

APPENDIX D

Recycling and Solid Waste Plan

APPENDIX D

RECYCLING AND SOLID WASTE PLAN

Summary

Sioux Falls Regional Airport (FSD or the Airport) can reduce waste generation and increase landfill diversion by:

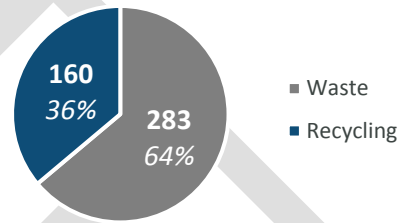
- **Integrating waste diversion practices into airport operations.**
- **Improving purchasing practices, reducing disposable items, and reusing supplies.**
- **Enhancing the existing recycling program.**
- **Tracking and voluntarily reporting waste metrics and diversion progress.**
- **Optimizing the program during terminal concourse expansion design.**

The existing program at FSD generates approximately 283 tons of landfill-bound waste annually, as well as an additional 160 tons of comingled recycling. These recommended strategies have the potential to divert at least 50 tons of general materials from the landfill a year.

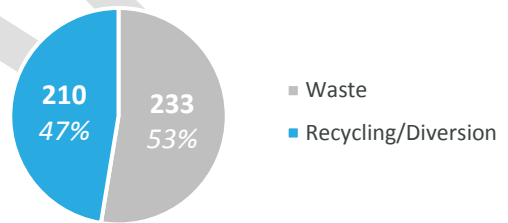
Reducing waste generation and increasing landfill diversion align with FSD’s efforts to operate in a responsible manner.

Planning for solid waste and recycling under the ongoing master plan fulfills FSD’s federal obligation under the **Federal Aviation Administration (FAA) Modernization and Reauthorization Act of 2012, FAA Reauthorization Act of 2018**, and associated guidance.

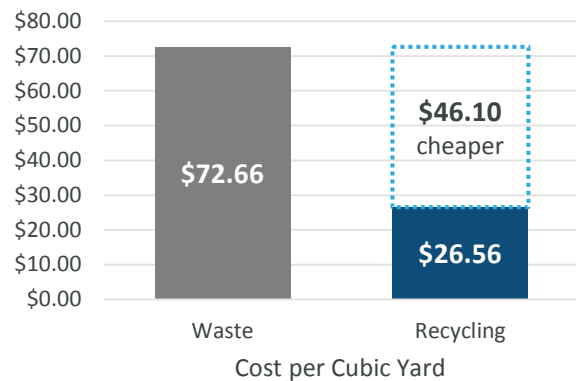
Existing Tonnage



Potential Tonnage












Waste vs. Recycling



Recommendations

The following recommendations to improve waste management at FSD include waste reduction, reuse, and recycling strategies. Evaluation for each recommendation considered estimated relative cost and diversion potential, the suggested implementation time frame, and noted alignment with best practices or standard programs. **Table D-1** shows the key for quick comparison of the impact of each recommendation on diversion.

Table D-1 Recommendation Key

Item	Icons	Significance
Relative Cost		Low cost
		Medium cost
		High cost
Estimated Diversion		Low diversion potential
		Medium diversion potential
		High diversion potential
Benefits		Reduced Environmental Impact(s) <i>(For example, Reduced Resource Consumption, Emissions, and/or Pollution)</i>
		Cost Savings
		Support Community / Build Relationships
Alignment	BMP	Best Management Practice
	TRUE	BMP and Total Resource Use and Efficiency (TRUE) Certification program element

Recommendation 1: Integrate Waste Diversion in Airport Operations

Relative Cost



Estimated Diversion



Benefits



Alignment

BMP

Description

Waste diversion is the concept of managing waste to avoid landfill disposal, including practices such as reducing, reusing, donating, recycling, and composting. These strategies offer various levels of fiscal, environmental, and social benefits.

Action

It is recommended that FSD continue to integrate waste diversion concepts and practices into existing policies and operations, for example, in maintenance operations, purchasing practices, and tenant requirements.

Justification

Most of the municipal solid waste generated at FSD is disposed of at a local landfill and recycling center (see **Current Waste Management Program**). Waste diversion would reduce the volume of waste sent to the landfill as well as reduce the financial and social impacts of waste.

Information Needed

- **Communication tools to reach FSD staff and tenants.**
- **Waste diversion information.**

Action Plan

- **Emphasize the importance of waste diversion to FSD staff and tenants.**
- **Adopt additional waste diversion policy or integrate in existing guidance documents, including tenant lease language.**
- **Identify sources of waste and promote strategies to avoid, reduce, or divert these materials.**
- **Encourage or require waste diversion in future tenant and project contracts.**

Recommendation 2: Improve Purchasing Practices, Reduce, & Reuse

Relative Cost	Estimated Diversion	Benefits	Alignment
\$ \$ \$	🗑️ 🗑️ 🗑️	🌿 🐷	BMP

Description

To reduce the Airport’s volume of waste sent to the landfill, FSD should reduce waste generation and reuse materials where possible. FSD staff’s existing purchasing practices may generate waste in the form of single-use and/or disposable items and supplies. Tracking these items could reveal opportunities for reduction and reuse.

