Appendix 8 City & County of Denver-Denver International Airport Case Example

Appendix 8
City & County of Denver
Denver International Airport (DEN)
Denver, Colorado

Denver International Airport (DEN) is cognizant of the environmental impacts an airport can have on its community. DEN has committed to sustainability and environmental protection through two overarching policy statements. In alignment with these policies, DEN has implemented several sustainability initiatives, including an objective focused on landfill diversion. To increase landfill diversion, DEN operates voluntary recycling programs for employees, passengers, and tenants; it also offers food donation and composting opportunities to airport food and beverage operators. Through these programs, DEN has been able to increase landfill diversion every year for two decades.

DEN's landfill diversion programs are administered by the Environmental/Sustainability and Facilities departments in cooperation with key stakeholders, including terminal tenants, janitorial contractors and private waste and recycling companies. The Environmental Services department monitors, measures, and tracks the programs' progress; an in-house team is focused on landfill diversion. Information about DEN's metrics is provided by the collection contractor via invoices. Airport staff present the facility's monthly diversion rate at management meetings. DEN is striving to reduce the amount of landfilled waste in 2020 by 2,000 tons from the 2012 baseline.

To inform decision-making, DEN has conducted waste stream composition studies (waste assessments), stakeholder surveys, and facility audits. Staff have also developed an Airport Recycling, Reuse, and Waste Reduction Plan; other recycling and waste management reports; a sustainability report; and a Sustainability Master Plan. An example, Denver International Sustainability Solutions Airport Waste Assessment Report, is included at the end of this case example. Airport staff also seek input from other airports on waste management strategies, for example, Denver International Airport's food donation program was created with help from Portland International Airport staff.

In general, DEN has a centralized waste management system. Airport staff and contractors collect materials from common-use compactors and roll-off dumpsters located in staging areas at the terminal building. Leased areas outside the concourses and terminal (rental car facilities, flight kitchens, and airline hangars) manage their own waste streams.

To reduce generation of single serve water bottles, the Airport has installed bottle refill stations throughout the passenger concourses.

DEN donates abandoned luggage, paper products, and excess office supplies to local non-profit organizations for reuse. The luggage is donated to local organizations who provide services for children who are in foster care or are wards of the court, as well as homeless individuals for their belongings. Some luggage is also donated to the City of Denver Police Department for use in canine detection training. DEN estimates that they donate about 450 pieces of luggage each year.

DEN's paper products donation program was the result of an employee observation. To ensure paper products are available for passengers, toilet paper rolls are changed on a regular basis during restroom servicing. The employee noted that the partial rolls removed from the restroom fixtures were being discarded and notified management. To divert this material from the landfill and aid those in need, these rolls are now donated to local non-profits serving the homeless and income challenged populations; these organizations collect the partial rolls from the Airport at their own expense. It is estimated that this program diverts three to four tons of material from the landfill each year.

Several of DEN's food and beverage tenants participate voluntarily in a food donation program. Excess edible food is collected from the concessionaires and donated to a local food bank for distribution to people in need. The first iteration of this program was supported by United Airline's loan of two refrigeration units/coolers for storage of food items. DEN was recently awarded a grant totaling $20,313.00 from the State of Colorado Department of Public Health & Environment to expand the initial pilot program through the purchase of additional refrigeration units/coolers. The coolers were installed throughout the facility and allow the concessionaires to safely store excess food for donation (Figure 1). This program is on track to donate over 100,000 pounds of food in 2017. A key element of this program's success and continuation is communication about the legal protections from the risks and liabilities associated with donating food. The Airport is looking to further expand this program to additional tenants, especially the restaurant management companies that participate in similar programs at other airports around the country.

Passengers traveling through DEN have access to over 250 waste clusters, which feature collocated waste and recycling containers (Figure 2). There are also over 300 collocated containers in the Airport's parking lots. Information about recycling is communicated to passengers via container labels, signage, and DEN's website.

Employees and tenants have access to interior bins, trash compactors, recycling compactors and a network of front load dumpsters and roll-off bins (Figures 3, 4 and 5). The compactors are housed in trash rooms located throughout the facility and most can be accessed by trash chutes. Employees can recycle single stream materials as well as toner cartridges and other items. Paper products purchased by the Airport are required to have recycled content; environmentally conscious recommendations for other supplies are in place as well.

Information about landfill diversion is communicated to employees through new employee and recurring training; emails; container labels and signage; and an employee newsletter. Tenants receive training on waste management; tenant containers and areas feature labels and signage. Airport staff also present recycling information during tenant meetings. Different colors of garbage bags/bin liners are used to identify the different waste streams.

Except for Southwest Airlines' materials and bags from outlying areas such as parking lots, single stream recyclables must be loose (not bagged) per the collection contractor's requirements. DEN pays an additional fee for the collection of recyclable materials in bags.

DEN's recycling program extends to plastic film and a pilot program for glass. The Airport owns and operates a material baler for plastic film generated by tenant deliveries. The baler was purchased through

a grant from the State of Colorado Department of Public Health & Environment. Plastic film is collected in satellite areas and then consolidated in the baler. DEN estimates that eight to ten tons of plastic film are diverted to recycling each year. Airport staff estimates that the facility generates 400 to 500 tons of glass annually, but little of this material was being recycled in the single stream program. In response to recycling facilities' operational challenges with and concerns about glass, DEN is working with a specific vendor to operate a separate collection program for this material. The vendor is planning to operate this program; the glass will be collected from the bars and restaurants instead of requiring their employees to deposit this material in a collection area outside the leased space. The glass will be recycled by the vendor for remanufacturing of bottles via a local bottling company as well as other markets like fiberglass and artisans.

Some of DEN's airline tenants participate in the voluntary recycling program; some recycle materials from deplaned waste. Southwest Airlines and DEN constructed a dedicated recycling center in the airline's operations area; this center is equipped with two waste compactors and one recycling compactor. The location of this center makes it contiguous with the airline's activities; collocating the compactors makes recycling as convenient as disposal. DEN is planning to work with the other airlines to improve recycling from their operations.

DEN's food and beverage operators have access to food waste composting for pre-consumer food waste and can participate voluntarily. DEN provides kitchen containers to all participating tenants (Figure 6) as well as 60 compost totes located in common-use staging areas (Figure 7). Airport staff provide training and education on the composting program. The restaurants are encouraged to use biodegradable bin liners. Caterers for employee events, for example picnics for a thousand people, are required to provide compostable garbage bags and service ware. Waste paper towel generated in the terminal and employee restrooms is also collected for composting. Compostable materials generated at DEN are processed at a commercial facility in the area.

DEN's Environmental Management System contains guidelines and work instructions for waste-related activities. Additional procedures are documented in DEN's Rules and Regulations.

DEN accepts feedback from employees, tenants, and passengers in a variety of ways, including through its website, a call-in line, and social media. DEN has received complimentary feedback, for example, on the waste and recycling container clusters and composting program, as well as constructive feedback, for example, observations that recycling is not available in the food courts. Waste-related suggestions from passengers, employees, and tenants are evaluated and considered for implementation on a case by case basis.

One of DEN's challenges related to tenant participation is the restriction of tenant employee access to the ramp areas where recycling facilities are located for security reasons. These restrictions limit the number of tenant employees who are granted clearance to access these areas to twenty-five percent of the tenant's employees.

Looking forward, the Airport is planning to install liquid collection stations at the security checkpoints and other key locations and increasing tenant and employee participation in the recycling and composting programs.

Figure 1: Food donation cooler, courtesy of Denver International Airport

Figure 2: Terminal waste cluster, courtesy of Denver International Airport

Figure 3: Terminal concourse trash compactor, courtesy of Denver International Airport

Figure 4: Ramp level recycling compactor, courtesy of Denver International Airport

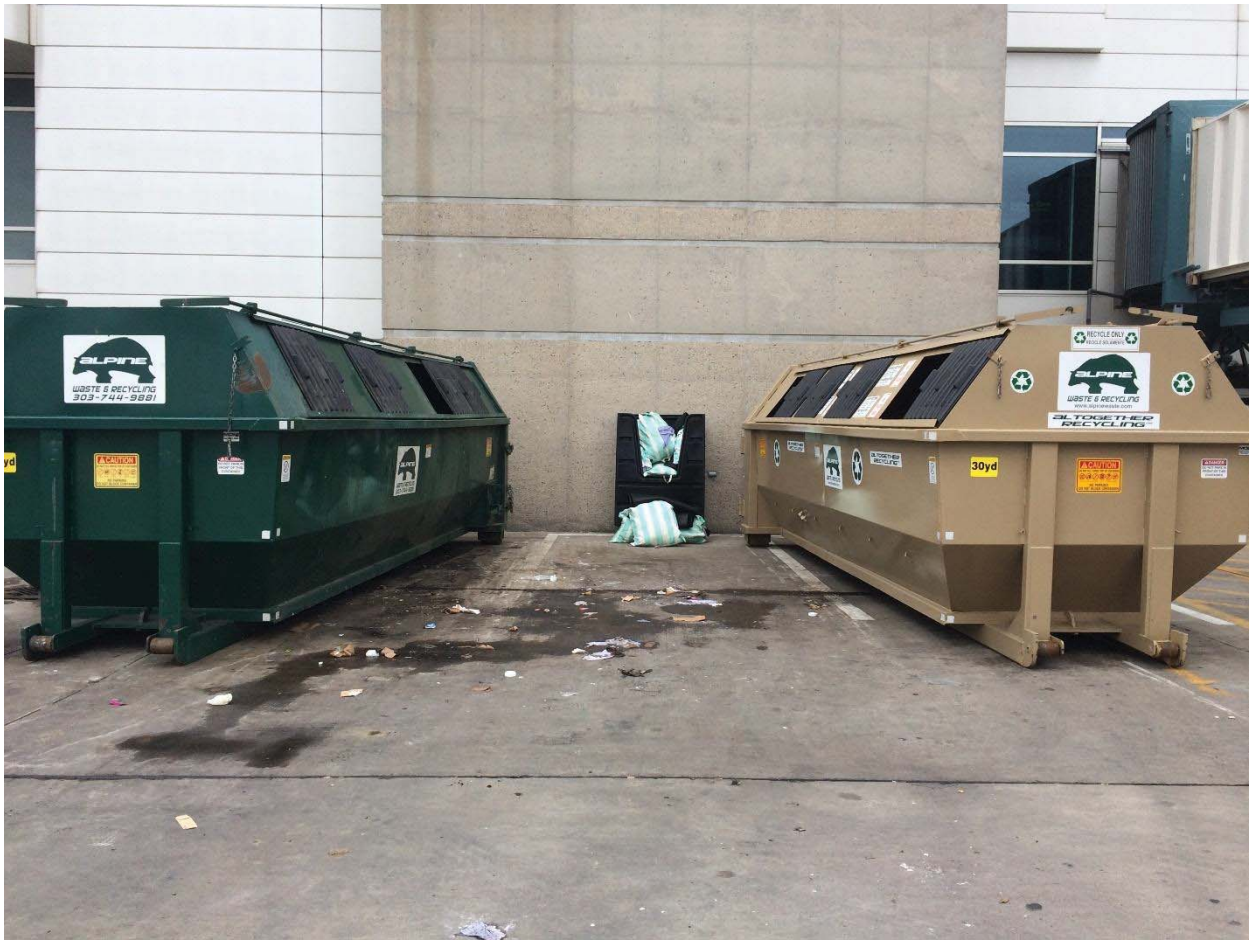

Figure 5: Ramp level waste and recycling front load roll-off dumpsters, courtesy of Denver International Airport

Figure 6: Restaurant kitchen food waste compost bin, courtesy of Denver International Airport

Figure 7: Food waste compost collection totes in staging area, courtesy of Denver International Airport

Sustainability Solutions

Waste Assessment Report

DENVER INTERNATIONAL AIRPORT
TOGETHER WE SOAR

green squad℠

Eco Leadership℠
brought to you by WM WASTE MANAGEMENT

Denver International Airport
8500 Pena Boulevard
Denver, Colorado 80249

July 26, 2010
Prepared by Green Squad℠

Waste Assessment Report – Denver International Airport

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Executive Summary

In its 2009 Strategic Plan, Denver International Airport (DIA), set a goal for itself of becoming a Zero Waste facility by 2020[1]. As the main provider of waste management services for DIA, Waste Management Inc. (WM) retained its WM Green Squad to analyze DIA's current waste streams, identify how far DIA is from reaching 100% landfill diversion today, and provide recommendations and solutions that will enable DIA to move closer to its Zero Waste goal.

In order to identify what opportunities exist for DIA to increase diversion, WM Green Squad conducted a comprehensive waste assessment of waste generated at DIA from the following areas:

- AOB/Main Terminal
- Concourses A, B and C
- East & West Overflow Parking
- Air Cargo
- Maintenance

The assessment, which was conducted from June 21 – June 24, 2010 sampled 20 loads (totaling 5,395.5 lbs) collected from compacted trash delivered to the aforementioned locations. Samples were sorted into 31 material types (organized into seven over-arching categories). Weights obtained from the sorts were used to evaluate the effectiveness of DIA's current recycling programs, identify areas for improving both the current and future recycling programs, and for identifying potential savings opportunities associated with waste diversion strategies.

Weights and percentages obtained from the waste assessment results were extrapolated to annual values based on the volume of solid waste generated from June, 2009-May, 2010. Based on sample results, the assessment revealed that DIA has an opportunity to decrease the amount of waste sent to landfill by over 62%. Under current market conditions, DIA also has an opportunity to save over $200,000 annually through avoided disposal costs and recycling rebate revenues.

WM Green Squad identified that up to 3229.5 tons of recyclables (29.8% of the solid waste stream) on annual basis were sent to landfill instead of being diverted to the existing single-stream recycling program; as well as 24.1 tons (.2%) of recyclable e-waste; and 95.5 tons (.9%) of construction & demolition (C&D) materials. In addition, on annual basis, DIA has the potential to divert up to 3,136.7 tons (28.9%) of its organics by expanding its current composting program to include pre-consumer and post-consumer waste throughout the entire airport. Finally, DIA could potentially divert an additional 170.9 tons (2.4%) annually by implementing new diversion programs.

By maximizing the effectiveness of its current single-stream, ewaste and C&D recycling

[1] http://business.flydenver.com/info/news/documents/strategicPlan.pdf

programs, expanding its current composting program to include post-consumer and pre-consumer organic material throughout the airport, and by implementing new programs to capture reusable materials, DIA can move significantly closer to its Zero Waste goal.

Recommendations resulting from the WM Green Squad assessment include:

- Improve educational awareness about DIA's zero waste goal and waste diversion throughout the entire airport.
- Improve collection strategies to encourage more diversion.
- Expand the current composting program to include pre and post consumer organic material throughout the entire airport.
- Implement new programs to divert additional materials.

WM's Green Squad looks forward to working with DIA to achieve its Zero Waste goal.

Introduction

This section provides a summary of findings for Denver International Airport and general background information relevant to the assessment.

» Overview
» Facility and Assessment Information

Introduction

Overview

In its 2009 Strategic Plan, Denver International Airport (DIA), set a goal for itself of becoming a Zero Waste facility by 2020[2]. As the main provider of waste management services for DIA, Waste Management (WM) retained its WM Green Squad to provide recommendations and solutions that would enable DIA to move closer to its Zero Waste goal. Green Squad's role is to identify opportunities at DIA that minimize waste generation, and maximize recycling and other forms of diversion; and provide recommendations that will enable DIA to move closer towards Zero Waste while also reducing costs over the long term.

In order to identify where opportunities exist to minimize waste and increase diversion, Green Squad Eco-Consultants conducted a comprehensive waste assessment for Denver International Airport. This assessment evaluated the current solid waste stream from all of the solid waste compactors located on site at DIA, located at 8500 Pena Boulevard Denver, Colorado[3].

Figure 1 WM Sustainability Solutions Sorting Materials during waste audit

The DIA Waste Assessment was conducted between June 21st and June 24th, 2010. The waste samples were sorted and weighed at WM's transfer station in Commerce City, Colorado. The assessment was coordinated and conducted for DIA by Green Squad Eco-Consultants. Green Squad arranged for the pickup and drop-off of materials from DIA to the transfer station and sorted, weighed and recorded all sample information.

The purpose of the waste assessment was to analyze the composition of solid waste generated at DIA by all locations that WM services. The areas of waste generation evaluated included the Airport Office Building (AOB) and Main Terminal; Concourses A, B, and C; Maintenance; Air Cargo and East & West Overflow Parking. A complete list of all trash compactors analyzed can be found in Table 2.

The primary purpose of the Waste Assessment was to:

- Observe the effectiveness of DIA's current recycling and composting programs.
- Identify areas for improvement (i.e. diverting materials through current programs more successfully and/or expanding existing programs).
- Inform DIA of how close the facility is to zero waste and provide recommendations to help move DIA closer to this goal.

[2] http://business.flydenver.com/info/news/documents/strategicPlan.pdf

[3] Note the assessment only evaluated compactor loads at DIA that WM is responsible for picking up and hauling to the landfill. It did not evaluate the contents of compactors located at 21998 E 88th Ave, C41 and 88th Avenue Sandshed due to the low volume of waste generated at these locations. These compactors are only disposed of on-call and the frequency is less than once a month. This assessment also did not evaluate the solid waste collected from the 18 front-end loader containers also onsite as DIA, other than those located at gates B15 and B16. Finally, this assessment did not evaluate recyclables collected in recycling gables and cardboard collected in cardboard compactors. All other waste collection practices taking place at DIA were not included as part of the assessment.

It is important to note that this report is the first in a series of reports that will ultimately provide DIA with information related to waste generation and characterization. For this reason, this waste assessment report did not look at the amount of material currently being recycled (diverted) or composted.

