

APPENDIX D

*AIRPORT RECYCLING, REUSE, AND WASTE
REDUCTION PLAN*

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Appendix D Airport Recycling, Reuse, and Waste Reduction Plan

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1.1 INTRODUCTION

In September 2014, the Federal Aviation Administration (FAA) provided guidance for preparing airport recycling, reuse, and waste reduction plans as an element of a master plan or master plan update.¹ This guidance was in response to the *FAA Modernization and Reform Act* (FMRA) of 2012² that added a requirement for all master plans and master plan updates to include a plan for “recycling and minimizing the generation of airport solid waste” to be consistent with the local recycling laws. Additionally, in January 2015, the FAA provided guidance³ about how airport planning should include plans for “recycling and minimizing the generation of airport solid waste” and “master plans address issues related to solid waste recycling and waste minimization.”

This report describes the Manassas Regional Airport’s (HEF or Airport) existing solid waste generation and recycling activity and identifies opportunities to increase the Airport’s recycling efforts in order to reduce waste deposited in local landfills. In reviewing the Airport’s existing solid waste and recycling activity, efforts were made to:

- » Review the current waste management sources
- » Review local recycling programs and practices
- » Review the feasibility of recycling efforts at the Airport
- » Review waste hauler management contracts
- » Identify potential recycling opportunities for cost savings or revenue generation
- » Identify a plan to minimize solid waste generation at the Airport

1.1.1 Facility Description

The Airport is classified as a reliever airport within the National Plan of Integrated Airport Systems (NPIAS) located approximately three miles southwest of the City of Manassas in Prince William County, Virginia. As described in **Chapter 1 of this MPU, Aviation Activity Forecast**, the Airport had 99,649 operations in 2021 and is forecasted to have 130,088 operations by the planning year 2041. This forecast increase in operations would result in increased municipal solid waste generation at the Airport.

1.1.2 Types and Distribution of Solid Waste at Airports

There are several types of solid waste generated at airports, and the following types of solid waste are included in this solid waste recycling plan:

¹ FAA Memorandum, *Guidance on Airport Recycling, Reuse, and Waste Reduction Plans*, https://www.faa.gov/sites/faa.gov/files/airports/environmental/airport_recycling/airport-recycling-reuse-waste-reduction-plans-guidance.pdf, Accessed: October 2022.

² 49 United State Code (U.S.C), §§ 132 and 133.

³ FAA Advisory Circular, 150/5070-6B, Change 2 to Airport Master Plans, https://www.faa.gov/documentlibrary/media/advisory_circular/150-5070-6b-change-2-consolidated.pdf Accessed: January 2023.

- » **Municipal Solid Waste (MSW):** This type of waste usually includes everyday items, such as glass bottles, aluminum, paper products, etc.
- » **Construction and Demolition Debris:** This type of debris usually includes concrete, wood, metals, bricks, asphalt, and other items associated with construction and demolition activities.
- » **Compostable:** This type of waste is considered green waste (e.g., tree clippings, weeds, grass clippings, leaves, etc.) and food waste.
- » **Deplaned Waste:** This type of waste is removed from the passenger aircraft and includes items, such as newspapers, plastic cups, utensils, food waste, unconsumed food, etc.

The FAA’s 2013 Recycling Synthesis report⁴ identified seven main airport waste streams that are present at airports: terminals, airfields, cargo hangars, aircraft, airport construction, flight kitchens, and administrative offices (see Table 1).

Waste at the Airport is generated by its tenants, fixed based operators (FBO), passengers, airport staff, and the airfield.⁵

An airport’s waste management is complex and involves many components. For example, an airport has multiple tenants, agreements, different operating requirements, and disposal processes that contribute to the Airport’s waste stream. The Airport’s waste stream can be divided into two main categories: areas where the Airport has direct control and areas where the Airport has indirect control (see Table 1).

Table 1
Airport Waste Stream Areas

Area of Direct Control	Area of Indirect Control
Terminal – Pre-Security (excluding concessions)	Cargo Hangars
Terminal – Post-Security (excluding concessions)	Flight Kitchens
Airfield	Concessions
Airport Offices	Aircraft Maintenance Hangars

Source: (FAA, 2014)

Waste streams in an area of direct control (i.e., the terminal) can be influenced by Airport management. Areas of indirect control would benefit from in-place recycling and waste management infrastructure at the Airport. **Figure 1** identifies aeronautical and nonaeronautical activities and their associated waste streams. **Figure 1** further explains the waste streams by identifying the associated inputs and outputs for the activity.