Action

It is recommended FSD adopt a purchasing policy prioritizing durable (versus disposable) items and supplies that are reusable, recyclable, compostable, and/or made from recycled content. It is also recommended that FSD identify supplies and materials that can be avoided, reused on site, or donated to a third party.

Justification

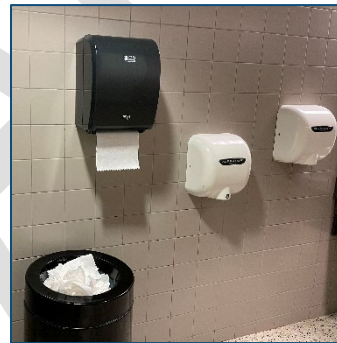
Waste reduction is the most environmentally preferred waste management strategy as determined by the **Environmental Protection Agency (EPA)**. Reduction and reuse simultaneously lower waste program costs by producing a smaller material stream.

Information Needed

- **Purchasing records.**
- **Waste stream information.**

Action Plan

- **Adjust practices that generate waste (printing, housekeeping, etc.)**
- **Substitute single use or disposable items with durable alternatives in the administration office and staff areas.**
- **Purchase environmentally preferable items such as compostable paper towels, coreless paper towels and toilet paper, and biodegradable bag liners.**



Air dryers in restrooms significantly reduce paper towel waste.

Coreless paper towels and toilet paper reduce cardboard waste.

- **Reuse items and materials where possible and encourage reuse by passengers, tenants, and contractors.**
- **Support food donation by restaurant tenants.**

Recommendation 3: Enhance Existing Recycling Program

Relative Cost	Estimated Diversion	Benefits	Alignment
\$ \$ \$	🗑️ 🗑️ 🗑️	🍃 🐷 👤 👤 👤	TRUE

Description

To reduce the facility’s volume of waste sent to the landfill, FSD should continue to recycle materials that cannot be reused or avoided.

Action

It is recommended FSD maintain its existing recycling program and supplement current practices with standardized receptacles, signage, and an education campaign.

Justification

Convenient receptacles, effective signage, and educational campaigns have been shown to increase participation and improve compliance with a recycling program. Recycling bins should be readily visible and instructional recycling signage would greatly increase the effectivity of designated recycling bins. An awareness campaign for employees, tenants, or visitors further compounds the program’s effectiveness.

Information Needed

- **Inventory of related signage and areas of significant waste generation.**
- **Protocol for communicating program to employees, tenants, and visitors.**
- **Input from janitorial staff and contractors regarding current practices and program effectivity.**



FSD currently uses several different types of waste and recycling bins in the terminal building.

Using a single, unified bin for every location in the terminal building greatly increases the visibility, accessibility, and effectiveness of a recycling container.

Action Plan

- Introduce consistent instructional signage in all public areas of the terminal. The signs should be color-coded and graphic, such as *Recycle Across America* recycling labels.
- Standardize public-facing bins and bin liners to match capacity needs as the Airport grows. Reuse existing waste and recycling bins in other non-public areas of the terminal, repurposing old bins where appropriate.
- Expand collocated recycling and garbage bin pairs throughout the facility.
- Train employees on the recycling program to explain its purpose, requirements, and importance.
- Develop a promotional campaign to communicate information about the recycling program to tenants and passengers.
- Monitor and adjust recycling program using feedback from the hauler.

Some of FSD’s existing recycling and trash bins are the primary tool for communicating with visitors about the program. They currently include an icon denoting “recycling” and “trash.” Accepted materials are represented on the gray recycling bin.

Because recycling programs serve an incredibly diverse group of users, clear instructional bin labeling increases program participation and reduces recycling contamination.

Up to
100%

Increase in Recycling Quantities from RAA

Nearly
Zero

Recycling stream contamination with RAA labels in place

Recycle Across America (RAA) is a non-profit organization whose sole mission is to standardize the labeling for collection containers to reduce confusion and fight contamination.

Their solution is color-coded, photo-centric, standardized labels that accommodate programs with different acceptable materials while displaying messaging in a consistent format.



Recommendation 4: Tracking & Reporting

Relative Cost	Estimated Diversion	Benefits	Alignment
\$ \$ \$	  	  	TRUE

Description

Monitoring waste metrics provides feedback on the efficiency of diversion efforts. Sharing this information with stakeholders has been shown to increase participation in diversion practices.

Action

It is recommended that FSD begin to regularly estimate and track the volume of waste sent to the landfill and diverted through reduction, reuse, donation, recycling, or other strategies as well as the costs associated with these services. It is also recommended FSD discuss these trends with the waste hauler and share this information with program stakeholders (FSD staff and tenants).

Justification

FSD does not currently track metrics associated with its waste. Trends associated with FSD’s waste generation, landfill, diversion, and associated costs could indicate opportunities for improvement.

