobs available at the airport and their economic impact, type of people employed and the employee development programs in which they participate. As such, this Focus Area touches on both economic and social facets of sustainability.

EMPLOYMENT ECONOMIC IMPACT

Several thousand jobs are directly or indirectly related to the airport (Table 24). Despite an overall reduction in jobs from the late 2000s, MKE is an employment hub for the region and continues to show signs of growth. Passenger volumes have been slowly increasing over the last several years and there is increased airline activity, including new domestic and international flights.

The majority of the jobs directly related to airport activity are provided by airlines or the airport, followed, in order of number of jobs, by freight/cargo, ground transportation and construction/consulting. In terms of the type of activity generating the jobs, passenger related activities are the main source, followed by air cargo, military and finally construction and consulting. The following job statistics and related graphs (Figure 9 and Figure 10) are based on the 2010 economic study[34].

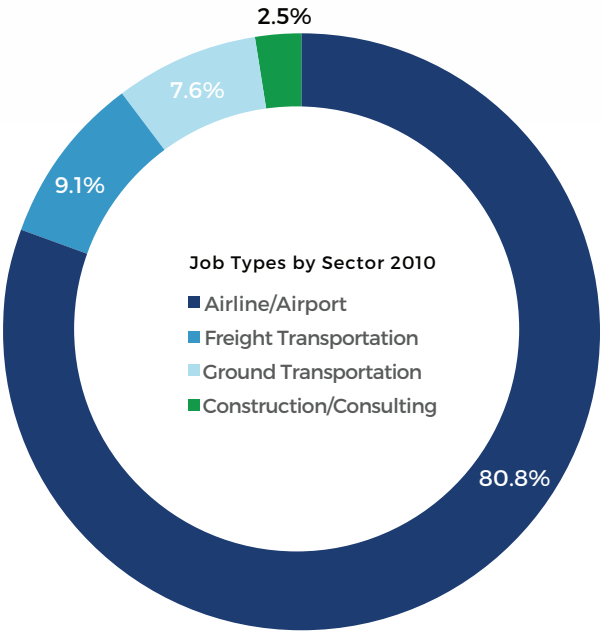
The distribution of the economic impact (revenue) generated by these jobs follows a similar pattern.

TABLE 24
MKE NUMBER OF DIRECT AND INDIRECT JOBS

MKE REGIONAL EMPLOYMENT IMPACT	YEAR
JOB TYPE	**2010**
MKE Airport Operations / Management	255
Other Direct Airport Employment (full and part time)	5387
Indirect/Induced Local Jobs	2887
Total Local Employment	**8529**

34 "The Local and Regional Economic Impacts of Milwaukee County's General Mitchell International Airport" prepared by Martin Associates and Weiss & Company Marketing Communications, LLC (2011)

FIGURE 9
JOBS DISTRIBUTION BY SECTOR AND ACTIVITY



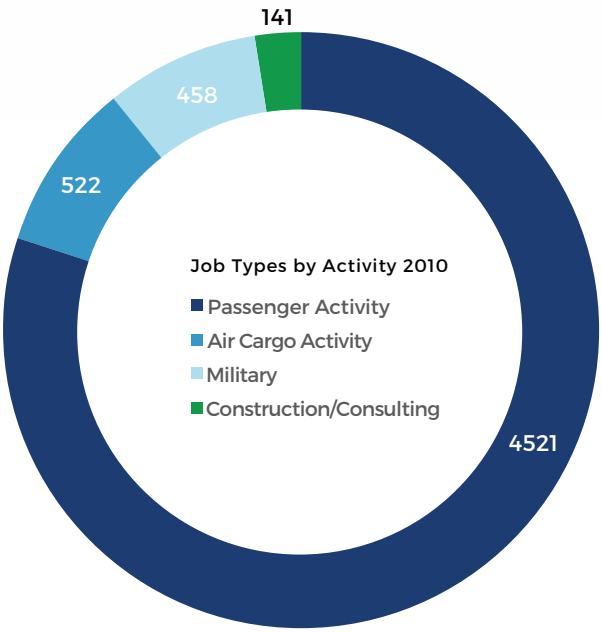
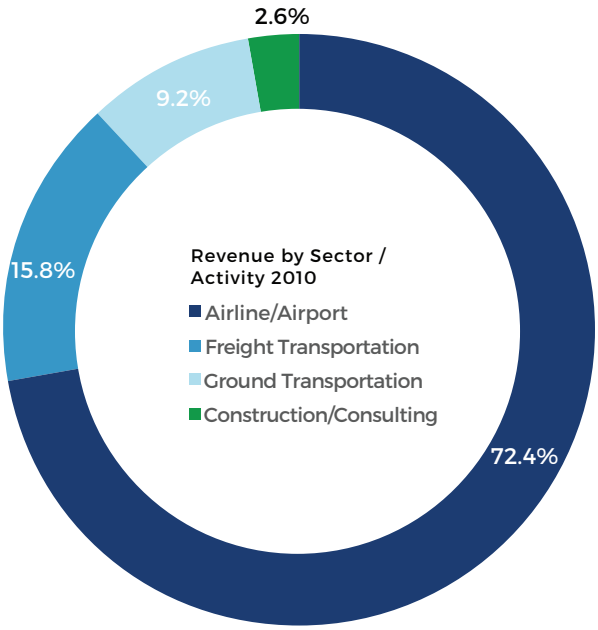


FIGURE 10
MKE REVENUE BY SECTOR



In 2010, passenger, air cargo and airport construction activity generated $1.3 billion of business revenue to firms providing services at the airport. As with the employment impact, the majority of revenue generated by airport activity is concentrated in the airline/airport service category, followed by 15.8 percent with the freight transportation sector and 9.2 percent with the ground transportation sector (Figure 10).

EMPLOYEE CHARACTERISTICS

Jobs within the boundary of MKE are generated by Milwaukee County employment, Federal agencies, airlines, tenants, and at the MKE Business Park. The following sections provide a summary of the employee baseline assessment, specific to employee characteristics from both direct and indirect airport employment.

DATA SOURCES AND REPORTING

Despite the large number of jobs, there is no readily available, comprehensive data source. For this section, a standardized source was located, and was supplemented with local knowledge gained through stakeholder engagement. In order to characterize the MKE workforce - who the workers are, how many there are, where they live and other characteristics – the AECOM Team turned to the one source of information that is readily available and can be reliably replicated in the future, the Longitudinal Employer Household Dynamics (LEHD) dataset compiled by the US Census. The LEHD data set allows the user to query for employment data within a specified boundary. The boundary can be hand-drawn by the user or an established boundary can be created, such as a zip code or municipal boundary. The AECOM Team chose to hand draw a boundary around the airport property which could easily be replicated in the future. Data extending back to 2010 is available on employee income, race, ethnicity, educational attainment, home zip code and job industry (NAICS code). The employment counts include both private and public employees. The LEHD data were verified and supplemented by estimates provided by members of the TAG.

DATA LIMITATIONS

The LEHD are imperfect in terms of their ability to create a comprehensive snapshot of employment characteristics, for several reasons:

- LEHD data omit Federal employees; an estimate of Federal employees was provided by the TAG.
- The data are aggregated to a limited number of categories, preventing detailed cross-referencing (e.g., full-time vs. part-time workers).
- At small geographies, such as the one analyzed for the airport, some data interpolation is required and some individual data points may be suppressed.
- Some workers may have their employment location assigned to locations other than the airport (e.g., company headquarters) and may not show up in the data.

However, keeping these limitations in mind, the LEHD data provide the best available source for characterizing current MKE employment and trends, and can be relied on to be available in the future for monitoring. Due to these limitations, counts reported should not be considered exact, but representative.

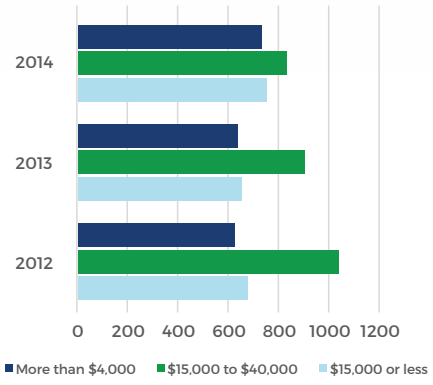
BASELINE FINDINGS

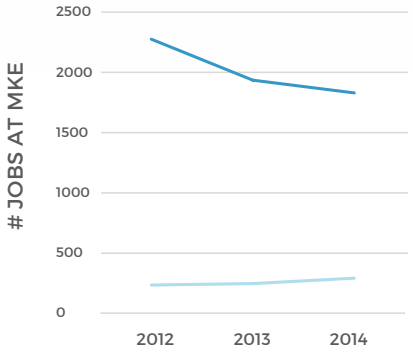
The following information summarizes the findings on employment characteristics, based on analysis of the LEHD data:

- *Overall employment at MKE*. The number of jobs has decreased by approximately 20% between 2012 and 2014, to about 1,800 direct airport employees. Over the same time period, employment at the MKE Business Park has increased to about 300. The airport employment numbers included private sector and public sector jobs. It did not include Federal employees, estimated at 350-375 (TSA has 275-300 employees and FAA has additional 80 employees). MKE has 350 allotted County positions, but not all are filled. Currently there are 250 MKE County employees at the airport, and employees peak at about 290 in the winter. The airport has issued approximately 4,000 badges, which includes contractors not in the LEHD data (see Figure 11 below).
- *Employment sectors*. Transportation & Warehousing and Food Service & Accommodations are the largest industry sectors represented at the airport. The proportion of people involved in Administration has shrunk by 50% since 2012, perhaps reflecting consolidation in the airline industry (see Figure 11).
- *Earnings*. Mid-range earnings (i.e., earning between $15,000 and $40,000 annually) account for the greatest number of jobs at MKE. However, about half of the 400 jobs lost since 2012 are from this segment of earners (See Figure 11).
- *Employee education*. Nearly 60% of MKE workers do not have a college degree (and 9% do not have a High School diploma), indicating that a range of opportunities exist for people with moderate educational attainment. This includes private sector employees.

FIGURE 11
MKE EMPLOYEE STATS

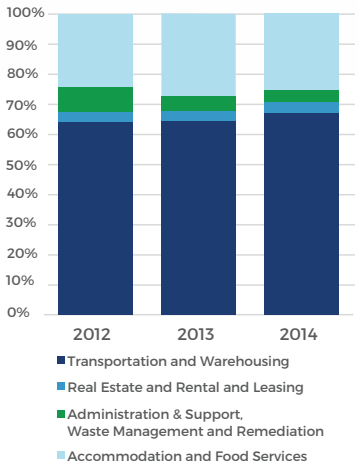
JOBS BY ANNUAL EARNINGS





	2012	2013	2014
Airport	2279	1938	1832
Business Park	234	246	291

KEY EMPLOYMENT SECTORS AT MKE



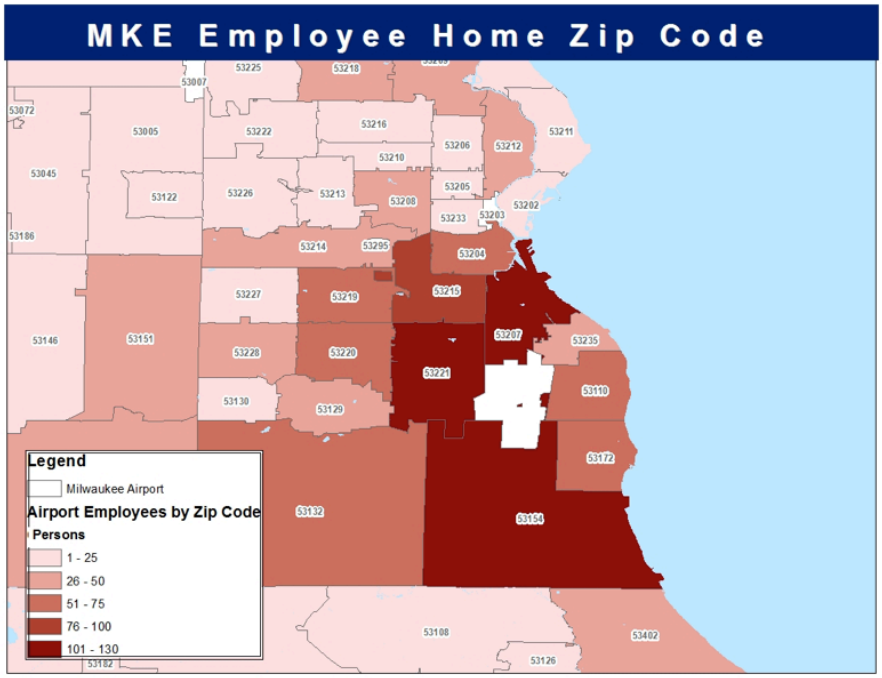


FIGURE 12
MKE EMPLOYEE ZIP CODE DISTRIBUTION

The Social Focus Areas consider how the airport operates as a socially responsible business and considers the needs and priorities of stakeholders that are critical to airport activities, such as employees, passengers, and the local community.