⁴ Federal Aviation Administration, *Recycling, Reuse, and Waste Reduction at Airports – A Synthesis Document*. FAA Office of Airports. April 24, 2013, <https://www.faa.gov/airports/resources/publications/reports/environmental/media/recyclingsynthesis2013.pdf>. Accessed: October 2022.

⁵ Airfield waste is typically generated during construction projects and waste items can range from concrete or asphalt to signage and old lighting.

Figure 1
Airport Waste Streams



(FAA, 2014)

1.2 EXISTING AIRPORT WASTE MANAGEMENT

1.2.1 Manassas Regional Airport Waste Management and Recycling

The primary goal of waste management at the Airport is to keep the Airport clean and to minimize Foreign Object Debris (FOD) and wildlife attractants (e.g., open trash bins) at the Airport. The Airport has four dumpsters, and each tenant at the Airport has their own dumpster. Refer to **Figure 2** for an example of a typical MSW dumpster at the Airport. Trash is collected weekly for the Airport (e.g., terminal). Airport tenants coordinate with waste disposal services to determine how often their waste is collected. The City of Manassas properly disposes of any hazardous material (e.g., batteries).. There is no designated official in charge of waste management at the Airport, therefore, each department or division at the Airport manages its own waste.

Figure 2
MSW Dumpster at the Airport



Sources: Manassas Regional Airport 2022, RS&H 2022.

The Airport currently does not operate a recycling program nor requires tenants or contractors to recycle. The Airport previously had recycling bins in the terminal, which were collected by the City of Manassas. However, the Airport no longer receives recycling collection services from the City, and it therefore became the responsibility of the Airport to dispose of the recycled material at a site located across town. Another issue with the former recycling program was passengers cross-contaminating non-recyclable waste into recycling bins, therefore making it difficult for the Airport to properly separate recyclable

material from non-recyclable waste. The Airport administration considered these factors regarding recycling and decided it was best to suspend their recycling program at the Airport. The Airport does recycle construction debris, which is brought to the staging location on the northeast side of the Airport. Airport tenants decide their involvement in recycling programs.

1.3 LOCAL RECYCLING PROGRAMS

1.3.1 City of Manassas Recycling Program

The City of Manassas does not have a mandatory recycling program.⁶ However, the City of Manassas strongly encourages businesses and residents to participate in recycling activities. In 2020, the City of Manassas had a 56% recycling rate, recycling 30,588 tons of material compared to 24,142 tons of trash.⁷

1.3.2 Prince William County Recycling Program

Prince William County requires businesses and residents to participate in recycling activities.⁸ Prince William County Code of Ordinances specifies the requirement of reporting a businesses' refuse, recycling, yard waste, and food waste activities on an annual basis to Prince William County's Department of Public Works.⁹ Prince William County allows the recycling of cardboard, mixed paper (i.e., newspaper, office paper), aluminum, and plastic bottles.¹⁰ However, Styrofoam and glass containers cannot be recycled. Prince William County in 2020 had a 33.5% recycling rate with 180,695 total recycled tons and 518,533 total MSW tons.¹¹

1.3.3 Commonwealth of Virginia Recycling Program

The Virginia Department of Environmental Quality requires that each county, city, town, or regional authority is required to establish and maintain a recycling program.¹² Regions within Solid Waste Planning Units (SWPUs) with populations less than 100 people per square mile or unemployment rates greater than 50% must have a 15% recycling rate. . For all other SWPUs, the required recycling rate is 25%.

⁶ City of Manassas, Solid Waste Management Plan. Accessed: <https://files4.1.revize.com/manassasva/Public%20Works/Trash%20&%20Recycling/Manassas%20SWMP%20FINAL%202021.pdf>, October 2022.

⁷ City of Manassas, Trash and Recycling Statistics. Accessed: https://www.manassasva.gov/public-works/trash_recycling/trash_and_recycling_statistics.php, October 2022.

⁸ Prince William County, Recycling. Accessed: <https://www.pwcva.gov/department/solid-waste-management/recycling-prince-william>, October 2022.

⁹ Prince William County, Virginia. (2022, October 17). Sec. 22-169. - Nonresidential and refuse removal reporting. Retrieved from municode: https://library.municode.com/va/prince-william-county/codes/code-of-ordinances?nodeId=CH22RE_ARTVIIRE

¹⁰ Prince William County, Recycling. Accessed: <https://www.pwcva.gov/assets/202208/PWC%20Guide%20to%20Recycling%20Single%20Stream%20FINAL%20new%20website.pdf>, October 2022.

¹¹ Virginia Department of Environmental Quality, Virginia Annual Recycling Summary Report. Accessed: <https://www.deq.virginia.gov/home/showpublisheddocument/12688/637738737851330000>, October 2022.