Information Needed

- **Waste generation, disposal, and cost estimates.**
- **Simple tracking tool (spreadsheet).**
- **Estimates of volume of waste diverted by various strategies and avoided costs.**
- **Mechanism for communicating progress to stakeholders.**

Action Plan

- **Collaborate with waste hauler to measure or estimate waste disposal.**
- **Obtain full estimate of associated program costs.**
- **Enter estimates into tracking tool.**
- **As strategies are implemented, update tracking tool to reflect waste avoided, diverted, and costs.**
- **Evaluate data for additional opportunities to set and pursue waste diversion goals.**
- **Share and celebrate progress with stakeholders.**

Recommendation 5: Optimize Program During Terminal Concourse Expansion Design

Relative Cost	Estimated Diversion	Benefits	Alignment
\$ \$ \$	🗑️ 🗑️ 🗑️	🌿 🐷 👤 👤 👤	BMP

Description

Design of the terminal concourse expansion presents a blank slate for aspirational goals. A unified effort examining waste and recycling during the terminal design process is an excellent opportunity to remedy logistical concerns inherent in the existing waste and recycling program.

Action

Airport staff should proactively consider waste management program enhancements during the upcoming terminal remodel and expansion.

Justification

By integrating waste diversion considerations into the terminal design, logistical concerns, such as inopportune placement of bins, can be mitigated or eliminated. Preemptive methods to improve FSD’s waste receptacles, support waste and recycling infrastructure, and maximize the waste management program in the new building design greatly improves the effectiveness of any future improvements.

Information Needed

- **Members of terminal design team.**
- **Functional limitations of existing waste and recycling program.**

Action Plan

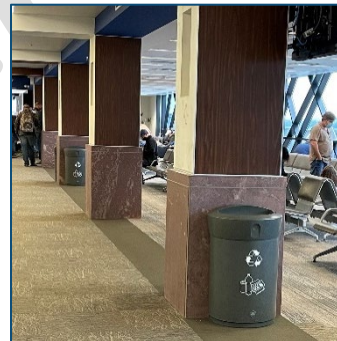
- **Integrate a waste planner as part of terminal design team.**

- **Identify optimal bin style, quantities, and placements.**
- **Install consistently labeled, color-coded recycling and waste bins throughout entire terminal.**



Convert separate-stream recycling bins into comingled recycling bins with standardized labeling and appropriate restrictive bin covers.

- **Implement easily identifiable wayfinding signage for collocated waste and recycling bins.**



Visible directions, such as a sign on a hallway column, provide additional visitor wayfinding to waste and recycling bins.

- **Examine waste bins and dumpsters for capacity or contamination concerns, such as any recyclables that should be absent from the waste stream.**

Attachments

1. Additional Recommendations for Consideration

In addition to the primary recommendations stated previously, the Waste Plan Team suggested several other items that could be implemented at FSD. These supplementary recommendations may be found in **Table D-2**.

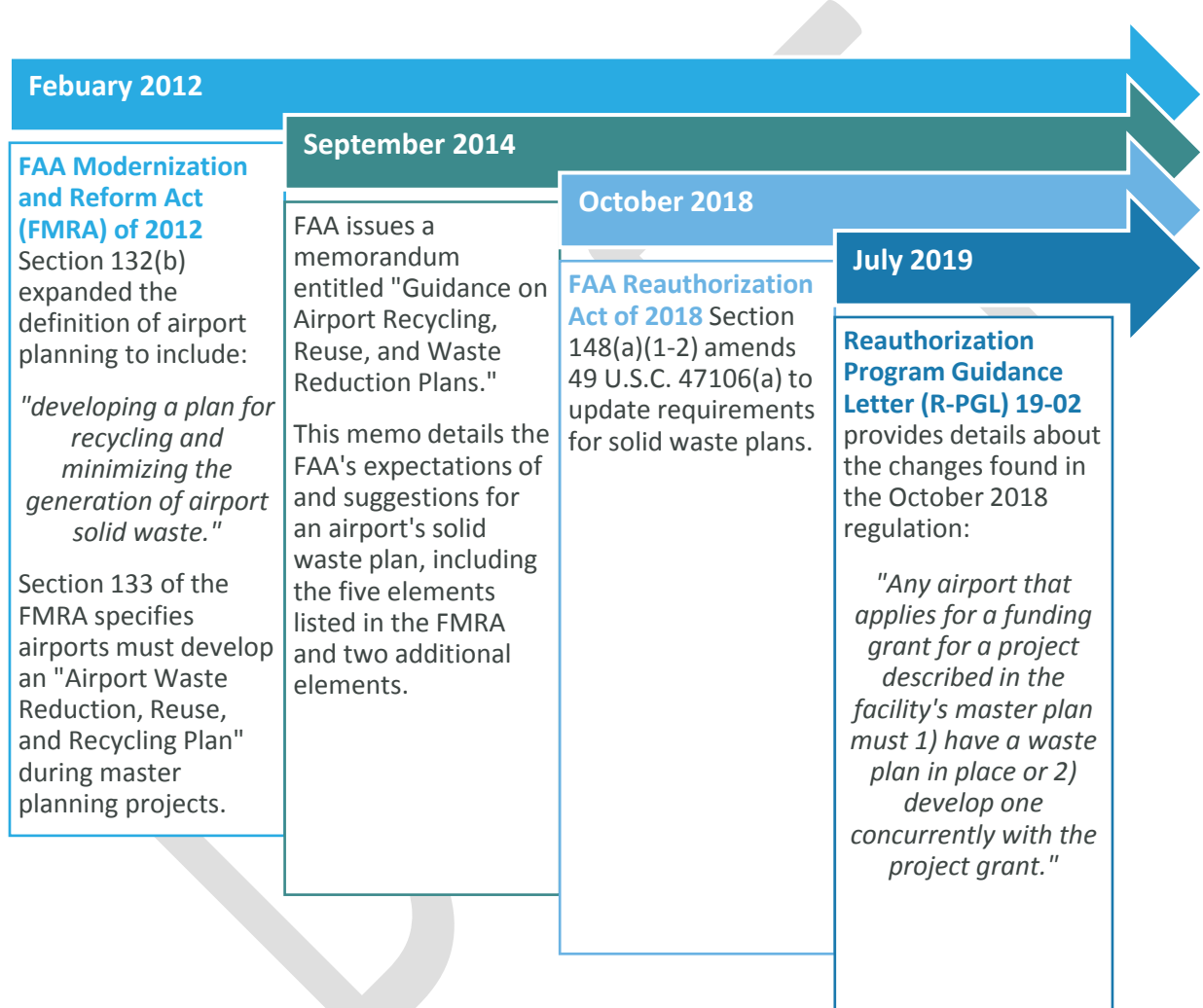
Table D-2 Additional Recommendations for FSD Waste and Recycling Plan