- *Employee home locations*. Most employees live in the zip codes immediately surrounding the airport. This includes private sector employees (see Figure 12).
- *Typical employee*. Demographics include White (83%), non-Hispanic (90%), male (63%), HS education or less (58%), age 30-54 (53%).

The following charts (Figure 11) and map (Figure 12) provide a better understanding of the existing employees at MKE.

EMPLOYEE DEVELOPMENT

As discussed above, Milwaukee County employees at the airport number between 250 and 300 at any given time. This section discusses the MKE employees and select initiatives that the County offers.

- *Customer Service.* All MKE employees that interact with the public watch a 17-minute Customer Service video and complete a corresponding quiz every year. This contributes to the high ratings of customer satisfaction on airport surveys (as described in the following section).

- *Professional Development*. Milwaukee County has a tuition reimbursement program. The educational assistance provides employees the opportunity to obtain additional education in order to increase their knowledge and abilities and prepare for future opportunities within the County. Educational assistance is capped at $2,500 per year.
- *Wellness*. The County has a robust wellness program that includes wellness classes, healthy eating initiatives and more available to County staff and their families. Among these initiatives, the County participates in the National Bike Challenge to encourage healthy lifestyles.

HEALTH AND SAFETY

The airport maintains a comprehensive airport Health & Safety (H&S) program covering both customers/passengers as well as employees. This is a responsibility that the airport takes seriously, having invested time and resources to improve the management of H&S issues, inviting employees, passengers, and other stakeholders to help create a healthy and safe environment at MKE.

A central component to MKE's safety program is the recently developed SMS. The program is updated as necessary to include security updates, FAA requirements, and other aspects of emergency planning. The SMS is built on the Cityworks management system (described in the Operational Efficiency section) which allows airport staff to manage a variety of safety metrics and activities as well as document hazards and complete safety assessments and corrective actions. The airport website also has a dedicated section for the SMS. This SMS Portal[35] allows all staff, tenants, and contractors to report safety hazard to the Airport Program Safety Manager. Reported hazards are managed and mitigated per the SMS objectives. Reporting can be done anonymously or providing contact information for feedback.

CUSTOMER EXPERIENCE

Increasingly, customer satisfaction is recognized as a key measurement of airport performance, a basis for understanding the airport's relationship to the traveling public, and an indicator of airport competitiveness. As noted in a recent report devoted to this subject from the Airport Cooperative Research Program (ACRP) of the National Academies of Sciences, Engineering and Medicine, "where options exist, travelers may choose to avoid airports with a poor customer service reputation. Alternatively, good customer service may have a positive effect on the airport and its community and is part of a trend that has rapidly gained momentum as more and more airports have made improved customer service a priority."[36]

These trends are not lost on the stakeholders engaged in the development of the SMP. Customer Satisfaction emerged from the Focus Area identification process as the highest rated factor for detailed study in the SMP. As a Focus Area, it is an important element in understanding the airport's social "bottom line," and also is related strongly with financial performance, as airports that are better able to meet and exceed customer expectations are better situated to attract passenger growth.

For the SMP, trends in customer satisfaction were identified through analysis of available data collected as part of the airport's ongoing satisfaction measurement program. A description of the program as well as baseline data and interpretations is included in the following section.

DATA SOURCE AND REPORTING

A third party provider conducts a monthly survey in the MKE concourses. Travelers are intercepted when leaving the airport and given a card with a link to an online survey. They are offered the chance to win airline tickets by participating. Monthly response rates typically range from 50 to 135 responses. MKE is provided with a quarterly report, showing a 12-month moving average across a number of analysis factors, including perceptions of facilities and staff and overall satisfaction with the airport. For the baseline, quarterly data from fourth quarter 2013 to third quarter 2016 were analyzed. Factors are rated on a 5-point scale:

1	2	3	4	5
"POOR"	"FAIR"	"GOOD"	"VERY GOOD"	"EXCELLENT"

35 http://www.mitchellairport.com/safety-management-system

36 Transportation Research Board, ACRP Report 157, "Improving the Airport Customer Experience." 2016. p. i.

DATA LIMITATIONS

Some data that was collected was not available for analysis. The AECOM Team was only able to access the evolving moving average. For example, a key factor for customer satisfaction, as identified in the ACRP report, is the availability of Wi-Fi in the passenger terminals.[37] Customer satisfaction with airport Wi-Fi is a data point collected by the third party surveyor, but these data were not made available for this analysis. Generally, however, the survey questions are asked consistently month after month, so data are comparable over time, and general levels of satisfaction are consistently measured. Because the data are reported as a moving average, they should be understood as lagging indicators (i.e., changes in the average reflect changes in perception that happened in the past)

BASELINE FINDINGS

Overall customer satisfaction with MKE is high, generally hovering around "very good." Following a dip that showed up in mid-2014 (perhaps attributable to construction of the new baggage claim area), MKE's overall satisfaction is higher than for peer airports (Canmark designates three tiers of airports based on originating revenue, peer airports refers to airports within the same tier as MKE) and is currently higher than at any time in the last three years[38]. The following Figure 13 shows overall customer satisfaction for the analysis period. As of the third quarter of 2016, customers rated their satisfaction with MKE as 4.1 out of 5. This equates to a rating of "very good."

Customer satisfaction is the function of many aspects of traveler experience. Some of those factors may be characterized as either structural factors or personnel factors.

STRUCTURAL FACTORS

For those factors directly influenced by airport facilities, MKE is performing well. Wayfinding suffered a considerable dip in mid to late 2014 (during baggage claim construction), but has since risen steeply. Restroom availability is consistently rated "very good." Quality, availability and variety of concessions are rated lower than other factors, but satisfaction with these features is steadily increasing. In aggregate, satisfaction with these structural factors was rated by customers as 4.0 out of 5, or "very good," as of the third quarter of 2016 (Figure 14).

PERSONNEL FACTORS

Travelers' satisfaction with staff interactions is quite high at MKE. Experiences with security are particularly highly

FIGURE 13 - MKE OVERALL SATISFACTION SURVEY RESULTS

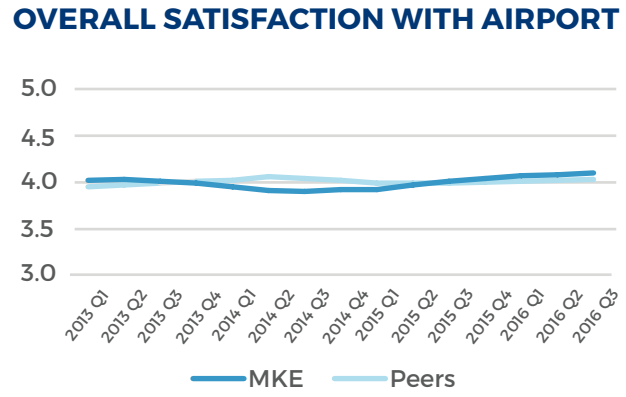
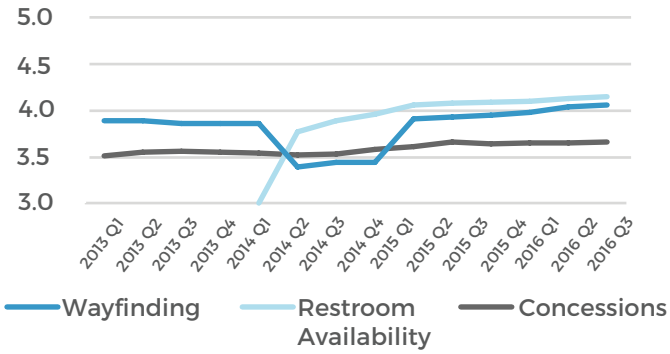
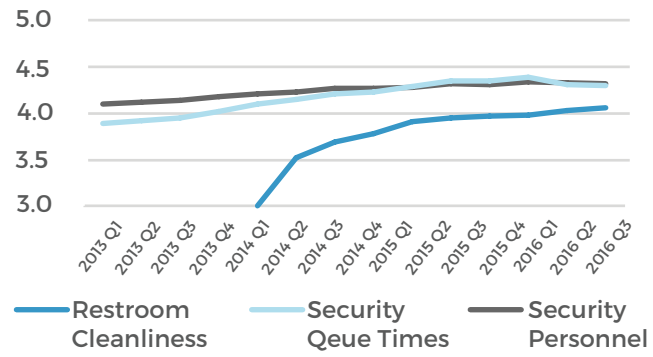


FIGURE 14 - MKE SATISFACTION SURVEY RESULTS FOR STRUCTURAL AND PERSONNEL FACTORS





37 Ibid, p. 35

38 The Canmark Research Center. Quarterly Airport Survey Results: 2014, 2015, 2016.

rated, both in terms of waiting times and professionalism of personnel. In this regard, MKE is doing very well. Satisfaction with restroom cleanliness is rising rapidly since a dip in mid-2014. In aggregate, satisfaction with personnel factors was rated by customers as 4.25 out of 5, better than "very good," as of the third quarter of 2016 (Figure 14).

AIRPORT AMENITIES

There are a variety of resources for travelers to shop, dine, relax, learn, and conduct business while waiting for flights. Services exist for first time travelers, frequent travelers, military travelers, travelers with babies and children, travelers with special needs or service animals, and business travelers. Many of these amenities are available to non-travelers too, as visitors can access several of these areas without clearing security.

PERSONAL AND PROFESSIONAL SERVICES & ASSISTANCE

Traveler's Aid Society, with over 30 years of service, staffs a help desk, or information desk, in the main concourse. They provide 8,000 hours of volunteer service per year. The following information is provided in the self-guided tour handout regarding the Traveler's Aid Society:

The Information Desk "is centrally located near the flight information displays in the center of the concession mall. The volunteers strive to meet the immediate crisis situations of travelers, visitors, and the general public. The desk is staffed from 5 AM to 12 PM. The volunteers assist people in cases of lost tickets, missed connections, illness, lack of funds, language difficulties and many other travel-related situations. They also help those who are physically or mentally ill, runaways, homeless, etc., and make referrals to other services and elsewhere for those in need."