This report evaluates the components of DIA's solid waste (residuals) that end up in their landfill-bound compactors. For the purposes of this report, waste bound for landfill is designated as "Residual" waste or "Trash". Waste that could be sent for recycling or material sorting is designated as "Recyclable" or "Divertible", waste that can be composted is designated as "Compostable", and material that can be reused is designated as "Reusable".

DIA currently has a number of strategies in place for diverting material from the landfill. These strategies include the implementation of an airport-wide single-stream recycling program that accepts a variety of materials[4]; a pre-consumer composting program for concessionaire's in the Main Terminal combined with a post-consumer composting program for the AOB break rooms; e-waste and universal waste recycling programs; and a C&D recycling program. Over 200 recycling receptacles are located throughout the airport for travelers and airport employees, and compost receptacles are available in those areas currently accepting compostable materials. Ultimately, janitorial staff, vendors and concessionaires are responsible for delivering both solid waste and recycling from within points of generation at the airport to either trash compactors, recycling gables or roll-offs, or cardboard compactors. A combination of 12 recycling gables and/or roll-offs are co-located with a select number of trash compactors[5].

Green Squad Eco-Consultants identified that there is a significant opportunity to increase diversion of those materials currently accepted by DIA's single-stream recycling program (29.8%). Moreover, if the airport were to expand its current composting program throughout the entire airport to include both pre and post-consumer waste, a substantial portion of the waste stream could be reduced (28.9%). Some of the ongoing issues in the waste stream include a high volume of currently recyclable materials presently found in the residual waste stream; food waste, and liquids in the load (i.e. bottles full of liquids, not emptied).

Green Squad identified that the areas of greatest opportunity to increase waste diversion lie within utilizing the existing recycling program to capture more materials now accepted by the single-stream recycling program and to expand the current composting program. However, in order to maximize the potential success of the existing programs, DIA will need to engage in a substantial education campaign to inform travelers, employees and others who are generating waste within the airport as to what can be recycled and to encourage them to do so. These and other opportunities are detailed in the Improvement Recommendations section of this report.

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[4] Materials currently accepted by the single-stream recycling program include all glass bottles and jars; metals including aluminum can, foil, steel, tin and aerosol cans; all plastics #1-#7 excluding Styrofoam and plastic bags, and fiber materials including OCC (cardboard), office paper, mixed paper, magazines & catalogues, paperboard, and newspapers.

[5] There are a total of 21 trash compactors

Facility and Assessment Information

Figure 2 Denver International Airport

Table 1 Facility and Assessment Information

Item	Comment
Organization Name	Denver International Airport
Description	International Airport
Address	8500 Pena Boulevard Denver, CO 80249
Contact Name	Janell Barrilleaux, Mark Kunugi, Jerry Williams, Debbie Loya
Contact Number	303.342.2730, 303.342.2637, 303.513.6343, 303.342.2858
Eco-Consultants	Stacy Katz, Ashley Faseler
Performed on	June 21, 2010
Completed on	June 24, 2010
Assessment Type	Waste Assessment

DIA is the primary airport serving the Denver region. The passenger terminal complex includes a landside terminal and three airside concourses. The landside terminal accomodates passenger ticketing, baggage claim, concessions and other facilities. Automobile parking facilities are provided in two public parking structures and in surface parking lots. Passengers travel between the landside terminal and three airside concourses (Concourse A, B and C) via an underground Automated GuideWay Transit System. In addition, the Airport Office Building (AOB) houses employee offices and additional space. The airside concourses provide 92 full service jet gates for large jet aircraft and up to 64 parking positions for regional/commuter airline aircraft. In January, 2010, 26 airlines provided scheduled passenger service at DIA: 11 major/national airlines, 10 regional/commuter airlines, and 5 foreign-flag airlines. In addition, several passenger charter and all cargo airlines including Airborne Express, DHL Worldwide Express, Emergy Worldwide, FedEx, and the United Parcel Service provide service at DIA. In addition, DIA is home to approximately 115 stores, restaurants, bars, and lounges throughout the terminals. The Denver International site comprises 33,800 acres (53 square miles) of land, an area larger than the island of Manhattan.

Waste Assessment Description

Waste Assessment Description

This section provides an overview of the material sampling plan and a breakdown of the sample materials composition.

» Summary
» Waste Assessment Procedures

Summary

Two Green Squad Eco-Consultants and three Eco-Technicians conducted an assessment of waste generated from Denver International Airport, located at 8500 Pena Boulevard, Denver, Colorado from June 21st – June 24th , 2010. Waste Management provides hauling service for the 21 trash compactors located at DIA, which are each serviced at least once every seven days.

Green Squad conducted an assessment of each DIA compactor load at Waste Management's solid waste transfer station located at 6091 Brighton Boulevard Commerce City, Colorado. Each compactor load was brought to the transfer station and weighed at the scale house. The total waste stream for all of the compactor loads consisted of 203,520 pounds (lbs) (101.8 tons) of residual waste. A representative sample was taken from each compactor load which was then sorted, weighed and photographed by Eco-Consultants. Each load was accurately labeled by compactor origin. Green Squad sampled a total of 2.65% (5,395.5 lbs) from the entire load (all compactor loads). Table 2 indicates the sample weights of each of the compactor loads that were sorted, weighed analyzed by compactor location.

Figure 3 Solid Waste Delivered from Compactor Load

Table 2 DIA Waste Samples (by AOB and Concourse Location)

DIA Sample Weights (lbs)				
Compactor/Roll-Off	21-Jun	22-Jun	23-Jun	24-Jun
A41			290.8	
A30	309.1			
A46		237.3		
B15 (roll-off)		195.2		
B16 (roll-off)				247.5
B36	239.7			
B39	337.8			
B24		353.3		
B30			388.3	
B44			257.7	
B52	240.5			
B81			321.7	
C38	363.6			
C34				214.7
C39		193.9		
C46		247.2		
AOB	251.9			
AIR CARGO				213.1
MAINTENANCE			281.2	
E&W OVERFLOW			211	
Total Weight of All Samples (lbs)	5395.5			

The waste assessment revealed that there is an opportunity for DIA to improve waste diversion through maximizing the utilization of the existing single-stream and other recycling programs, expanding the current composting program, offering new programs for diversion of additional materials and by enhancing recycling education and communication programs throughout the airport.

Waste Assessment Procedures

Waste Stream Analysis

This section provides an overview of the material sampling plan and a breakdown of the sample materials composition.

- Waste Assessment Summary
- Residuals Stream
- Observations

Figure 4 WM Sustainability Solutions Sorting Materials

To analyze a normal collection cycle for DIA, Green Squad conducted an assessment of each WM-serviced compactor load located throughout the airport. All other waste collection practices taking place at DIA were not included as part of the assessment.

According to WM staff, each compactor is collected at least once per week. Each compactor load was delivered to Green Squad for sorting on its regularly-scheduled pickup date. This ensured that the volume collected for this waste assessment was typical for the facility. The assessment included waste from AOB/Main Terminal, Concourses A, B & C, Maintenance, East & West Overflow Parking and Air Cargo (see Table 2 above for the complete list of compactor locations).

All waste samples collected from DIA were sorted into 31 materials types, listed in Table 3. These 31 material types fall into over-arching categories of Glass, Plastic, Metal, Fiber, Organics, Miscellaneous and Residual Waste. A full description of the types of waste that were sorted into each category are also listed in Table 3. Unusual materials - or a predominance of one type of material - were observed and are noted in this report. Observations were made, photos were taken and measurements were made to the nearest 0.1 pound. Please reference Table 3 for information related to the material types included within each category throughout the remaining document. Table 3 below also indicates how each material listed in the assessment was designated (i.e. 'recyclable', 'compostable', etc.) for the analysis.

In order to calculate annual values, extrapolations were made using data provided from WM's billing department. WM provided a 12-month summary covering June, 2009 – May, 2010 indicating how many loads were picked up from each compactor and the associated tonnages. This information was used to generate annual weight values for each material category based on the corresponding percentages found in the sampled residual waste stream.

Table 3 Material Description by Category & Diversion Opportunity

MATERIALS	CATEGORIES & DESCRIPTION	DIVERSION OPPORTUNITY
GLASS		
Glass Food & Beverage Containers	All colors of food & beverage containers	*Recyclable in Single Stream Program*
All Other Glass	Non-fluorescent light bulbs, glassware, and window glass	*Recyclable Outside of Single Stream Program*
PLASTICS		
#1 Plastic Bottles	PETE Polyethylene Terephtalate (Any bottles with necks/openings narrower than body including beverage containers and cleaning containers	*Recyclable in Single Stream Program*
# 1 Plastic (Non Bottle)	PETE Polyethylene Terephthalate (cups, cup lids, plates, food packages)	*Recyclable in Single Stream Program*
#2 Plastic Bottles	HDPE High Density Polyethylene (Any bottles with necks/openings narrower than body including beverage containers and cleaning containers)	*Recyclable in Single Stream Program*
#2 Plastic (Non Bottle)	HDPE High Density Polyethylene (cleaning containers, pails, motor oil bottles)	*Recyclable in Single Stream Program*
#3 Plastic	PVC Polyvinyl Chloride (All #3 plastics including plastic piping, toys, furnishings).	*Recyclable in Single Stream Program*
#4 Plastic	LDPE Low-density Polyethylene (All #4 Plastics including plastic film, wrap, grocery bags, sandwich bags from large & small packaging, including clear garbage bags/liners)	*Non–Recyclable in Single Stream Program except for Film Plastic found in Air Cargo Area*
#5 Plastic	PP Polypropylene (All #5 plastics including drinking cups, and food containers)	*Recyclable in Single Stream Program*
Styrofoam	PS Polystyrene (#6 Plastics made of Styrofoam including cups, food containers, packing peanuts	*Non-Recyclable - Trash*
#6 Plastics - excluding Styrofoam	#6 plastics excluding Styrofoam including cups, food packaging, cup lids	*Recyclable in Single Stream Program*
#7 Plastic	Plastics labeled #7 - Other- including biodegradable, cups, bottles, food containers	*Recyclable in Single Stream Program*
All Other Plastic	Foams, mixed plastics, unidentifiable plastics, etc.	*Non-Recyclable - Trash*
METAL		
Steel/Tin	Steel/Tin	*Recyclable in Single Stream Program*
Aluminum	Aluminum cans/foil	*Recyclable in Single Stream Program*
Aerosol Cans	Aerosol Cans	*Recyclable in Single Stream Program*
All Other Metal	Non-food containers, all scrap metal & items that are primarily metal, container lids/caps	*Recyclable in Single Stream Program*

PAPER		
OCC Corrugated Cardboard	Unwaxed/uncoated corrugated containers and boxes	*Recyclable in Single Stream Program*
Newspaper	All newspaper including inserts (glossy & otherwise)	*Recyclable in Single Stream Program*
Mixed Paper	Office paper (except fluorescent), envelopes, junk mail, telephone directories & paperboard	*Recyclable in Single Stream Program*
Magazines & Catalogues	All magazines and catalogues	*Recyclable in Single Stream Program*
Waxed Cups	All wax coated drinking cups	*Compostable*
ORGANICS		
Food Waste	All food/beverage waste (out of containers where possible) including bones & rinds, food contaminated paper towels and napkins and compostable wrappers	*Compostable*
Lavatory Waste	Primarily paper towels & tissues	*Compostable*
Liquid Waste	All liquid emptied from bottles and drinking containers	*Compostable*
All Other Organics	Textiles including cloth napkins, blankets, clothing, hats, safety vests, rubber, broken wood etc.	*Reusable Depending on Nature of Item*
MISCELLANEOUS WASTES		
Hazardous Waste	Any material that requires special treatment and handling	*Special Treatment*
E-waste	Electronics including headphones, cell phones and other devices with electronic components	*Recyclable in e-waste Program*
Universal Waste	Bulbs, batteries, and items that cannot be disposed of in a landfill but are not e-waste or Hazardous Waste.	*Special Treatment*
Construction & Demolition Waste	Construction materials including concrete, wood, steel that can be recycled	*Recyclable in C&D Recycling Program*
Residual Waste (Trash)		
Trash/Residual Waste	All materials not classified elsewhere, materials that are not recyclable and/or were too soiled or contaminated to be repurposed (includes soiled food containers, nitrile gloves, wax and plastic food wrappers, cigarette butts, dark trash bags, etc.)	*Trash*

Waste Stream Analysis

Waste Assessment Summary

Green Squad assessed the residual waste stream using the general material categories of Glass, Plastics, Metal, Fiber, Organics, Miscellaneous, and Residual Waste. Our assessment did not include an analysis of DIA's current recycling or composting practices.

Appendix A includes the log sheets for all samples collected including summary and analytical results for each of the waste generation areas included in the waste assessment. Other than visual observations, all measurements taken and analyzed in this report are weights or percentage of weights.

During the waste assessment, 20 waste samples were sorted from each of the compactors on-site at DIA (Table 2), totaling 5,395.5 pounds. These samples were collected from full compactor and roll-off loads which represented 203,520 lbs (101.8) tons of DIA waste according to the scale tickets provided.

Table 4 breaks down the estimated yearly waste generation attributed to each area examined for this assessment.

Table 4 Material Description by Category & Type

	Annual Waste (Tons)	Percent Contribution
Airport Office Building/Main Terminal	1,672	15%
Concourse A	1,889	17%
Concourse B	3,815	35%
Concourse C	2,108	19%
Maintenance	1,052	10%
East & West Overflow	238	2%
Air Cargo	75	1%
Total	**10,849**	**100%**

The Green Squad analysis revealed that a significant portion of the sampled waste stream could be recycled, composted or reused. The analysis revealed that 29.8% can be recycled using the current single-stream recycling program; .8% could potentially be recycled if a plastic film collection program were implemented for the Air Cargo area; 28.9% could potentially be composted if a pre-consumer and post-consumer organics collection program were to be implemented throughout the entire airport area; .2% consisted of e-waste that can be recycled using the airport's existing e-waste recycling program; .9% could be recycled using DIA's existing C&D recycling program; 1.6% consisted of organic material that could be repurposed or reused if a textiles collection program were to be implemented but would

not be acceptable in the current composting program and the remaining 37.8% was residual waste or trash that, in its current form, could not be recycled, composted or reused.

Table 5 Diversion Potential

Item	Waste Reduction Potential (%)
Divert Recyclables to Existing Single Stream Program	29.8%
Implement Pre and Post Consumer Composting Collection Program for Food Waste	28.9%
Bale and Recycle Film Plastic	0.8%
Recycle E-waste from Airlines	0.2%
Implement Airlines Textile Collection Program for Reuse through Donation	1.6%
Recycle C&D Debris	0.9%
Total Landfill Diversion Potential	**62.2%**
Residual Material	37.8%
Totals	**100%**

Within the total residual waste stream the weights per material found were; Glass (4.1%), Plastics (12.3%), Metal (1.6%), Fiber (20.6%), Organics (28.6%), Miscellaneous Waste (1.1%) and Residual Waste (31.7)% (Chart 1).

Chart 1 below illustrates the overall composition of DIA waste by material category. As shown, the Residual Waste, Organics, Fiber and Plastic categories represent the majority of wastes observed (totaling more than 93% of all sample waste by weight).

Chart 1 Overall Waste Composition by Material Category

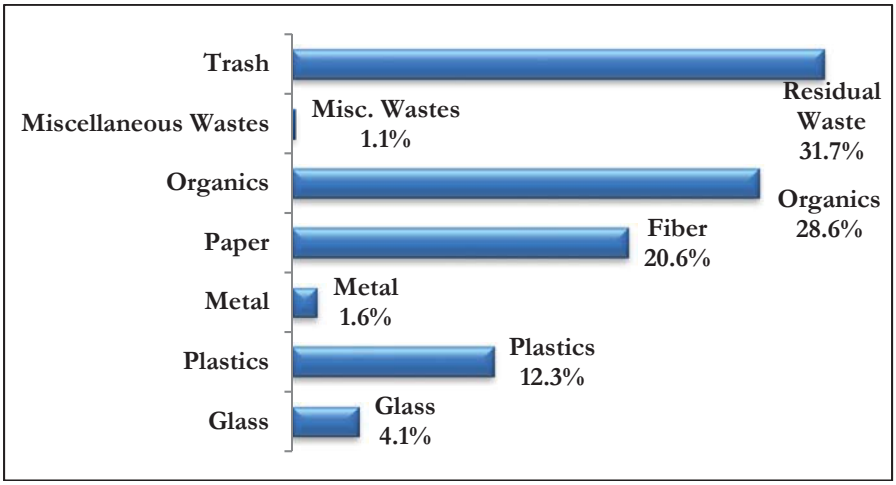
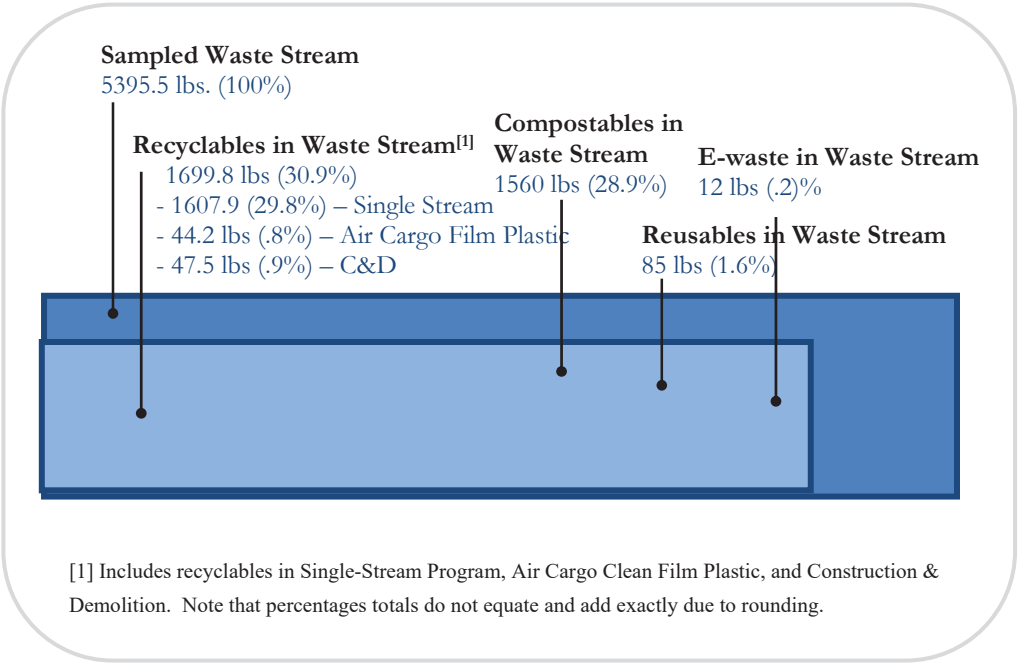


Chart 2 summarizes the total sampled residual stream by weight and the portion of the stream that could be recycled, composted or otherwise diverted.

