

Wayne County
Airport Authority

Sustainability Accomplishments Report

JAN 2017



People.



Planes.



Planet.

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Introduction

The Wayne County Airport Authority recognizes that global challenges such as resource depletion, economic stability, and energy security can impact the future of the aviation industry and the prosperity of Southeast Michigan. With these challenges in mind, the Authority is committed to increasing economic benefits, reducing environmental impacts, and improving employee and community relations associated with the operation of Detroit Metropolitan (DTW) and Willow Run (YIP) Airports.

DTW is a large-hub airport that served 33.4 million passengers in 2015. Willow Run is a busy reliever airport serving cargo, corporate, and general aviation operations. These two airports represent significant infrastructure investments made for the benefits of the community, business partners, and the national aviation system. The Authority is proud to be entrusted with the long-term viability of these important air transportation centers.




This Wayne County Airport Authority Sustainability Accomplishments Report describes the many projects that the Authority has completed over the past several years and that are currently underway to anchor the Authority's commitment toward a sustainable future.

This report is an element of the Authority's Sustainability Management Plan (SMP) that is being developed under three themes: **People, Planes & Planet.**


"This Sustainability Accomplishments report is a living document that will be updated periodically as new sustainability measures are undertaken."

There are objectives within each theme that outline the areas in which the Authority will focus effort and resources and that will be considered when making decisions regarding current and future operation of the Authority's airports. These objectives are shown below:

People.

-  **Provide a World-Class Passenger Experience**
-  **Promote Employee Training and Succession**
-  **Build Partnerships**

Planes.


-  **Operate Safe and Secure Airports**
-  **Maximize Airfield Efficiency**
-  **Maintain Competitive Cost Structure**

Planet.

-  **Air Quality**
-  **Noise**
-  **Waste Management**
-  **Water Management**
-  **Energy Management**
-  **Natural Resources**

The objectives shown above may overlap between the three themes. In this report, projects are documented under the theme and linked to the objectives to which they most closely align.

People



“People” focuses on the Authority’s commitment to its employees, neighboring communities, and passengers that fly from its facilities. The Authority is consistently advancing its commitment to these stakeholders by promoting employee wellness and career development, being a good neighbor in the community, and providing world-class services for passengers.

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Employee Wellness

Objective:



Promote Employee Training and Succession

Employee wellness is an integral component of overall staff satisfaction and effective performance. The employee wellness measures discussed below have been implemented for Authority staff.

EMPLOYEE ASSISTANCE PROGRAM

The Wayne County Airport Authority offers an Employee Assistance Program (EAP) which is a free, voluntary, confidential service providing professional counseling and referral services designed to help employees, spouses, and dependent children with their personal, job or family problems. EAP’s purpose is to help employees and their families identify, resolve, and gain control over personal problems that may be interfering with work and daily life, including:

- Emotional
- Marital
- Family
- Alcohol Abuse
- Substance Abuse
- Job-Related Problems
- Grief/Loss
- Stress/Depression

If referral to an outside provider is needed, a counselor will recommend carefully selected resources, considering health insurance and other financial factors, to help ensure that needed services are available to Authority employees.

EMPLOYEE-INITIATED, HEALTH-FOCUSED SOCIAL GROUPS

There is a marked and measured, one-mile walking track on the ground level of the Smith Building that was envisioned and designed by Authority employees and laid out by the Authority Maintenance Department. The track allows employees to exercise inside throughout the year. Self-guided employee groups often meet there during lunch, or before and after work, to support each other in their exercise goals. Additionally, employees have come together to organize Weight Watchers meetings and other healthy social opportunities.

DISCOUNTED HEALTH CLUB MEMBERSHIPS

Understanding that exercise plays an integral role in a healthy lifestyle, the Authority partners with the Romulus Health Club to offer Authority employees discounted annual memberships.

HEALTH FAIR

The Authority organizes a biannual health fair. A variety of health-related vendors are invited to share information, offer giveaways, provide insurance enrollment, and conduct basic health screenings. Representatives from health and dental insurance companies, health care providers, fitness centers, weight loss programs, tobacco treatment services, hearing services, vision services, and other organizations have participated in these health fairs.

Future Plans:

EMPLOYEE FITNESS CENTER

The Authority plans to include an employee fitness center in the new administration building. This center will be open to all Authority employees for their use. The fitness center will be equipped with machines and weights for cardio exercise as well as strength training. Locker room and shower facilities are also planned. The administration building is anticipated to open in the summer of 2017.

Career Development

Objectives:



Employee Training and Succession



Maintain Competitive Cost Structure

Career Development is an important component of hiring and retaining competent staff. The Authority has implemented the following programs to support the Career Development of its employees:

LEARNING MANAGEMENT SYSTEM

The Authority maintains a computerized Learning Management System (LMS) to monitor and advance employee career development. The LMS software delivers critical skills courses, tracks employee training, and ties employee learning to performance metrics. LMS improves the Authority's business performance and enhances the work practices and productivity of its employees.

Types of Training Offered by WCAA through LMS

COMPLIANCE TRAINING: *human resources, safety, FAR 139, environmental.*

EXTERNAL DEVELOPMENT: *seminars, college courses.*

CRITICAL SKILLS CLASSES: *airport familiarization, safety, computer technology, customer service.*

From 2014 to 2015, the Authority provided employees with over 40,000 hours of training and critical skill courses. These training opportunities included new hire orientations, compliance trainings, and career and personal development courses, among others. Through the LMS discussed above, employees have access to webinars and classes to enhance their skills and to improve and grow their careers with the Authority.

In addition to facilitating the professional development of staff, the LMS helps the Authority to promote from within by identifying eligible employees for promotions or new positions. Employees are encouraged to update their resumes in the LMS so that the Authority can conduct internal talent searches when new positions open.

INTERN/CO-OP PROGRAM

The WCAA Internship Program is designed to provide selected students an opportunity to experience working at a large commercial Airport, and receive a real world, work-setting experience to gain an in-depth knowledge of how the WCAA operates on a day-to-day basis. Authority interns are assigned to various departments including: Airfield Operations; Public Safety; Facilities, Design, & Construction; Environment & Sustainability; Human Resources; Financial Planning and Analysis; Public Affairs; and Procurement.

Each Intern works closely with his/her functional leader to develop an IDP (Individual Development Plan) which is used to guide the intern through their goals and objectives for the duration of the program. The IDP outlines specific projects, activities and rotational opportunities the interns will experience during the course of their time with the Authority. In 2016, 14 interns with diverse educational backgrounds, from various local and national colleges and universities were hired. The internships are paid and are completed in 13 -14 weeks.

The Authority also partnered with a Detroit technical aviation high school – Davis Aerospace Technical High School – and hired five 10th -12th grade students who spent six weeks in a rotational CO-OP program learning the various operations of the Authority. Similar to the Internship Program, the CO-OP Students developed an IDP which guided their activities throughout their six weeks at DTW. The students were assigned a primary department where they spent 70% of their time with the other 30% spent rotating to different departments within the Authority.

Food Recovery and Donation

Objectives:



Waste Management



Build Partnerships

The Authority initiated a food recovery and donation program at DTW in June 2016. Unsold food generated by concessionaires in the McNamara Terminal is collected and transported to a local food bank organization by Authority staff. During the first two months of the program, more than 3,000 pounds of food was provided to the food bank. To further support this program, the Authority applied for and was awarded a \$45,000 Community Pollution Prevention (P2) Grant by the State of Michigan Department of Environmental Quality.