Other amenities found throughout the airport and terminals include:

- USO Lounge
- Children's play area
- Mamava nursing suites
- Service animal relief area
- Shoe Shine
- On-site banking (BMO Harris Bank)
- ATM
- Fed Ex and UPS
- US Mail boxes
- Travel Insurance kiosks
- Luggage carts
- Recombobulation area
- Restrooms including family restrooms
- Rest area for service animals
- Elkay refillable water bottle stations
- WIFI – BOINGO (free and for purchase)
- Passenger (work stations) and recharging areas
- TDD phone
- Ground transportation
- Meditation Room
- Delta Sky Club

SELF GUIDED TOURS

MKE has a self-guided tour booklet posted online. Self-guided tours of the airport can be informative and enriching for all age groups. Groups may visit the exhibits in the Mitchell Gallery of Flight aviation history museum and watch activity on the airfield from the windows of the fifth-floor skywalk or Concourse C corridor.

DINING, SHOPPING (LOCAL), AND ENTERTAINMENT

A variety of dining and retail options, including many local Milwaukee businesses, may be found at MKE Airport.

- Bartolotta
- Harley Davidson
- Valentine Coffee Roasters
- Miller Brew House
- North Point
- Pizzeria Piccolo
- Vino Volo
- Leinie's Lodge
- Usinger's
- News and gift shops
- Retail Shopping

To entertain passengers, a ping pong table is available for use in the main concourse, free of charge. There is also a grand piano where live music is performed during holiday travel periods.

HISTORY, ART, SCIENCE AND VISUAL INTEREST

The airport hosts several items of visual interest, including art as well as scientific and historical exhibits.

- MKE Monument letters on Airport spur when entering from I-94
- Gallery of Flight Museum
- Gravity Well (coin vortex for Gallery of Flight Museum)
- Aircraft exhibits – restored Mitchell B25 at exterior entry sign and Curtis 1911 Pusher airplane in airport
- Reproduction antique Milwaukee clock
- F-4 fighter jet positioned at entrance of airport property
- Revolving Current Art exhibits
- "Slalom" kinetic sculpture by Tim Prentice
- Neon artwork by Stephen Antonakos
- Metal sculpture by local artist Evelyn Patricia Terry
- "Submerged Vessels" by Dennis Oppenheim
- Terrazzo and ceramic floor with mosaic medallions by Carlos Alves
- Communities Mosaic of Culture by Milwaukee Public School children sponsored by WE Energies
- American Soviet Mural Project "Clay: A Healing Way" by citizens of Leningrad
- Baggage claim green roof educational signage
- Baggage claim LEED certification signage
- Metal sculpture by local artist Richard Taylor

PUBLIC MEETING AND EVENT SPACES

MKE has conference rooms (Sijan, Lovell and Maitland) available for the public as well as a larger Milwaukee Banquet Room, which can be reserved via HMS Host.

COMMUNITY ENGAGEMENT

Beyond the employment impact, airports play a vital role in the community. MKE is increasingly implementing activities to serve as the best possible neighbor to the local community. The initiatives discussed in this section include events, programming and airport amenities.

EVENTS HOSTED AT THE AIRPORT

As a gateway to Milwaukee, MKE often hosts community events, many of which attract considerable media attention. These events are some of the ways MKE engages the greater Milwaukee community.

Stars and Stripes Honor Flights. Stars and Stripes Honor Flight Inc. honors veterans by flying WWII, Korean War and terminally ill veterans from other conflicts to Washington, DC to visit their memorials. They also actively promote educational aspects of this mission in schools and communities. Returning flights to Milwaukee are typically greeted by a grand homecoming celebration with flags, bands and well-wishers. Since 2008, more than 4,500 veterans have participated in Honor Flights at MKE.

Community Art Exhibits. The terminal at MKE hosts art exhibits. As part of October's disABILITY Awareness Month, the airport hosts an annual Tap the Potential Mitchell International Airport Art Show. In 2016, the exhibit included over fifty artists representing a full spectrum of disabilities and they also hosted an artist reception in the main concourse. The public shared their comments about the artwork at an interactive display. Many passengers wrote messages sending support and encouragement

SOURCE: HTTPS://WWW.MITCHELLAIRPORT.COM/

SOURCE: HTTPS://WWW.MITCHELLAIRPORT.COM/

SOURCE: HTTPS://WWW.MITCHELLAIRPORT.COM/

SOURCE: HTTPS://WWW.MITCHELLAIRPORT.COM/

to the artists.

Flight to the North Pole. The "Flight to the North Pole" is an annual event to benefit children with life-threatening illnesses and their families. The event aims to recreate the North Pole at the airport with games and entertainment; including Santa and his sleigh. In addition to airport volunteers, military and civilian volunteers from the 128th Air Refueling Wing and Children's Hospital of Wisconsin contribute to this annual event, in place since 1985.

PROGRAMMING AND PARTNERS

MKE regularly partners with education and social organizations. Some examples of recent initiatives include:

Aviation Careers Education (ACE). Aviation Careers Education (ACE) is a summer employment and learning opportunity for high school students. ACE promotes aviation and space education, offers extracurricular activities and provides students experiences in aviation related jobs. ACE is the result of partnerships between industry, schools and government. Thirty MKE employers have hosted over 900 students coming from 20 local high schools. Through the Wisconsin Department of Transportation, Bureau of Aeronautics, ACE encourages students by making class work more meaningful and promotes aviation and space education.

Wings for Autism. Since 2015, more than 200 families have enrolled an individual in the Wings for Autism program. This program offers airport dress rehearsals designed for those with intellectual and developmental disabilities and their families. The airport partnered with the Autism Society of Southeastern Wisconsin to make traveling a more enjoyable experience for those with autism. Participants are able to interact with TSA agents and flight crews.

Overcoming Your Fear of Flying. MKE offers twice-yearly fear of flying classes. Classes have been offered since 1988 and are believed to be the longest running program at any US airport. The classes help people use commercial flight as a means of transportation and reduce the amount of anxiety and fear that go along with thinking about or taking commercial flights. The class concentrates on two areas: learning about airplanes and how they fly, and learning about the causes and cures of fear. More than 700 people have participated in the class, with the vast majority flying a short round-trip flight.

United Services Organization, Inc. (USO). The USO

center is located inside security in Concourse D. The center offers a secure area for our military and veteran families. Guests can relax, watch TV, play video games, work on a computer, read and enjoy snacks and beverages. Toys and puzzles provide entertainment for the children. The USO provides support for military families requiring privacy to say their good-byes, for wounded warrior families and families of the fallen who are participating in the dignified transfer of their loved one. The center is open daily.

Adopt-a-Pilot. The Adopt-a-Pilot program connects kids to pilots to educate students through aviation-themed activities related to science, geography, math, writing, and other core subjects. From February through May of each year, students in more than 1,500 classrooms across the country will "adopt" Southwest Airlines Pilots, giving aviators opportunities to mentor students in and around the fifth-grade level. As part of the Adopt-A-Pilot program, students will also research careers and further develop life skills, while reinforcing the importance of staying in school.

Council of Small Business Executives (COSBE) "Be the Spark Education Tours." MKE participates in this COSBE program that sets up 25 Milwaukee public schools with tours of 25 businesses throughout the school year to get kids thinking about their future career path and connecting what they're learning in school to various jobs.

General Mitchell International Airport Project SEARCH. Partnering with Goodwill Industries and tenant companies, MKE works to place people with developmental disabilities in internship positions with airport vendors. The interns gain work experience, and receive job coaching in anticipation of transitioning into the general workforce.

SUMMARY AND CONCLUSIONS

The baseline inventory effort was the first major assessment of sustainability activities and performance for MKE and served as a reference point for evaluating current and projected sustainability impacts and actions. It was a key activity in the development of the Sustainability Management Plan.

BASELINE / METRICS SUMMARY

The sustainability baseline effort generated information on various consumption rates (e.g., electricity, water) that can be used for future comparisons and benchmarking against other airports. The baseline year was set to 2015 because it represented the most recent year with fully available data. The following table summarizes key baseline consumption values, spend, and metrics from select Focus Areas found in this report and is compiled in this section (Table 25) for ease of reference.

BENCHMARK — PEER AIRPORT COMPARISON

In order to provide a benchmark / comparison of the sustainability baseline data, data from peer airports was gathered as well as sustainability data from other airports that have more developed sustainability programs. In many cases airports that have completed similar FAA-funded sustainability plans provide data for comparison purposes. The main sources for the benchmark data are airports' websites, sustainability master plans and management plans in addition to the ACI-NA Airport Performance Benchmark Survey results. Results of this comparison can be found in Table 26.

As indicated by the table, larger hub airports, with more established sustainability programs, provide more public information regarding their performance, especially environmental topics, than airports that can be assumed as MKE's peers based on size and number of passengers. With limited exceptions, most of the peer airport data was obtained through the ACI-NA Airport Performance Benchmark Survey results. While the data is relatively recent and is a good source for comparison, there are some limitations to these data sources. Some of these limitations are listed below:

- Data refers to a range of different years so it may not be suitable for comparison
- The information provided is mostly financial and operational and does not cover environmental focus areas and related resource consumption values
- Airports self-report the numbers, allowing for potential discrepancies amongst airports based on data collection methodology
- Similarly, potential discrepancies may exist with airport sustainability plans (such as other SMPs) as the collection methodology is often not available. Similarly, unless environmental data is verified against a protocol, the collection / assessment methodology may not generate accurate / reputable values.
- The cost of utilities is likely to vary based on geography and on account set up / structure.
- Energy consumption for airports varies based on regional climate.

Having a solid understanding of how the airport is currently performing in the select Focus Areas that form the basis for the sustainability program provides the following benefits:

- Provides understanding on what data is currently available, who manages or is responsible for the data, and overall efficiency and completeness of the data gathering process
- Identifies gaps in aspects of data management and improvements to close data gaps
- Provides basis for identifying key performance indicators (KPIs) that can be monitored in the future
- Provides basis for setting meaningful and achievable goals and related actions based on current performance.

Some of main take-aways from the baseline assessment are summarized below:

- In general, the airport has data under management for several Focus Areas but the current system the airport and Milwaukee County are using is not sufficient to cover ongoing management and performance improvement assessment in all Focus Areas. For some Focus Areas, information is either not actively managed or is managed at the individual level (i.e., there is no comprehensive data management tool). Also, the majority of information is controlled at the Milwaukee County level.
- The **Economic Focus** Areas provide a good overview of the airport's financial and operational performance.

2015 BASELINE DATA SUMMARY

TABLE 25
BASELINE DATA SUMMARY

SOLID WASTE

ABSOLUTE VALUES			& BY TOTAL WEIGHT	INTENSITY METRICS (LB PER PASSENGERS)
Total waste production	**tons**	**892.1**	**100%**	**0.272**
Disposed	tons	801.3	**89.8%**	**0.245**
Recycled	tons	90.7	**10.2%**	**0.028**
*Estimated Values				

GREENHOUSE GAS EMISSIONS*

ABSOLUTE VALUES			INTENSITY METRICS (PER 1000* PASSENGERS)
Total	**mT CO_{2e}**	**33,921**	**5.18**
Scope 1	mT CO_{2e}	6,696	
Scope 2	mT CO_{2e}	90.7	
*Does not include Scope 3 emissions			

WATER / SEWER

ABSOLUTE VALUE			INTENSITY METRICS (PER PASSENGER)
Water Consumption	**gallons**	238,689,420	**36.44**
Water Expenses	**$**	162,474	**0.02**
Sewer Expenses	**$**	899,283	**0.14**

AIRPORT ENERGY USE*

ABSOLUTE VALUES			INTENSITY METRICS (PER PASSENGER)
Airport Electricity	**kWh**	**39,417,906**	**6.02**
	MBtu	**133,883**	**0.02**
	$	**3,469,075**	**0.53**
Airport Natural Gas	**Therms**	**928,399**	**0.14**
	MBtu	**93,874**	**0.01**
	$	**410,431**	**0.06**
Total Energy	**MBtu**	**227,757**	**0.03**
	$	**3,879,506**	**0.59**
*Does not include Business Park			

It is important to highlight that while traditional financial data is complete and allows for year over year comparisons, operational data is mostly tied to the Cityworks system so there is an opportunity to identify which metrics or KPIs can be monitored within that system. Information regarding sustainable buildings and infrastructure is not currently tracked given the limited activity in this topic to date.