Chart 2 Sampled Residual Waste Stream for All Compactors



[1] Includes recyclables in Single-Stream Program, Air Cargo Clean Film Plastic, and Construction & Demolition. Note that percentages totals do not equate and add exactly due to rounding.

Below is a detailed analysis of the residual stream by material type with percentages for all compactors at the airport. This section details what percentage of materials within the existing residual waste stream can be recycled using either the existing single-stream, e-waste, or C&D recycling programs; composted if an expanded compsting program were to

be instituted, or diverted if new programs were to be implemented. A detailed evaluation of the overall waste composition from each of the main generation areas assessed for this report also follows.

Airport-Wide Residual Stream Composition

The total 5,395.5 lbs sampled from all compactors were analyzed by material category. Green Squad determined that a substantial percentage of the residual stream could be further diverted using either the existing single-stream, e-waste or C&D recycling programs, potentially composted if the current composting program were to be expanded, or potentially diverted if a new program were to be implemented. The following section examines the components in each material category that make up residual waste stream for all compactors. A detailed discussion for each of the airport areas analyzed also follows. Table 6 below illustrates the total waste stream generated as well as the potential for diversion.

Table 6 Residual Waste Stream Components

Material Type	Total (%)	Can be Recycled Using Single-Stream, C&D or E-waste Program (%)	Could be Recycled with Air Cargo Film Collection Program (%)	Could be Composted with Expanded Composting Program (%)	Could be Diverted if New Textile Collection Program were Implemented (%)	Residual material with no potential for recycling or reuse (%)
Glass	4.1%	4.1%				
Plastics	12.3%	5.4%	0.8%			6.1%
Metal	1.55%	1.55%				
Fiber	20.6%	18.7%		1.85%		
Organics	28.6%			27.06%	1.6%	
Miscellaneous Wastes	1.1%	1.1%[1]				
Trash	31.7%					31.7%
Total	100.0%	30.9%	0.8%	28.9%	1.6%	37.8%

[1] .9% is C&D material and .2% is ewaste
*Note due to rounding, percentages do not always add exactly

For a detailed breakdown of both the weights and percentages of recyclable and compostable materials found within each material category, please see Appendix A.

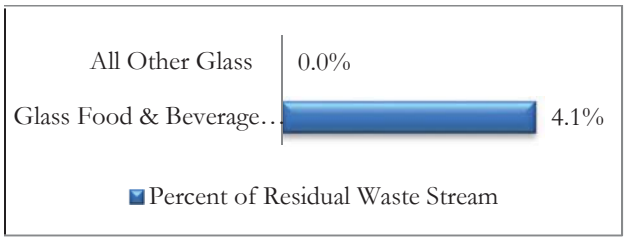
Based on our waste assessment of the all of the airport compactor loads, Green Squad identified several opportunities for DIA to improve diversion through its current recycling programs and through expansion of its organics program.

Glass

4.1% (219.9 lbs) of the residual stream consisted of glass that currently can be diverted using

DIA's existing program. All of the glass found consisted of used food and beverage containers with virtually all glass containers coming from beer bottles. Extrapolating based on assessment percentages, this amount of glass would translate into approximately 442 tons per year.

Chart 3 Glass Found in Residual Waste Stream

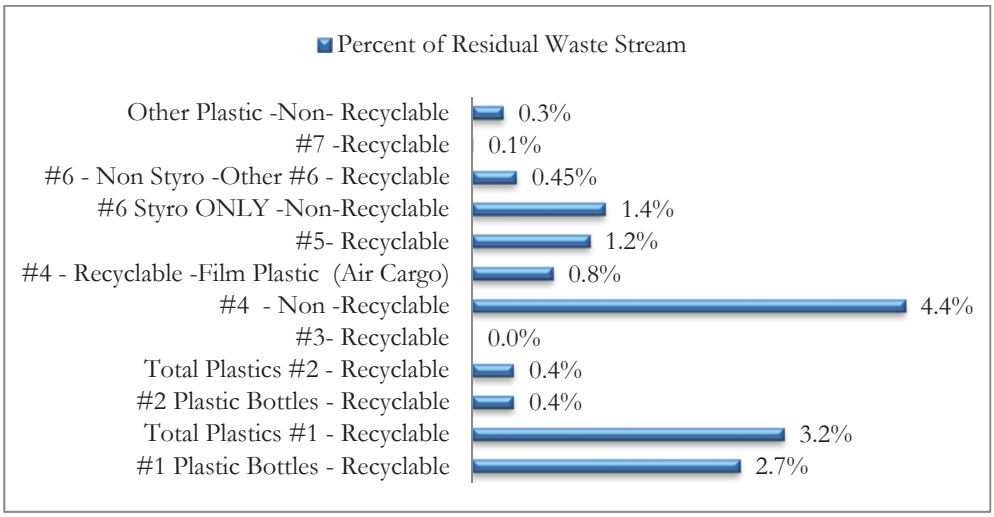


Plastic

Roughly 12.3% (664.9 lbs) of the residual stream consisted of plastic materials. It is important to note that for all plastic bottles, all liquids were emptied and for all plastic containers, all food was removed to the furthest extent possible. 5.4% of this plastic material (291.5 lbs) can be diverted using DIA's single-stream recycling program and .8% (44.4 lbs) could be diverted through implementation of a Plastic #4 film collection program in the Air Cargo area. Materials that were found in the residual stream that are divertible through the existing single-stream program included: Plastics #1 PET (3.2%, 172 lbs) (beverage bottles, cups, food containers, lids); Plastics #2 HDPE (.6%, 30.3 lbs) (beverage containers, food containers and various cleaning bottles); Plastics #5 PP (1.2%, 64.7 lbs) (cups and food containers); and Plastics #6 Non Styrofoam Plastics (.45%, 24.2 lbs) (cup lids, beverage containers); and Plastics #7 (.01%, .3 lbs) (beverage containers, food containers). Plastics #4-film plastic found in the Air Cargo area, could also potentially be diverted if a new program were to be implemented to capture this material. The film plastic found in the Air Cargo area was extremely clean. Extrapolating based on the preceding numbers, the amount of recyclable plastic found in the waste stream that is able to recycled in the existing single-stream program is equivalent to approximately 586 tons per year. On an annual extrapolated basis, the additional amount of recyclable Plastic #4-film plastic that could be diverted from Air Cargo is equivalent to approximately 89 tons. Plastics that cannot be recycled in the current single-stream program include Plastics #4 (plastic bags and film) found in all areas other than Air Cargo, Plastic #6 Styrofoam (food trays and cups) and Other Plastics that consisted of mixed composites. There were no Plastics #3 found in the waste stream.

Figure 5 Emptied Drink Containers

Chart 4 Plastic Found in Residual Waste Stream



Metals

Approximately 1.55% (83.4 lbs) of the residual stream consisted of metal, all of which can be recycled in the existing single-stream program. 1.2% (65.3 lbs) of the residual stream consisted of aluminum cans. .3% of the residual waste stream (16.9 lbs) consisted of steel/tin. .02% (1.2 lbs) consisted of other metals. Based on percentages found during this assessment, the amount of recyclable aluminum generated on an annual basis is equivalent to 131 tons; the amount of Steel/Tin is equivalent to 34 tons; and All Other Metals are equivalent to 2.4 tons.

Chart 5 Metal Found in Residual Waste Stream

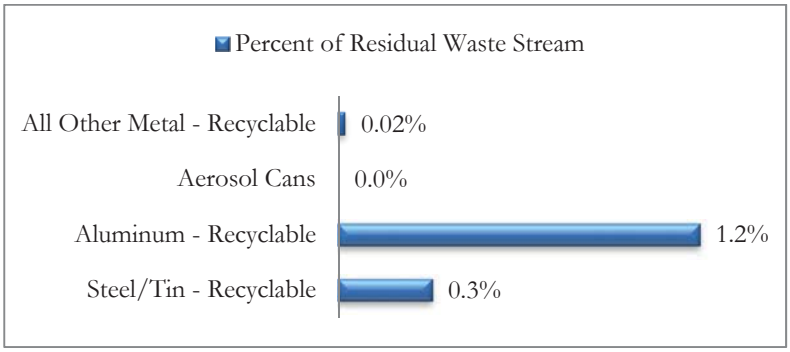


Figure 6 Clean Cardboard (OCC)

Fiber

A total of 20.6% (1,111.3 lbs) of the residual waste stream consisted of fiber materials. 18.7% (1011.3 lbs) of the residual waste stream consisted of Fiber products that currently can be diverted using the existing recycling program. These materials included old corrugated cardboard (OCC) (1.7%, 416 lbs), newspaper (6.4%, 345 lbs), mixed paper (2.9%, 156 lbs), and magazines and catalogues (1.8%, 95 lbs). Based on the percentages found in this assessment, the approximate amount of recyclable material found in the Fiber category annually is as follows:

- OCC – 836 tons
- Newspaper - 694 tons
- Mixed Paper - 313 tons
- Magazines and Catalogues - 191 tons

Waxed cups made up 1.9% (100 lbs) of the residual waste stream. These materials can be composted if an expanded organics collection program were to be implemented.

Chart 6 Fiber Found in Residual Waste Stream

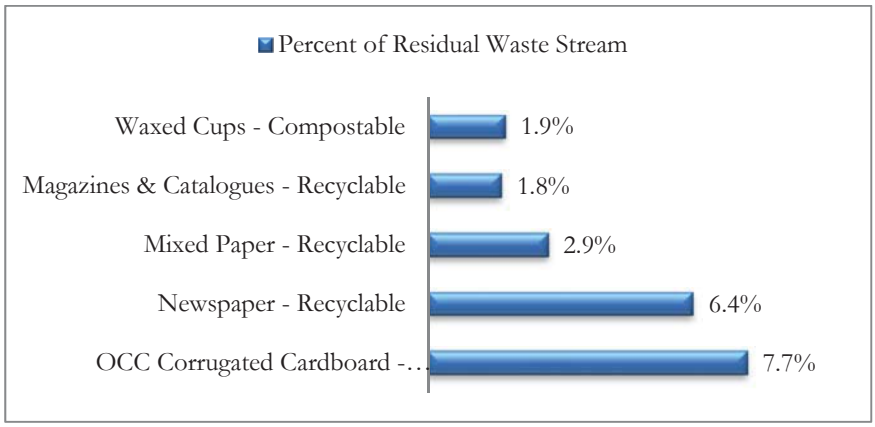


Figure 7 Food Waste

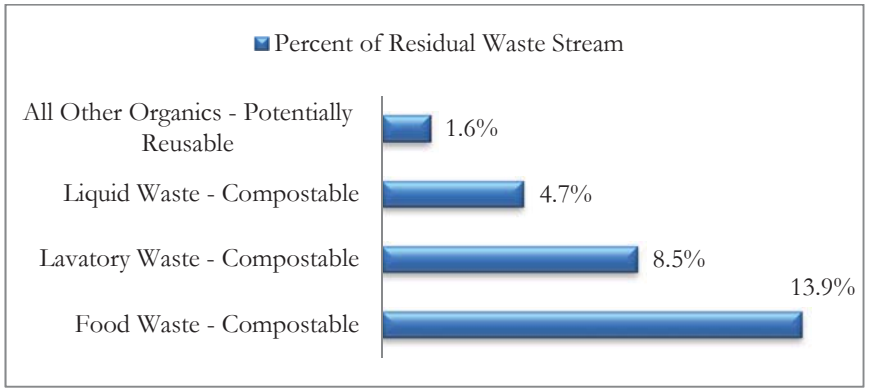
Organics

Approximately 28.6.% (1545 lbs) of the residual waste stream consisted of organic material. These materials included food waste (13.9%, 751 lbs); lavatory waste (8.5%, 456 lbs); and liquid waste (4.7%, 253 lbs). Liquid waste was primarily found in bottles that were emptied. 27.1% (1460 lbs) could be diverted by expanding the current composting program to include pre-consumer and post-consumer food waste collection for the entire airport (including the airlines). Based on the percentages found in this assessment, the approximate amount of compostable material found in the organics category on a yearly basis is as follows:

- Food waste -1509 tons
- Lavatory waste- 917 tons
- Liquid waste – 509 tons

All other organics constituted 1.6% (85 lbs) of the residual waste stream. These materials included primarily clothing items, blankets, cloth napkins, and textiles that would not be accepted by a traditional composting program. Some of this material could be donated, repurposed or reused if a program is implemented to capture this material. A cursory observation revealed that the majority of this material was coming from airplane discards. DIA could consider implementing a trial program with the airlines to collect this material for delivery to local shelters or charities. Based on the preceding numbers, this material constitutes approximately 171 tons per year.

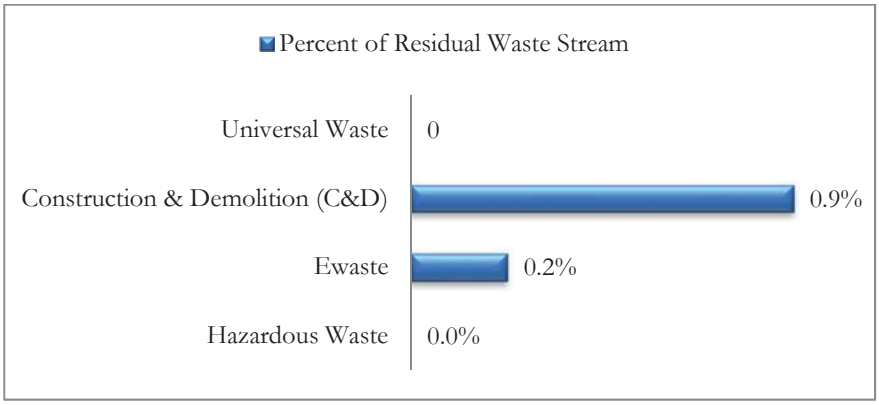
Chart 7 Organics Found in Residual Waste Stream



Miscellaneous

A small amount, 1.1% (59.5 lbs), of the residual waste stream consisted of miscellaneous material containing e-waste and C&D debris that could be diverted to either the existing e-waste or C&D recycling programs. A total of .2% of the residual material was e-waste and .9% was C&D debris. The e-waste material primarily consisted of head phones from airlines. The C&D material primarily consisted of concrete rubble. No hazardous or universal waste was found in the residual waste stream. Extrapolating based on the numbers above, the amount of e-waste generated per year is equivalent to 24.1 tons and C&D generated per year is equivalent to 95.5 tons.

Chart 8 Miscellaneous Materials Found in Residual Waste Stream



Trash (Residual Waste)

Approximately 37.8% (2040.5 lbs) of the sorted stream consisted of residual material. Extrapolating using this data, this material is equivalent to 4,103 tons per year. A significant portion of this material was from the Plastics category that ultimately had to be discarded as Trash because it could not be recycled and amounted to 329 lbs (.16 tons) equivalent to 6.1% of the residual waste stream.

AOB/Main Terminal Residual Waste Stream

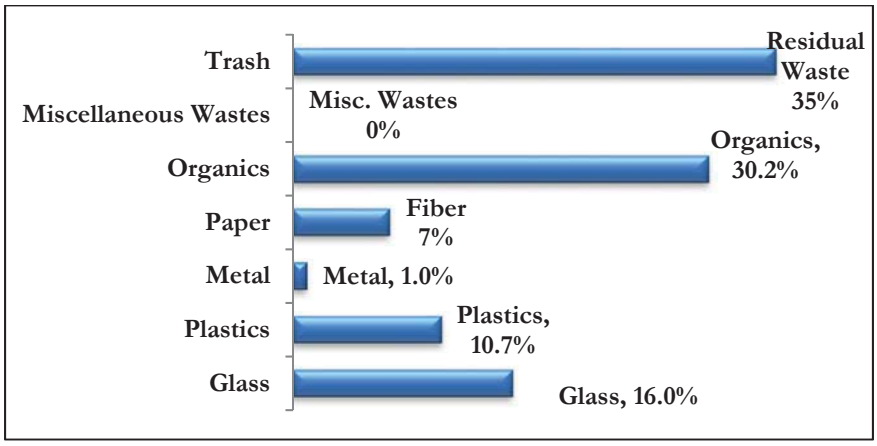
Figure 8 Main Terminal

All AOB and Main Terminal waste is collected in the 34 yard compactor located at the building's loading dock. The loading dock also contains a 25 yard recycling gable, a 42 yard cardboard compactor and composting collection bins. From June, 2009 – May, 2010 AOB/Main Terminal generated 15% of the total waste collected annually from the areas detailed in this report[6]. All waste assessment samples were taken from trash compactors filled at this location. A total of 8,580 pounds of waste was collected from the AOB/Main Terminal and delivered to the transfer station, of which 252 pounds (3%) was sorted for the waste assessment.

