



APPENDIX U: AIRPORT SOLID WASTE RECYCLING

Introduction

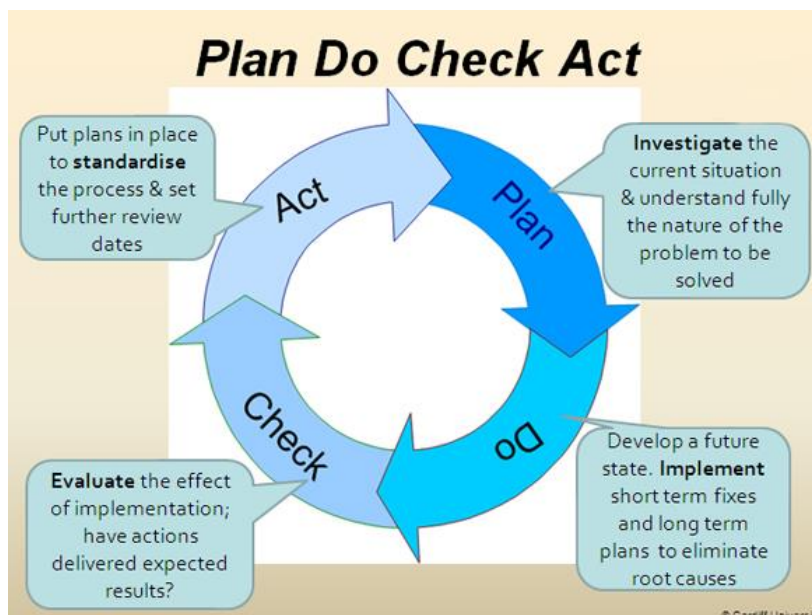
In the FAA Modernization and Reform Act of 2012 (Public Law 112-95), the Airport Improvement Program language was amended (49 USC Section 47106(a)) to include the evaluation of airport solid waste recycling. The change stipulates that the following issues will be addressed:

- Feasibility of Solid Waste Recycling at the Airport,
- Minimizing the Generation of Solid Waste at the Airport,
- Operation and Maintenance Requirements Related to Solid Waste,
- Review of Waste Management Contracts, and
- Potential Cost Savings or Generation of Revenue from Solid Waste Recycling.

To accomplish these objectives this appendix will include:

- Examination of Existing Solid Waste Handling and Recycling
 - o Existing Practices including Operations and Maintenance Issues
 - o Existing Waste Management Contracts
- Examination of Recycling Opportunities
- Alternatives to Minimize Generation of Solid Waste and
- Cost Savings/Revenue Potential from Recycling.

The FAA published “Recycling, Reuse and Waste Reduction at Airports - A Synthesis Document” April 24, 2013 which is an available resource for this plan. Please note, a Solid Waste Recycling plan is one element of an Environmental Management System (EMS). This appendix will not address all elements of an EMS but information regarding an EMS can be found in FAA AC 150/5050-8 “Environmental Management Systems for Airport Sponsors”. The EMS concept follows the “Plan, Do, Check, Act” model which will also be the manner in which the Solid Waste Recycling can be continually evaluated and improved.





Existing Solid Waste Handling and Recycling

There are eight types of waste typically generated at an airport. These are: 1) municipal solid waste, 2) construction/demolition waste, 3) green waste, 4) food waste, 5) waste from aircraft flights, 6) lavatory waste, 7) spill cleanup/remediation waste, and 8) hazardous materials. These are further described in **Table U-1 - Waste Types**.