- Within the **Environmental Focus Areas**, there is an abundance of data and information available; however, the data that is available is not consistent within each Focus Area. The Focus Areas with the least comprehensive data, particularly waste management and to a lesser extent water management, contain gaps or inconsistencies for both consumption/ generation and cost information. Energy data is

TABLE 26
PEER AIRPORT COMPARISON

		MKE	PEER AIRPORTS			
	UNITS	MILWAUKEE INTERNATIONAL AIRPORT (MKE)	CINCINNATI / NORTHERN KENTUCKY INTERNATIONAL AIRPORT (CVG)	INDIANAPOLIS INTERNATIONAL AIRPORT (IND)	PITTSBURGH INTERNATIONAL AIRPORT (CMHM)	COLUMBUS INTERNATIONAL AIRPORT (CMH)
BENCHMARK VALUES FROM ACI-NA SURVEY						
Terminal Sq. Ft.	Sq ft	880,666 sq. ft.	2,009,234 sq. ft.	1,183,723 sq. ft.	1,640,000 sq. ft.	1,020,663 sq. ft.
Full Time Employees	-	255	396	423	445	319
Total Passengers	-	3.2 million	3.1 million	4 million	4 million	3.4 million
Electricity Consumption (kWh)	kWh	35.5 million	65.5 million	-	100.5 million	24.7 million
Electrical Power	$	3.8 million	5.1 million	3.5 million	7.4 million	2.5 million
Total Operating Revenue 2015	$	97.3 million	88 million	147.9 million	134.6 million	84 million
Total Operating Expenses 2015	$	110.5 million	124.5 million	156.4 million	147.6 million	93.6 million

more complete and easier to track as a result of the EnergyCAP utility billing management system. Greenhouse gas data is compiled from several sources. As such, data quality and consistency varies but in general can be considered sufficiently complete to provide a realistic picture of MKE's performance in this area.

- Information related to **Social Focus Areas** tends to be more qualitative. Nonetheless there is an abundance of data available regarding employee and community engagement programs, so it is important that the effort started for the baseline assessment in terms of identifying possible trends and meaningful KPIs to track should continue in future years as MKE's sustainability program develops.

		OTHER AIRPORTS			
	UNITS	NASHVILLE INTERNATIONAL AIRPORT (BNA)	TAMPA INTERNATIONAL AIRPORT (TPA)	SALT LAKE CITY (SLC)	MINNEAPOLIS / ST. PAUL (MSP)
BENCHMARK VALUES FROM ACI-NA SURVEY					
Terminal Sq. Ft.	Sq ft	408,646	2,103,708	980,943	3,325,303
Full Time Employees	-	226	605	506	591
Total Passengers	-	4.8 million	8.5 million	10.5 million	18.2 million
Electricity Consumption (kWh)	kWh	45 million	91.3 million	54.9 million	162.2 million
Electrical Power	$	3.7 million	10.9 million	4.8 million	12.9 million
Total Operating Revenue 2015	$	115.7 million	194.8 million	132.5 million	295.5 million
Total Operating Expenses 2015	$	107.1 million	202.8 million	136.2 million	264.7 million
OTHER SUSTAINABILITY BENCHMARK VALUES					
GHG Emissions (Scope 1 & 2)	MtCO2e			11,165	9,045 (non aircraft)
Waste Generation	Tons	2,200 tons	4,000 tons	2,835 tons	6,000 tons
Recycled	Tons			0.07 lbs per passenger	
Waste Diversion	%	7.30%	24%		
Water	Gal			140 million gallons	200 million gallons

The sustainability actions are the heart of the SMP, the blueprint for enabling MKE to reduce its environmental footprint and positively contribute to the region's social and economic well-being.

SUSTAINABILITY GOALS & ACTIONS »

CHAPTER 4

SUSTAINABILITY GOALS & ACTIONS

GOALS & ACTIONS DEVELOPMENT PROCESS

ACTIONS RANKING PROCESS

SUSTAINABILITY GOALS & ACTIONS TABLE

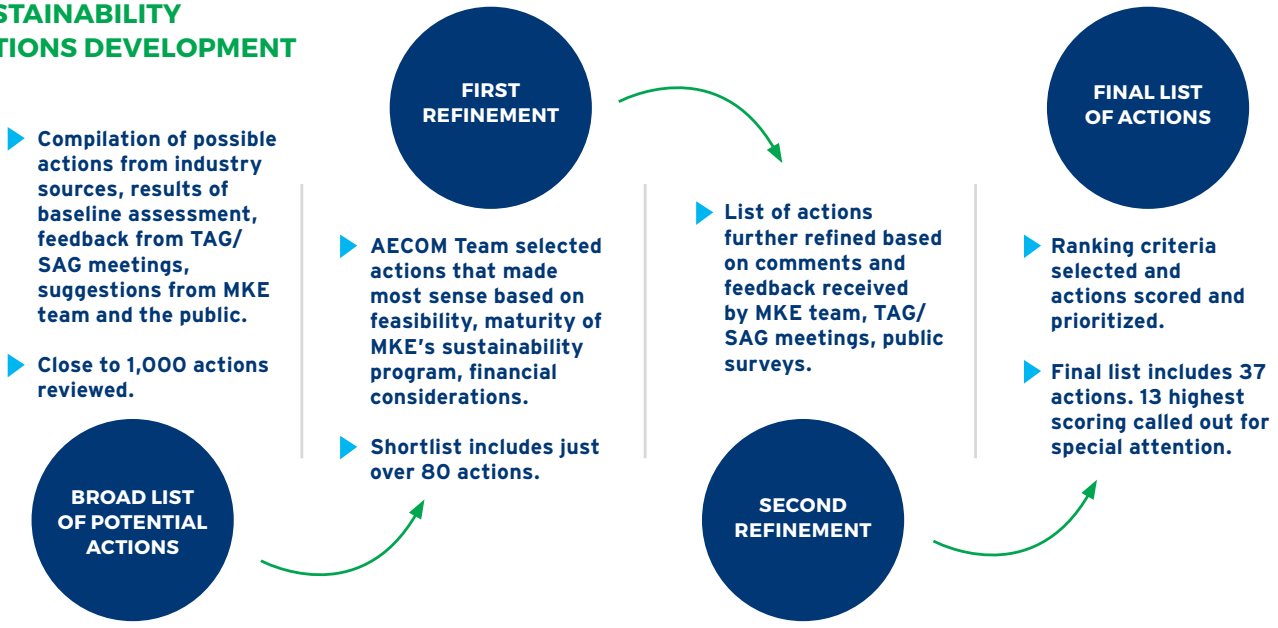
Following the completion of the baseline analysis of Mitchell Airport's performance across all 11 focus areas, the planning process pivoted to focus on identifying a set of sustainability actions to enable MKE to improve that performance and progress toward realizing the airport's sustainability vision. These actions were developed along with a set of high level goals for each focus area. The sustainability actions are the heart of the SMP, the blueprint for enabling MKE to reduce its environmental footprint and positively contribute to the region's social and economic well-being. This chapter details the process for developing the sustainability goals and actions and provides details on each activity. It includes:

- **Sustainability goals and actions development and refinement**
- **Sustainability actions ranking process**
- **Goals for each focus area**
- **Ranked table of sustainability actions.**

SUSTAINABILITY GOALS AND ACTIONS DEVELOPMENT

As with previous tasks in the Sustainability Management Plan process, the actions were developed with a set of iterative steps, each featuring input and refinements solicited through a range of stakeholder involvement activities. The SMP process included four distinct steps to identify actions applicable to MKE. These steps are graphically summarized below.

SUSTAINABILITY ACTIONS DEVELOPMENT



> As with all SMP analyses, the actions ranking process was completed with input from stakeholders to adapt the ranking to the opportunities and constraints specific to MKE.

Specifically, the process included:

1 **Broad list of potential actions.** An initial list of nearly 1,000 potential actions to improve airport sustainability was compiled using a variety of industry sources – including best practices collected by the Sustainable Aviation Guidance Alliance and the Airport Cooperative Research Program of the National Academies of Sciences, Engineering and Medicine – along with ideas generated by the Technical and Stakeholder Advisory Groups and responses to surveys of MKE's traveling public and the Milwaukee business communities. These actions represent both the cutting edge of industry practice internationally, and ideas specific to MKE facilities, operations and community, generated by the people most familiar with them. They addressed all aspects of the 11 focus areas, from energy conservation to neighbor relations.

2 **First refinement**. The AECOM team sorted and categorized all the actions on the broad list, considering their applicability to the MKE focus areas, scale of airport operations, implementation feasibility, the maturity of the airport's existing sustainability activities, and financial considerations. A refined list of approximately 80 action was organized in terms of their relationship to the focus areas; a larger number of items from the broad list of actions was added as tactics – discrete initiatives that can support a larger sustainability action. In this way, many of the locally-generated actions were carried forward into the refined list. In addition, for each of the 11 focus areas,

the AECOM team developed one or more draft goals, based on industry best practices and the input from stakeholders. These goals were designed to establish outcomes across each category, the attainment of which is supported by the sustainability actions.

3 **Second refinement**. The refined list was presented to the TAG and SAG at two facilitated workshops. In total, the list presented to the leadership groups was substantial, with 81 sustainability actions and 188 tactics. The TAG and SAG reviewed all the actions and tactics, and selected actions were presented to the public through a second online survey. After assimilating all the input, AECOM worked with the MKE core management team to review each action and tactic; these were refined, some were eliminated, some were combined or recombined, moving actions to tactics.

4 **Final list of sustainability actions**. Following a final review by AECOM and the MKE core management team, a final list of actions and tactics was forwarded into the prioritization process. At this level of refinement, the list of actions included only those considered to be implementable at MKE within a reasonable timeframe. Simultaneously, the draft goals for each focus area were refined based on the stakeholder input. The characteristics of the final list of 18 goals, 37 actions and 138 tactics is detailed in the following table. An additional seven actions with associated tactics were placed in a "parking lot," ideas that MKE did not want to abandon but which face barriers to implementation that may currently be insurmountable. These actions may become relevant as MKE develops its sustainability program and will be reevaluated in the future.

RANKING SUSTAINABILITY ACTIONS

Once the list of applicable and feasible sustainability actions was finalized, those actions were prioritized to determine which should be the focus of implementation efforts, were most likely to achieve successful outcomes, and which could provide the greatest returns on the airport's investment. As with other SMP analyses, this process was completed in an iterative process with input from stakeholders to adapt the ranking to the opportunities and constraints specific to MKE.