Staff working on Food Recovery and Donation Program.

The following quote is from Mary Hollens, Executive Director of Fish and Loaves Community Food Pantry, "I cannot fully express the difference these deliveries are making to our clients. You are allowing families to stretch their food. Young children who are out of school for the summer can have healthful sandwiches, salads, and more already prepared. Because of your diligence and your proximity, we are able to put these foods on the refrigerator shelves within minutes of unpacking and review".

Employee Efficiency Improvements

Objectives:



Employee Training and Succession



Maintain Competitive Cost Structure

Employee Efficiency is an important part of creating a sustainable and effective workforce. The Authority sponsors the following programs to support the efficiency of its employees:

MOBILE WORK ORDER/ SAFETY MANAGEMENT APPLICATION

The Authority is developing a mobile Work Order Application program to replace manual field data collection. The new application will be hosted on mobile electronic devices, creating a paperless method to process work orders and inspections. This initiative will increase the efficiency of information transfer by recording information in real-time and maintaining all information in one database.

In conjunction with the improved Work Order Application program discussed above, a computer notebook-based Safety Management System (SMS) program is being implemented as a method to track incidents and notify all departments of emergencies as they occur. For example, in the event of a chemical spill, all affected departments are simultaneously notified to facilitate a coordinated and timely response. The SMS mass notification helps connect people during a crisis to better manage operational incidents and increase overall airport safety.

ENCOURAGE PAPERLESS WORK ENVIRONMENT

The Authority is implementing numerous programs to substitute electronic documents for paper. Below are descriptions of some of these initiatives:

- **The Technical Services Department implemented a document management system to allow documents to be more efficiently located, and to reduce space needed for historical document storage. Currently, historical paper documents are being scanned and uploaded to an electronic system.**
- **Safety Data Sheets are now paperless.**

- **A pilot-program for paperless processing of solicitations was launched in 2015, reducing paper consumption and the time required to process documents. The goal of the pilot-program was to streamline the procurement document submittal process by eliminating paper, shipping, and storage. All solicitations received electronically are stored on a robust document management system, reducing the need to create physical paper copies of electronic submittals. This initiative reduces the use of environmental resources as well as staff time. Additional electronic procurement programs are in development.**

Expand Options for Travelers with Disabilities

Objectives:

-  **Provide a World-Class Passenger Experience**
-  **Build Partnerships**

The following programs and initiatives illustrate the Authority's dedication to improve travel experiences for travelers with disabilities at DTW.

ON BOARD WITH AUTISM PROGRAM

The travel experience can be often be overwhelming and difficult for families affected by autism. In 2014, the Authority and the Autism Alliance of Michigan teamed up to create the On Board with Autism Program to assist and guide families with autistic children through the air travel process. The On Board with Autism Program was designed to ease the anxiety that can come with navigating the terminal, security, and overall air travel processes by providing children with autism and their family members with the opportunity to visit the airport and familiarize themselves with the terminal and travel procedures prior to travelling.



K9 Dog in Service Animal relief Area.

DTW SERVICE ANIMAL RELIEF AREA

In 2014, the Authority partnered with Leader Dogs for the Blind and Paws with a Cause to offer a service animal relief area in the McNamara Terminal. DTW is one of the first airports in the world to install this type of facility, allowing service dog owners the ability to travel more comfortably and efficiently. In 2016, a service animal relief area was also added to the North Terminal. These areas are also used by the Police K9 units that patrol the terminals.

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Terminal Enhancements

Objective:

 **Provide a World-Class Passenger Experience**

Customer experience and ease of travel is a priority for the Authority. The Authority provides the following features to give its passengers a comfortable, safe, and memorable experience while traveling through DTW:





- **No-cost Wi-Fi access is available to all passengers at DTW.**
- **State-of-the-art digital interactive directories located in the McNamara Terminal scan the boarding pass of passengers and display the most convenient path to gates, restaurants, and other concessions.**
- **Airport Ambassador volunteers serve as information resource specialists to assist passengers with finding their way, flight status, baggage claim, gate locations, ground transportation, lost & found, as well as providing directions for regional visitors to conventions and local events.**



Passenger Using Interactive Directory Terminal.

Flooding Mitigation

Objectives:

-  **Water Management**
-  **Maximize Airfield Efficiency;**
-  **Maintain Competitive Cost Structure**
-  **Build Partnerships**

The DTW stormwater management system provides numerous water quality benefits as discussed in the Planets section of this report. However, this system also provides significant protection against flooding for residents living along county drains downstream of the Airport as noted below:




- All of the 6,700 acre DTW airfield drains to a stormwater detention pond system rather than directly to a county drain.
- These ponds are operated to reduce the risk of downstream flooding by holding stormwater generated during large rain and snowmelt events until flows in receiving streams recede and there is room to accept the DTW stormwater discharges.
- Diligent operation of this system has significantly reduced the frequency and severity of flooding downstream of the airport. The picture shown above was taken along the Frank and Poet Drain in Southfield, Michigan during a large rain storm when DTW stormwater ponds were not being discharged. This flooding would have been much more severe without the benefit of DTW stormwater detention.



Flooding Along the Frank and Poet Drain.

Community Engagement

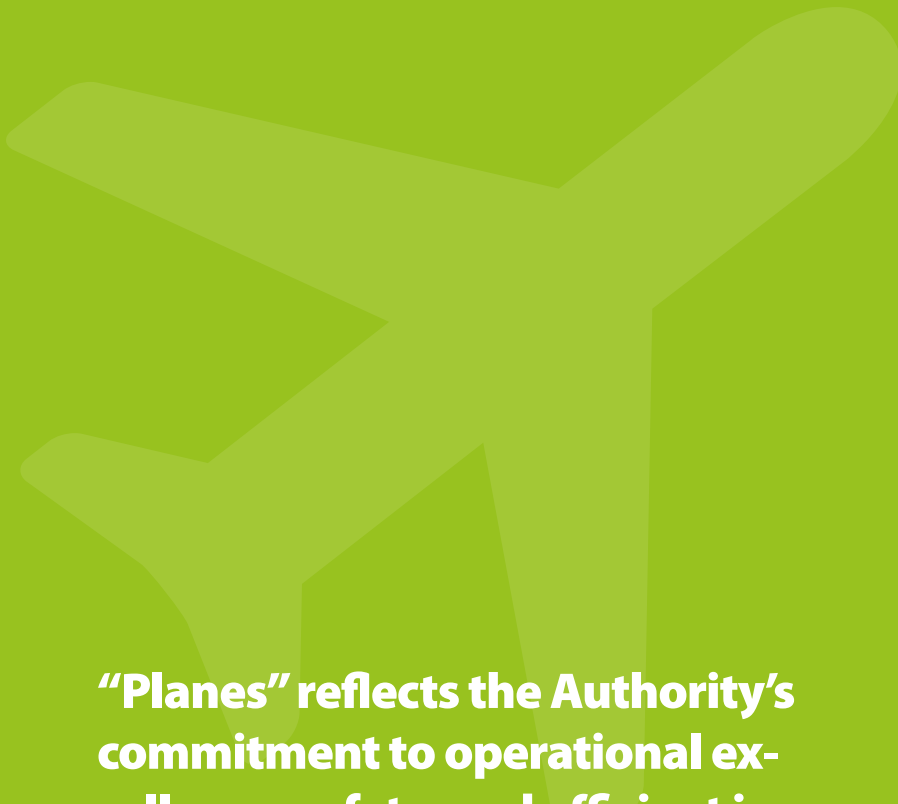
Objectives:

-  **Build Partnerships**
-  **Provide a World-Class Passenger Experience**
-  **Promote Employee Training and Succession**

The Authority hosts numerous community events throughout the year to give back to its neighbors, foster a sense of community, and enhance communication with the traveling public. Some examples of Authority-hosted events include:

- Leader Dogs for the Blind Training Program.
- Terminal holiday music and Karaoke program.
- Terminal holiday decorating.
- Silverliner's Fantasy Flight.
- Toy collection for various children's hospitals.
- American Cancer Society Relay for Life.
- Employee social events.
- Gleaner's food drive.
- Mittens for Detroit Drive.
- Romulus Animal Shelter Drive.
- Red Cross Blood Drive.
- Employee charitable giving campaign.
- Book drive for Romulus Elementary School.
- City of Romulus Clean Sweep.
- Thunder Over Michigan, Air Show & Employee Picnic.
- Liaison to the Detroit Visitor and Convention Bureaus.
- Touch a Truck community event.

Planes.








“Planes” reflects the Authority’s commitment to operational excellence, safety, and efficient infrastructure. The Authority has completed, or is in the process of completing airfield efficiency and infrastructure initiatives to ensure a safe and memorable experience for passengers, and whenever possible, conserve natural resources.

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New Taxiway Construction

Objectives:

-  **Maximize Airfield Efficiency**
-  **Provide a World-Class Passenger Experience**
-  **Air Quality**
-  **Water Management**
-  **Operate Safe and Secure Airport**

The construction of two new high-speed taxiways at DTW has resulted in substantial operational, financial and environmental benefits. The implementation of these new high speed taxiway configurations has reduced runway occupancy time by 4.6 seconds per arrival, translating into a savings of approximately 100 hours per year in taxiing time. This substantial operational improvement allows the airport to run more efficiently, improves customer experiences, and reduces operational and fuel costs. The total cost of reconfiguring these taxiways was approximately \$1.7M with an approximate three-year return on investment expected for the project.

Implementation of these new high speed taxiway configurations has reduced runway occupancy time by 4.6 seconds per arrival, translating into a savings of approximately 100 hours per year in taxiing time.

Part 150 Noise Compatibility Program

Objectives:

-  **Build Partnerships**
-  **Noise**

In 1992, DTW began implementation of a Noise Compatibility Plan (NCP) Federal Aviation Regulation - Part 150 Noise Study. The NCP included developing operational measures to reduce community exposure to aircraft noise, recommending guidelines intended to control land development, and mitigating noise impacts on incompatible uses.

The NCP process was based on guidance from FAA staff and aviation planning professionals and included extensive outreach to neighboring communities.

The NCP included the following FAA approved Noise Abatement Recommendations:

- **Sound Insulation of five (5) schools within the 65 DNL Noise Contour, as outlined in Noise Exposure Maps.**
- **Voluntary acquisition of homes within the 70 DNL and greater Noise Contour.**
- **Residential Sound Insulation of single family homes within the 65 – 70 DNL Noise Contours.**
- **Construction of noise berms on the airport perimeter.**
- **Study of the feasibility of construction and use of a ground run-up facility for aircraft engine testing.**
- **Work with communities to discourage noise-sensitive uses within the 65 DNL Noise Contour.**
- **Encouraging preferential runway use maximizing south slow over less populated areas.**
- **Fanning all departures to equitably spread the noise impact on neighboring communities.**
- **Extending the hours of contra-flow in the overnight hours.**

Ultimately, the NCP provided for the sound insulation (installation of acoustical windows and doors) of 2,400 homes and five schools in five communities, fee-simple acquisition of 250 homes, and installation of more than 4.5 miles of earthen berms and a Ground Run-up Enclosure (GRE). Between 1992 and 2009, the Noise Program at DTW represented a \$120 million effort by the Wayne County Airport Authority. Funding for the Program was provided by General Airport Revenue Bonds (GARBs) and FAA Airport Improvement Program (AIP) grants.



The DTW Ground Run-Up Enclosure (GRE).

Ground Run-Up Enclosure

Objectives:

 **Build Partnerships**

 **Noise**

 **Maximize Airfield Efficiency**

In 2012 following a recommendation from the 2009 NCP update, the Authority constructed a new ground run-up enclosure (GRE) at DTW. Historically, aircraft engine run-up tests, or “run-ups,” typically took place at night, causing a significant amount of noise and disturbing residents adjacent to the airport. The GRE greatly reduced single event noise impacts resulting from aircraft engines being tested at elevated power levels – a necessary practice to ensure aircraft safety. Noise complaints have dropped substantially since the completion of the GRE.

Preconditioned Air and 400-Hertz Aircraft Power Units

Objectives:

 **Air Quality**

 **Build Partnerships;**

 **Provide a World-Class Passenger Experience**

 **Maximize Airfield Efficiency**

 **Maintain Competitive Cost Structure**

In 2007, the FAA awarded the Authority a Voluntary Airport Low Emissions Program Grant of \$5.1 million to purchase and install 400-Hz ground power units and pre-conditioned air units for 26 passenger loading bridges at the North terminal at DTW.

These two systems reduce air emissions associated with the use of auxiliary power units and diesel-powered portable ground power units. They also reduce noise by having aircraft use ground power rather than running their APUs.

This grant also funded an underground hydrant fuel system for these gates that eliminated 14 mobile fuel trucks, reducing emissions associated with the operation of these trucks. As an ancillary benefit, ramp congestion was reduced and safety was increased as a result of the removal of these fuel trucks.



Pre-conditioned Air and Ground Power Units.

Back-up Generators

Objectives:



Energy Management



Operate Safe and Secure Airports

The Authority Power Systems Department operates several large natural gas-fired generators to ensure an uninterrupted supply of electricity to all important airport facilities in the event primary feeds from Detroit Edison (DTE) are unavailable for short or prolonged periods of time. Brought on line in 2010, the North Terminal back-up generator, a Titan 130 Gas fired turbine, produces 14 MW of electricity, sufficient to run the entire North Campus and the airfield lighting in the South Campus.

For the McNamara Terminal, three (3) 5.7 MW Wartsila natural gas-fired generators provide sufficient electricity to power the Terminal, the McNamara Parking Garage, and several important stormwater pumpstations.

Safelane Pavement Overlay

Objectives:



Water Management



Operate Safe and Secure Airport

In 2008, the Authority partnered with the Research Center of Michigan Technological University to install a state-of-the-art, polymer pavement overlay product called "SafeLane" on 7,000 square feet of sloped roadway at the McNamara Terminal. This test area was selected based on the road's high vehicle traffic volume, steep incline, and volume of deicing agents required during the winter to maintain safety.



A shuttle bus safely transporting employees on a road with SafeLane overlay during winter snow conditions.

SafeLane has anti-icing and anti-skid properties that help prevent frost and ice formation on the pavement, while sealing road beds to prevent degradation. It holds deicing agents in place, helping prevent hazardous winter conditions such as ice, black ice, and snow pack formations on road and sidewalk pavement.