Table U-1 – Waste Types

Waste Type	Description
Municipal Solid (MSW)	Consists of everyday items that are used and then discarded, such as product packaging, furniture, clothing, bottles, food scraps, and newspapers. This type of waste is addressed by the airport and all tenants.
Construction /Demolition (C&D)	Generally categorized as MSW. However, as it can be a major component of airport waste, it has been separated into its own category in this document. C&D waste is any non-hazardous solid waste from land clearing, excavation, and/or the construction, demolition, renovation or repair of structures, roads, and utilities. C&D waste commonly includes concrete, wood, metals, drywall, carpet, plastic, pipes, land clearing debris, cardboard, and salvaged building components. In some instances, C&D waste may be subject to special requirements (e.g., tar impregnated roofing materials, asbestos containing building materials, etc.). This type of waste is addressed by the airport and contractors and, on occasion, private developers.
Green	Categorized as MSW and is also referred to as yard waste. Green waste consists of tree, shrub and grass clippings, leaves, weeds, small branches, seeds, pods and similar debris generated by landscape maintenance activities.
Food	Food that is not consumed or is the waste generated and discarded during food preparation activities. Food wastes are considered part of the MSW waste stream.
Deplaned	A type of MSW removed from passenger aircraft. These include bottles and cans, newspaper and mixed paper, plastic cups and service ware, food waste, food soiled paper, and paper towels. Waste that comes off the airplanes after flights can represent 20% of an airport's total municipal solid waste stream. The composition is roughly 30% each of paper waste, compostable food material, and non-recyclable materials, with the balance consisting of cups and beverage containers. Deplaned waste is handled by the airlines.
Lavatory	A type of special waste generated when the lavatory tanks of airplanes are emptied via hose and pumped into a lavatory service vehicle, which can be either a self-powered truck or a lavatory cart pulled by a tug. After the aircraft's lavatory tanks are emptied, they are refilled with a mixture of water and disinfecting concentrate, commonly called "blue juice." The lavatory waste removed from the aircraft is transported to a triturator facility, generally located airside near airline operations, for pretreatment prior to discharge to the sanitary sewage system and publicly owned treatment works (POTW). Lavatory waste is handled by the airlines. In the U.S., waste from international flights, except Canada, needs to be processed separately as the waste can potentially introduce plant pests and diseases. International waste is governed by the U.S. Department of Agriculture and must follow the handling procedures found in the <u>Manual for Agricultural Clearance</u> . International waste is handled by the airlines and Customs and Border Patrol.
Spill Cleanup /Remediation	Another type of special waste. This is generated during cleanup of spills and/or remediation of contamination from various sites on an airport. Care must be taken to ensure that these waste materials are not co-mingled with other waste streams and that storage and disposal procedures comply with applicable regulatory requirements. Spill cleanup is handled by the airport, airlines, and FBO refueling personnel.
Hazardous	Must be handled in accordance with stringent federal regulations. Wastes designated as "hazardous" are covered by regulations outlining legal handling, treatment or disposal. Hazardous wastes are either specifically "listed" in the regulation (40 CFR 261.31-.33), or are ignitable, corrosive, toxic or reactive (as defined in 40 CFR 261.21 -.24). For details, see the Resource Conservation and Recovery Act ("RCRA") and its amendments and the regulations 40 CFR Subtitle C, Parts 260-270. This type of waste is handled by the airport, airlines, and TSA.

Source: FAA "Recycling, Reuse and Waste Reduction at Airports - A Synthesis Document" April 24, 2013



For the Minot International Airport waste is generated primarily from the terminal area, the general aviation area, and construction. The waste generated from these normal activities around the airport is collected by airport staff, airline staff, CBP, TSA, and various contractors. KLJ contacted airport administration, tenants, private recycling companies, and City of Minot Sanitation for existing conditions.

Existing Practices in Terminal Area

The terminal area includes all public areas in the terminal facility as well as individual leased space, and airside areas around the terminal. The terminal area generates a variety of waste such as municipal solid, lavatory, food, and aircraft (deplaned). The custodial services are provided by the airport staff and collection is done by the City of Minot Public Works Department. Recycling is currently not available in public or leased areas in the terminal. Waste receptacles are provided in the facility where all waste is comingled and processed through the municipal solid waste stream. The deplaned waste from aircraft goes into the same container adjacent to the terminal and is processed in the municipal solid waste stream. Lavatory carts for the airlines and FBO are emptied at a waste disposal inside the terminal with a triturator connected to the sanitary sewer. Food waste generated from the restaurant area goes into the waste receptacles and is processed through the solid municipal waste stream. Used grease from the restaurant is collected in a grease trap and disposed.

Existing Practices Outside of Terminal Area

Tenants who operate outside of the terminal area primarily use Waste Management as their solid municipal waste disposal company. Minot Aero Center sorts recyclables into containers that is collected by Kalix and also stores its own waste oil and uses it in their furnace for building heating. Waste oil from the airport is brought to the city maintenance shop where it is collected by private entities who primarily use the oil to heat buildings.

Existing Waste Management Contracts

The disposal of waste is a specialized service not regularly performed by airports. There are approximately 5 private solid municipal waste companies serving the commercial needs of the Minot area. The City of Minot has begun to serve some of its municipal facilities. The airport currently utilizes two containers, one large roll-off at the terminal and one smaller container at the snow removal equipment building. The primary solid waste haulers and recyclers are listed in **Table U-2 - Waste Management & Recycling Handlers**.

Table U-2 – Waste Management & Recycling Handlers

Type of Waste	Contractor(s)	Containers/Locations	Tenants
MSW	Waste Management www.wm.com	Unknown	Minot Aero Center
	City of Minot www.minotnd.org	26 yard Terminal) 4 yard (SRE)	Airport and Terminal Tenants
Plastic, Glass, Aluminum, Steel	Kalix www.kalixnd.org	55 Gallon	Minot Aero Center
Paper & Cardboard	Kalix www.kalixnd.org	55 Gallon	Minot Aero Center
Grease (Restaurant)	Midwest Grease	100 gallon	Oakwells (Restaurant)
Oil/Diesel	City Vehicle Maintenance	250 Gallon(SRE)	Airport

Source: Airport Staff & Tenants



Solid Waste and Recycling Opportunities

Recycling Opportunities

When developing a recycling program it is important to note that all planning for recycling must start with the disposal or the recycling destination in mind. If a destination facility is capable of efficiently sorting the comingled recyclable materials than a single-stream program would be possible. This allows all allowable recyclables to be deposited into a single bin by the depositor. Single stream recycling garners the highest participation rate from the population and has the biggest reduction in products going to the landfill. However if the destination does not have the means to efficiently sort comingled recyclable materials than a multi-stream recycling program should be planned. This is where the recyclable materials are sorted by the depositor into separate containers and are handled separately throughout the recycling process. The capabilities and requirements of the destination facility should periodically be reassessed to identify any changes and capture new opportunities.