Waste generators in the AOB/Main Terminal include several concessionaires (including approximately 12 restaurants/bars/cafes/and grab and go's; and approximately eight stores, news and gift shop retailers) as well the main ticketing areas on Level 6, the primary Transportation Security Administration (TSA) screening area, and sizeable city office space. Chart 9 below shows the residual waste stream by material type by weight with percentages generated in the AOB/Main Terminal. Detailed sample data and summary results for the AOB/Main Terminal can be found in Appendix A.

[6] Per Waste Management hauling records of compactors and roll-offs for AOB/Main Terminal, Concourses A, B, C, Maintenance Center, Air Cargo and East & West Overflow Parking.

Chart 9 AOB/Main Terminal Waste Composition by Material Category



Excluding trash, the top three material categories by weight sorted from the AOB/Main Terminal samples were Organics (30.2%), Glass (16%), and Plastics (10.7%) (Chart 9).

The top three material types (Chart 10) by weight sorted from AOB/Main Terminal samples were Glass Food & Beverage Containers (16%), Lavatory Waste (14.2%) and Food Waste (11.5%). Together these categories total more than 40% of all AOB/Terminal sample waste by weight.

Chart 10 AOB/Main Terminal Waste Composition by Material Type

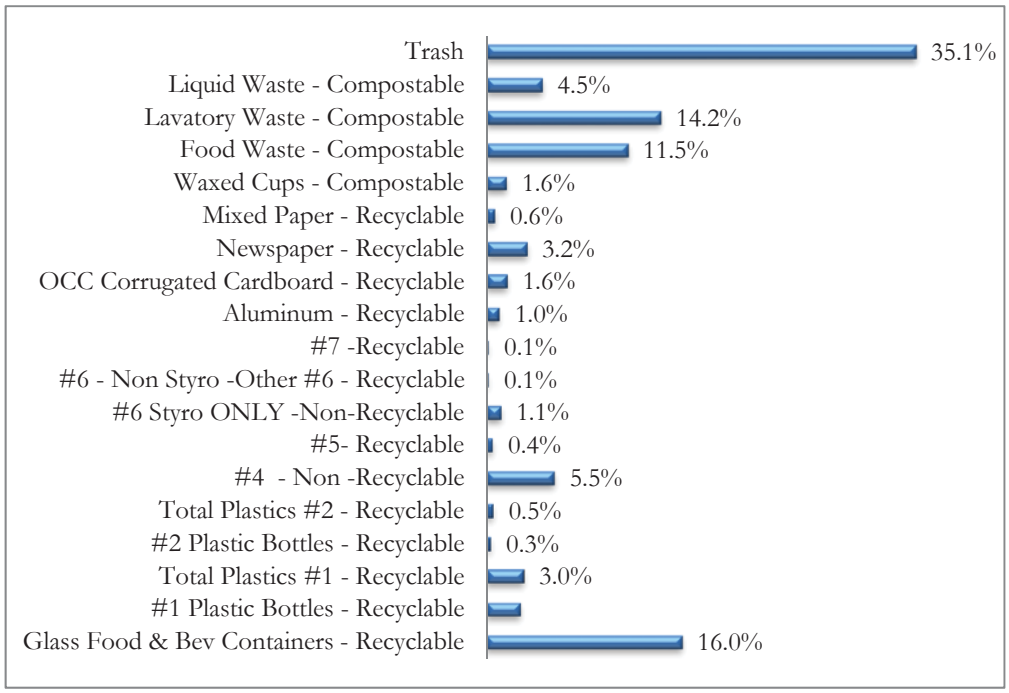


Chart 11 Sampled Residual Waste Stream for AOB/Main Terminal

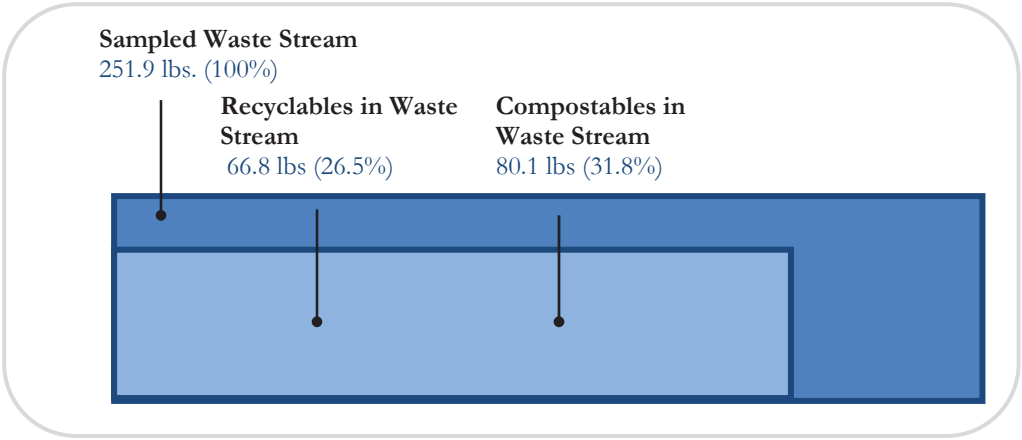


Table 7 Percent of Recyclable and Compostable Material in AOB/Main Terminal

Material Type	Total (%)	Can be Recycled Using Single-Stream or E-waste Program (%)	Could be Composted with Expanded Composting Program (%)	Residual material with no potential for recycling or reuse (%)
Glass	16.0%	16.0%		
Plastics	10.7%	4.1%		6.6%
Metal	1.0%	1.0%		
Fiber	7.0%	5.4%	1.6%	
Organics	30.2%		30.2%	
Miscellaneous Wastes	0.0%	0.0%		
Trash	35.1%			35.1%
Total	100.0%	26.5%	31.8%	41.7%

Out of all of the material sorted from AOB/Main Terminal, 26.5% is currently recyclable using the existing single-stream and e-waste recycling programs; 31.8% could be composted if the current organics program were expanded to include pre-consumer and post-consumer material and 41.7% cannot be recycled, composted or reused under current conditions (Table 7). Please note that 41.7% is calculated from 35.1% Trash originally sorted plus 6.6% of Plastics that could not be recycled or reused.

Other observations include:

- There was a substantial amount of liquid waste (4.5%, 11.3 lbs) that had to be emptied

from discarded drink bottles. Given the amount of passenger/visitor travel though the AOB/Main Terminal and the need to discard materials at the TSA screening point, a high level of containers that would be filled with liquids that need to be discarded is not surprising.

- Glass beverage containers made up a substantial portion of the waste stream by weight (16%, 40.2 lbs). Four bar/restaurant's in the AOB/Main Terminal are the likely sources of this glass. While these locations ultimately may not be responsible for disposing of these bottles, working with these vendors to encourage their patrons to recycle this material could increase diversion rates and decrease tonnages associated with solid waste going to landfill[7].

- Lavatory Waste also made up a substantial component of the waste stream (14.2%, 35.8 lbs). This waste primarily consisted of paper towel and tissue waste. While this material could potentially be composted, another option would be to consider replacing the paper towel dispensers in the AOB/Main Terminal bathrooms with high efficiency electric hand driers. Cost savings associated with reduced paper towel purchases could help offset the costs associated with installing new hand driers.

- High quantities of Food Waste were also found in the AOB/Main Terminal (11.5%, 29 lbs). This finding is not surprising given the large number of food/beverage vendors in the AOB/Main Terminal, along with passengers and city employees' meal waste. If a post-consumer organics program were to be implemented, a substantial amount of this material could potentially be diverted.

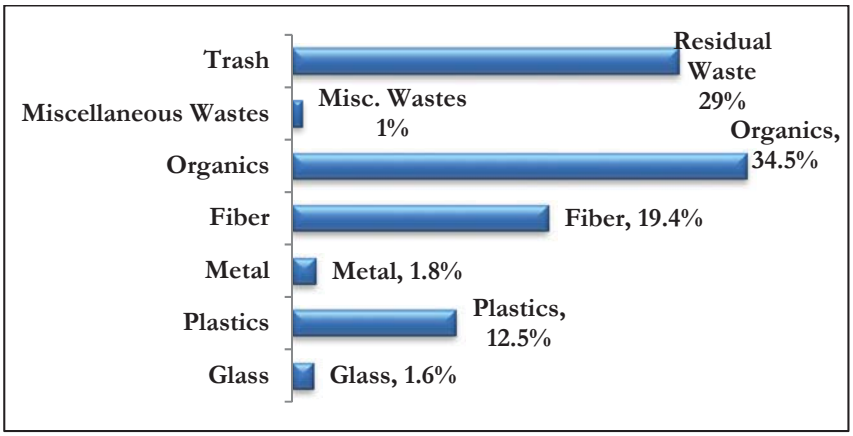
Concourse A Residual Waste Stream

All Concourse A waste is collected in three 27 yard compactors located at three gates (A30, A41 and A46). A 25 yard recycling gable and a 27 yard cardboard compactor are also located at Gate 38 (a substantial distance from each of the trash compactors). From June, 2009 – May, 2010 Concourse A generated 17% of all of the waste collected annually from the airport areas analyzed in this report. All three compactors loads totaling 38,260 pounds of waste were collected from Concourse A and delivered to the transfer station, of which 837 pounds (2.2%) was sorted for the waste assessment.

Waste generators in Concourse A include several concessionaires (including approximately 14 restaurants/bars/cafes/and grab and go's; approximately ten stores, news and gift shop retailers), gate activities for primarily Frontier airlines but also for approximately 8 other air carriers, a secondary TSA screening location, and small city offices. Charts 12-14 below include general material category and material type results for Concourse A. Detailed sample data and summary results for Concourse A can be found in Appendix A.

[7] Possible ways to do this would be to include messages on receipts, table tents or implement other messaging near the cashier encouraging patrons to recycle.

Chart 12 Concourse A Waste Composition by Material Category



Excluding Trash, the top three category types by weight sorted from Concourse A were Organics (34.5%), Fiber (19.4%), and Plastics (12.5%) (Chart 12). Excluding Trash, the top three material types (Chart 13) by weight sorted from Concourse A were Lavatory Waste (19.0%), Food Waste (11.6%), and Cardboard (OCC) (9.5%).

Chart 13 Concourse A Waste Composition by Material Type

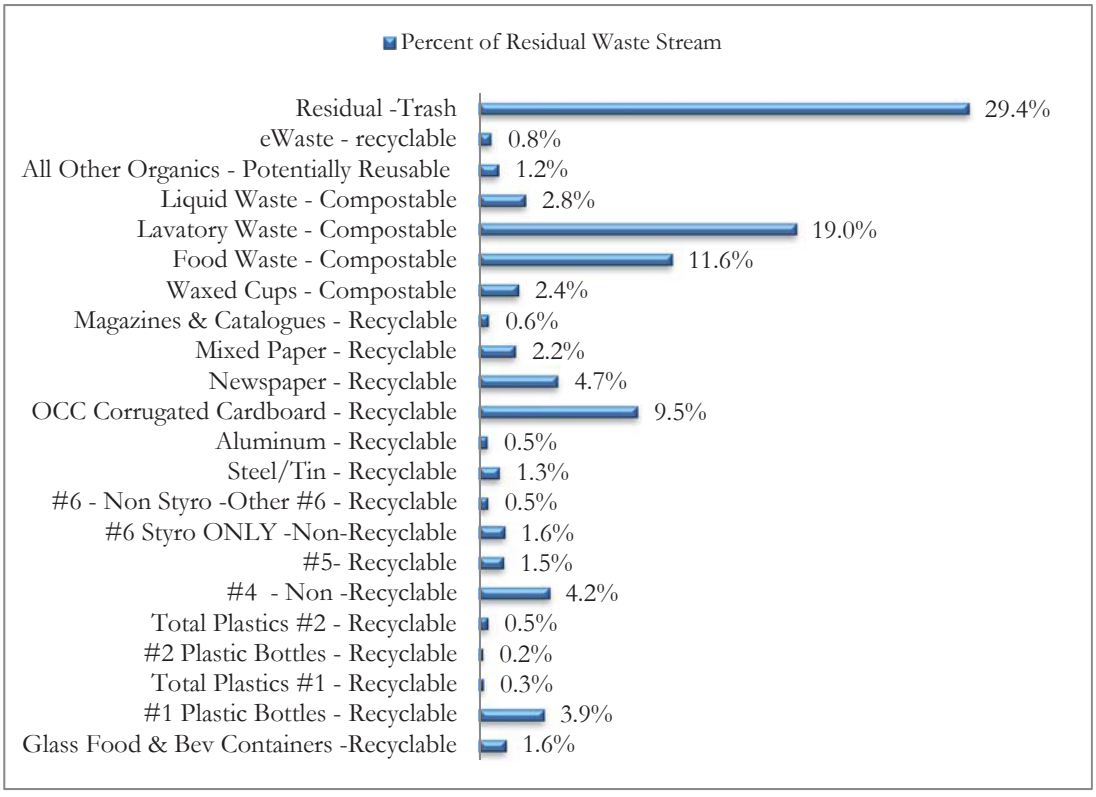


Chart 14 Sampled Residual Waste Stream for Concourse A

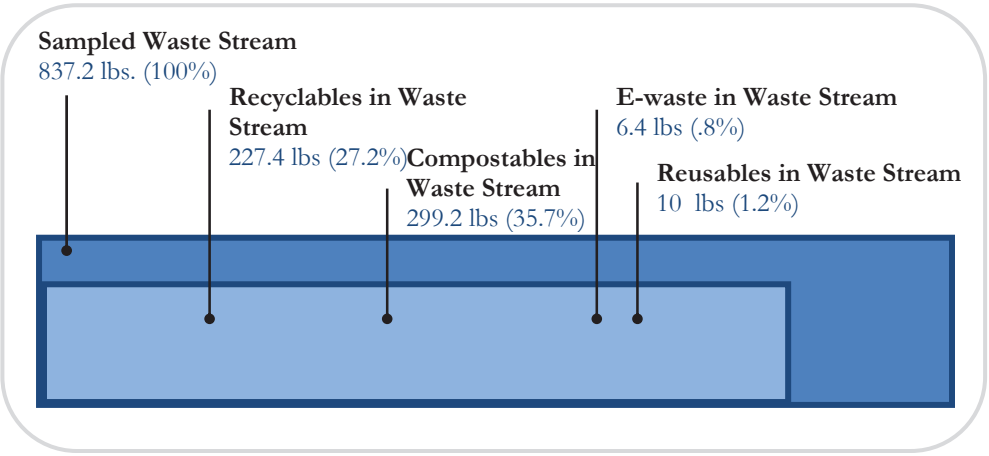


Table 8 Percent of Recyclable and Compostable Material - Concourse A

Material Type	Total (%)	Can be Recycled Using Single-Stream or E-waste Program (%)	Could be Composted with Expanded Composting Program (%)	Could be Diverted if New Textile Collection Program were Implemented (%)	Residual material with no potential for recycling or reuse (%)
Glass	1.6%	1.6%			
Plastics	12.5%	6.7%			5.8%
Metal	1.8%	1.8%			
Fiber	19.5%	17.1%	2.4%		
Organics	34.5%		33.3%	1.2%	
Miscellaneous Wastes	0.8%	0.8%			
Residual	29.4%				29.4%
Total	100.0%[1]	28%	35.7%	1.2%	35.2%

[1] Value totals 100.1 due to rounding in excel

Out of all of the material sorted from Concourse A, 28% is currently recyclable using the existing single-stream and e-waste recycling programs; 35.7% could be composted if the current organics program were expanded to include pre-consumer and post-consumer material, 1.2% could potentially be diverted if a textile donation program were to be implemented and the remaining 35.2% cannot be recycled, composed or reused under current conditions (Table 8). Other observations include:

- There was a substantial amount of OCC (9.5%, 79.7 lbs) found in the waste stream. While DIA is currently paid for all compacted OCC that is recycled, if DIA were able

to collect this additional OCC and compact it separate from the single-stream program, DIA could recognize additional revenue from rebates to recycle this material rather than haul and deposit it at the landfill[8].

- Lavatory Waste also made up a substantial component of the waste stream (19%, 158.9 lbs). This waste primarily consists of paper towel and tissue waste. While this material could potentially be composted, another option would be to consider replacing the paper towel dispensers in Concourse A bathrooms with high efficiency electric hand driers. Cost savings associated with reduced paper towel purchases could help offset the costs associated with installing new hand driers.

- High quantities of Food Waste were also found in Concourse A (11.6%, 96.8 lbs). This finding is not surprising given the large number of food/beverage vendors in Concourse A, along with passenger meal waste. Implementing a pre and post-consumer organics program combined with an effective educational campaign could potentially divert much of this waste. While vendors might initially be opposed to switching to biodegradable or compostable products, Green Squad did observe at least one vendor, in this terminal, Quiznos, already using such products. DIA could consider meeting with this vendor to identify how switching to compostable products have worked to their advantage, and potentially use this information to engage other vendors.

- The Other Organics category included textiles that consisted of eyeshades, socks, blankets and pillows.

- A substantial number of plastic bottles contained liquids that were emptied in order to account for the liquid waste. This liquid waste amounted to 3% (23.5 lbs) of the entire load. Encouraging visitors to empty bottles before depositing them in the trash through educational signage could potentially reduce the amount of liquid waste landfilled.

- The Plastics #5 category primarily consisted of airline and other plastic drink cups.