SafeLane also provides a superior friction surface, giving vehicles a safer driving environment year-round. As a result of the 2008-2009 study, Authority personnel determined that SafeLane reduced the use of deicing agents by 50 percent for the test section of pavement. Ultimately, the application of SafeLane lowers both operating costs and environmental impacts due to reduced usage of deicing agents. Following the success of the 2008 installation, SafeLane was overlaid on an additional 25,000 square feet of roadway at the airport.



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New Vehicle Fueling Facility at DTW

Upgraded Vehicle Fuel Management System

Objectives:

-  **Energy Management**
-  **Maintain Competitive Cost Structure**

The Authority recently completed construction of a state-of-the-art fueling facility located adjacent to the existing Maintenance Complex to replace an outdated fueling facility. This new facility will provide fuel for Authority vehicles including: field vehicles, snow removal equipment, shuttle busses, staff vehicles, and the Authority fuel truck.






The facility includes two new underground storage tanks and eight new fuel dispensers. More importantly, the facility is equipped with a fuel management system that provides the following safeguards:

- **Only authorized users can obtain fuel for vehicles for which they are authorized to fuel.**

- **The system conducts a “reasonability-check” to verify that an appropriate number of miles has been driven between fuelings.**

Sustainable Infrastructure

Objectives:

-  **Energy Management**
-  **Operate Safe and Secure Airports**
-  **Maintain a Competitive Cost Structure**
-  **Maximize Airfield Efficiency**
-  **Natural Resources**

The Authority is committed to implementing cost-efficient sustainability measures in its construction of new infrastructure

LEED BUILDINGS

The Authority recently completed construction of Building 610, a new Public Safety Headquarters (see photo on next page). This building was converted from a former airline cargo facility. Sustainable measures include: Bioswales at the entrance of the building to reduce impact on the existing stormwater collection system; a management system that optimizes energy use; recycled content that makes up over 20% of the construction materials used in this building. In addition, over 25% of regional materials were used in the construction of the building. Utilizing these and other criteria from the US Green Building Council, the Authority plans to receive certification for the Public Safety Headquarters as the first LEED Building on the DTW campus.

Future Plans:

The Authority is currently constructing a new administration building for its staff. This building was also designed to achieve LEED accreditation.



Building 610.


RW 4L/22R.

The Runway 4L/22R and Associated Taxiways Reconstruction project received the Envision Rating System Silver award from the Institute for Sustainable Infrastructure, which evaluates sustainable infrastructure projects across a wide range of environmental, social, and economic categories. The reconstructed runway project included a reduction of existing impervious surfaces, reused stormwater for dust control, reused a portion of the excavated material, and included installation of LED lights and signage.



Aerial view of Runway 4L/22R Rehabilitation Project.

Planet.



“Planet” reflects the Authority’s commitment to the conscientious use of earth’s natural resources and the minimization of waste. As with all forms of transportation activities that rely on the combustion of fossil fuels, aircraft and their supporting ground systems release significant quantities of greenhouse gases as well as other waste associated with their operation and maintenance.

Planet.

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“ From 2012 to 2015 energy efficiency measures at DTW and Willow Run resulted in enough electricity savings to power almost 1,150 homes for a year.

Source: US Energy Information Administration based on 2014 average electricity consumption of a home equal to 10,932 kWh

Although the majority of airport greenhouse gas and other waste emissions are due to aircraft operation, airport operators such as the Authority can do their part to increase energy efficiency, reduce waste generation, improve recycling, and protect water quality related to operations that it controls.

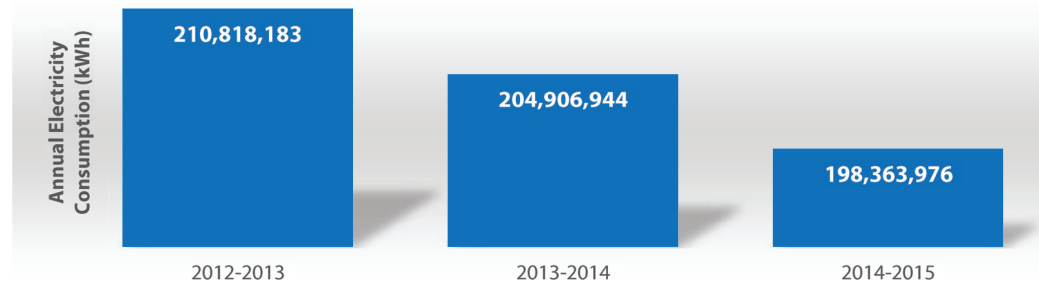
The Authority has implemented numerous environmental improvement projects at DTW and YIP to reduce impacts on the environment as discussed below:

Energy Management

The Authority is dedicated to improving the efficiency of operations at DTW and YIP via an aggressive energy management program. From 2012 to 2015, the Authority reduced its overall electricity consumption by nearly 6 percent. This is equal to over 12.4 Gigawatt Hours (GWh) or approximately \$1 million in energy savings. As illustrated in Figure 1, electricity consumption across DTW and YIP has been steadily declining due to the many efficiency initiatives implemented at the two airports.

Detroit Metropolitan Airport and Willow Run Airport Annual Electricity Consumption, 2012-2015

SOURCE: Wayne County Airport Authority



Several of the more significant energy management initiatives implemented at DTW and YIP airports are discussed below.

Powerhouse Efficiency Improvements

Objectives:



Energy Management



Maintain Competitive Cost Structure;



Maximize Airfield Efficiency



Air Quality

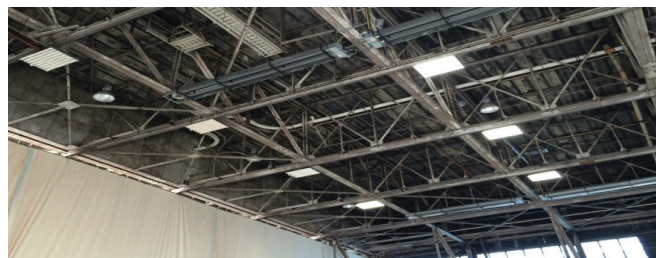
The Authority has initiated numerous improvements at the two DTW energy centers and to the YIP heating system in order to increase the efficiency of heating and cooling delivered to Authority facilities. Energy assessments conducted on these systems in 2013 and 2016 helped to identify inefficiencies and target energy conservation priorities. Specific accomplishments are highlighted below:

- In 2013, the Authority installed four 20.8 MMBtu/hour high-efficiency boilers at the North Powerhouse. The four boilers provide steam for the North Terminal Building, North Powerhouse Building, Public Safety Headquarters, Big Blue Parking Deck, North Ground Transportation Center, L.C. Smith Building, and the Authority Administration Building (under construction). There is plant

capacity to provide heating steam to additional buildings, including the Common Air Freight Building (when renovations are completed), and for a new FAA Control Tower. The new boilers qualified for a Voluntary Airport Low Emissions grant of \$1,849,866.

- Five air-handling units (circa 1965) at the North Powerhouse are being replaced with new, more efficient air-handling units and rooftop make-up air units.
- In 2008, the North Terminal and associated Ground Transportation Center were commissioned utilizing variable frequency drive (VFD) controlled pumps for hot water heating and centralized chilled water cooling systems supplied from the North Powerhouse. VFDs electronically control the speed of these pumps based on the heating or cooling demand, helping to conserve energy when the pumps do not need to run at full speed.