Recommendations Summary
<p>Objectives and Targets</p> <ul style="list-style-type: none"> ▪ Set specific, measurable, achievable, realistic, and time-bound (SMART) goals for FSD’s waste program.
<p>Tenant Requirements</p> <ul style="list-style-type: none"> ▪ Revise rules and regulations and/or minimum standards to encourage or require waste diversion among tenants, including recycling.
<p>Additional Facilities and New Development</p> <ul style="list-style-type: none"> ▪ Consider waste diversion and management in the design and construction process of future airport projects, especially the upcoming terminal expansion.
<p>Continuous Improvement</p> <ul style="list-style-type: none"> ▪ Maintain and improve the recycling and waste program per the <i>Plan Do Check Act</i> cycle.

2. Regulatory Background

Figure D-1 outlines the introduction timeline and specifics of FAA’s waste planning requirement. The FAA provides content guidance for airport waste plans in the September 2014 memo on the topic (available on the FAA’s website).

Figure D-1 FAA Solid Waste Recycling Planning Requirement Timeline and Details



Source: FAA.

Figure D-2 details the elements required for a solid waste recycling plan per the FMRA (marked with an asterisk, *) or suggested for inclusion in a plan in the FAA Memo (marked with two asterisks, **). Figure D-3 lists the factors influencing the scope and nature of an airport’s waste program, as described in the FAA memo.

Figure D-2 Elements of Airport Solid Waste Management



Source: FAA.