Figure 9 Plastic Drink Cups

Figure 10 Recyclable Drink Cup

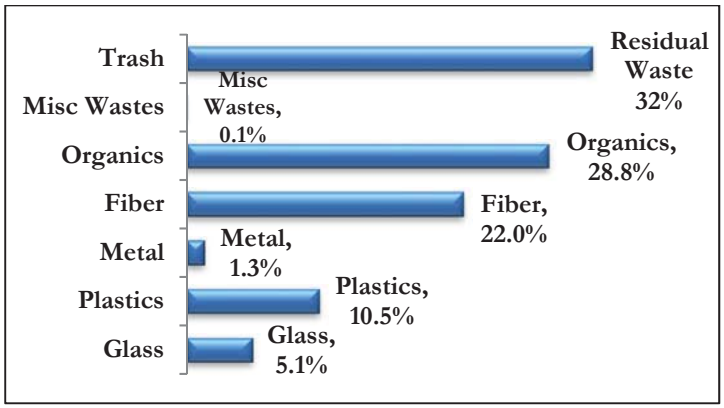
[8] It currently costs $57.50 per ton to haul and deposit each ton to Denver Arapahoe Disposal Site (DADS). From Mar-April 2010 (the months during which the new DIA contract pricing was effect) the average rebate for OCC was $108.60. Hauling cost for recyclables are $129 yielding a disposal cost of $20 for recycling OCC vs $57.50 for sending it to landfill. DIA thus saves $37 for every ton it recycles versus landfills.

Concourse B Residual Waste Stream

All Concourse B waste is collected in seven 27 yard compactors located at seven gates (B24, B30, B36, B39, B44, B52 and B81). United Airlines' and Continental airplane waste is also collected in two 30 yard roll-offs located at Gates B15 and B16. 25 yard recycling gables and 27 yard cardboard compactor are also located at Gates B24, B36, B52, and B81. Employees taking trash to Gates B30, B39, and B44 therefore do not conveniently have access to co-located recycling gables and cardboard compactors. From May, 2009 – May, 2010 Concourse B generated 35% of all of the waste collected annually from all of the airport areas analyzed for this assessment. Nine loads totaling 82,040 lbs were collected from the seven compactors and two roll-offs located at Concourse B and delivered to the transfer station. A representative sample, 2582 pounds (3.2%) was sorted for this waste assessment.

Waste generators in Concourse B include several concessionaires (including approximately 34 restaurants/bars/cafes/and grab and go's; approximately 12 stores, news and gift shop retailers and services), and gate activities for primarily United Airlines and other commuter airlines. However, othe airlines including Continental and US Air also use the gates at Concourse B. Charts 15-17 below illustrate general material category and material type results for Concourse B. Detailed sample data and summary results for Concourse B can be found in Appendix A.

Chart 15 Concourse B Waste Composition by Material Category



Excluding Trash, the top three category types by weight sorted from Concourse B were Organics (28.8%), Fiber (22%), and Plastics (10.5%) (Chart 15). Excluding Trash, the top three material types (Chart 16) by weight sorted from Concourse B were Food Waste (15.3%), Lavatory Waste (7.8%), and Cardboard (OCC) (7.6%).

Chart 16 Concourse B Waste Composition by Material Type

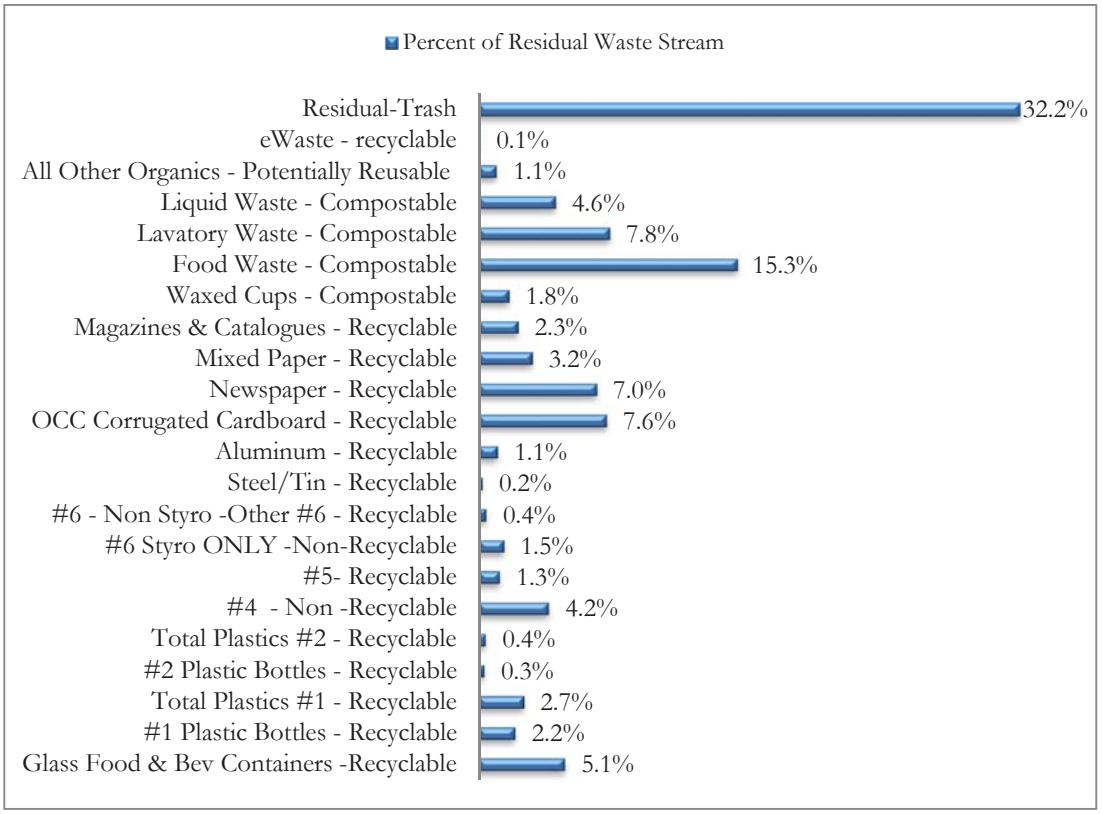


Chart 17 Sampled Residual Waste Stream for Concourse B

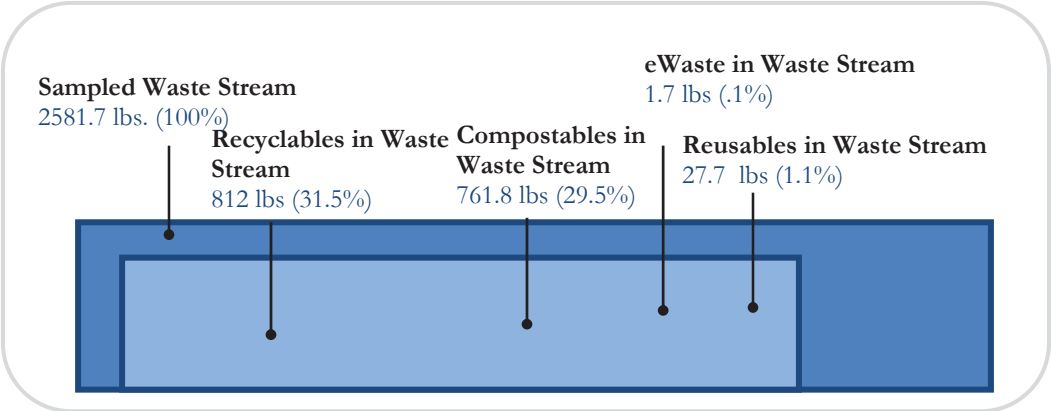


Table 9 Percent of Recyclable and Compostable Material - Concourse B

Material type	Total (%)	Can be Recycled Using Single-Stream or E-waste Program (%)	Could be Composted with Expanded Composting Program (%)	Could be Diverted if New Textile Collection Program were Implemented (%)	Residual material with no potential for recycling or reuse (%)
Glass	5.1%	5.1%			
Plastics	10.5%	4.8%			5.7%
Metal	1.3%	1.3%			
Fiber	22.0%	20.2%	1.8%		
Organics	28.8%		27.7%	1.1%	
Miscellaneous Wastes	0.1%	0.1%			
Trash	32.2%				32.2%
Total	100.0%	31.5%	29.5%	1.1%	37.9%

Out of all of the material sorted from Concourse B, 31.5% is currently recyclable using the existing single-stream and e-waste recycling programs; 29.5% could be composted if the current organics program were expanded to include pre-consumer and post-consumer material, 1.1% could potentially be diverted if a textile donation program were to be implemented and the remaining 37.9% cannot be recycled, composted or reused under current conditions (Table 9). Other observations include:

- There was a substantial amount of OCC (7.6%, 196.5 lbs) found in the waste stream. While DIA is currently paid for all compacted OCC that is recycled, if DIA were able to collect this additional OCC and compact it, separate from the single-stream program, DIA could recognize additional revenue from rebates to recycle this material rather than haul and deposit it at the landfill[9].

- Lavatory Waste also made up a substantial component of the waste stream (7.8%, 201.3 lbs). This waste primarily consists of paper towel and tissue waste. While this material could potentially be composted, another option would be to consider replacing the paper towel dispensers in the Concourse A bathrooms with high efficiency electric hand driers. Cost savings associated with reduced paper towel purchases could help offset the costs associated with installing new hand driers.

- High quantities of Food Waste were also found in Concourse B (15.3%, 395.6 lbs). A visible assessment indicated that a substantial portion of the this food waste consisted

[9] It currently costs $57.50 per ton to haul and deposit each ton to Denver Arapahoe Disposal Site (DADS). From Mar-April 2010 (the months during which the new DIA contract pricing was in effect) the average rebate for OCC was $108.60. Hauling cost for recyclables are $129 yielding a disposal cost of $20 for recycling OCC vs $57.50 for sending it to landfill. DIA thus saves $27.50 for every ton it recycles versus landfills.

of wet coffee grinds. This material could easily be separated for composting purposes. Moreover, some vendors in this terminal do currently use compostable packaging materials (i.e Quiznos). A post-consumer organics program combined with an effective educational campaign could potentially increase diversion rates for food waste. While vendors might initially be opposed to switching to biodegradable or compostable products or participating in an organics collection program, research that Green Squad conducted did indicate that many of these vendors have Corporate Sustainability goals and programs in place (including McDonalds, Auntie Anne's, Starbucks, Quiznos, etc.). DIA might be able to use these Corporate initiatives to encourage participation in a composting program.

- The Other Organics category included textiles that consisted of eyeshades, socks, and blankets. These came primarily from a Japanese air carrier.

- The majority of all plastics found were drinking bottles, discarded food containers and/or beverage cups. The Plastics #5 category primarily consisted of airline and other plastic drink cups. There were also several gallon buckets in the #2 plastics category. The majority of Plastics #4 were from clear trash bags, bags and other films that are currently not accepted by the existing single-stream program. Clean, film plastic is recyclable and so collecting and recycling film plastic is an option. However, a new program would need to be implemented in order to divert this material. It is important to note that the current condition of most of this plastic was too dirty to be accepted by a recycler and diverting this material in its current condition is not a likely alternative.

- A substantial number of plastic bottles contained liquids which were emptied in order to account for the liquid waste. This liquid waste amounted to 4.6% (118 lbs) of the entire load. Encouraging visitors to empty bottles before depositing them in the trash could potentially reduce the amount of liquid waste landfilled.

Figure 11 Headphones

- 1.7 lbs (.07%) of the material found was e-waste, all of which consisted of airline headphones. Disposing of e-waste in the landfill can result in negative harmful environmental consequences. DIA currently has an e-waste collection program in place. It would therefore be advantageous for DIA to work with the airlines to ensure this material does not end up in the stream designated for landfill and instead is diverted to the e-waste recycling program.

B15 and B16 - Airline Residual Waste Stream

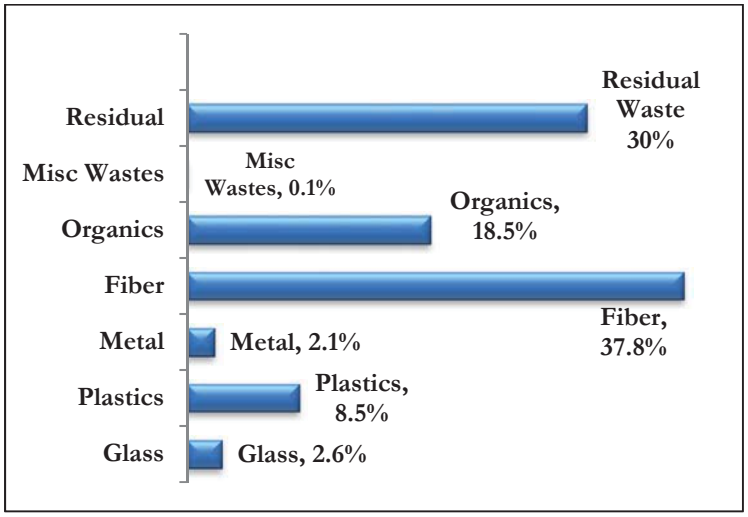
At gates B15 and B16 there are two 30 yard roll-offs that collect primarily airline waste from United Airlines[10]. While the solid waste collected from these two roll-off containers was included in the preceding B Concourse waste analysis, this section has been included in order to provide a sample analysis of the waste composition of primarily Airline waste.

[10] Continental Airlines recently moved over to Concourse B so airline waste from Continental could also be deposited into these roll-offs.

The closest recycling gable to Gates B15 and B16 is located at Gate B-24. At B-24 there is a 25 yard recycling gable and a 27 yard cardboard compactor. Airline cleaning crews taking trash to Gates B15 and B16 therefore do not conveniently have access to co-located recycling gables and cardboard compactors. From June, 2009 – May, 2010 the roll-offs at B15 and B16 generated 4.4% of all of the waste collected annually from all of the airport areas analyzed[11]. All waste assessment samples were taken from the two roll-off containers filled at the aforementioned gate locations. Two loads totaling 5,480 pounds were collected from the two roll-offs at Gate B15 and B16 and delivered to the transfer station, of which 442.7 pounds (8.1%) was sorted for the waste assessment.

As previously mentioned, waste generators for the roll-offs located at Gates B15 and B16 primarily include United Airlines and Continental passengers. Charts 18-20 below indicate general material category and material type results for B15 and B16. Detailed sample data and summary results for B15 and B16 can be found in Appendix A.

Chart 18 B15 & B16 Airline Waste Composition by Material Category



Excluding Residual Waste, the top three category types by weight sorted from B15 and B16 were Fiber (37.8%), Organics (18.5%), and Plastics (8.5%) (Chart 18). Excluding Residual Waste, the top three material types (Chart 19) by weight sorted from B15 and B16 were Newspaper (26.2%), Liquid Waste (10.2%) and Magazines & Catalogues (4.9%).

[11] Per Waste Management hauling records of compactors and roll-offs for AOB/Main Terminal, Concourses A, B, C, Maintenance Center, Air Cargo and East & West Overflow Parking.

Chart 19 B15 & B16 Airline Waste Composition by Material Type

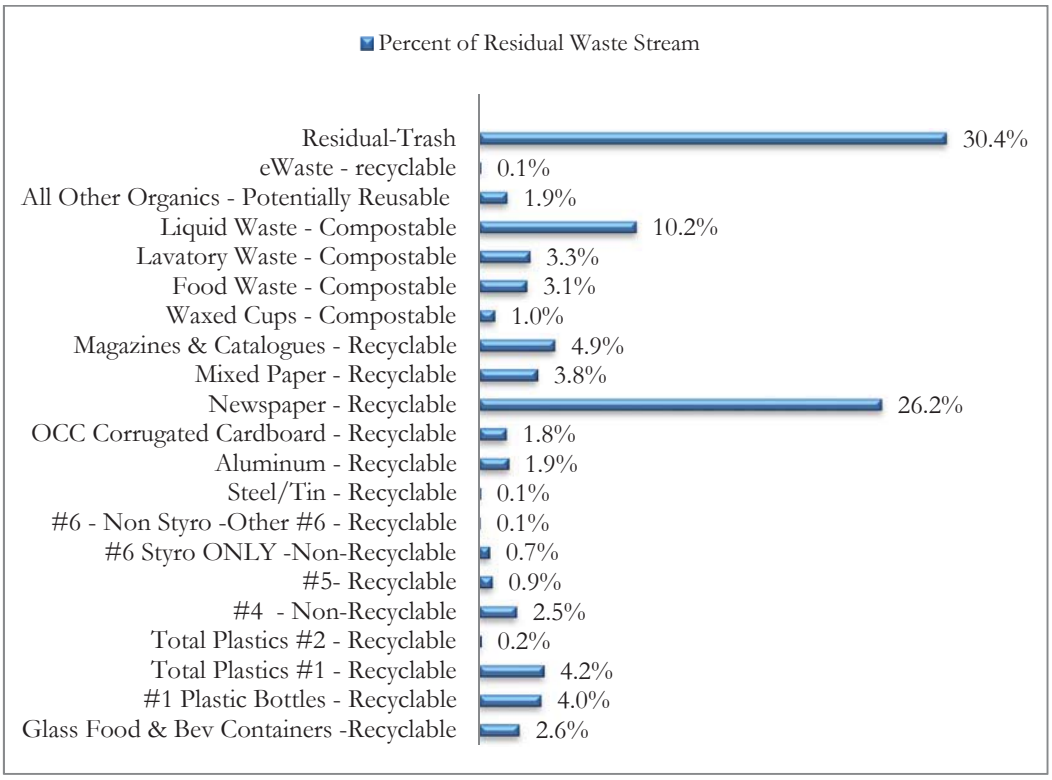


Chart 20 Sampled Residual Waste Stream for B15 & B16 – Airline Waste

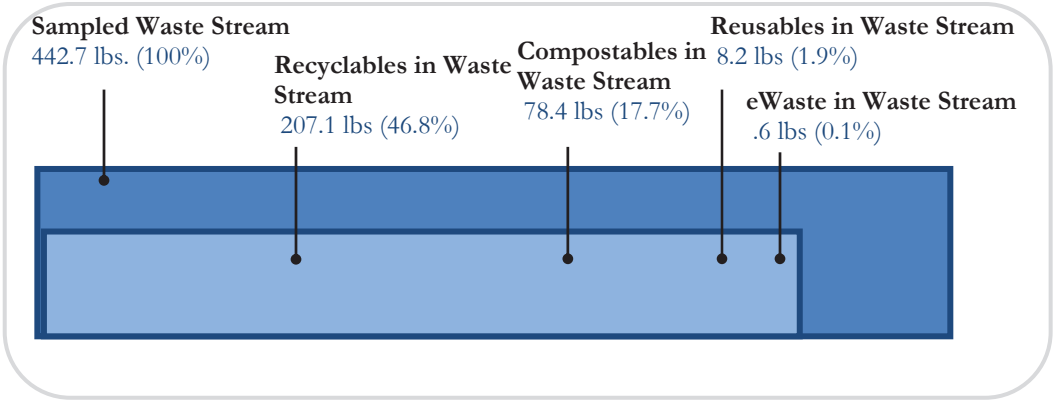


Table 10 Percent of Recyclable and Compostable Material – B15 & B16 Airline Waste