According to the California Energy Commission, VFDs are known to cut energy usage and costs by as much as 50 percent for the systems on which they are installed.



Infrared Heaters Installed at Willow Run Airport.

- In 2014 the Authority was awarded \$43,400 in energy incentives from DTE Energy to install an infrared heating system at Willow Run Airport. This system is more energy efficient than conventional forced-air systems, improving employee comfort and reducing energy distribution and standby losses. This project generates approximately \$88,800 in annual savings.
- The Authority is continuing to replace old and inefficient in-ceiling heat pumps located at the McNamara Parking Deck and Ground Transportation Center walkways. The older units do not provide enough heat to prevent freezing of fire protection lines and maintain passenger comfort. There are 39 of these units, 10 of which have already been replaced, with the remaining 29 scheduled for replacement in the near future.
- Regular tune-ups of boilers are essential for reducing fuel waste and emissions of hazardous air pollutants generated by inefficient combustion. Boiler tune-ups are performed every year on all boilers.

NORTH AND SOUTH CAMPUS POWER CONNECTION/UPGRADES

Beginning in 2016, a project will increase the line voltage for the North Terminal area from 4,800 to 13,800 volts. This increased voltage will allow a larger current load to be carried using the existing cables with less transmission loss.

A companion project involves interconnecting the North and South Terminal electrical systems, which will reduce power interruptions that occur at the North Terminal and will allow for double-redundancy between the two terminals. The Authority anticipates the frequency of power interruptions will be reduced and greater efficiencies will be achieved through the uniform use of higher primary voltage.

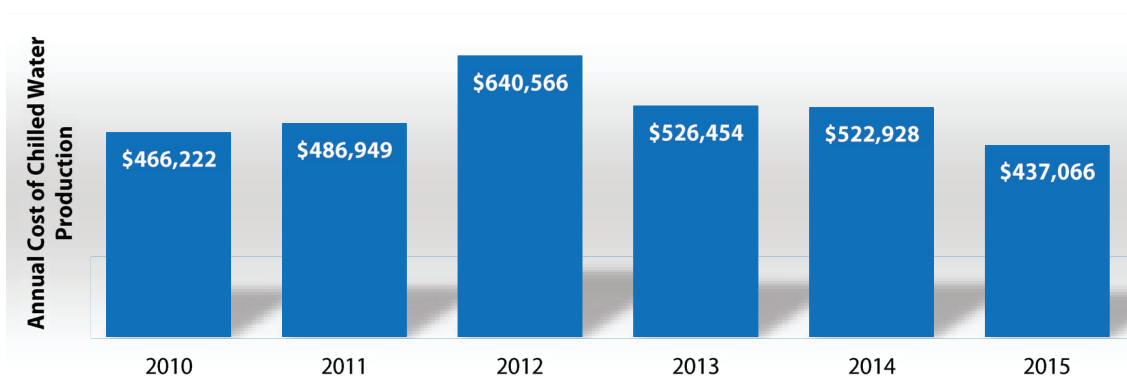
CHILLER OPTIMIZATION

Regular maintenance of existing chillers ensures that HVAC cooling systems operate efficiently. At the North Powerhouse, Chillers #3 and #4 received tune-ups in 2015, helping to keep cooling costs low and employees comfortable. Figures 2 shows the downward trend in annual cost for chilled water production at DTW over the past several years.

Future Plans:

CHILLERS

In 2016/2017, three new high-efficiency 1,500-ton chiller units will be installed at the North Powerhouse to replace less efficient units. These chillers will be equipped with magnetic-bearing compressors, which operate without oil for lubrication which significantly reduces energy losses due to friction and increases the heat transfer efficiency of the chillers. The oil-free system will also eliminate the need for periodic oil and seal replacement which will generate additional savings in maintenance costs.



Detroit Metropolitan Airport Annual Cost of Chilled Water Production

SOURCE: Wayne County Airport Authority, 2016

In 2013 and 2014 WCAA replaced approximately 7,000 metal halide light fixtures with LED fixtures. This change reduced the carbon footprint of the Airport by approximately 6,000 metric tons of CO2 per year (equal to taking 1,267 cars off the road).

Source: US EPA Greenhouse Gas Equivalencies Calculator. Note that estimates are approximate.

REMOTE METERING

The Authority is planning to implement a \$6 million project to connect electric, gas, and water meters to a computer network that will allow remote monitoring and reporting of utility usage. Remote metering supports better management of utilities by providing real-time information on gas, electricity and water consumption, enabling the Authority to monitor usage and costs. Additionally, real-time monitoring can help identify areas that are consuming energy when they shouldn't be and to alert staff of losses and leaks.

Efficient Lighting

Objectives:



Energy Management



Maintain Competitive Cost Structure



Air Quality

LED LIGHTING – PARKING AREAS

In 2013 and 2014, the Authority retrofitted approximately 7,000 lighting fixtures in the McNamara Terminal and Big Blue Parking Deck structures, replacing metal halide bulbs with low wattage LED fixtures. This change resulted in a nearly 70 percent reduction in annual energy consumption, or \$658,000 in annual savings from the combined projects. In addition to the energy cost savings, the Authority was awarded nearly \$587,000 in energy incentives from DTE Energy for these projects.

These projects were nationally-recognized in the 2015 Better Buildings Alliance's Lighting Energy Efficiency in Parking (LEEP) Campaign Awards in two categories:

- **Highest Absolute Annual Savings in a Retrofit at a Single Parking Structure.**
- **Largest Portfolio-wide Annual Absolute Energy Savings.**

On average, LED bulbs use 75% less energy and last 25 times longer than incandescent bulbs. The long lifespan of LEDs reduces maintenance costs and lowers long-term operating costs.

Source: Department of Energy, 2016

Automated lighting control systems were also installed to further reduce energy consumption and maximize the efficiency of the LED lighting fixtures. Two photo-electric Programmable Logic Controllers (PLCs) that use solar panels to track the sun were installed in the McNamara Terminal Parking Deck to ensure that the lighting in the parking structure is on only when conditions are such that it is needed. It is estimated that the installation of the PLCs generates an additional \$46,000 in energy savings per year.

At the Big Blue Parking Deck, PLCs were not feasible due to the older lighting and control systems. However, this facility was outfitted with outdoor photocell controllers that automatically adjust the lighting fixtures' output based on ambient conditions. The photocell controllers generate an estimated additional \$33,000 in energy savings per year. Following the success of the LED lighting projects at the McNamara Terminal and Big Blue Parking Deck structures, the Authority has retrofitted the South Employee Lot, Buildings 703 (DTW) and 2601 (YIP), and the North Powerhouse with LED lighting fixtures and modern controls to further improve the energy efficiency of Authority facilities.

As the result of these initiatives, the Authority has achieved over 11.1 GWh in energy savings and nearly \$1.2 million in energy cost savings. In addition to cost savings, the Authority was awarded more than \$850,000 in energy incentives from DTW for these LED lighting projects.

Note that these energy cost savings were calculated using the US Environmental Protection Agency Pollution Prevention (P2) Program Cost Calculator in June 2016 to estimate cost savings based on kWh reductions..

AIRFIELD LED LIGHTING

Airfield lighting is also being converted to LED as part of routine runway and taxiway reconstruction projects and as airfield lighting repairs are undertaken by Authority Electricians. LEDs on the airfield are brighter and have better color resolution, consume less electricity for a higher lumen output, and have a longer lifetime than quartz or halogen lights.