Figure D-3 Factors Influencing Airport Solid Waste Management Programs

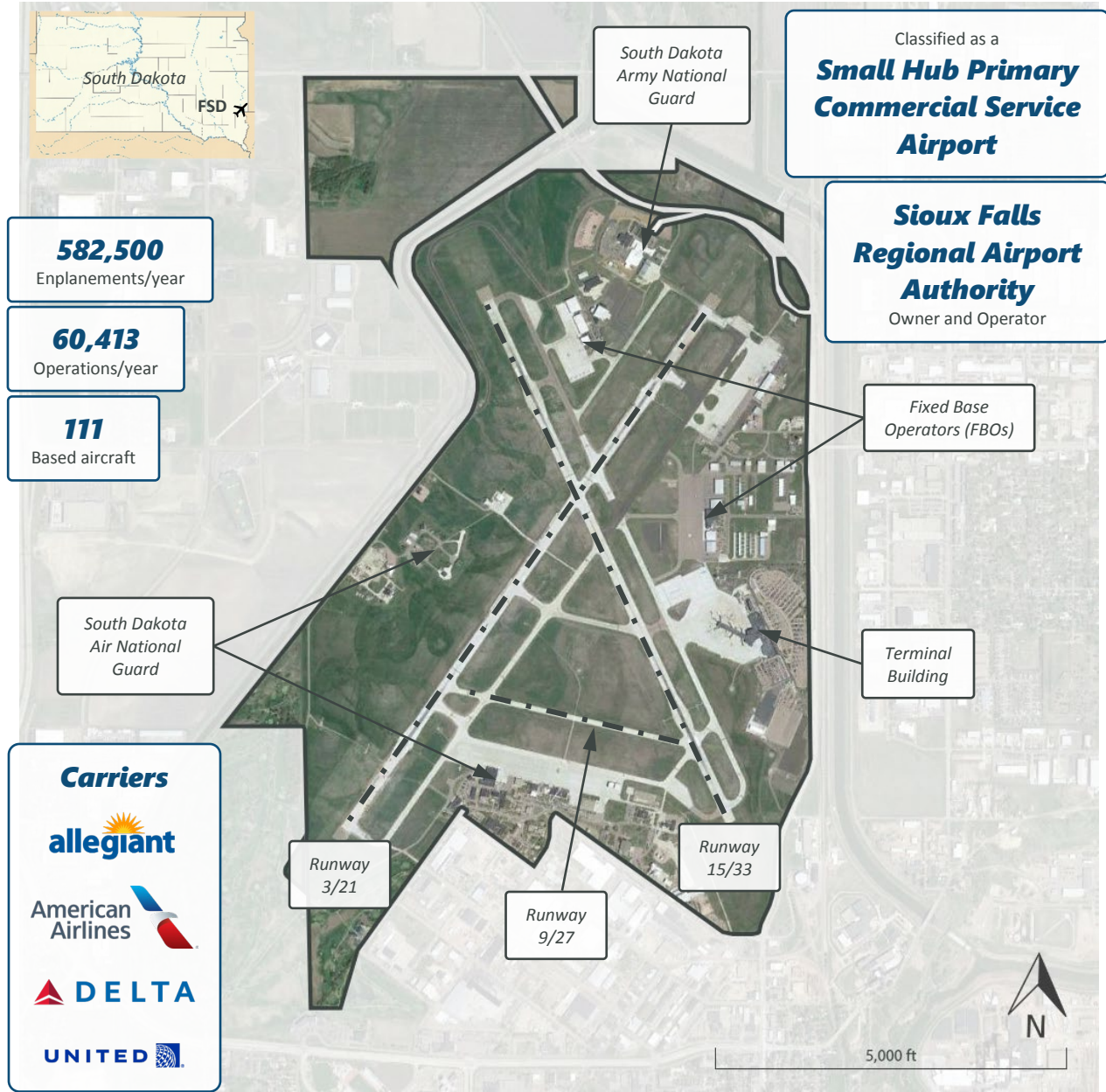


Source: FAA.

3. Airport Information

Figure D-4 shows a summary of background information about FSD, including its location, layout, operations, air carriers, governance, and classification.

Figure D-4 FSD Background Information



Sources: FSD; Google Earth; Alexrk – “South Dakota location map”.

4. Plan Scope

Municipal Solid Waste (MSW) consists of everyday items that are used and then discarded. This plan focuses on the management of MSW and other materials that may be recycled or disposed of in a municipal solid waste landfill. There are five primary types of MSW generated at airports: **general MSW**, **food waste**, **green waste (yard waste)**, **deplaned waste**, and **construction and demolition (C&D) waste**. This plan does not address the management of other waste types regulated by federal, state, or local laws, specifically: hazardous, universal, or industrial waste; waste from international flights; or C&D waste that is subject to special requirements/handling.

Facilities at FSD include buildings and areas over which FSD has a varying degree of control or influence over waste management practices. Some areas fall under direct control of FSD and its staff, while others FSD has influence over but not direct control. According to FAA guidance, areas over which FSD has direct control or influence should be included in the Recycling, Reuse, and Waste Reduction Plan; areas outside FSD’s control or influence may be excluded.

Table D-3 lists a breakdown of the areas FSD controls, influences, and neither controls nor influences.

Table D-3 Waste Management Areas at FSD

Management Level	Description
Areas under direct control	Public terminal areas <ul style="list-style-type: none"> ▪ Parking and curbside ▪ Ticketing lobby, baggage claim, restrooms, concourse, gates, hold rooms, etc. Maintenance facilities Airport administration areas
Areas under influence <i>(Spaces owned by Airport, leased by tenants)</i>	Terminal tenants <ul style="list-style-type: none"> ▪ TSA/airline offices ▪ Restaurants, gift shops ▪ Airline/rental car counters General Aviation facilities <ul style="list-style-type: none"> ▪ Fixed Base Operators (FBOs) ▪ Civil Air Patrol areas ▪ Private hangars Rental Car Quick Turn Around (QTA) Facility Air cargo facilities
Areas not under control or influence	Security/customs areas Air Traffic Control Tower (ATCT) South Dakota Air National Guard Areas (including ARFF facilities) South Dakota Army National Guard areas

5. Current Waste Management Program

The waste management program at FSD is managed and maintained by facilities staff. Waste Management is the waste and recycling hauling contractor for FSD and collects garbage and recyclable materials from FSD’s dumpsters. Dumpsters are provided for use by the FSD facilities and tenants.

Figure D-5 shows materials currently collected and picked up by the waste hauler in FSD’s existing recycling program.

Figure D-5 Items Currently Collected for Comingled Recycling at FSD



Source: FSD.

Operation and Maintenance Requirements (Roles and Responsibilities)

FSD’s janitorial staff is responsible for custodial activities in buildings and areas directly managed by the Airport, such as the public terminal and administration areas. Janitorial staff collect waste and recyclables from bins and transfer these materials to the appropriate dumpsters. All airport tenants are individually responsible for housekeeping activities in their leased areas.

FSD’s terminal tenants (rental car companies, air carrier offices, concessionaire, etc.) use FSD’s dumpsters for waste and recycling removal. The FBOs, hangar tenants, and other aviation-related businesses at the airport are responsible for contracting for their own waste dumpsters and recycling services.