1 **Identify and operationalize ranking criteria**. Each sustainability action was ranked against a set of criteria evaluating its implementability and effectiveness in meeting sustainability goals. Criteria were developed based on best practices in the aviation industry and local priorities, and were reviewed and refined by the MKE core management team following an opportunity for comment by the Technical Advisory Group. The final list of seven ranking criteria included:

a The degree to which the action improves MKE financial performance;

b The degree to which the action improves effectiveness / resilience of MKE operations;

c The degree to which the action reduces environmental impacts within or outside the airport boundary

d The degree to which the action improves community perception and builds the MKE brand and reputation

e The degree to which the action supports or helps improve customer experience

f The degree to which the action improves multiple aspects of sustainability or impacts more than one Focus Area

g The degree to which MKE is ready to implement the action.

In order to rationally compare performance of the actions, an evaluation rubric was developed for each criterion, defining how the actions would be rated. The evaluation definitions are summarized in the following table.

2 **Initial ranking**. Using the definitions in the ranking rubric, AECOM undertook an initial exercise to assign values across the criteria to each action. For each action, the values were summed and the actions arranged from highest total ranking value to lowest. A maximum of 35 points was available (up to five points for each of seven ranking categories). Higher values indicated actions that were both more effective at reaching sustainability goals for each Focus Area, and relatively more implementable. The first draft of the ranked actions was presented to the MKE core management team for comment, discussion and refinement in a facilitated workshop.

3 **Second ranking**. MKE staff then undertook the same ranking exercise independently and the results were compared the first draft. More detail was added to the understanding of performance of the actions across the full range of criteria. The final list of ranked actions evolved from this iteration; AECOM reordered the actions from highest to lowest priority. The lowest ranked actions – those for which major barriers to implementation were identified – were removed to a separate list for future consideration after MKE has better established its sustainability framework. Seven

CHARACTERISTICS OF MKE FINAL LIST OF SUSTAINABILITY GOALS, ACTIONS AND TACTICS

FOCUS AREA	ACTIONS	TACTICS	GOALS
General	3	6	
Economic Prosperity	4	15	Enhance MKE's economic performance by developing cost containment strategies and increasing revenue streams. Build the airport's role as an economic engine in the region.
Operational Efficiency	3	9	Improve performance tracking by adopting management systems and developing new metrics and specific procedures.
Sustainable and Resilient Buildings and Infrastructure	3	15	Adopt sustainable design and construction practices for MKE's buildings and infrastructure. Ensure MKE is prepared to face emergencies by improving resiliency through mitigation and adaptation strategies.
Air Emissions and Climate Change	3	9	Develop a carbon reduction management program. Take a regional leadership role on carbon and climate change.
Energy Management	5	15	Reduce MKE's energy consumption by developing a formal energy management program that relies both on energy efficiency and renewable energy.
Waste Management	2	10	Increase waste diversion through enhanced waste management program, including education and training programs, formal policies and procedures, increase waste revenue streams and avoided disposal costs.

FOCUS AREA	ACTIONS	TACTICS	GOALS
Water Management	5	17	Support the Milwaukee area in becoming a national hub for water related innovation and technology. Reduce MKE's water consumption by managing use, monitoring data and implementing efficiency strategies.
Employee Engagement	3	15	Attract workers from throughout Milwaukee County. Retain employees and build employee satisfaction. Provide opportunities for advancement.
Community Engagement	2	15	Create lasting partnerships to enhance reputation and be responsive to community needs. Communicate airport's leadership related to sustainability.
Health and Safety	1	1	Maintain a robust health and safety program.
Customer Experience	3	11	Maintain or improve high customer satisfaction.

4

5

ACTIONS RANKING RUBRIC

VALUE	DEFINITION FOR CRITERIA (A)-(E)	DEFINITION FOR CRITERION (F)	DEFINITION FOR CRITERION
1	No impact, or negative impact.	No additional impact to other Focus Areas or has singular benefit.	No systems, no basis for implementation, significant cost, or significant organizational constraints.
2	Potential for marginal direct impact, or moderate indirect impact (impacts other stakeholders or activities that may have direct impact).	Impacts 2 or more Focus Areas and/or may benefit other aspects of sustainability.	No existing system or implementation, there may be cost and organizational constraints but organization may be supportive of implementation.
3	Moderate direct impact, significant indirect impact, or significant potential for direct impact.	Impacts 3 or more Focus Areas and/or other aspects of sustainability.	No existing system or implementation, however relatively easy / feasible for MKE to implement or can be implemented by outside party.
4	Strong direct impact, significant indirect impact, or potential for significant direct impact.	Impacts 4 or more Focus Areas and/or multiple aspects of sustainability.	Existing system but some level of effort or obstacle to implement or no existing system but limited/no cost/or constraints to implement.
5	Significant and/or sustained direct impact, significant indirect impact.	Impacts 5 or more Focus Areas and/or significant other aspects of sustainability.	Action has limited barriers to implementation ('ready to go').

actions fell into this category. In discussion with the MKE core management team, it was decided that all actions with a sum rating of 20 points or more were to be considered Priority Sustainability Actions, to receive a high level of detail in the implementation planning phase of the SMP. Thirteen actions were considered to be priority actions, and they include actions from nine of the 11 Focus Areas.

FINAL RANKED LIST OF SUSTAINABILITY ACTIONS FOR MKE

The following pages detail sustainability actions for MKE. Actions are ranked from highest to lowest priority; the table includes all associated tactics – individual initiatives – that were identified as supporting the overall actions.

RANK	1	SUSTAINABLE BUILDINGS AND INFRASTRUCTURES	

ACTION	DESCRIPTION
Develop airport-specific construction guidelines for sustainable planning and design. Consider a green building commitment or policy (i.e. pursuing LEED certification where appropriate).	Coordinate with existing Milwaukee County policies and guidance, develop airport-specific green building guidelines and commitment or policy and pursue Leadership in Energy and Environmental Design (LEED) certification, or other 3rd party certification, for appropriate airport buildings.

TACTIC 1	TACTIC 2	TACTIC 3	TACTIC 4
Evaluate existing policies and guidance, including Green Print (2007), Sustainable Design Guidelines (2009), and County Ordinance – Chapter 21 (2016), and develop a new airport-specific green building commitment and policy.	Implement the policy for all new buildings, relevant capital projects, and other building programs at MKE.	Benchmark similar efforts undertaken by other airports to support the structure of the guidelines.	Provide training on the airport's sustainable planning, design and construction guidelines, including their basis, the parties responsible for using the guidelines, and the sustainable rating system.
TACTIC 5	**TACTIC 6**	**TACTIC 7**	**TACTIC 8**
Require a LEED or equivalent building standard and green operating commitment from non-airport controlled buildings that are undergoing construction activities, including renovations.	Use LEED Performance based measure (LDP) tool.	Incorporate comprehensive energy specifications and design guidance into RFPs.	Market and publicize efforts.

RANK	2	WASTE MANAGEMENT	

ACTION	DESCRIPTION
Enhance waste management and recycling efforts by developing education/training on best practices.	Expand and enhance waste management and recycling programs and develop education/training for employees and tenants. MKE should continue building on the existing programs and promote airport waste management practices and related waste and diversion results. Increased awareness and engagement will improve involvement from employees and airport users. Having a formal waste management plan will allow for better procedures and result monitoring.

TACTIC 1	TACTIC 2	TACTIC 3	TACTIC 4
Educate airport staff on waste management policies and best practices.	Expand education/training on the recycling program beyond recycling container labeling.	Engage tenants by incorporating waste management and recycling requirements within leases/contracts.	Improve recycling stations by enhancing signage and using unique bins that can be better distinguished by passengers.

TACTIC 5	TACTIC 6	TACTIC 7	TACTIC 8
Add dumping station before security for people to dispose of liquids and install water bottle filling stations after security.	Create reusable MKE branded water bottles to reduce amount of single use plastic bottles bought from vendors and disposed. Bottles should include a recycling message to promote the MKE recycling program.	Replace traditional drinking fountains with units that include water refilling station.	Build and expand on the SMP Waste/Recycling Opportunities Assessment and develop and implement an a Recycling, Reuse, and Waste Reduction Plan that includes the following topics: - Review of Recycling Feasibility - Operation & Maintenance Requirements - Roles & Responsibilities - Potential for Cost Savings or Revenue Generation - Tracking and Reporting on Recommendations - Education & Outreach In order to develop the plan refer to the following resources: - FAA Guidance on Airport Recycling, Reuse, and Waste Reduction Plans (9-30-2014), Section 6 - Contents of an Airport Recycling, Reuse, and Waste Reduction Plan; - FAA Recycling, Reuse, and Waste Reduction at Airports: A Synthesis Document (04-24-2013), Section 5 - Waste Management Plan Development; - Sustainable Aviation Guidance Alliance (SAGA), Sustainable Practices web page http://airportsustainability.org/sustainable-practices to develop a Recycling, Reuse, and Waste Reduction Plan.

RANK	3	ENERGY MANAGEMENT	

ACTION	DESCRIPTION
Implement Energy Conservation Measures (ECMs) identified in SMP and any other existing or future energy studies.	Implementing ECMs that have been identified will reduce GHG emissions and energy consumption.

TACTIC 1	TACTIC 2	TACTIC 3	TACTIC 4
Complete an ASHRAE Level II Energy Audit for the terminal and MKE Business Park. Utilize local utility programs that can perform the energy audit at a lower cost.	Complete retro commissioning of all energy systems and implement identified measures.	Upgrade airport Controls Systems and install a building automation system (BAS).	Install modulating condensing boilers for summer operation.
TACTIC 5	**TACTIC 6**	**TACTIC 7**	**TACTIC 8**
Install variable frequency drives (VFDs) on cooling towers.	Convert air handling units (AHUs) to variable volume.	Install dedicated domestic hot water heaters.	

RANK	4	CUSTOMER EXPERIENCE	
ACTION		**DESCRIPTION**	
Create a unique sense of place, specific to Milwaukee.		Provide services and design features that will create the impression of being in a unique and well-identified place (Gateway to Milwaukee).	
TACTIC 1	**TACTIC 2**	**TACTIC 3**	**TACTIC 4**
Improve variety of vendors (e.g., local, healthy, unique options).	Provide display space for visiting art from area museums.		
TACTIC 5	**TACTIC 6**	**TACTIC 7**	**TACTIC 8**

RANK	5	ECONOMIC PROSPERITY	

ACTION	DESCRIPTION
Develop and implement an Asset Management Plan (AMP).	An Asset Management Plan (AMP) incorporates a systematic and coordinated set of activities and practices through which an organization optimally and sustainably manages its assets and asset systems, their associated performance, and risks and expenditures over their lifecycles. An AMP is a framework being widely adopted as a means to achieve sustainable infrastructure and minimize the total cost of owning and operating this infrastructure, while delivering the desired service levels.

TACTIC 1	TACTIC 2	TACTIC 3	TACTIC 4
Compile existing information on MKE's assets and infrastructure in order to develop an up-to-date inventory.	Establish criteria against which assets will be evaluated.	Identify a schedule for asset performance review.	Align AMP with SMP implementation plan.
TACTIC 5	**TACTIC 6**	**TACTIC 7**	**TACTIC 8**

RANK	6	WATER MANAGEMENT	
ACTION		**DESCRIPTION**	
Develop a dedicated water management and efficiency program.		Developing a dedicated water management and efficiency program will allow the airport to better track water usage (consumption) and develop and track actions/measures to save water.	
TACTIC 1	**TACTIC 2**	**TACTIC 3**	**TACTIC 4**
Develop water efficiency guidelines for all new installation and replacement fixtures.	Develop an employee training program around water management best practices.	Install sub meters in different buildings and areas to track water usage.	Continue monitoring water consumption and track and report on water usage and cost savings.
TACTIC 5	**TACTIC 6**	**TACTIC 7**	**TACTIC 8**

RANK	7	EMPLOYEE ENGAGEMENT	

ACTION	DESCRIPTION
Involve employees directly in the SMP and airport sustainability programs.	Involve employees directly in the SMP and airport sustainability program by increasing training, information and responsibilities around sustainability

TACTIC 1	TACTIC 2	TACTIC 3	TACTIC 4
Include educational training on sustainability in periodic employee meetings.	Include sustainability responsibilities in job descriptions.	Link achievement of the organization's sustainability goals to performance reviews of key personnel.	Post sustainable meeting best practices in meeting rooms and on internet and intranet sites.
TACTIC 5	**TACTIC 6**	**TACTIC 7**	**TACTIC 8**
Empower employees to reward travelers who act sustainably.	Allow opportunities to collect employee feedback through surveys or during employee reviews.		