Currently, the Authority has converted the following airfield lighting fixtures to LEDs:

- **100 percent of blue taxiway lights.**
- **100 percent of lighted wind cones.**
- **80 percent of runway guidance lights.**
- **100 percent of Runway 22L centerline and touchdown zone lights.**
- **100 percent of Runway 22R centerline, edge and touchdown lights.**

LED-LIGHTED SIGNS

Airfield signage at DTW consists of approximately 750 directional and guidance signs. These signs are being replaced with LED designs whenever runway/taxiway reconstruction projects take place. Capital expenditure for LED upgrades of airfield signs at DTW has been budgeted at \$1.8 million over three years. There were 27 signs on Runway 22R that were replaced in 2014 and 72 signs on Runway 22L that were replaced in 2015. In Fiscal Year (FY) 2016, all the remaining signs were replaced.

WATER

Water and stormwater management initiatives implemented at DTW and YIP airports are described below:

Award-Winning Stormwater Management System

Objectives:

 **Water Management**

 **Maximize Airfield Efficiency:**

 **Maintain Competitive Cost Structure**

STORMWATER DISCHARGE PERMIT COMPLIANCE

DTW operates one of the largest airport stormwater management systems in North America, consisting of three “clean” stormwater detention ponds that contain a combined 425 million gallons of “clean” stormwater that is discharged to surface waters in compliance with a National Pollution Discharge Elimination System (NPDES) permit; and a fourth pond, which has a 70-million gallon capacity, which is used for stormwater that contains diluted spent aircraft deicing fluid runoff (SADR) during the winter, and uncontaminated stormwater during the summer.

WCAA worked on addressing water quality issues with MDEQ and neighboring communities for over a decade, culminating in the MDEQ selecting DTW as a “Stormwater Showcase” in 2013.

The Pond 3W Pumpstation/Force-Main has increased POTW treatment capacity by an additional 1 million gallons per day, decreasing the risk of pond overflow and earning a highly-regarded ACI-NA Environmental Achievement Award

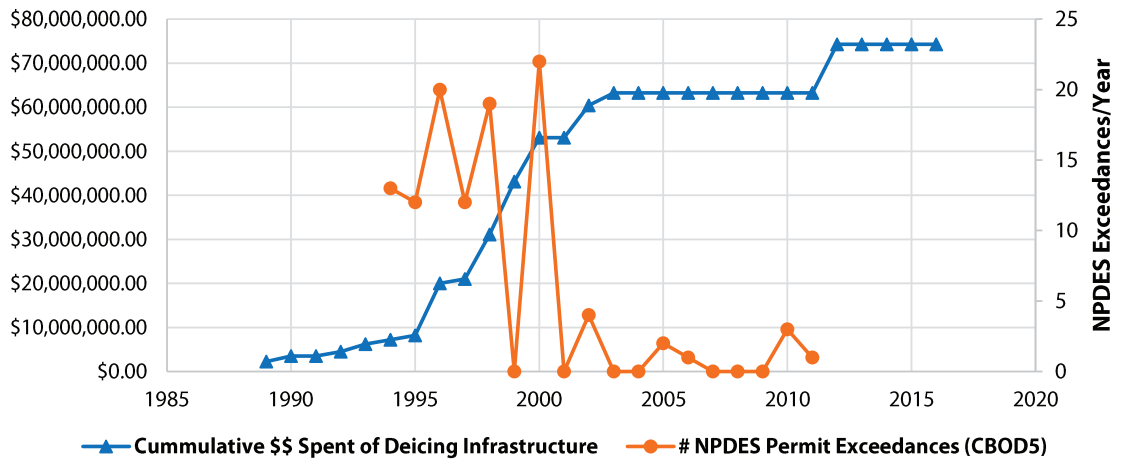
As noted above, the “clean” DTW stormwater detention ponds are discharged according to the provisions of an NPDES permit. This permit prescribes numerical discharge limits for 5-day carbonaceous bio-chemical oxygen demand, dissolved oxygen, oil & grease, total suspended solids, and pH. There are also narrative requirements for turbidity, color, and floatables. During the late 1990s and early 2000s, compliance with the DTW NPDES permit was problematic and significant effort and expense was put forth by the Authority toward improving water quality in the DTW stormwater detention ponds to better comply with this permit. The Deicing Infrastructure Investment chart on the following page displays the money spent on the DTW stormwater system and the improvement in NPDES permit compliance that resulted from this effort. The improvements in stormwater quality and permit compliance were recognized by the MDEQ in 2013 when that agency selected DTW as one of three “Stormwater Showcase” sites in Southeast Michigan.

CONTAMINATED STORMWATER MANAGEMENT

Prior to 2012, contaminated runoff from Pond 3W was treated solely at the Downriver Wastewater Treatment Facility (DWTF), a publicly-owned treatment plant. During severe winters, the load from Pond 3W could comprise as much as a third of the DWTF’s capacity. The DWTF accepted as much runoff from Pond 3W as it could, but limited treatment capacity and a required acclimation period when increasing and decreasing loads resulted in Pond 3W rising to critically elevated levels during the spring and winter months.

Deicing Infrastructure Investment

SOURCE: Wayne County Airport Authority



This was a major concern to the Authority because Pond 3W could overflow into adjacent clean stormwater ponds, risking permit exceedances in those ponds and costly clean-up.

To address this issue, the Authority constructed a new \$11.5 million pumping station and five-mile long force-main connection to the Great Lakes Water Authority Treatment Facility in Detroit, Michigan, which became operational for the 2012-2013 deicing season. This additional Pond 3W discharge outlet reduces the risk of overflows and permit exceedances while increasing the Authority's flexibility and capacity to manage and treat SADR. The following were noteworthy benefits of the Pond 3W improvements:

- **Increased capacity for discharge to sanitary treatment by an additional one million gallons per day to drain Pond 3W more rapidly.**
- **Faster treatment plant acclimation periods.**
- **Improved stability in maintenance of pond levels.**

This program received the highly-regarded Airports Council International – North America (ACI-NA) Environmental Achievement Award in the Innovative Projects category in 2013, further acknowledging the Authority's leadership in airport stormwater management.

Stormwater Reuse for Dust Control

Objectives:

 **Water Management**

 **Maximize Airfield Efficiency;**

 **Maintain Competitive Cost Structure**

Stormwater has been reclaimed for use as dust control on runway/taxiway reconstruction projects at DTW since 2015. Stormwater is pumped from both Pond 3E and Pumpstation #11 for this purpose and during this period more than 20-million gallons of water have been reclaimed. This is more than 5% of the annual DTW water consumption and saved the WCAA over \$125,000 in potable water costs.



Stormwater Reuse.

AIR QUALITY

The relationship between aviation and air quality is an increasingly important consideration with regard to development, maintenance and operations of airports. Described below are sustainable practices implemented by the Authority with regard to air quality.

ACI Airport Carbon Accreditation Program

Objectives:

 **Air Quality**

 **Build Partnerships**

The Airports Council International (ACI) Airport Carbon Accreditation Program is an internationally-recognized program that provides a framework and tools for active carbon management at airports. In 2014, the Authority initiated the ACI Airport Carbon Accreditation process with an ACI-certified auditor, and began estimating its carbon emission footprint at DTW. This multi-year effort culminated in September 2016 with DTW's award of the ACI Airport Carbon Accreditation Level 1 award. DTW is one of only 20 airports in North America to currently hold an ACI Carbon Accreditation award.