FSD receives four monthly invoices from Waste Management, with each servicing a different building. These buildings are the terminal, rental car QTA, north cargo building, and maintenance building. The terminal building is the largest monthly invoice, and the total cost is divided among the relevant tenants. Terminal tenants pay a set share of the waste and recycling collection because they may use FSD’s dumpsters. The terminal building waste invoice is divided into thirds as follows:

- **Airport Administration and Gift Shop**
- **Concessionaire**
- **Airlines**

It was observed that the existing concessions spaces do not offer recycling bins for customer use. It is recommended that all areas of the terminal building have equal access to recycling infrastructure.

Infrastructure

Figure D-6 through D-8 detail the existing waste infrastructure in place at FSD.

Figure D-6 Existing FSD Infrastructure – Waste and Recycling Dumpsters



Figure D-7 Existing FSD Infrastructure – Interior Waste and Recycling Bins



Figure D-8 Existing FSD Infrastructure – Best Practices Achieved by FSD



6. Waste Audit

An evaluation of FSD’s waste invoices and records, as well as aviation industry waste and recycling trends, supported efforts to identify the source, composition, and quantity of waste generated at FSD, including areas under FSD’s direct control or influence. This information then served as a foundation to identify opportunities to improve and monitor program effectiveness.

Quantity



283

Annual tons of MSW



160

Annual tons of Recycling

These volumes are estimates based upon the capacity and frequency of collection service for the infrastructure listed previously and the EPA’s volume-to-weight conversion factors for MSW. The calculations assume a 75% fill factor, or the assumption that dumpsters are collected at ¾ capacity.

Purchases

FSD staff do not currently track the quantity and type of disposable items and supplies purchased for the facility. This information could provide insight on some of the materials coming into the Airport that will go back out as waste (other materials are brought on-site by visitors, employees, and vendors). Identifying and tracking the type and quantity of all disposable items purchased for use at FSD will allow Airport staff to identify opportunities to reduce outgoing waste by eliminating certain items or substituting them with reusable/recyclable alternatives.

Sources and Composition

Based on the activities taking place at FSD, a varied waste stream can be expected. **Table D-4** lists each area included in the scope of this plan and the type(s) of waste likely generated there. A physical waste material sort could also be used to identify opportunities to improve the composition of the waste stream (by item substitution, by improving recycling to reduce the volume of waste, etc.).

A waste sort could be beneficial in providing more detailed information about the specific composition of waste at FSD. This information may include:

- **Types of items included in each general category**
- **Contamination rate of the recycling stream**
(items that are not recyclable in the recycling bins)
- **Recovery rate for recycling**
(the proportion of recyclable items that are segregated properly)

Table D-4 FSD Waste by Area and Material

Area Material	Office Paper	Newspapers	Magazines	Plastic	Aluminum	Cardboard	Glass	Food Waste	Paper Products	Liquids	Toiletries	Deplaned Waste	Packaging	Styrofoam	Metals	Green Waste	C & D Waste	Other Waste*
Terminal Building																		
Public areas		X	X	X	X		X	X	X	X			X					X
Airline areas	X	X	X	X	X	X	X	X	X	X		X	X					X
Tenant areas	X	X	X	X	X	X	X	X	X	X			X					X
Airport administration offices	X	X	X	X	X	X	X	X	X				X					X
TSA security checkpoint		X	X	X	X		X	X		X	X		X					
Airport Support Buildings																		
Maintenance activities	X			X	X	X	X		X	X			X	X	X	X	X	X
General aviation facilities	X	X	X	X	X	X	X	X	X				X					
Other Airport Buildings																		
GA and commercial hangars				X	X	X	X						X					
Cargo tenant facilities	X			X	X	X	X						X	X				

Source: FSD.

Note: * "Other Waste" includes hazardous, universal, or industrial waste; waste from international flights; or C&D waste that is subject to special requirements/handling.

7. Review of Recycling Feasibility

There are several factors that influence the feasibility of recycling and other waste diversion strategies at an airport. The project team assessed these factors for influence at FSD, as described below.

Guidelines and Policies

To evaluate FSD’s existing diversion plan in the context of local, state, and national requirements, the project team reviewed federal, South Dakota State, and local-level waste and recycling regulations, policies, and factors.