RANK	8	COMMUNITY ENGAGEMENT	

ACTION	DESCRIPTION
Involve airport business and community stakeholders in the development and implementation of MKE's sustainability programs.	Involve airport business and community stakeholders in the development and implementation of MKE's sustainability programs.

TACTIC 1	TACTIC 2	TACTIC 3	TACTIC 4
Develop a sustainability stakeholder engagement calendar.	Coordinate informal meetings with the mayors of neighboring cities to discuss airport projects, sustainability, and other general information.	Detail current and anticipated sustainability practices on airport and local municipality websites and provide an opportunity for community input.	Develop a "Speaker's Bureau" where airport representatives report the airport's sustainability accomplishments to local communities and determine points of collaboration for future practices.
TACTIC 5	**TACTIC 6**	**TACTIC 7**	**TACTIC 8**
Highlight community based sustainability initiatives (e.g. through photo exhibit)	Promote MKE volunteer service day	Identify local / regional academic institutions that may be interested in having the opportunity to collaborate.	Provide sustainability awareness training programs, presentations, and/or meetings for employees, consultants, tenants, and contractors.
TACTIC 9	**TACTIC 10**		
Set up annual or bi-annual clean-up events to collect bulky, non-hazardous items from tenants, airlines, and airport employees for recycling, donation, or disposal.	Establish a regular meeting schedule to discuss sustainability progress with construction and maintenance contractors, tenants, airlines, local regulators, and/or national civil aviation administration		

RANK	9	OPERATIONAL EFFICIENCY	

ACTION	DESCRIPTION
Evaluate the feasibility of expanding the use of Cityworks to include monitoring of additional sustainability actions.	MKE already uses Cityworks to manage operation and maintenance (O&M), safety and other areas. The potential expansion of this program to monitor and manage additional sustainability topics represents an opportunity for MKE to build on existing business software and bring additional sustainability topics under management.

TACTIC 1	TACTIC 2	TACTIC 3	TACTIC 4
Evaluate current uses of Cityworks at the airport, including work flow management and operations, for potential expansion to include new sustainability topics, data points and work flow activities.	Use a maintenance log to track resource use (fuel, water, waste, materials).	Emphasis should be on focus areas with specific data and work flow activities that impact operations, such as Air, Energy, Waste, and Water.	
TACTIC 5	**TACTIC 6**	**TACTIC 7**	**TACTIC 8**

RANK	10	SUSTAINABLE BUILDINGS AND INFRASTRUCTURE	
ACTION		**DESCRIPTION**	
Use the Envision rating system to assess the sustainability of airport infrastructure projects and development programs.		Envision is a rating system that provides a holistic framework for evaluating the community, environmental, and economic benefits of all types and sizes of infrastructure projects. The Envision Rating System is increasingly being considered and used in aviation industry to evaluate, grade, and give recognition to infrastructure projects and assess the sustainability indicators over the course of the project's life cycle.	
TACTIC 1	**TACTIC 2**	**TACTIC 3**	**TACTIC 4**
Identify an upcoming project at MKE to complete an informal Envision assessment as a trial / pilot project.	Identify one or more staff member to become Envision accredited.	Complete one Envision certified project.	Include Envision language in the specifications for major infrastructure projects.
TACTIC 5	**TACTIC 6**	**TACTIC 7**	**TACTIC 8**

RANK	11	WATER MANAGEMENT	

ACTION	DESCRIPTION
Improve stormwater management at MKE through green infrastructure and watershed restoration projects in collaboration with MMSD.	MMSD has set ambitious goals for greenhouse gas (GHG) reduction, stormwater management improvement and development of green infrastructure. Leverage MMSD's goals to partner on stormwater management and watershed restoration projects.

TACTIC 1	TACTIC 2	TACTIC 3	TACTIC 4
Install rain gardens, green roofs, bioswales, infiltration features, and other stormwater management facilities to reduce stormwater runoff throughout the airport (including entry roads).	Develop green infrastructure policy and / or design and construction guidelines for green infrastructure.	Remove concrete from Wilson Creek channel downstream of the airport.	
TACTIC 5	**TACTIC 6**	**TACTIC 7**	**TACTIC 8**

RANK	12	ECONOMIC PROSPERITY	
ACTION		**DESCRIPTION**	
Establish a dedicated yearly budget and identify grants to fund sustainability initiatives.		Having an established sustainability budget will support the planning and strategy development process for MKE by allowing the airport to forward fund sustainability projects, resulting in operational cost savings.	
TACTIC 1	**TACTIC 2**	**TACTIC 3**	**TACTIC 4**
Allocate financial savings from sustainability initiatives such as energy and water efficiency towards the implementation of further sustainability programs.	Investigate energy tax credits, rebates, and grants by local utilities or federal, state, or local agencies.	Apply for national, state, and local grants to support the implementation of sustainable practices.	
TACTIC 5	**TACTIC 6**	**TACTIC 7**	**TACTIC 8**

RANK	13	OPERATIONAL EFFICIENCY	

ACTION	DESCRIPTION
Evaluate the airport's operation and maintenance (O&M) manual to ensure it is sufficient and comprehensive, including any new areas identified in the SMP.	Evaluate the airport's O&M manual to ensure it is sufficient and comprehensive and incorporate any new or enhanced O&M areas that are developed as a result of the SMP. A comprehensive O&M manual would include all systems and operations at MKE and include any new or expanded / enhanced sustainability considerations.

TACTIC 1	TACTIC 2	TACTIC 3	TACTIC 4
Collaborate O&M updates with Cityworks action.			

TACTIC 5	TACTIC 6	TACTIC 7	TACTIC 8

RANK	14	AIR QUALITY AND CLIMATE CHANGE	
ACTION		**DESCRIPTION**	
Pursue Airport Carbon Accreditation certification.		Use the baseline information gathered for the SMP to pursue Airport Carbon Accreditation (ACA) Level 1 mapping certification. ACA is a platform for aviation industry GHG and climate leadership, sponsored by Airports Council International (ACI).	
TACTIC 1	**TACTIC 2**	**TACTIC 3**	**TACTIC 4**
Pursue Level I Mapping certification by: developing a carbon footprint report in accordance to ISO 14064 standard, developing a carbon policy that explicitly includes management commitment, and verifying the GHG Inventory by a third party.	Pursue Level II Reduction certification by fulfilling Level I requirements and demonstrating reductions in GHG emissions per passenger.		
TACTIC 5	**TACTIC 6**	**TACTIC 7**	**TACTIC 8**

RANK	15	AIR QUALITY AND CLIMATE CHANGE	

ACTION	DESCRIPTION
Complete an annual GHG inventory.	Building on the SMP baseline GHG inventory, complete annual GHG inventory updates to monitor performance and track progress toward achieving GHG emission reduction.

TACTIC 1	TACTIC 2	TACTIC 3	TACTIC 4
Identify and categorize GHG Scope 1 and 2 emission sources.	Engage data owners for each emission source and require monitoring and collection of data on an annual basis.	Use a calculation tool that allows easy data input and that can quickly provide results.	Review ACRP Report 11 - Guidebook on Preparing Airport GHG Inventories.
TACTIC 5	**TACTIC 6**	**TACTIC 7**	**TACTIC 8**

RANK	16	ENERGY MANAGEMENT	
ACTION		**DESCRIPTION**	
Develop a Strategic Energy Management Plan (SEMP).		Build on the Energy Survey Report and SMP by developing a Strategic Energy Management Plan (SEMP). An SEMP is developed to analyze various energy improvement options and select actions that will yield the greatest benefit to the airport over the short- and long-term.	
TACTIC 1	**TACTIC 2**	**TACTIC 3**	**TACTIC 4**
Develop SEMP including an Implementation and Monitoring component that will allow MKE to evaluate progress towards goals.	Review Airport Cooperative Research Program (ACRP) Synthesis 21 - Airport Energy Efficiency and Cost Reduction.		
TACTIC 5	**TACTIC 6**	**TACTIC 7**	**TACTIC 8**

RANK	17	ENERGY MANAGEMENT	

ACTION	DESCRIPTION
Evaluate the potential for guaranteed energy performance contract.	Evaluate the potential for using an energy performance contract to implement significant energy reduction opportunities. In this case, a performance contractor, typically an Energy Service Company (ESCO), is hired to carry out and pre-finance improvement measures with regard to the energy efficiency in major areas such as lighting, HVAC or cogeneration, as well as with renewable energy systems. Compared to traditional project delivery methods, the performance contractors provides the capital for improvements.

TACTIC 1	TACTIC 2	TACTIC 3	TACTIC 4
Get references for the ESCO from other clients (especially other airports) to make sure the ESCO doesn't get savings by cutting corners (i.e. closing ventilation dampers, reducing lighting quality, adjusting thermostat set points too high / low, etc.).	Engage a third party engineering firm to help write the RFP, evaluate the ESCOs and proposed energy savings measures.		
TACTIC 5	**TACTIC 6**	**TACTIC 7**	**TACTIC 8**

RANK	18	GENERAL	
ACTION		**DESCRIPTION**	
Incorporate the MKE Sustainability Management Plan in the upcoming Master Plan (MP) update.		Build on the SMP process and results to include sustainability as a guiding principle for the upcoming MP update.	
TACTIC 1	**TACTIC 2**	**TACTIC 3**	**TACTIC 4**
Identify focus areas that will be discussed in the MP and incorporate results.	Build on the relationships built during the SMP program to develop the MP engagement program.		
TACTIC 5	**TACTIC 6**	**TACTIC 7**	**TACTIC 8**

RANK	19	OPERATIONAL EFFICIENCY	

ACTION	DESCRIPTION
Develop and implement an Environmental Management System (EMS) and a Energy Management System (EnMS).	Develop and implement an Environmental and/or Energy Management System (EMS and EnMS) to track progress in improving environmental performance and energy efficiency. A management system is a management structure that helps organizations achieve goals through a systematic approach toward regulatory compliance. It includes voluntary goals and can be tailored to meet the specific requirements and goals that apply to an organization.

TACTIC 1	TACTIC 2	TACTIC 3	TACTIC 4
Follow ISO 14001 EMS and ISO 50001 EnMS guidance and consider independent audit/ verification.	Have a staff member attend a certified training on ISO 14001 EMS and ISO 50001 EnMS.	Establish a document management system so that project files can be submitted and archived electronically.	Review ACRP Synthesis 44 - Environmental Management System Development Process.
TACTIC 5	**TACTIC 6**	**TACTIC 7**	**TACTIC 8**
Create an "Environment and Energy handbook for tenants" that includes emergency contact numbers, policies, reporting requirements and all procedures that affect their operations.			