DTW received Airport Carbon Accreditation at Level 1 in September 2016.

Emission Reductions at the North Powerhouse

Objectives:

 **Air Quality**

 **Energy Management**

 **Build Partnerships**

 **Maximize Airfield Efficiency**

In 2011, the Authority installed four 20.8 MMBtu/hour new natural gas-fired tube boilers, replacing four aging 45-MBTU boilers at the North Powerhouse, two of which were not operational. Each new boiler is equipped with state-of-the-art, ultra-low-NOx burners and a feedwater economizer. Significantly reduced NOx emissions have resulted from the installation of these new boilers.

Over the 30-year lifespan of the new boilers, NOx emissions will be reduced by approximately 176 tons—the equivalent of taking over 11,000 cars off the road for a year.

Source: US EPA Greenhouse Gas Equivalencies Calculator. Note that estimates are approximate.

Electric Vehicle Charging Stations

Objectives:

 **Energy Management**

 **Air Quality**

 **Build Partnerships**

The Authority has provided four single-port and six dual-port electric vehicle (EV) charging stations for public use at several DTW locations. These electric charging stations are provided free-of-charge and are located in prime parking locations near terminal entrances.

Alternative Fuel Taxi Services

Objectives:

 **Air Quality**

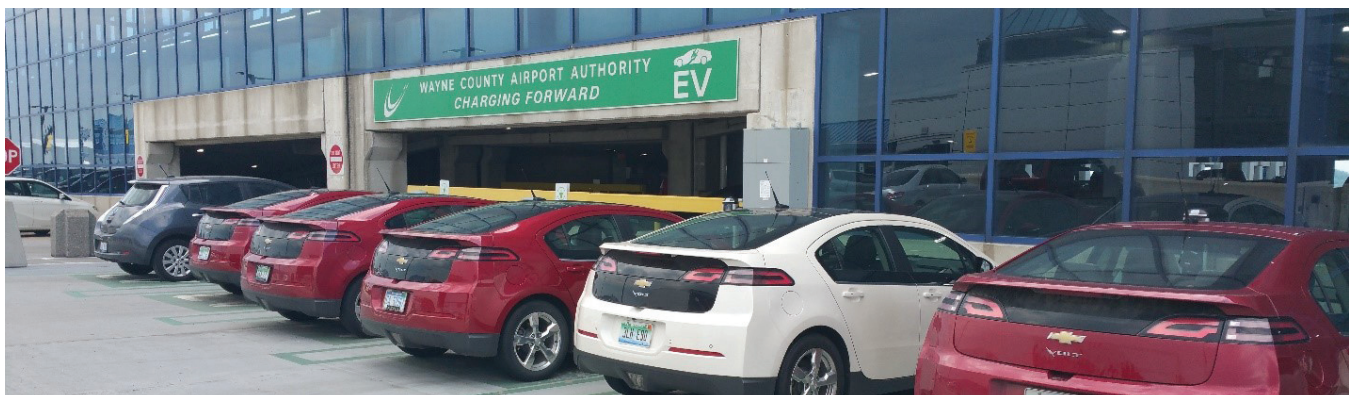
 **Build Partnerships**

 **Energy Management**

Ground transportation at airports can represent a significant contribution to carbon emissions given that these vehicles are often used 24 hours per day and are frequently kept idling while waiting for passengers.

At DTW, 1,010 luxury sedans and 99 taxis are fueled with propane, an energy source recognized by the U.S. Department of Energy as an “alternative fuel,” and by the American Lung Association as a “Clean Air Choice.” Propane produces 80 percent less NOx and VOC emissions, and 40 percent less CO₂ emissions than gasoline or diesel.

In 2014, the Authority initiated the ACI Airport Carbon Accreditation process with an ACI-certified auditor, and began estimating its carbon emission footprint at DTW. This multi-year effort culminated in September 2016 with DTW’s award of the ACI Airport Carbon Accreditation Level 1 award.



EV Charging Stations at Big Blue Deck

WASTE

The Authority is committed to reducing waste and improving recycling programs as discussed below.

The Authority has recycled over 700,000 cubic yards of concrete at DTW with over 350,000 cubic yards reused on-site. The Authority has also recycled over 110,000 cubic yards of asphalt material, with over 15,600 cubic yards reused on-site.

Waste Management

Objectives:



Waste Management



Provide a World-Class Passenger Experience



Maintain Competitive Cost Structure

UNIVERSAL WASTE MANAGEMENT

Universal waste is a category of common waste materials, including fluorescent lights and ballasts, batteries, and light bulbs. The table below shows a list of universal waste items that were recycled by the WCAA from 2013 to 2016.

REUSE OF CONSTRUCTION WASTE

To reduce construction waste, the Authority has been re-using crushed concrete and asphalt millings produced from on-airport projects. Crushed concrete is used whenever possible for on-site road, parking lot, and runway reconstruction work at DTW and YIP. Since 2012, the Authority has recycled over 700,000 cubic yards of concrete at DTW with over 350,000 cubic yards reused on-site. The Authority has also recycled over 110,000 cubic yards of asphalt material, with over 15,600 cubic yards reused on-site.

At YIP, the Authority has reused over 40,000 cubic yards of concrete, with the entirety remaining on-site. Approximately 30% of asphalt millings, totaling over 10,000 cubic yards, were also kept on-site. In addition, 95,000 square yards of pavement was left in place and pulverized to reduce runoff.

DETROIT METROPOLITAN AIRPORT UNIVERSAL WASTE RECYCLING, BY TYPE (POUNDS) 2013-PRESENT

Lamps (Flourscent, Incandescent, HID)	Batteries (Lead-Acid, Lithium, Alkaline)	Cathode Tube	Ballasts (PCB and non-PCB)	Misc. Electronics
22,258	1,509	824	1,742	265

SOURCE: WCAA, Rickman Enterprise Group, LLC Invoices for Universal Waste Recycling.

HAZARDOUS WASTE MINIMIZATION

The Authority has reduced its purchases and use of materials that are considered hazardous waste, particularly oil-based paints that have been replaced with water-based latex paints. Paint usage is tracked on an annual basis, and the predominant use of water-based paint is shown in the table below.

DETROIT METROPOLITAN AIRPORT AVERAGE PAINT USED ANNUALLY	
Paint Type	Annual Paint Usage (Gallons)
Latex Paint (Building)	237
Latex Primer (Building)	30
Oil-Based Paint	7
Waterborne Latex (Pavement) - Black	12,175
Waterborne Latex (Pavement) - Green	430
Waterborne Latex (Pavement) - Red	650
Waterborne Latex (Pavement) - White	11,715
Waterborne Latex (Pavement) - Yellow	5,500
TOTAL	30,744

SOURCE: Wayne County Airport Authority.

USE OF ENVIRONMENTALLY-RESPONSIBLE PRODUCTS

The Authority is dedicated to using products that are environmentally-responsible when operationally feasible. This includes choosing products that are biodegradable, less toxic, and generally cause less harm to the environment. The following are some of the environmentally-conscious products used at DTW and Willow Run airports:

- **An environmentally-friendly Freon is used as a coolant whenever possible.**
- **Biodegradable, citrus-based cleaners and degreasers are used by the Maintenance Department.**

Future Plans:

The Authority is in the process of implementing a green cleaning program in its newest building, the Public Safety Department Headquarters. This cleaning program will also be implemented at the new WCAA Administration Building.