The City of Minot is planning to provide single-stream curbside recycling collection beginning in 2020. The program will begin with the city acquiring automated collection trucks and residential bins. This will be followed by the construction of a transfer station which will provide temporary storage of recyclables before being trucked to a materials recovery facility (MRF) in Minneapolis. While commercial service will not be provided at launch there may be opportunities to utilize the single-stream service through the city if the program is successful and expands. A large container collected by the city and onsite compactor could provide single-stream recycling opportunities for the terminal area and other users on the airport outside of the terminal area. It is recommended that the airport reevaluate its waste program when participation in the city's single stream program becomes available.

Airport Instituted Efforts to Minimize the Generation of Solid Waste at the Airport

Efforts have been underway to reduce solid waste at the Minot International Airport. The airport staff sorts through scrap metal waste and either repurposes on future maintenance projects or brings to a recycling facility for revenue. When construction projects occur, any debris that can be reused in the project, such as old pavement being crushed into aggregate, is repurposed when possible. Little green waste is generated from the airport as all mowing is mulched in place and current landscaping does not require trimming or pruning.

Areas Where Gains Can Be Made Within the Terminal Area

It is recommended that the Airport begin a new collection and sorting procedure for recyclables and solid waste. The waste/recycle streams are portrayed in ***Exhibit U-1 - Recommended Terminal Area Waste & Recycling Streams***. Because facilities in Minot are not currently equipped for efficient sorting of comingled recyclables, single stream systems are not available and therefore requires additional effort on the airport, tenants, and individuals to sort recyclables in the appropriate containers.



The Minot International Airport should recognize and establish four 'streams' for waste. These are based on the best way that recyclables can be handled to minimize cost and maximize revenue from recyclables. The four streams are:

Trash - all trash not otherwise identified as recyclable. Dispose in standard waste containers and handled by the City of Minot for disposal in landfill.

Paper Products - Continue office paper recycling effort. Since recycling companies in the Minot area require that office paper be separated from newspaper and magazines the paper recycling effort should remain with the airport staff and its tenants with no specific containers for the general public. Office paper products can be best collected in a communal bin for airport and tenants which can be handled by a private recycling company. Paper products are sensitive to moisture and if exposed the quality of the recyclable is lost and may result in landfilling all the paper exposed to moisture.

Cardboard Products - boxes and other cardboard. Most cardboard at the airport is generated from deliveries and therefore can be collected by custodial staff or tenants with no specific containers for typical airport customers. These items are affected by moisture and cannot be comingled with other recyclables that may contain residual moisture. If cardboard is exposed to moisture then the quality of the recyclable is lost and may result in landfilling all the cardboard exposed to moisture. Cardboard products can be handled by a private recycling company.

Non-Paper Based Products - several different recyclables can be comingled together and recycled. These items are not made of substances like paper and are therefore not affected by moisture. These can be handled by a private recycling company and are explained as follows:

- Plastic Beverage Bottles - Plastic #1 beverage bottles (may include caps). These items are best collected with receptacles that have smaller circular openings. Recycling companies in the Minot area require that the various types of plastics be separated. Designing the collection around the beverage bottle (Plastic #1) which is commonplace in the airport environment will increase participation and minimize contamination with other recyclables.
- Glass - bottles and packaging. Glass containers are generated from the restaurant primarily at the airport. There is a market for this material but the demand in Minot depends upon benefit/cost of transporting the recyclables.
- Steel/Tin - containers and packaging. Steel/Tin containers are generated primarily from the restaurant at the airport. There is a market for this material but the demand in Minot depends upon benefit/cost of transporting the recyclables. Aluminum - beverage containers. Aluminum containers can be generated all around the airport. There is a market for this material but the demand in Minot depends upon benefit/cost of transporting the recyclables.



The airlines serving the airport should be advised about these waste/recycling streams and asked to sort trash being generated on the aircraft into these streams. All terminal tenants should be advised of these waste/recycling streams and containers be provided by the airport or tenant to facilitate sorting.

Areas Where Gains Can Be Made Outside of the Terminal

Knowing the established waste streams in Minot, the airport can disseminate this information to all tenants and coordinate centralized containers or recycling efforts to divert recyclables out of the waste stream.

Potential Cost Savings/Revenue Generation

It is possible that cost savings could occur in the long term as recycling is expanded at Minot. The cost savings would likely occur from long term reductions in container sizes and frequency of collections. It is not feasible to estimate that savings at this time, but it is expected to only be slight. There were no recyclables found at the airport in sufficient quantity to be a revenue source. It is recommended that the Airport work with the Public Works Department to develop a baseline of trash and recyclables collected at the Minot Airport. The Airport should regularly measure usage and maintain awareness of solid waste/recyclable handling in the community to take advantage of opportunities as they occur.



Exhibit U-1 - Recommended Terminal Area Waste & Recycling Streams for Minot International Airport