RANK	20	SUSTAINABLE BUILDINGS AND INFRASTRUCTURE	
ACTION		**DESCRIPTION**	
Conduct a Climate Change and Resiliency Impact / Vulnerability Assessment.		Conduct a Climate Change and Resiliency Impact / Vulnerability Assessment to provide proactive planning with the goal to mitigate negative impacts, prepare for changing conditions, increase safety and limit potential financial losses due to closures or operational blackouts.	
TACTIC 1	**TACTIC 2**	**TACTIC 3**	**TACTIC 4**
Coordinate with other educational and governmental organizations studying this topic in the region to develop an assessment.	Look to Federal Emergency Management Agency (FEMA), in addition to FAA, for guidance and funding sources.	Identify potential impact of climate change on flight delays and cancelations for flights in and out of MKE.	
TACTIC 5	**TACTIC 6**	**TACTIC 7**	**TACTIC 8**

RANK	21	WASTE MANAGEMENT	

ACTION	DESCRIPTION
Develop a monitoring and tracking plan for the airport waste stream.	Develop a monitoring and tracking plan for the airport waste stream and create a centralized system. This would allow the airport to better understand waste diversion activities and results and inform development of effective waste reduction strategies. Currently available information regarding waste, number of pickups and cost is fragmented and does not provide the airport with the necessary information to manage waste effectively.

TACTIC 1	TACTIC 2	TACTIC 3	TACTIC 4
Conduct periodic waste stream audits.	Periodically evaluate the status of low priority waste streams.		

TACTIC 5	TACTIC 6	TACTIC 7	TACTIC 8

RANK	22	AIR QUALITY AND CLIMATE CHANGE	
ACTION		**DESCRIPTION**	
Evaluate options and consider direct purchase of renewable energy or purchase of renewable energy certificates (RECs).		Energy represents the largest GHG emission source for MKE. Purchasing renewable energy or RECs could have a significant impact in terms of GHG emission reductions.	
TACTIC 1	**TACTIC 2**	**TACTIC 3**	**TACTIC 4**
Purchase "Green Power" from a local energy provider to fund renewable energy research, development, production, and use.	Evaluate possibility of entering into a Power Purchase Agreement with a renewable energy developer (e.g., for onsite solar energy production).	Review ACRP Report 57 - The Carbon Market: A Primer for Airports.	
TACTIC 5	**TACTIC 6**	**TACTIC 7**	**TACTIC 8**

RANK	23	CUSTOMER EXPERIENCE	

ACTION	DESCRIPTION
Track and evaluate existing data collected on passenger satisfaction.	Track passenger / customer satisfaction (CANmark survey) and communicate results with airport staff in order to maintain or improve customer satisfaction.

TACTIC 1	TACTIC 2	TACTIC 3	TACTIC 4
Monitor CANMark results.	Determine if addition data is needed, if so, consider implementing annual customer experience survey.	Share customer satisfaction results from Airport Survey with airport staff in a standardized way.	Provide recognition to employees when customer satisfaction is high in a particular area.

TACTIC 5	TACTIC 6	TACTIC 7	TACTIC 8

RANK	24	CUSTOMER EXPERIENCE	
ACTION		**DESCRIPTION**	
Improve customer experience by improving wayfinding, travel and wait.		Improve wayfinding so that customers can easily move throughout the airport efficiently, improve travelers experience by creating a better 'waiting' experience.	
TACTIC 1	**TACTIC 2**	**TACTIC 3**	**TACTIC 4**
Install, increase, and/or improve wireless internet connectivity to ensure consistent access for passengers and customers.	Consider improving waiting areas by adding features such as TV screens, charging stations, business meeting rooms and other amenities.	Develop an airport mobile app that includes access to retail and dining promotions, real-time flight status, emergency alerts, terminal maps, weather and city guides and airport facilities (also include a sustainability tab/ component).	Include wayfinding as part of master plan update.
TACTIC 5	**TACTIC 6**	**TACTIC 7**	**TACTIC 8**
Improve wayfinding during construction or any interruption to normal operations.			

RANK	25	ENERGY MANAGEMENT	

ACTION	DESCRIPTION
Enhance the airport's energy management program by developing an energy efficiency program for tenants.	Enhance the airport's energy management program by developing an energy efficiency program for tenants. Tenant activities contribute a significant amount of energy use, being able to track tenant consumption and collaborate to improve energy efficiency would allow for increased savings and reduced energy consumption for the airport.

TACTIC 1	TACTIC 2	TACTIC 3	TACTIC 4
Install tenant energy sub-metering systems.	Include minimum energy efficiency requirements in concession contracts.		

TACTIC 5	TACTIC 6	TACTIC 7	TACTIC 8

RANK	26	WATER MANAGEMENT	
ACTION		**DESCRIPTION**	
Review and update comprehensive Storm Water Management Plan (SWMP).		Review and update Comprehensive SWMP and stormwater management approach at MKE to continue moving beyond compliance and incorporating best management practices (BMPs) that will reduce stormwater flow and runoff contamination.	
TACTIC 1	**TACTIC 2**	**TACTIC 3**	**TACTIC 4**
Train on-site personnel in pollution prevention procedures and make the SWMP available at construction sites for review.	Ensure construction sites are inspected frequently to ensure compliance with the SWMP and BMPs.	Coordinate SWMP elements with tenant plans.	Continue evaluating BMPs and use of technologies to reduce unnecessary deicing.
TACTIC 5	**TACTIC 6**	**TACTIC 7**	**TACTIC 8**

RANK	27	EMPLOYEE ENGAGEMENT	

ACTION	DESCRIPTION
Build awareness of airport job openings and improve communications regarding job advertising.	Improve available job advertisement to reach a larger audience, including the greater Milwaukee metro area, allowing for a larger pool of candidates to apply for openings.

TACTIC 1	TACTIC 2	TACTIC 3	TACTIC 4
Targeted advertising of openings with a specific focus on Milwaukee's disadvantaged areas.	Recruitment incentives for employees to make referrals.		

TACTIC 5	TACTIC 6	TACTIC 7	TACTIC 8

RANK	28	EMPLOYEE ENGAGEMENT	
ACTION		**DESCRIPTION**	
Provide opportunities for employee engagement, advancement and growth.		More engaged employees that can see advancement opportunities will improve retention and allow for higher efficiency and better results in all aspects of the airport including sustainability.	
TACTIC 1	**TACTIC 2**	**TACTIC 3**	**TACTIC 4**
Mentor programs.	Education programs.	Coordinate with employees for feedback, such as a periodic roundtable/summit.	Build on existing team-building initiatives such as bike to work competition.
TACTIC 5	**TACTIC 6**	**TACTIC 7**	**TACTIC 8**
Monitor employee survey results to identify areas for improvement and develop new programs.	Identify MKE employees who may be interested in joining a committee to advance specific topics including sustainability, employee retention and more.		

RANK	29	ENERGY MANAGEMENT	

ACTION	DESCRIPTION
Complete installation of sub-meters in all areas of the airport including terminals, Business Park buildings, tenant areas and airfield.	Having extensive sub-metering capabilities would allow MKE to track all energy uses and identify possible anomalies and issues in the energy usage pattern. This could lead to the development of strategies promoting efficiencies and savings.

TACTIC 1	TACTIC 2	TACTIC 3	TACTIC 4
Identify areas that are currently sub-metered.	Develop a plan to install sub-meters prioritizing areas and systems that are large energy users (HVAC systems, lighting, etc.).		
TACTIC 5	**TACTIC 6**	**TACTIC 7**	**TACTIC 8**

RANK	30	GENERAL	
ACTION		**DESCRIPTION**	
Integrate sustainability metrics into MKE KPI initiative.		Add new sustainability metrics identified in SMP into the MKE KPI initiative. Leverage and incorporate what has already been done through Cityworks and the SMP. This will apply to all focus areas.	
TACTIC 1	**TACTIC 2**	**TACTIC 3**	**TACTIC 4**
Develop or adopt sustainability guidelines and metrics.	Include Facility Condition Index (FCI) as a KPI to be tracked.	Integrate various airport departments and functions to promote sustainability goals, including planning and design, operations and maintenance, procurement, real estate, and legal.	
TACTIC 5	**TACTIC 6**	**TACTIC 7**	**TACTIC 8**

RANK	31	HEALTH AND SAFETY	

ACTION	DESCRIPTION
Develop and implement a Risk Management System Plan.	Having a formal Risk Management System Plan in place would allow MKE to improve the ability to identify risks and accordingly prepare for them. This will increase the airport's resiliency.

TACTIC 1	TACTIC 2	TACTIC 3	TACTIC 4
Develop and implement a Risk Management System Plan according to International Organization for Standardization (ISO) 31000 Risk Management Principles and Guidelines.			
TACTIC 5	**TACTIC 6**	**TACTIC 7**	**TACTIC 8**

RANK	32	WATER MANAGEMENT	
ACTION		**DESCRIPTION**	
Develop a tenant engagement program for water management and efficiency.		Develop a program to engage tenants in water management and efficiency. Involving tenants in the airport water management and efficiency program would allow for increased savings and reduced water consumption for the airport.	
TACTIC 1	**TACTIC 2**	**TACTIC 3**	**TACTIC 4**
Provide incentives to tenants that meet or exceed minimum water efficiency requirements set by MKE.	Conduct regular tenant check ins and enforcement.	Install sub meters on all concessions to track water usage.	
TACTIC 5	**TACTIC 6**	**TACTIC 7**	**TACTIC 8**

RANK	33	COMMUNITY ENGAGEMENT	

ACTION	DESCRIPTION
Develop a communication plan for distributing sustainability information to the public.	Communicating the efforts and results of the sustainability program will create more engagement and support from the region.

TACTIC 1	TACTIC 2	TACTIC 3	TACTIC 4
Develop a communication plan that includes social media posts, website information, commercial advertisement in the terminals, stakeholder presentations, etc.	Distribute press releases regarding specific airport projects and sustainability accomplishments.	Use social media to promote the airports sustainability accomplishments.	Promote sustainable achievements and goals in relation to construction activities.
TACTIC 5	**TACTIC 6**	**TACTIC 7**	**TACTIC 8**
Issue a newsletter to local residents, businesses, libraries, and the city hall that promotes sustainable activities in construction, airport updates, events and facts.			

RANK	34	ECONOMIC PROSPERITY	

ACTION	DESCRIPTION
Develop an updated economic study (potentially incorporated as part of the master plan update).	An updated economic study would include updated information on MKE's economic impact and incorporate the latest economic conditions in the region thus providing useful information for airport planning. The latest Economic Study for the airport utilizes 2010 data.

TACTIC 1	TACTIC 2	TACTIC 3	TACTIC 4
Develop a new 2015 or 2016 economic study to support the upcoming MKE Master Plan Update.	Use existing studies (2005 and 2010) as a basis for comparison.	Communicate economic data on airport costs, activities and direct and indirect economic impact.	Include analysis on airport related assets such as the Amtrak station.
TACTIC 5	**TACTIC 6**	**TACTIC 7**	**TACTIC 8**

RANK	35	GENERAL	

ACTION	DESCRIPTION
Produce a sustainability newsletter, that would be available to employees, stakeholders and the general public periodically (every quarter or six months).	Keep internal and external stakeholders aware of MKE's sustainable achievements by producing and distributing a summary document of including current and future projects and results of sustainable initiatives.