Material Type	Total (%)	Can be Recycled Using Single-Stream; or E-waste Program (%)	Could be Composted with Expanded Composting Program (%)	Could be Diverted if New Collection Program were Implemented (%)	Residual material with no potential for recycling or reuse (%)
Glass	2.6%	2.6%			
Plastics	8.5%	5.4%			3.2%
Metal	2.1%	2.1%			
Fiber	37.8%	36.7%	1.0%		
Organics	18.5%		16.7%	1.9%	
Miscellaneous Wastes	0.1%	0.1%			
Residual	30.4%				30.4%
Total	100.0%	46.9%	17.7%	1.9%	33.5%

Out of all of the material sorted from B15 & B16, 46.9% is currently recyclable using the existing single-stream and/or e-waste recycling programs; 17.7% could be composted if the current organics program were expanded to include pre-consumer and post-consumer material; 1.9% could potentially be diverted if a textile donation program were to be implemented and the remaining 33.5% cannot be recycled, composted or reused under current conditions (Table 10). Other observations include:

Figure 12 Continental On-Board Recycling Bag

- Continental Airlines, which to our knowledge is now using B15 and B16, appears to have an on-board recycling program that includes the use of specially designated bags for collecting recyclables on-board. However, Green Squad found a number of these recycling bags filled with recyclables in the trash. There seems, therefore, to be a disconnect between Corporate Airline on-flight and on-ground policies for dealing with waste materials. There could be an opportunity for DIA to work with Continental to ensure that recyclables make it to their intended location and that airline staff are aware that recycling is the preferred option at DIA.

- There was a substantial amount of Newspaper (16.2%, 115.8 lbs) found in the waste stream. While DIA is currently paid for all Newspaper that is recycled as part of its single-stream program, if DIA were able to collect this additional Newspaper, DIA could recognize additional revenue from recycling rebates for this material rather than haul and deposit it at the landfill[12].

- The Other Organics category made up 8.2 lbs (2%) of the residual waste stream. This material consisted of napkins and other textiles. All of this material is potentially reusable and could be diverted if a collection program for reusable items were to be instituted for donation to charity.

[12] It currently costs $57.50 per ton to haul and deposit each ton to Denver Arapahoe Disposal Site (DADS). It currently costs $129 to haul recyclables. The most recent rebates from April and May, 2010 (when DIA's new recycling contract has been implemented) were $99 per ton of single stream recycling yielding an overall cost of recycling of $30. At current rates, DIA is therefore saving $27.50 for every ton it recycles as opposed to landfills.

- A substantial number of plastic bottles contained liquids which were emptied in order to account for the liquid waste. This liquid waste amounted to 10.2% (45.3 lbs) of the entire load. Encouraging airline staff to empty bottles and cups before depositing them in the trash could potentially reduce the amount of liquid waste landfilled although this could be a difficult challenge given the constrained nature of airline waste collection.

- Magazines & Catalogues constituted 21.9 lbs (4.9%) of the waste stream. Extrapolating this material out to an annual figure yields a total of 25.5 tons of Magazines & Catalogues. While DIA is currently paid for all Magazines & Catalogues that are recycled as part of its single-stream program, if DIA were able to collect this additional material for recycling, DIA could recognize additional revenue from rebates to recycle this material rather than haul and deposit it at the landfill[13].

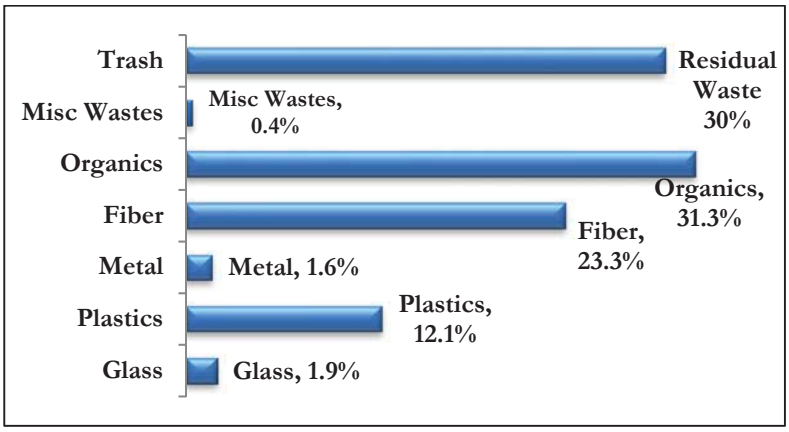
Concourse C Residual Waste Stream

All Concourse C waste is collected in four 27 yard compactors located at four gates (C34, C38, C39, and C46). A 25 yard recycling gable and a 27 yard cardboard compactor are also located at Gate C41. Employees taking trash to all Gates in this Concourse do not have convenient access to co-located recycling gables and cardboard compactors. From June, 2009 – May, 2010 Concourse C generated 19% of all of the total waste collected annually from all the airport areas analyzed for this assessment. Four loads totaling 83,380 lbs were collected from all of the compactors located at Concourse C and delivered to the transfer station. A representative sample, 1019.4 pounds (1.2%) was sorted for the waste assessment.

Waste generators in Concourse C include several concessionaires (including approximately 13 restaurants/bars/cafes/and grab and go's; approximately 10 stores, news and gift shop retailers), and gate activities for primarily Southwest Airlines. Charts 21-23 below illustrate general material category and material type results for Concourse C. Detailed sample data and summary results for Concourse C can be found in Appendix A.

[13] It currently costs $57.50 per ton to haul and deposit each ton to Denver Arapahoe Disposal Site (DADS). It currently costs $129 to haul and process recyclables. However, the most recent rebate from April and May, 2010 (months when DIA's new contract was in effect) was paying $99 per ton of single stream recycling yielding an overall cost of recycling of $28. Therefore in April and May, 2010 DIA saved $28 for every ton it recycled as opposed to send to the landfill.

Chart 21 Concourse C Waste Composition by Material Category



Excluding Residual Waste, the top three category types (Chart 21) by weight sorted from Concourse C were Organics (31.3%), Fiber (23.3%), and Plastics (12.1%). Excluding Trash, the top three material types (Chart 22) by weight sorted from Concourse C were Food Waste (19.7%), Cardboard (OCC) (8.5%) and Newspaper (8.5%).

Chart 22 Concourse C Waste Composition by Material Type

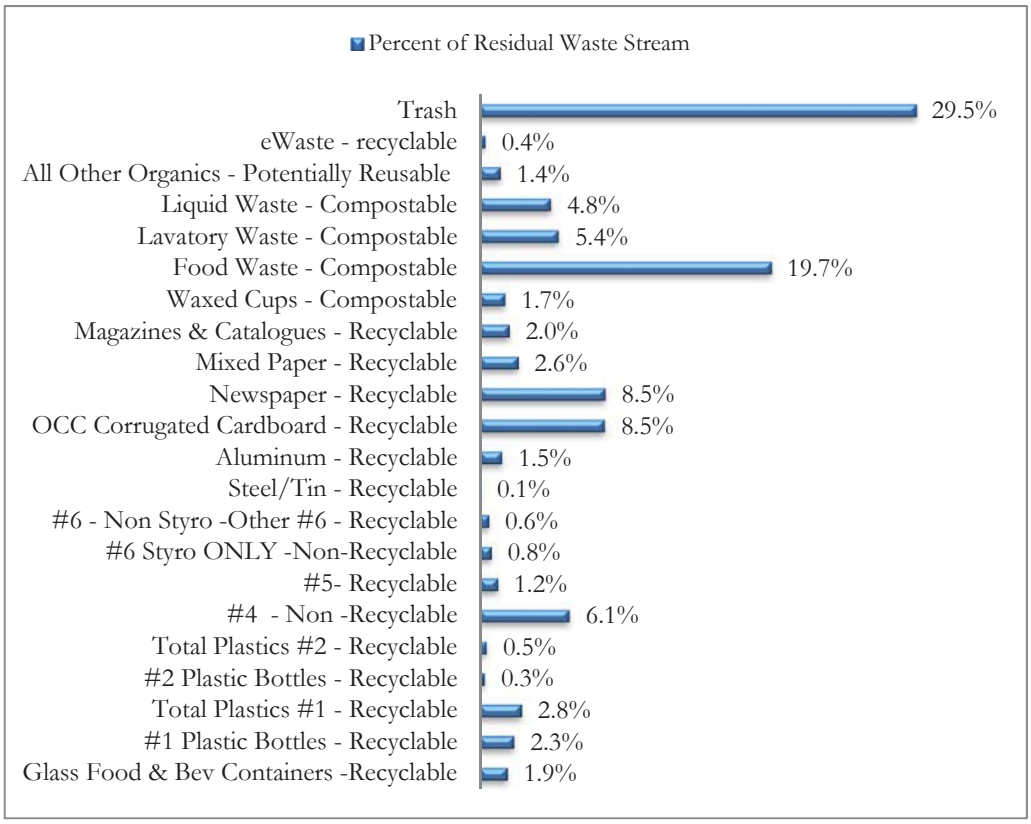


Chart 23 Sampled Residual Waste Stream for Concourse C

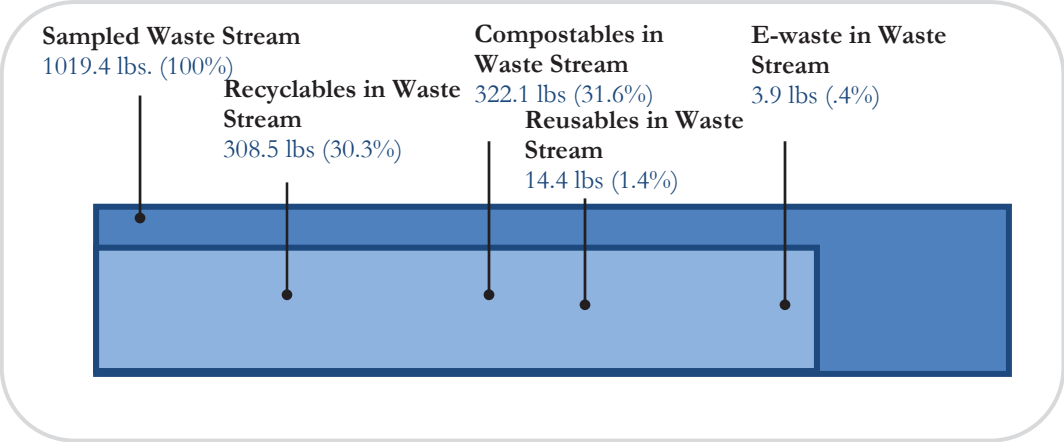


Table 11 Percent of Recyclable and Compostable Material - Concourse C

Material Type	Total (%)	Can be Recycled Using Single-Stream or eWaste Program (%)	Could be Composted with Expanded Composting Program (%)	Could be Diverted if New Textile Collection Program were Implemented (%)	Residual material with no potential for recycling or reuse (%)
Glass	1.9%	1.9%			
Plastics	12.1%	5.2%			6.9%
Metal	1.6%	1.6%			
Fiber	23.3%	21.6%	1.7%		
Organics	31.3%		29.9%	1.4%	
Miscellaneous Wastes	0.4%	0.4%			
Trash	29.5%				29.5%
Total	100%[1]	30.7%	31.6%	1.4%	36.3%
[1] Value is off due to rounding in excel					

Figure 13 Delta On-Board Recycling Bag

Out of all of the material sorted from Concourse C, 30.7% is currently recyclable using the existing single-stream and e-waste recycling programs; 31.6% could be composted if the current organics program were expanded to include pre-consumer and post-consumer material, 1.4% could potentially be diverted if a textile donation program were to be implemented and the remaining 36.3% cannot be recycled, composted or reused under current conditions (Table 11). Other observations include:

- Several of the airlines using Concourse C, including Southwest, and Delta appear to have on-board recycling programs that included the use of specially designated bags for collecting recyclables on-board. However, Green Squad found a number of these recycling bags filled with recyclables in the trash. There could be an opportunity for DIA to work with these airlines to ensure that recyclables make it to their intended

location and that airline staff are aware that recycling is the preferred option at DIA.

- There was a substantial amount of OCC (8.5%, 86.2 lbs) found in the waste stream. While DIA is currently paid for all compacted OCC that is recycled, if DIA were able to collect this additional OCC separate from the single-stream program, DIA could recognize additional revenue from rebates to recycle this material rather than haul and deposit it at the landfill[14].

- Lavatory Waste also made up a substantial component of the waste stream (5.4%, 54.6 lbs). This waste primarily consisted of paper towel and tissue waste. While this material could potentially be composted, another option would be to consider replacing the paper towel dispensers in Concourse A bathrooms with high efficiency electric hand driers. Cost savings associated with reduced paper towel purchases could help offset the costs associated with installing new hand driers.

- High quantities of Food Waste were also found in Concourse C (19.7%, 200.8 lbs). A visual assessment indicated a substantial portion of this food waste was wet coffee grinds. This material could easily be separated for diversion into a composting program. A post-consumer organics program combined with an effective educational campaign could potentially increase the amount of diverted materials. While vendors might initially be opposed to switching to biodegradable or compostable products or engaging in an Organics collection program, research that Green Squad conducted did indicate that some of these vendors have Corporate Sustainability goals or environmental initiatives in place to reduce waste (including McDonalds and Red Rocks Brewery, etc.). DIA might be able to use these Corporate initiatives to encourage participation in a composting program.

- The Other Organics category included textiles that consisted of miscellaneous clothing items. DIA could consider implementing a textiles collection program and donate these materials to charity or homeless shelters.

- The majority of all plastics found were from drinking bottles, discarded food containers and/or beverage cups. The Plastics #5 category primarily consisted of airline and other plastic drink cups. The majority of Plastics #4 were from clear trash bags, bags and other films that are currently not accepted by the existing single-stream program. Clean, film plastic is recyclable and collecting and recycling film plastic is an option. However, a new program would need to be implemented in order to divert this material. It is important to note, that the current condition of most of this plastic was too dirty to be accepted by a recycler and diverting this material in its current condition is not a likely alternative.

- A substantial number of plastic bottles contained liquids that were emptied in order to account for the liquid waste. This liquid waste amounted to 4.8% (49.1 lbs) of the

[14] It currently costs $57.50 per ton to haul and deposit each ton to Denver Arapahoe Disposal Site (DADS). From Mar-April 2010 (the months during which the new DIA contract pricing was in effect) the average rebate for OCC was $108.60. Hauling cost for recyclables are $129 yielding a disposal cost of $20 for recycling OCC versus $57.50 for sending it to landfill. DIA thus saves $37 for every ton it recycles versus landfills.

entire load. Encouraging visitors to empty bottles before depositing them in the trash could potentially reduce the amount of liquid waste landfilled. Moreover, DIA might want to consider identifying an engineering solution to eliminate liquids in the loads such as crushing or puncturing bottles.

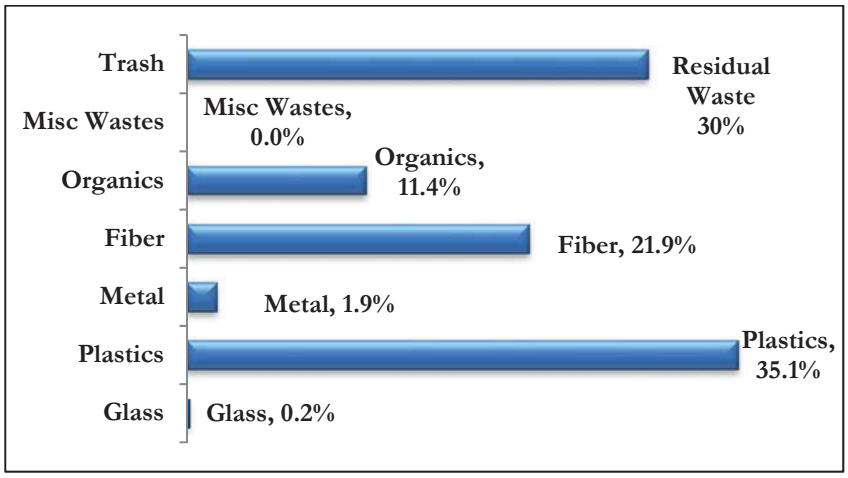
- All of the e-waste consisted of discarded consisted airline headphones. Disposing of e-waste in the landfill can result in negative harmful environmental consequences. It would therefore be advantageous for DIA to work with the airlines to ensure this material does not end up in the stream designated for landfill.