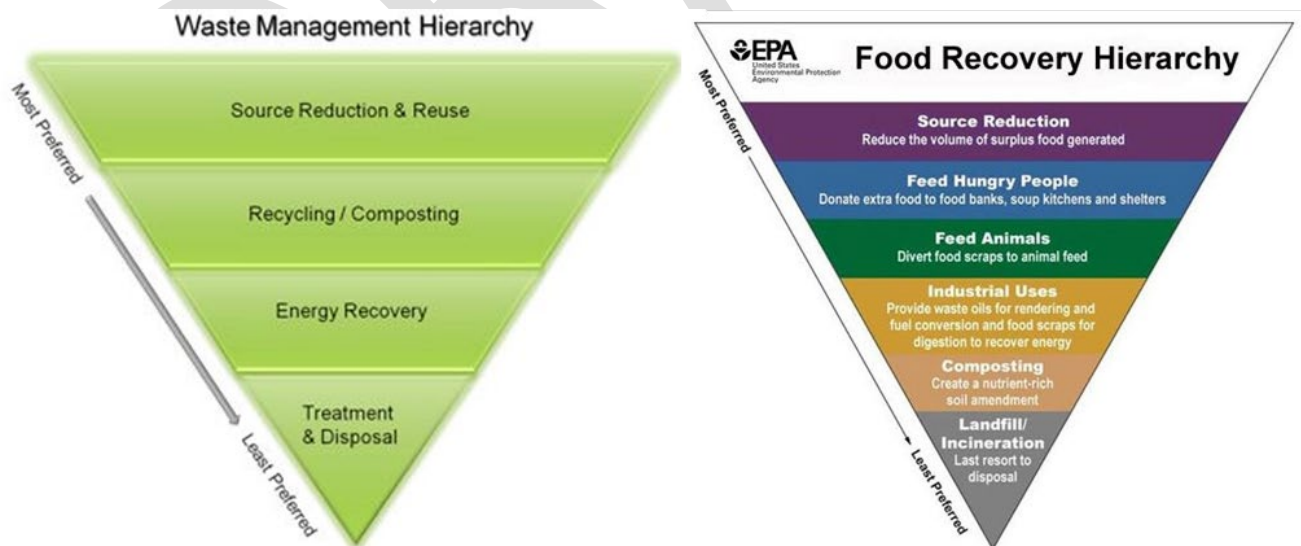
Federal

As described in **Regulatory Background**, the FAA’s definition of airport planning includes planning for recycling and waste minimization.

The United States **Environmental Protection Agency (EPA)** is responsible for developing a solid waste management program under the **Resource Conservation and Recovery Act (RCRA)** and related policies and guidance. RCRA provides the framework for management of hazardous and non-hazardous waste. All generators of hazardous waste, including airports, are required to comply with RCRA and all other federal waste laws and regulations.

Figure D-9 shows a hierarchy of waste management strategies developed by the EPA. This hierarchy on the left ranks these strategies from most- to least-environmentally preferred and places emphasis on reducing, reusing, and recycling. In addition to the general waste management hierarchy, the EPA has also developed a preference ranking of management strategies for food waste, as shown in the figure at the right.

Figure D-9 Waste Management and Food Recovery Hierarchies



Source: United States Environmental Protection Agency.

State

The South Dakota Department of Agriculture and Natural Resources oversees the state’s overall waste management program. South Dakota requires all state agencies to recycle cardboard, office paper, newspaper, and containers (plastic, glass, aluminum, and steel). No additional statewide regulations on waste management have been established.

Local

All waste in Minnehaha County, including within the City of Sioux Falls, is regulated by the Minnehaha County Planning Department. All residential users in the County are provided streetside pickup of separated waste and comingled recycling once a week; regular waste and recycling collection for commercial users requires individual contracting through local waste haulers, such as Waste Management. The City of Sioux Falls currently accepts for recycling all items listed in **Table D-5**.

Table D-5 Recyclable Items in Sioux Falls

Single Stream/Curbside Recycling	
Plastic Containers	Aluminum, tin, and steel cans
Cardboard	Paper Cartons
Paper	Glass bottles and jars
Household Hazardous Waste (HHW) Recycling (at a designated HHW facility)	
Household electronic devices	CFL bulbs, cords, and holiday lights
Paint	Household cleaners
Household chemicals	Batteries
Cooking oil	Fire extinguishers
Fuels	Ammunition
Landfill Recyclable	
Household appliances	Lawn mowers and snow throwers
Scrap metal	Tires
Green Waste Disposal (compostable at the landfill)	
Grass, leaves, and plant cuttings	Branches
Wood	Wood Palettes

Source: City of Sioux Falls, SD.

Minnehaha County and the City of Sioux Falls actively support and encourage recycling measures. Based on the availability of recycling infrastructure, this plan assumes the communities surrounding FSD, and therefore its employees and visitors, have been exposed to recycling, receive ongoing messaging about its importance, and are generally supportive of recycling efforts.

Technical and Economic Factors

Local Markets and Infrastructure

Markets for recycled materials fluctuate based on many factors and interactions. Local waste haulers typically accept materials that can be recycled cost-effectively in the area. Manufacturers purchasing

recycled material want it to be predictable and ready for use; therefore, recycling facilities are discriminatory about what materials they accept. They almost unilaterally prefer materials that are of high value, clean, and easy to separate.

The drop-off location for MSW and recycling in Minnehaha County is the Sioux Falls Regional Sanitary Landfill. This facility is located roughly 15 miles southwest of FSD and it has adequate capacity to serve FSD and the local area for the foreseeable future.

Logistical Considerations and Constraints

To maintain a recycling program at FSD, certain elements must be in place. These include:

- **A proactive and engaged custodial staff**
- **A willing and affordable hauling contractor**
- **Space for bins, dumpsters, and compactors**
- **Hauler access to secure areas of the facility (including airside ramps and sterile areas)**

At present, these elements appear unconstrained. Additional resources including custodial labor, waste hauling services, space, and airport access are anticipated to be available to support the introduction and/or expansion of the diversion program at FSD.