TACTIC 1	TACTIC 2	TACTIC 3	TACTIC 4
Use the available KPI tracking tools (e.g. Cityworks, SMP tracking tool) to develop a 1-2 page periodic sustainability newsletter.			
TACTIC 5	**TACTIC 6**	**TACTIC 7**	**TACTIC 8**

RANK	36	ECONOMIC PROSPERITY	
ACTION		**DESCRIPTION**	
Develop a business plan for the Business Park and Timmerman Airport.		Identify current and possible future uses for the Business Park buildings including land development options and explore potential growth of Timmerman Airport.	
TACTIC 1	**TACTIC 2**	**TACTIC 3**	**TACTIC 4**
Include an analysis of the current conditions of the Business Park in terms of occupancy, the revenue it provides and the expenses incurred to maintain it.	Develop scenarios for future use of the Business Park including options such as demolition and redevelopment of the area.	Develop a business plan for Timmerman Airport. Consider aligning effort with the business plan for the MKE Business Park and with the economic study developed for MKE during the MP process.	Leverage internal resources and get support from a consultant with specific expertise.
TACTIC 5	**TACTIC 6**	**TACTIC 7**	**TACTIC 8**

RANK	37	WATER MANAGEMENT	

ACTION	DESCRIPTION
Develop partnerships with other organizations in the water management / technology space and engage stakeholders on relevant water topics.	Leverage the City of Milwaukee's role as a water technology hub by partnering with innovators and allow technologies to be utilized and/or tested at the airport.

TACTIC 1	TACTIC 2	TACTIC 3	TACTIC 4
Develop a partnership with organizations such as The Water Council.	Partner with Global Water Center or University of Wisconsin-Milwaukee School of Freshwater Sciences on topics such as gray water, green roofs, etc.	Develop a stakeholder engagement and awareness program around water management (potable and stormwater) and technology.	

TACTIC 5	TACTIC 6	TACTIC 7	TACTIC 8

The Action Registry is intended to be consulted and updated frequently as MKE works to implement sustainability actions.

IMPLEMENTATION PLAN »

CHAPTER 5

IMPLEMENTATION PLAN

IMPLEMENTATION TOOLS

MANAGEMENT ACTIVITIES & RESPONSIBILITIES

SUSTAINABILITY ACTIONS IMPLEMENTATION DETAILS

The prioritized table of sustainability actions details initiatives to reduce the airport's environmental footprint and maximize beneficial social and economic impacts. The final effort for the MKE Sustainability Management Plan was the development of a set of tools and recommendations for implementing those actions, with an analysis of each action and an overview of key factors affecting its execution, monitoring and reporting. This chapter includes a description of the tools that have been developed to aid in implementation and discusses airport management activities and responsibilities. Together, the set of tools and implementation activities will guide the airport in carrying out the sustainability initiatives.

IMPLEMENTATION TOOLS FOR SUSTAINABILITY AT MKE

Action Registry: The full set of 37 sustainability actions - including the 13 Priority Sustainability Actions and remaining 24 sustainability actions which received fewer than 20 points in the ranking activity - were compiled in a spreadsheet with description, tactics, results of the ranking exercise and summary of high level implementation considerations. For each action, the table includes columns listing estimated implementation cost, duration, status, the person or department responsible, and funding sources. Although the table features less detail than the Implementation Detail Sheets, it will allow MKE staff and their partners to sort through the lengthy list of initiatives to program future activities based on available funding, grant cycles, and staff availability. The full Action Registry is provided in the attachments.

Implementation Detail Sheets: Through the sustainability actions development, refinement and prioritization process described in Chapter 4, 13 priority actions were identified to improve the sustainability of airport operations. For these actions – representing 9 of the 11 focus areas – AECOM and the MKE core team developed individual Implementation Detail Sheets. The Implementation Detail Sheets are included in an intuitive spreadsheet management tool that features estimates of time and costs to implement each action, identifies internal champions and their responsibilities, notes how progress may be monitored and lists potential barriers to implementation. These sheets provide detailed information on a range of implementation factors:

- **General information.** Action title and ID, focus area, description and tactics.
- **Sustainability goals addressed by the action.**
- **Performance monitoring.** Performance targets and indicators used to monitor progress towards goals.
- **Budget information.** Estimated cost to implement and operate actions and tactics, funding sources.

- **Implementation information.** Status, start date and duration, responsible individuals or departments.
- **Additional notes.** Information regarding obstacles, relevant changes, incentives, etc.
- **Related policies, guidance and documents.**

The detail sheets are intended to provide MKE staff and its partners a detailed overview of the actions and the considerations to be addressed in implementing them. They relate the action to the overall SMP and provides an opportunity to monitor successes. The sheets are intended to be consulted and updated frequently as MKE works to implement sustainability actions. A sample sheet is included in this chapter; the full Action Registry is included as Attachment 6 to this document and was provided to MKE in an editable format to allow updating.

Monitoring Tool. AECOM provided MKE with a tool to standardize the ongoing monitoring and reporting of sustainability performance at the airport. Linked to the baseline evaluation completed for the SMP, the MS Excel-based tool is a sophisticated spreadsheet developed to enable MKE staff and their partners to regularly enter performance data regarding energy consumption and costs, water consumption and costs, and waste production and disposal and recycling costs. The spreadsheet then can output charts detailing usage and cost over time, with the ability to select and separate the information between the two main airport facilities (terminals and Business Park) and to visualize values in absolute terms or by enplanement. These options and functionalities will allow MKE to monitor performance over time and to account for any change (growth or reduction) in airport activity.

MANAGEMENT ACTIVITIES AND RESPONSIBILITIES

Mitchell Airport's administration and staff include numerous people and departments with an interest in improving the airport's sustainability performance. These include engineering, operations, environmental, human resources, communications and financial management staff, each of whom may find that their sphere of responsibility benefits from implementing and monitoring the performance of sustainability actions. The interest and participation of a wide range of internal stakeholders on the Technical Advisory Group demonstrates the potential for strong airport commitment to implementing these actions.

A general framework for implementation could look like this:

> Mitchell Airport's administration and staff include numerous people and departments with an interest in improving the airport's sustainability performance.

The steps in this framework include:

Select sustainability actions for implementation. MKE staff and partners review the action registry and select actions for implementation based on funding, staff availability, costs and return on investment or other opportunity factors (such as related capital projects being undertaken, partner activities, etc.).

Implement selected actions. Refine actions or tactics as necessary, identify funding, and implement the actions.

Collect data and evaluate implementation results. Collect data and enter into monitoring tool as appropriate; evaluate outcomes.

Report and communicate results of implementation. Communicate internally and externally to describe the returns on the implementation.

Review all potential actions. Review actions in both the priority and non-priority lists in this SMP; determine whether conditions have altered sufficiently to move some non-priority actions to the priority list. Then select actions and begin the cycle again. This process could coincide with annual budgeting or on another convenient timeframe. The action registry, and detailed sheets should be updated at this time.

A collaboration between the Milwaukee County Sustainability Department, MKE Engineering and MKE Environmental will initially take the lead on implementing the SMP at the airport. This collaboration will work to find a long term champion to head the MKE sustainability efforts.

As the SMP represents the first formal step toward institutionalizing sustainability at the airport, several enhancements to MKE operations and policies could be considered.

- **Continue to engage the Technical Advisory Group assembled to guide the development of the SMP.** The TAG includes representatives from a range of airport operations and management roles, and contributed their knowledge and insights to the SMP, making its recommended actions relevant to conditions at the airport. Through ongoing regular meetings, the TAG may continue in guiding implementation of the sustainability actions, monitoring the results, and communicating successes to management, staff and the public.
- **Develop dedicated sustainability policies and procedures.** Policies and procedures may be created to guide sustainability decision-making and to institutionalize consideration of sustainability in airport capital and operations planning. These policies and supporting procedures should establish how and by whom sustainability activities will be conducted, which activities are the top priorities for the airport, and how to resolve potential conflicts between different priorities.
- **Evaluate data sources and management tools.** Quality data for the airport's sustainability program is critical to effective and strategic implementation. This may involve assigning responsibility for monitoring outcomes and maintaining the sustainability monitoring tool. Additionally, data should be available to those who need access to coordinate activities and to create the airport's public narrative as a regional leader in sustainability management.
- **Define staff roles and responsibilities.** Defined roles and responsibilities for staff that deal with sustainability initiatives could prevent overlap and siloed efforts between departments, while streamlining decision making and supporting efficient budget and resource allocation in line with the goals outlined in the SMP. A critical consideration in reorganizing roles and responsibilities of existing staff as well as for hiring new staff is to have professionals with the right qualifications. Staff should be trained appropriately and qualified to provide support and technical experience related to airport systems as well as support tenant and other lease holder areas with sustainability management experience.
- **Develop a formal sustainability management program.** The initiatives described in the SMP could converge in the development of a formalized sustainability program at MKE. Having a structured sustainability management policy and approach, goals, specific procedures, a comprehensive list of actions with an implementation plan, a clear organizational structure with defined roles and responsibilities, and mechanisms in place to track, collect, verify and analyze sustainability data would allow MKE to systematically implement sustainability actions and drive continual improvement in outcomes.

MILWAUKEE INTERNATIONAL AIRPORT - SUSTAINABILITY MANAGEMENT PLAN - ACTION REGISTRY					
GENERAL INFORMATION					
ACTION TITLE					
ACTION ID					
FOCUS AREA					
DESCRIPTION					
SUSTAINABILITY GOALS					
GOALS					
BUDGET INFORMATION					
UPFRONT COST	☐ Expected		<notes>		
	☐ Actual		<notes>		
ADDITIONAL COSTS	☐ Expected		<notes>		
	☐ Actual		<notes>		
IMPLEMENTATION INFORMATION					
STATUS	☐ Standby	☐ Planned	☐ Ongoing	☐ Completed	
START DATE	<date>	Duration	☐ Expected		<notes>
END DATE	<date>		☐ Actual		<notes>
PRIMARY RESPONSIBILITY	<department/ staff members>				
	<department/ staff members>				
	<department/ staff member				
	<notes>				

MILWAUKEE INTERNATIONAL AIRPORT - SUSTAINABILITY MANAGEMENT PLAN - ACTION REGISTRY				
GENERAL INFORMATION				
TACTICS				
TARGETS AND KPIs				
PERFORMANCE TARGETS	‹list›		Tracked Key Performance Indicators (KPIs) / Metrics	‹list›
BUDGET INFORMATION				
ANNUAL OPERATING COST	☐ Expected		‹notes›	
	☐ Actual		‹notes›	
FUNDING SOURCES	☐ CapEx	☐ OpEx	☐ Mix	☐ Unknown
	Gran Eligible ☐ Yes ☐ No	Type of Grant		% Coverage
ADDITIONAL NOTES				
‹relevant changes, obstacles, barriers, etc.›				
RELATED POLICIES, GUIDANCE AND OTHER DOCUMENTS				
‹list of docs›				


To Parking

This report describes the results of AECOM's collaboration with Milwaukee County's General Mitchell International Airport (MKE) to develop a sustainability management plan. AECOM's report is subject to the limits of the established scope of work described in AECOM's proposal and contract. To the extent possible, AECOM has attempted to independently assess the information provided to it by MKE and others within the limits of the established scope of work and in accordance with the generally accepted practices for the consulting profession; however, it is possible that certain information could not be independently verified. AECOM shall not be held responsible for conditions or consequences arising from relevant facts that were concealed, withheld, misrepresented or not fully disclosed by others, MKE or their respective representatives at the time these services were performed. In addition, the findings in the report are subject to certain conditions and assumptions and its accuracy is limited to the time period and circumstances in which it was collected, processed, made or issued. The conditions and assumptions are noted in the report, and any party reviewing the findings of the report must carefully review and consider all such conditions and assumptions. Particularly, the Report must be read as a whole, and sections thereof should not be read out of their context.

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