¹² Virginia Department of Environmental Quality, Mandatory Recycling Rates for Localities. Accessed: <https://www.deq.virginia.gov/land-waste/recycling/statewide-recycling-programs/virginia-recycling-mandates>, October 2022.

1.4 REVIEW OF WASTE HAULER CONTRACTS

The Airport is currently contracted with American Disposal Services, Inc. The Airport’s waste hauler monthly fee since June 2021 has been about \$461 per month or about \$5,538 annually (see Table 2). Tenants at the Airport are able to manage their own MSW receptacles and develop their own contracts with their choice of waste haulers in the local community. American Disposal Services, Inc. conducts weekly pick-ups for dumpsters managed by the Airport. Tenants at the Airport determine their own pick-up schedule with their specific waste hauler.

Table 2
Municipal Solid Waste Hauler Costs

Monthly Cost	\$461
Dumpster Size	Four 8-yard
Frequency of Service	Weekly
Annual Cost	\$5,538

Source: Manassas Regional Airport 2022, RS&H 2022.

1.5 RECYCLING FEASIBILITY AT THE AIRPORT

The Airport does have the opportunity to develop a recycling program that would reduce the amount of waste that would be sent to a landfill. The Airport could restart recycling efforts by recycling commonly found items at an airport that are identified in Table 3.

To help address the issues that were present during the Airport’s previous recycling program, the Airport could do the following:

- » Public outreach and education.
- » Establish multi-stream recycling bins throughout the Airport.
- » Reestablish recycling pick up.

The Airport could conduct a waste assessment to determine the Airport’s waste composition and identify areas of opportunity for reducing the Airport’s waste. Table 4 illustrates the various approaches to a waste assessment at an airport.

1.6 PLAN TO MINIMIZE SOLID WASTE GENERATION

As the Airport continues to grow in the future. Airport management can take actions to improve and limit the solid waste generated at the Airport. The Airport has identified the desire for tenants at the Airport to establish a barrier and lock each dumpster to prevent illegal dumping (e.g., non-Airport waste brought to dumpster). The Airport could develop a Recycling/Waste Reduction Program.

Table 3
Commons Recyclable Materials Found at Airports

What	Where											
	Public Terminals	Ticketing	Security Gates	Food Service Areas	Offices	Cargo Shipping	Maintenance Areas	Airport Grounds	Aircraft	Airfield Ramps	Construction Areas	Concessionaires, Retailers, Rental Cars Facilities
Corrugated Carboard				X	X	X	X		X			X
Mixed Paper	X	X	X	X	X	X	X	X	X	X		X
Newspaper	X	X	X		X				X			
Glass	X	X	X	X	X	X	X		X			
Aluminum Cans	X	X	X	X	X	X	X		X			
Plastic Bottles	X	X	X	X	X	X	X		X			
Pallets						X						
Food Waste & Cooking Oil	X			X	X							
Organics/Green Waste								X				
Electronics					X							
Used Tires							X					
Used Oils							X					
Scrap Metal						X	X				X	
Concrete											X	
Lumber											X	
Batteries					X							
Toner Cartridges					X							X
Plastic (non-bottles)						X	X					X

(EPA, 2009)

Table 4
Water Assessment Approaches

Strengths	Limitations
<p>Records Examination</p> <ul style="list-style-type: none"> • Provides weights and volumes of waste generated. • Tracks major potential waste from the point of origin. • Identifies the expensive or valuable components of an organization’s waste. • Documents financial benefits of reuse and recycling including total revenues and avoided disposal costs. • Requires the least time and effort. • Establishes baseline for metrics. 	<ul style="list-style-type: none"> • Lack of quantitative data for specific waste components. • Does not provide qualitative data on how or why wastes are generated. • Substantial effort necessary to collect and analyze data.
<p>Facility Walk-Through</p> <ul style="list-style-type: none"> • Requires less time and effort than waste sorts. • Allows first-hand examination of facility operations. • Provides qualitative information about major waste components and waste-generating processes. • Reveals waste reduction activities. • Develops appreciation of logistics and obstacles tenants encounter in their efforts to recycle. 	<ul style="list-style-type: none"> • Limited identification of wastes generated. • Multiple attempts may be necessary for comprehensive evaluation. • Relies on estimates of waste generation.
<p>Waste Sort</p> <ul style="list-style-type: none"> • Provides quantitative data on total waste generation and specific waste components. • Allows problem solving and design of recycling programs to be site specific. 	<ul style="list-style-type: none"> • Requires more time and effort than other approaches. • Multiple attempts may be necessary for comprehensive evaluation. • Does not provide qualitative data on how or why wastes are generated.