Air Cargo Residual Waste Stream

Air Cargo waste is collected in one 40 yard compactor that is located behind Continental Airlines (airside). There are no recycling gables or cardboard compactors for Air Cargo. There is one 30 yard roll-off container for wood collection. From June, 2009 – May, 2010 Air Cargo generated 1% of all of the waste collected annually from the airport areas analyzed for this assessment. Representative samples were taken from the 40-yard compactor at the Air Cargo location. One load totaling 920 pounds was collected and delivered to the transfer station, of which 213.1 pounds (23.2%) was sorted for the waste assessment.

Waste generators in the Air Cargo area include employees associated with Air Cargo activities for approximately five airlines. Charts 24-26 indicate general material category and material type results for Air Cargo. Detailed sample data and summary results for Air Cargo can be found in Appendix A.

Chart 24 Air Cargo Waste Composition by Material Category



Excluding Residual Waste, the top three category types by weight sorted from Air Cargo were Plastics (35.1%), Fiber (21.9%), and Organics (11.4%) (Chart 24). Excluding Trash, the top three material types by weight sorted from Air Cargo were Plastic Film #4 (20.8%), Cardboard (OCC) (14.1%) and All Other Organics (4.2%) (Chart 25).

Chart 25 Air Cargo Waste Composition by Material Type

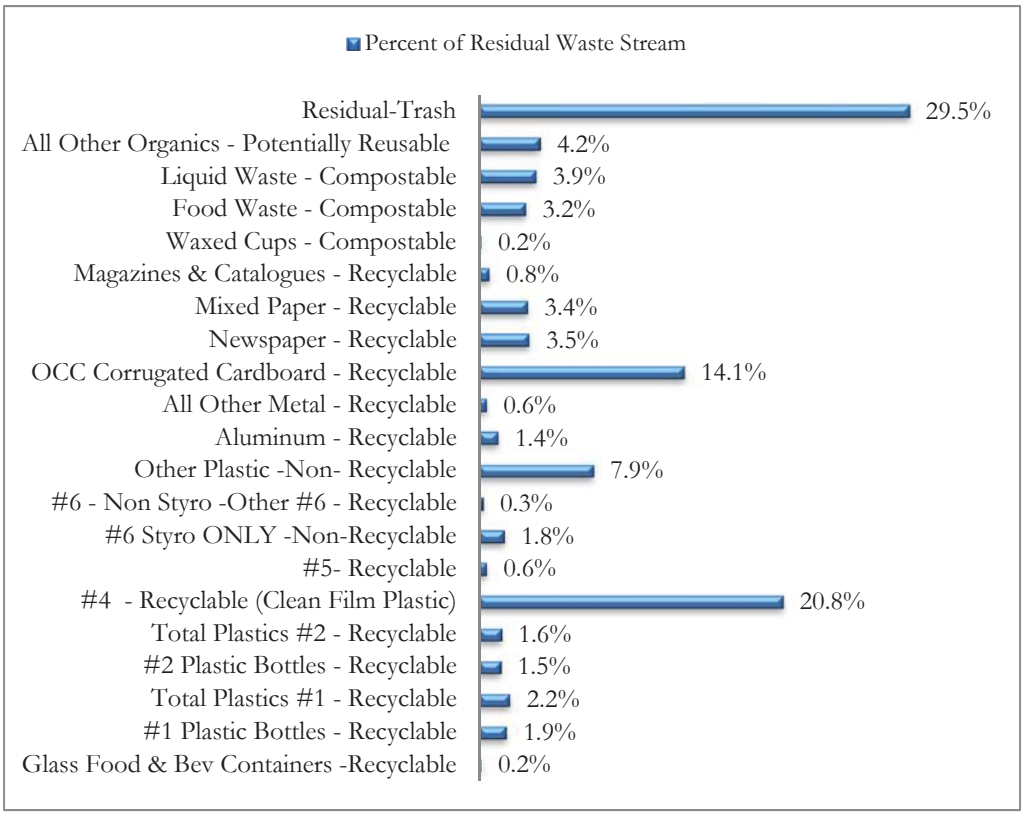


Chart 26 Sampled Residual Waste Stream for Air Cargo

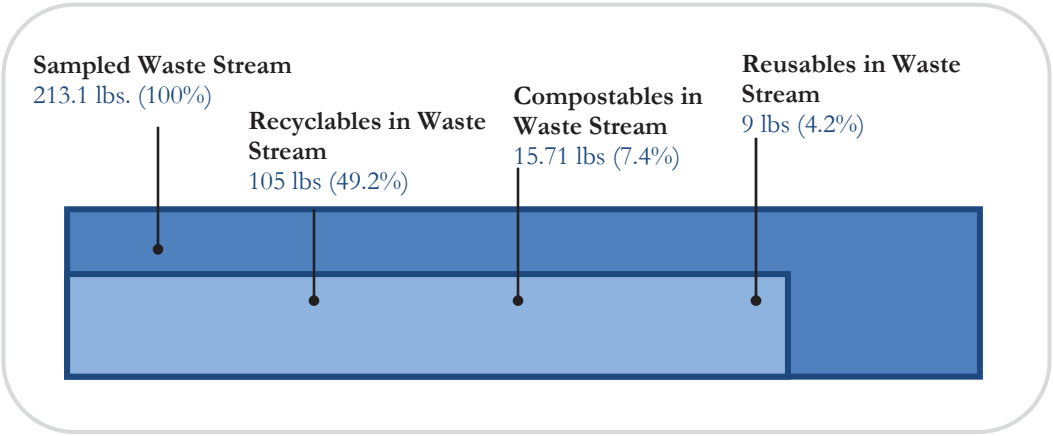


Table 12 Percent of Recyclable and Compostable Material – Air Cargo

Material Type	Total (%)	Can be Recycled Using Single-Stream or e-waste Program (%)	Could be Recycled with Air Cargo Film Collection Program (%)	Could be Composted with Expanded Composting Program (%)	Could be Diverted if New Textile Collection Program were Implemented (%)	Residual material with no potential for recycling or reuse (%)
Glass	0.2%	0.2%				
Plastics	35.1%	4.6%	20.8%			9.7%
Metal	1.9%	1.9%				
Fiber	21.9%	21.7%		0.2%		
Organics	11.4%			7.2%	4.2%	
Miscellaneous Wastes	0.0%	0.0%				
Trash	29.5%					29.5%
Total	100.0%	28.4%	20.8%	7.4%	4.2%	39.2%

Out of all of the material sorted from Air Cargo, 28.4% is currently recyclable using the existing single-stream recycling program. An additional 20.8% of Plastic #4-Film Plastic, could be recycled if a collection program were implemented. A total of 7.4% of the waste sample could be composted if the current organics program were expanded to include pre-consumer and post-consumer material. Implementation of a textile donation program could divert an additional 4.2%. The remaining 39.2% of the material sample cannot be recycled, composted or reused under current conditions (Table 12). Other observations include:

- The Plastic #4 – film plastic collected at Air Cargo is extremely clean and could potentially be recycled. If the airport were to expand its recycling program to capture film plastic, the airport could receive additional rebates on this material. Baled film plastic, in particular receives a higher rebate than un-baled or compacted film plastic. Extrapolating from waste assessment percentages, this clean film plastic material amounts to .8% of the total annual waste stream or a total of 89.3 tons of film plastic yearly. While hauling and baling charges would also need to be considered, the potential rebate on this amount of material is currently $60 per ton and could result in annual revenue from this material totaling more than $5300[15]. DIA could consider adding a baler for air cargo to capture this clean film plastic material. Storage for this material and the baler could potentially be located at the WM staging area.

Figure 14 Clean Film Plastic #4 Air Cargo

- There was a substantial amount of OCC (14.1%, 30 lbs) found in the waste stream. While DIA is currently paid for all compacted OCC that is recycled, if DIA were able to collect this additional OCC separate from the single-stream program, DIA could recognize additional revenue from rebates to recycle this material rather than

[15] Per Clint Morford, WMRA Recycling Manager, the current rebate for film plastic is $60 per ton.

haul and deposit it at the landfill[16].

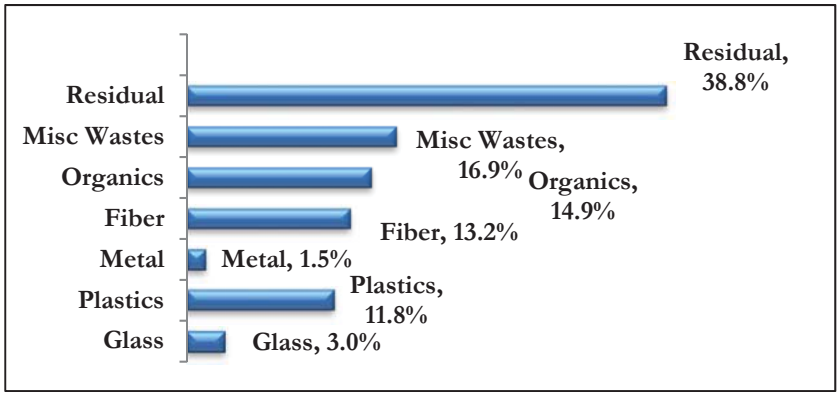
- The Other Organics category included textiles that consisted of a raincoat, rags and broken wood.

Maintenance Center Residual Waste Stream

All Maintenance Center solid waste (not including special waste and iron/metals) is collected in three 30 yard roll-offs that are located airside. In addition, there is an eight yard front end loader (FEL) where material from the Facility Maintenance Building is collected. A 25 yard recycling gable and 30 yard cardboard compactor are also located at the Maintenance Center (landside). From June, 2009 – May, 2010 Maintenance generated 10% of all of the waste collected annually from all of the airport areas analyzed for this assessment. Waste assessment samples were taken from the 30 yard roll-offs filled at the Maintenance Center airside locations. One load totaling 22,040 pounds was collected and delivered to the transfer station, of which a representative sample of 281.2 pounds (1.3%) was sorted for the waste assessment.

Waste generators in the Maintenance Area include airport employees that perform maintenance work for the airport. Charts 27-29 below indicate general material category and material type results for the Maintenance Area. Detailed sample data and summary results for the Maintenance Area can be found in Appendices A.

Chart 27 Maintenance Area Waste Composition by Material Category



Excluding Residual Waste, the top three category types by weight sorted from Maintenance were Miscellaneous (16.9%), Organics (14.9%), and Fiber (13.2%) (Chart 27). Excluding

[16] It currently costs $57.50 per ton to haul and deposit each ton to Denver Arapahoe Disposal Site (DADS). From Mar-April 2010 (the months during which the new DIA contract pricing was in effect) the average rebate for OCC was $108.60. Hauling cost for recyclables are $129 yielding a disposal cost of $20 for recycling OCC versus $57.50 for sending it to landfill. DIA thus saves $37 for every ton it recycles versus landfills.

Residual Waste, the top three material types by weight sorted from Maintenance were Construction & Demolition (C&D) (17%), Liquid Waste (8.4%) and Plastics #1 (4.8%) (Chart 28).

Chart 28 Maintenance Area Waste Composition by Material Type

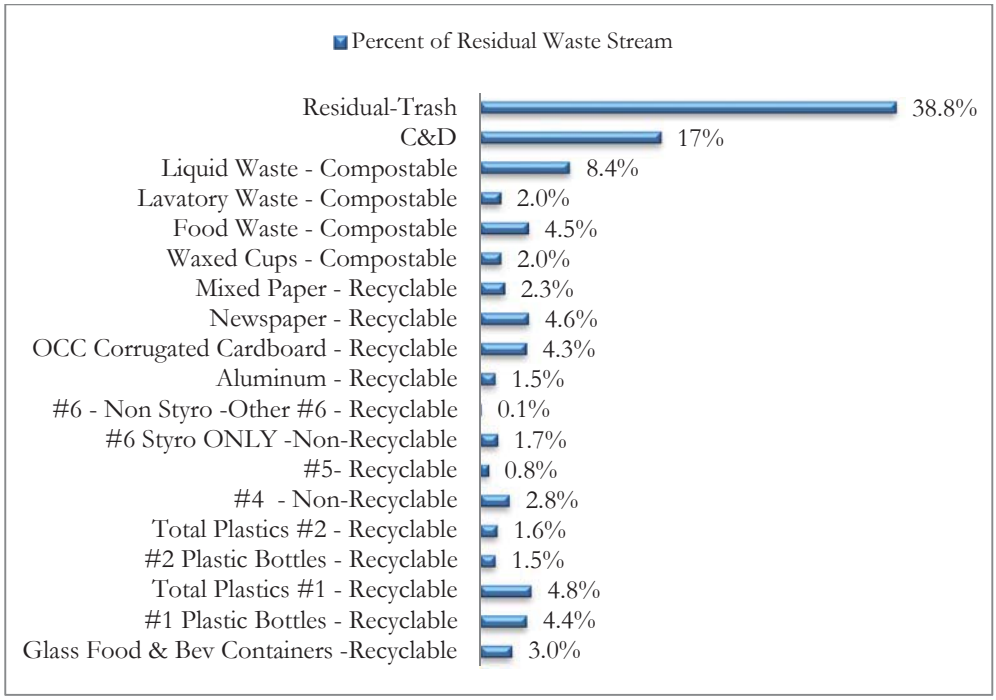
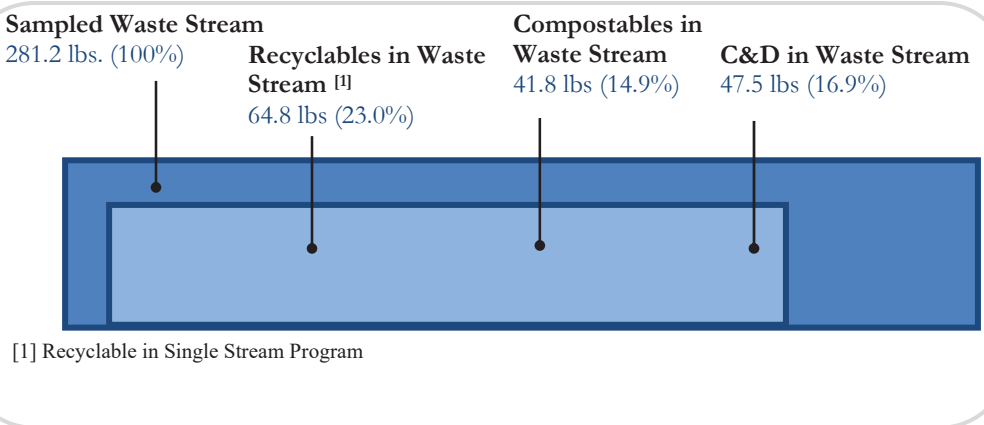


Chart 29 Sampled Residual Waste Stream for Maintenance



[1] Recyclable in Single Stream Program

Figure 15 Concrete Rubble

Figure 16 Concrete Repair Bag

Table 13 Percent of Recyclable and Compostable Material – Maintenance Center

Material Type	Total (%)	Can be Recycled Using Single-Stream; E-waste or existing C&D Recycling Program (%)	Could be Composted with Expanded Composting Program (%)	Residual material with no potential for recycling or reuse (%)
Glass	3.0%	3.0%		
Plastics	11.8%	7.4%		4.4%
Metal	1.5%	1.5%		
Fiber	13.2%	11.2%	2.0%	
Organics	14.9%		14.9%	
Miscellaneous Wastes	16.9.%	16.9%[1]		
Trash	38.8%			38.8%
Total	100.0%[2]	40%	16.9%	43.2%

[1]16.9% of material was C&D (Concrete Rubble) that could be diverted through existing C&D Recycling Program
[2] Value is off due to rounding in excel

Out of all of the material sorted from Maintenance, 40% is currently recyclable using the existing single-stream and C&D recycling programs. A total of 16.9% could be composted if the current organics program were expanded to include pre-consumer and post-consumer material and the remaining 43.2% cannot be recycled, composted or reused under current conditions (Table 13). Other observations include:

- A significant amount of concrete rubble, 47.5 lbs (16.9%) was found in the residual waste stream. This material is divertible to DIA's existing C&D recycling program. Because of its weight this material can result in substantial hauling cost to DIA. Based on percentages identified during the assessment, a total of 95.5 tons of C&D material gets disposed of in the residual waste stream annually resulting in approximately $5,500 in additional annual solid waste hauling costs[17]. While the fact that this material was found in the waste stream could be an isolated instance, it might be in DIA's interest to address this issue with Maintenance employees. To address this issue, DIA should make efforts to improve communication of goals and promote recycling and educational awareness amongst maintenance employees.

- A substantial number of plastic bottles contained liquids that were emptied in order to account for the liquid weight. This liquid waste amounted to 8.4% (23.6 lbs) of the entire sample. Encouraging maintenance staff to empty bottles before depositing them in the trash could potentially reduce the amount of liquid waste landfilled.

- OCC (4.3%, 12.2 lbs) was also visibly present in the waste stream. Extrapolating this

[17] It currently costs $57.50 per ton to haul and deposit each ton to Denver Arapahoe Disposal Site (DADS). From Mar-April 2010 (the months during which the new DIA contract pricing was in effect) At 95.4 tons per year the savings totals $5492.

cardboard material out to an annual figure yields a total of 48 tons of OCC. While DIA is currently paid for all compacted OCC that is recycled, if DIA were able to collect this additional OCC separate from the single-stream program, DIA could recognize additional revenue from rebates to recycle this material rather than haul and deposit it at the landfill[18]. The Maintenance Center currently has a cardboard compactor located on the air side but not on the land side. This means that employees need to badge in to access the secured area where the cardboard compactor is located if they want to dispose of it for recycling. To make it easier for employees to access the cardboard compactor, DIA could consider moving it to the land side.