Recycling

The Authority champions recycling programs in several areas and is always exploring opportunities to increase the quantity of materials that can be recycled rather than disposed of in a landfill, as discussed below:

RECYCLING OF SPENT AIRCRAFT DEICING FLUID

Objectives:

 **Water Management**

 **Waste Management**

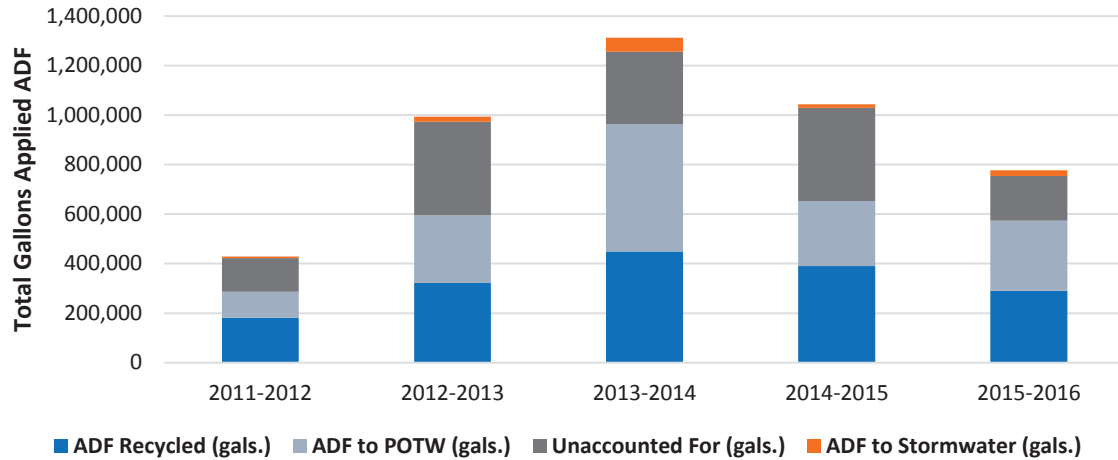
 **Maximize Airfield Efficiency**

 **Maintain Competitive Cost Structure**

Beginning in 1997, DTW pioneered remote pad aircraft deicing and associated recycling of spent aircraft deicing fluid (ADF) and since then has established itself as one of the top ADF recycling airports in the world. From 2011 to 2016, the Authority collected and processed more than 10.7 million gallons of spent ADF runoff to recover more than 1.6 million gallons of industrial-grade propylene glycol that is used in a variety of products, including paints and plastics. This recycled ADF represents approximately 35% of the total ADF applied at DTW over this period. To process this quantity of spent ADF at a treatment plant, rather than recycling it, would have cost more than \$6 million.

Distribution of Spent Aircraft Deicing Fluid at DTW

SOURCE: Wayne County Airport Authority, 2016



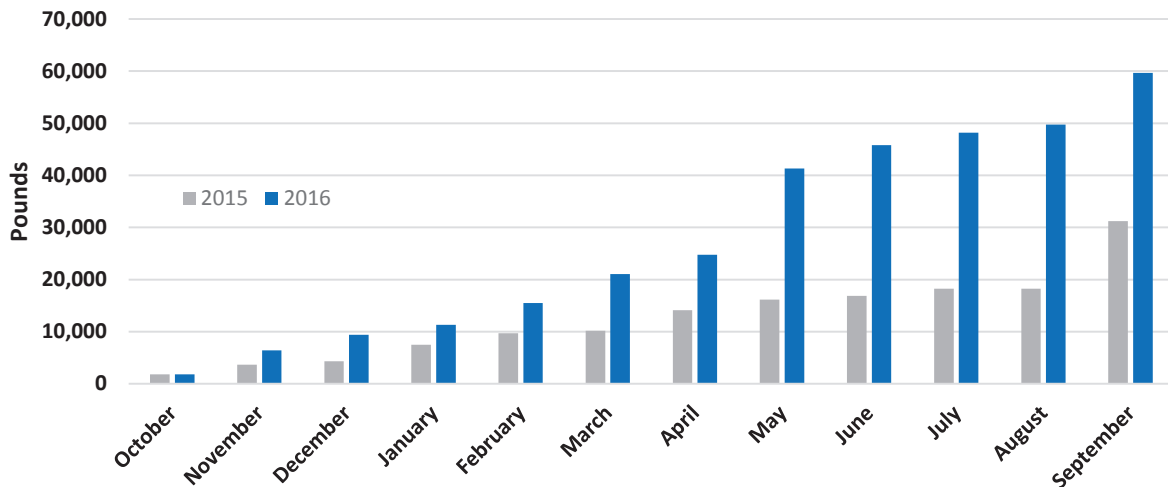
AUTHORITY OFFICE RECYCLING PROGRAM

The Authority has operated an office-paper/plastic bottle recycling program for its facilities since 2005. Employees have individual containers in their offices and large rolling "totes" are provided for recycling of large quantities of paper. These totes are locked and the company providing the recycling service certifies that paper is shredded prior to further processing. Metal waste generated by the Authority is also collected for recycling as a separate element of the contract with the recycling vendor.

The chart below shows recycling totals in pounds for each month between the start of fiscal year 2015 (October 2014) and the end of fiscal year 2016. In addition to the cardboard, paper, and plastic that comprise the office recycling program, the Authority also recycled 143,740 pounds of metal in fiscal year 2016.

REPURPOSE USED CLOTHING AS SHOP RAGS

The Authority uses donated clothing scraps in lieu of expensive disposable shop rags. In 2015, 2,950 pounds of discarded t-shirts were repurposed as shop rags by the Maintenance Department.



Assorted Waste Recycled Monthly – FY2015 & FY2016

SOURCE: Wayne County Airport Authority, 2016

NATURAL RESOURCES

Crosswinds Marsh Nature Preserve

Objectives:



Crosswinds Marsh Nature Preserve is a 1,050-acre constructed wetland created by the Authority to offset wetlands impacted due to runway and terminal construction at DTW. Crosswinds Marsh offers 1.4 miles of boardwalk over ponds and streams for public access and enjoyment. In addition, Crosswinds Marsh contains over four miles of equestrian trails, over five miles of hiking trails, and is home to many species of wildlife, including over 240 species of birds (featuring two bald eagles), and over 40 species of mammals, including beaver, fox, coyote, and deer.

In April 2016, the Authority hosted an Arbor Day tree planting event with Wayne County and Detroit area high school students. Participants from the Authority, Wayne County, Davey Landscaping, and Wayne County Soil and Water Conservation District hosted learning stations that provided brief overviews covering various natural resource topics.



Crosswinds Marsh, A Wetland and Nature Preserve.



Students from Allen Academy Attending Arbor Day Event at Crosswinds Marsh.

Endangered Species Management

Objectives:



In 1993, several endangered plant species were encountered during the construction of Runway 9R/27L and areas outside of the construction site were dedicated to relocate and preserve these plants. Two of the management areas are located at DTW and two additional areas are located at Crosswinds Marsh. Seeds and small seedlings of these impacted species were excavated from the project site and relocated. The progress of these plants in their “new homes” was monitored for ten years, in compliance with an MDEQ permit.

However, the Authority viewed these Endangered Species Areas as an opportunity to educate local high school students and involved them in the management of these areas.