Source: (ICAO, 2018)

Under the Airport's Rules and Regulations (3.03 Environmental Pollution and Sanitation), tenants must follow the following:

- a. Each Person while on Airport property shall conduct his/her activities thereon in such a manner as not to cause littering or any other form of environmental pollution.
- b. No Person shall dispose of garbage, papers, refuse, or other forms of trash, including cigarettes, cigars and matches, except in receptacles provided for such purpose.
- c. No Person shall dispose of any fill or building materials or any other discard or similar waste materials on Airport property, except as approved in writing by the Airport Director. No liquids shall be placed in storm drain or other systems which will result in water pollution having passed through such drain or system.

Sustainable Aviation Guidance Alliance¹³(SAGA) created a database with numerous practices that can be implemented at an airport to reduce solid waste generation and create new sustainable practices.

The Airport Cooperative Research Program (ACRP) *Synthesis 92 Airport Waste Management and Recycling Practices* (ACRP, 2018) identified effective practices for reducing waste that could be implemented at an airport.

- » Food Donation
- » Back-of-House [Tenant] Composting
- » Office/Workplace Recycling for Employees
- » Terminal Recycling for Passengers
- » Environmentally Preferred Purchasing
- » Tenant and Service Provider Contracting Designed to Increase Diversion
- » Training for Employees and Tenants
- » Strong [Recycling] Signage
- » Measuring and Monitoring of Metrics

The Airport could follow the FAA's Ten Steps for Creating and Implementing an Effective Airport Recycling and Waste Reduction Program for creating and implementing a recycling program.

1. Management Commitment
2. Program Leadership
3. Waste Identification
4. Waste Collection and Hauler
5. Waste Management Plan Development
6. Education and Outreach
7. Monitor and Refine Program
8. Performance Monitoring
9. Promote Success

¹³ Sustainable Aviation Guidance Alliance. Accessed: <http://www.airportsustainability.org/sustainable-practices>, January 2023

10. Continuous Improvement

If a recycling/waste reduction program is re-established, the following actions can be considered for potential implementation at the Airport:

- » **Reposition Recycling Bins** – Reestablish recycling and strategically reposition recycling bins so passengers are given adequate opportunity to recycle. Recycling stations should be abundant in all areas of the terminal.
- » **Increase Water Bottle Refill Station** – Establish water bottle refill stations to decrease use of single use plastics in the terminal.
- » **Optimize Cleaning** – Optimize cleaning processes and manage the chemical cleaning process to reduce the need for harmful cleaning chemicals.
- » **Recycle/Reuse Construction-Materials** – Continue to recycle construction materials and expand upon this program by including materials such as pallets/spools, deicers (road salt, sodium formate, sand), green waste, and construction debris.
- » **Recycle Deplaned Waste** – Increase coordination with aeronautical users to help increase the recycling rate of deplaned waste. Although the recycling of deplaned waste is dependent on the individual aeronautical user, proper recycling infrastructure can provide a greater opportunity to increase the recycling rate.
- » **Green Concession Program** – Require concessionaires to participate in all relevant recycling initiatives at the Airport (i.e., food donations, composting, environmental planning) Additionally, concessionaires could implement biodegradable containers.
- » **Organic Waste Management** – Evaluate the feasibility of sending organic waste to an anaerobic digester to produce methane.
- » **Reduce/Recycle Cargo Waste** – Evaluate how to help reduce/recycle cargo waste, which is mainly composed of cardboard, and plastic packaging materials.
- » **Mandate Recycling at the Airport** – As much as possible, update leases to require tenants to recycle or compost at the airport, as well as to establish required sustainability practices.
- » **Education and Awareness Efforts** – Post signage above each receptacle describing what is and is not acceptable in the recycling stream and provide training for employees and tenants.
- » **Conduct a Waste Audit** – Conduct a waste audit in order to analyze the most recent waste stream. Information from the new waste audit can be used to adjust waste management practices where it is deemed necessary.

1.7 CONCLUSION

The Airport has multiple waste streams that include the airfield, fixed-based operators, aircraft maintenance hangars, cargo hangars, and concessions. The composition and management of these waste streams vary by location and whether they are under direct or indirect control. Reference the FAA's Ten Steps for Creating and Implementing an Effective Airport Recycling / Waste Reduction Program and performing a waste audit, the Airport would be able to set and monitor goals, implement policies, and identify areas for increased recycling efforts, which would allow the Airport to determine cost savings and reduce the Airport's contribution to landfills. A formal recycling program, potentially led by a recycling

coordinator, can establish the process for reaching waste reduction goals. This plan could result in the establishing of strategic initiatives, implement policies, and the identification areas for increased recycling and reuse efforts. Additionally, the plan could also create an education plan for the Airport's staff, tenants, and contractors.