Potential Partnerships

Several air carriers serving FSD have established sustainability programs that include elements of waste diversion and recycling for both passengers and internal operations. The following practices and principles could complement FSD's program:

- **American Airlines has had an aluminum can recycling program since 1989. Internal operations at American Airlines reflect waste reduction and diversion through minimizing paper use and recycling electronic waste.**
- **Delta Air Lines includes waste diversion in its overarching sustainability goals. Their milestones for waste include a minimization of single-use plastic for flights by 2025, a 65 percent landfill waste diversion rate by 2035, and a 100 percent diversion rate by 2050.**
- **United Airlines is "committed to operating sustainably and responsibly" and has recycled more than 28 million pounds of aluminum cans, paper, and plastic from flights and facilities. In 2014, United began to replace its hot beverage cups with fully recyclable alternatives made from recycled plastic water bottles.**

Aligning the FSD program with air carrier practices represents a win-win scenario whereby the facility can reduce its environmental impact and, by helping the air carriers reduce their impact, generate goodwill between FSD and the local community.

Recycling, Landfill, and Energy-From-Waste Facility Requirements

Components that seem recyclable (plastic, glass, or metal parts) may make up some items generated at FSD; however, the recycling facility has specific material standards that should be followed to protect the stream. It is important that non-recyclable items are not included in future recycling efforts at the facility.

Costs

Airport staff strive to operate FSD to be as self-sustaining as is feasible; therefore, it is imperative that programs implemented and maintained at FSD, including recycling and other waste diversion strategies, are as cost-effective as possible. See **Financial Analysis** (below) for more information.

8. Review of Waste Management Contracts and Tenant Leases

The FAA memorandum titled “Guidance on Airport Recycling, Reuse, and Waste Reduction Plans” explains that the purpose of reviewing waste management contracts is to “identify opportunities for improving (waste) program scope and efficiency, as well as identify constraints.” By reviewing contracts and tenant leases for language pertaining to waste management practices, the waste plan may appropriately identify opportunities to encourage responsible waste management for all levels of Airport activity.

A full review of tenant leases was not conducted as part of this study. A draft lease agreement provided by Airport staff details general housekeeping requirements and related expectations for managing trash; it provides no information about or requirement to reduce waste or recycle. The lease language does not necessarily impede recycling or other waste management strategies, but neither does it explicitly require conformance with or support of Airport-related waste efforts.

9. Financial Analysis

According to the FAA memo “Guidance on Airport Recycling, Reuse, and Waste Reduction Plans,” an analysis of the financial aspects of waste management assists airport sponsors in determining the cost versus benefit of all existing and proposed enhancements to an airport’s practices and should include capital costs, physical infrastructure, transport, and labor.

The estimated average cost for collection and disposal per cubic yard under Waste Management at FSD is \$72.66 for waste and \$26.56 for recycling; this makes recycling collection \$46.10 cheaper per cubic yard than waste. The size of dumpsters and the frequency at which they are serviced represents a significant contributor to the average cost per cubic yard, and a reduction of either factors would reduce the total spend. A reduction in dumpster size and/or servicing frequency would allow a shift to recycling without changing the total cost of the program. Reduction and reuse practices would further lower the program’s cost, as materials that are eliminated from the stream do not need to be recycled or landfilled.

10. Waste Glossary

(Sorted by chronology)

FAA Modernization and Reform Act of 2012 (FMRA) – legislation that seeks to improve aviation safety and capacity of the national airspace system and provide a stable funding system.

FAA Reauthorization Act of 2018 – reauthorization of FMRA 2012 to extend funding and administrative authority to the FAA.

Total Resource Use and Efficiency (TRUE) – Zero waste certification program administered by the Green Business Certification Inc. (GBCI).

Environmental Protection Agency (EPA) – independent agency of the US government that establishes policies that protect the natural environment.

Reauthorization Program Guidance Letter (R-PGL) 19-02 – implements provisions to FAA Reauthorization Act of 2018 that changed project eligibility, scope, or funding under 49 U.S.C., Chapter 471.

Municipal Solid Waste (MSW) – everyday items that are used and then discarded. There are five primary types of MSW generated at airports:

- **General MSW** – common inorganic waste, such as product packaging, disposable utensils, plates and cups, bottles, and newspaper. Less common items, such as furniture and clothing, are also considered general MSW.
- **Food waste** – either food that is not consumed or the waste generated and discarded during food preparation. Food waste and green waste make up a waste stream known as compostable waste.
- **Green waste (yard waste)** – tree, shrub and grass clippings, leaves, weeds, small branches, seeds, pods, and similar debris generated by landscape maintenance activities. Food waste and green waste make up a waste stream known as compostable waste.
- **Deplaned waste** – waste removed from passenger aircraft. These materials include bottles and cans, newspaper and mixed paper, plastic cups, service ware, food waste, food-soiled paper, and paper towels.
- **Construction and demolition (C&D) waste** – 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.

Resource Conservation and Recovery Act (RCRA) – federal law of the US governing the disposal of solid or hazardous waste.