- 40% of the materials founds in the waste stream are currently accepted by either DIA's single stream or C&D recycling programs. Given that the Maintenance Center waste stream is generated by DIA employees as opposed to a transient and visiting population, it could be advantageous for DIA to develop an educational campaign or an incentive program for Maintenance Center employees to encourage them to meet DIA's waste reduction goals.

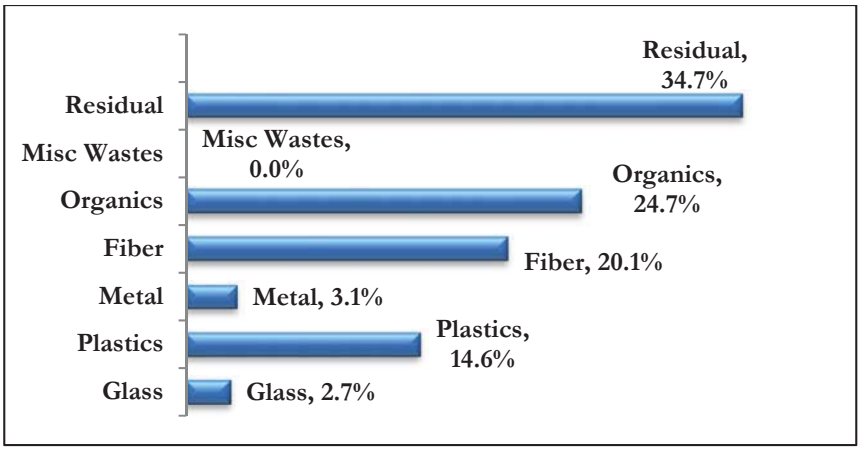
East & West Over Flow Parking Residual Waste Stream

All East & West Over Flow Parking (EWOFP) solid waste (not including special waste and iron/metals) is collected in one 20 yard roll-off. There are no recycling gables or cardboard compactors in close proximity to this location. From June, 2009 – May, 2010 EWOFP generated 2% of all of the waste collected annually from all of the airport areas analyzed for this assessment. One load totaling 2,800 pounds was collected and delivered to the transfer station, of which a representative sample, 211 pounds (7.5%) was sorted for the waste assessment.

Waste generators in the EWOFP include airport visitors that park and travel through this area. Charts 30-32 below indicate general material category and material type results for the EWOFP Area. Detailed sample data and summary results for the EWOFP can be found in Appendix A.

[18] It currently costs $57.50 per ton to haul and deposit each ton to Denver Arapahoe Disposal Site (DADS). From Mar-April 2010 (the months during which the new DIA contract pricing was in effect) the average rebate for OCC was $108.60. Hauling cost for recyclables are $129 yielding a disposal cost of $20 for recycling OCC vs $57.50 for sending it to landfill.

Chart 30 East West Over Flow Parking Waste Composition by Material Category



Excluding Residual Waste, the top three category types by weight sorted from EWOFP were Organics (24.7%), Fiber (20.1%), and Plastics (14.6%) (Chart 30). Excluding Residual Waste, the top three material types (Chart 31) by weight sorted from EWOFP were Other Organics (11.3%), Liquid Waste (9.1%) and Plastics #1 (6.4%).

Chart 31 East West Over Flow Parking Waste Composition by Material Type

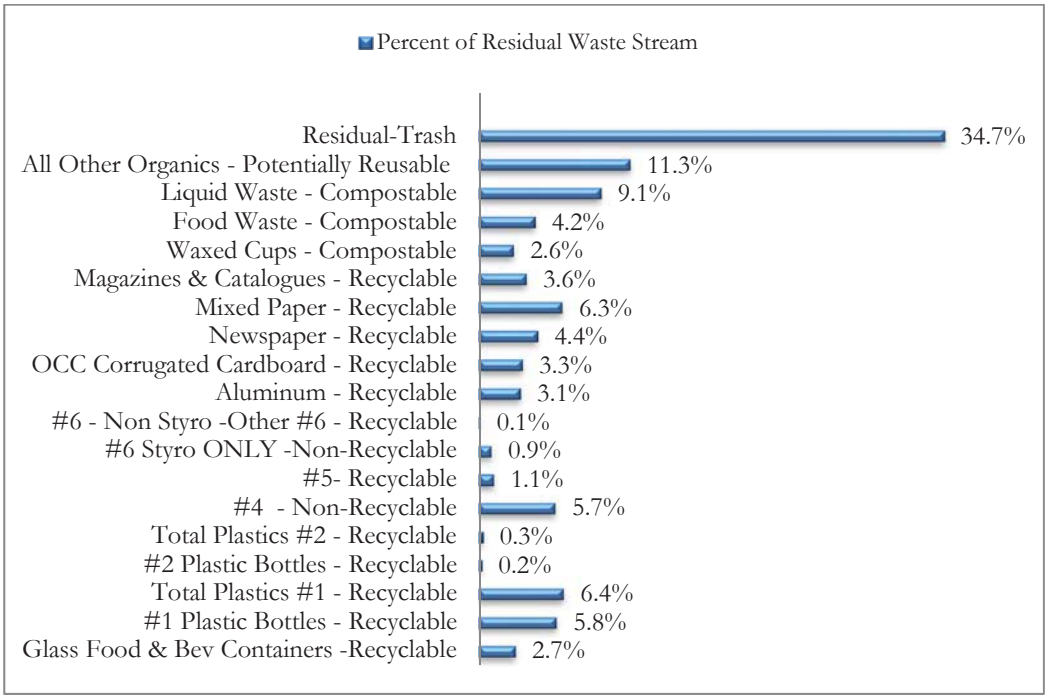


Chart 32 Sampled Residual Waste Stream for EWOFP

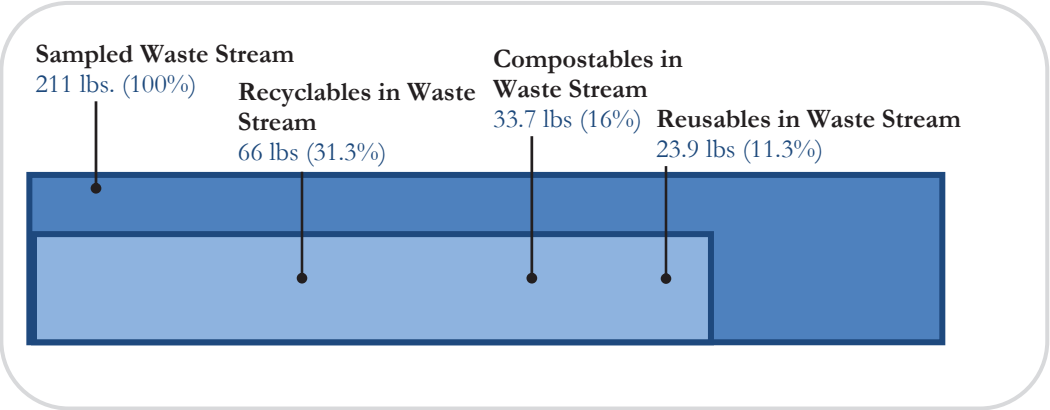


Table 14 Percent of Recyclable and Compostable Material – EWOFP

Material Type	Total (%)	Can be Recycled Using Single-Stream; or E-waste Program (%)	Could be Composted with Expanded Composting Program (%)	Could be Diverted if New Collection Program were Implemented (%)	Residual material with no potential for recycling or reuse (%)
Glass	2.7%	2.7%			
Plastics	14.6%	7.9%			6.7%
Metal	3.1%	3.1%			
Fiber	20.1%	17.5%	2.6%		
Organics	24.7%		13.4%	11.3%	
Miscellaneous Wastes	0.0%	0.0%			
Residual	34.7%				34.7%
Total	100%[1]	31.2%	16.0%	11.3%	41.4%
[1] Totals 99.9% due to rounding in excel					

Out of all of the material sorted from EWOFP, 31.2% is currently recyclable using the existing single-stream programs. A total of 16.0% could be composted if the current organics program were expanded to include pre-consumer and post-consumer material; and 11.3% could potentially be diverted if a reusable collection and/or textile donation program were to be implemented. The remaining 41.4% cannot be recycled, composted or reused under current conditions (Table 14). Other observations include:

- The Other Organics category made up 23.9 lbs (11.3%) of the residual waste stream. This material consisted of safety suits, other textiles and pylon cones. All of this material is potentially reusable and could be diverted if a collection program for reusable items were to be instituted. However, due to the nature of this collection location, the logistics of implementing such a program and it being successful would be challenging.

- A substantial number of plastic bottles contained liquids that were emptied in order to account for the liquid waste. Encouraging visitors to empty bottles before depositing them in the trash could potentially reduce the amount of liquid waste landfilled. Given the outside nature of this collection site, it could be easier for visitors to empty bottles before discarding them.

- 31.2% of the material found in the EWOFP consisted of materials accepted by the existing single stream program. DIA might want to consider the feasibility of including a recycling collection container at this location to capture this material.

Improvement Recommendations

Improvement Recommendations
This section provides an explanation of the options available to improve diversion rates and source reduction efforts.

» Recommendations
» Summary

Recommendations

As a result of this assessment, Green Squad identified several opportunities to improve waste diversion and move DIA closer to its Zero Waste goal. Waste Management is looking forward to assisting DIA research and explore the technical feasibility of implementing recommended solutions. WM Green Squad recommends the following process for moving forward:

1. Assess Recommendations Listed
2. Discuss Potential Improvements
3. Research Feasibility and Costs
4. Implement Solutions

1. Increase Diversion to Existing Single Stream Recycling Program

DIA currently has a single-stream recycling program in place that can take a number of recyclable items that were found in substantial quantities in the residual waste stream. Items that can be included in the single-stream program that were found in the residual stream included glass bottles and jars; plastics #1-#7 excluding Styrofoam and film plastic; metals including steel/tin and aluminum cans; and fiber materials including OCC, newspaper, mixed paper, magazines & catalogues. An analysis of DIA's residual stream indicates that these components that can be included in the single-stream program make up 29.8% of the residual waste stream. Based on percentages found in the waste assessment, the recyclable material found in the residual stream amounts to 3,230 tons of recyclables. While recycling markets do fluctuate and values do not always stay constant, a calculation using April and May 2010 recycling rebate values, reveals that if DIA were able to capture this additional 3,230 tons of material for recycling, as opposed to sending this material to

landfill, DIA could save over $88,800 annually[19]. It is important to note that DIA's new contract with Waste Management went into effect in April, 2010. Prior to this point, DIA was receiving $33/ton to recycle. However, the average rebate between April, 2010 and May 2010 was $99/ton to recycle. While this value can change depending on the recycling markets, under current conditions, DIA saves on average $27.50 for every ton it recycles in comparison to sending the material to landfill[20].

Table 15 Diversion and Cost Savings Potential of Capturing More Recyclables

Item	Waste Reduction Potential (%)	Waste Reduction Potential (Tons)	Potential Cost Savings
Divert Recyclables to Existing Single Stream Program*	29.8%	3,229.5	$88,811
* It currently costs $57.50 per ton to haul and deposit each ton to Denver Arapahoe Disposal Site (DADS). It currently costs $129 to haul recyclables. The most recent rebates from April and May, 2010 (when DIA's new recycling contract has been implemented) were $99 per ton of single stream recycling yielding an overall cost of recycling of $30. At current rates, DIA is therefore saving $27.50 for every ton it recycles as opposed to landfill.			

2. Move to One Container Single Stream Recycling throughout the Airport

As previously mentioned, DIA currently has a single-stream recycling program in place. However, while DIA has over 300 recycling collection bins strategically placed all over the airport, unfortunately, these bins do not compliment the ease of collection intended with a single stream program and as a result do not adequately educate potential users about all of the materials that can be recycled in these bins (see Figure 17).

Figure 17 Recycling Receptacles at DIA

Single-stream recycling encourages users to recycle by making processes of use and collection easy by using one container. Currently, DIA utilizes separate containers for collecting bottles and cans and paper. These separate bins do not communicate the full

[19] It currently costs $57.50 per ton to haul and deposit each ton to Denver Arapahoe Disposal Site (DADS). It currently costs $129 to haul recyclables. However, the most recent rebates from April and May, 2010 (when DIA's new contract is in effect) on avg is paying $99 per ton of single stream recycling yielding an overall cost of recycling of $30. Therefore in April and May, 2010 DIA saved $28 for every ton it recycled as opposed to send to the landfill. Annually, from these compactors DIA generates 10849 tons of waste and 28.9% yields 3229.5 tons per year for savings totaling $88,811.

[20] See footnote 34

extent of materials that can be collected in the single-stream program. Switching to a single container system versus having separate containers for only some of the materials accepted, would streamline the process, increase ease-of-use and increase the number of materials that end-users think can be accepted. This, combined with employee training and improved public awareness can potentially improve DIA's recycling program success. WM Green Squad therefore highly recommends moving to a single container system for the recyclables and including appropriate educational signage that indicates to users all of the materials that can and cannot be accepted within each bin. By moving to a one-container system that includes appropriate educational materials, there will be more bins available to place throughout the airport indicating more materials to recycle, more materials that will be captured, and users will be less confused as to what can really be accepted at DIA for recycling.

DIA also has an opportunity to improve signage and educational materials that incorporate recycling messages and accompany recycling bins throughout the airport. Recycling containers currently do not clearly indicate to users all of the materials that can be captured in the current recycling program and improved signage could help capture additional materials and increase program success. There are a number of signage alternatives that DIA could consider to use for educational materials that would be attractive and compelling within DIA's existing marketing schema.

Figures 18 and 19 illustrate examples of standing signs that could be used to accompany all recycling receptacles illustrating what materials to recycle. Figure 20 illustrates an example of a shadow box that could be used to display recyclables and Figure 21 illustrates an accompanying list of materials. Figures 22 and 23 illustrate larger, more obvious bins that easily communicate what can be recycled to end users. Figures 24 through 26 illustrate examples of signage used to communicate the materials that can be collected in a single stream program.

Figure 18 Sample of Sign for Bin

Figure 19 Sample of Sign for Bin 2

Figure 20 Sample of Display for Bin

Figure 21 Sample of Sign for Bin

Figure 22 Sample of Display for Bin

Figure 23 Sample of Display for Bin

Figure 24 Sample of Single Stream Sign 1

Figure 25 Sample of Single Stream Sign 2

Figure 26 Sample of Single Stream Sign 3

Green Squad is more than happy to assist DIA in researching effective and attractive signage options.

3. Improve Educational Awareness of Recycling Throughout Airport

Education of Airport Visitors

A substantial portion of the waste that is generated at DIA is generated from a transient population unaware of DIA's current recycling goals and initiatives. DIA's ability to move closer to its Zero Waste Goal is dependent on these visitors and their recycling efforts, and for this reason, it is extremely important that DIA work to educate visitors to DIA about its Zero Waste Goal, the importance of recycling at the airport, what can be recycled at the airport and the important role visitors play.

A refreshed commitment to public recycling education can help achieve recycling goals through increased public buy-in. Green Squad therefore recommends creating a strong educational outreach campaign to encourage airport visitors to recycle more materials. Green Squad recommends creating a branded campaign that includes campaign objectives, a strategy, key messages, signage, announcements, and potential incentives. Educational materials should include proper signage that relays information about the existing recycling programs, associated materials, appropriate drop-off locations and cleaning and separation requirements. Signage on recycling and collection containers should be consistent, bi-lingual, and utilize pictures when possible. Also, consistent-colored recycling containers should be used to minimize confusion.

Green Squad also recommends encouraging public recycling program participation through interactive activities such as contests with measurable recycling components that further incentivize visitors to recycle. Further, Green Squad also recommends pairing contests and incentives with an information campaign to further inform the public of the DIA recycling program.

Green Squad is aware that DIA currently has an ongoing GreenPrint Denver campaign that is designed to educate visitors about Denver's 'Green' initiatives. DIA might consider participating in this campaign to include information about DIA's Zero Waste Goal. Moreover, Green Squad is aware that the City of Denver is planning on establishing kiosks at DIA that will allow travelers to offset the carbon emissions associated with flying. Recycling is also a very good way of reducing greenhouse gas emissions and DIA might want to consider working at these Kiosks to simultaneously promote DIA's recycling initiatives.

In order to ensure that educational and marketing campaigns are effective, Green Squad recommends conducting a small waste assessment of Concourse C including the Center Core area to establish a waste generation baseline for just this portion of the airport. Green Squad then recommends piloting the proposed DIA educational campaign and marketing activities within this area for a fixed time period followed by a second waste assessment at the end of the period to identify areas of opportunity and successes. If the pilot proves to be effective,

Green Squad then recommends rolling the educational and marketing program out to the entire airport.

Education of Airport Concessionaires

Green Squad is aware that DIA continuously engages in ongoing education with DIA tenants and concessionaires to encourage them to participate in DIA's recycling program. To build on this initiative, Green Squad recommends that all vendors and concessionaires be provided with DIA-created educational materials to be posted within each vendor location that promote DIA's Zero Waste mission, inform users of where recycling bins are located; and of what can be recycled. The goal of such materials is to ensure that education is consistent and frequent and that all new and existing employees are trained on the program so that there aren't any 'knowledge gaps'. Green Squad also recommends sending regular email communications to all vendors updating them of DIA's progress toward its Zero Waste Goal and incentivizing concessionaires to participate by creating contests and/or developing other incentive benefits. Green Squad also recommends potentially meeting with Properties Management to discuss the possibility of offering financial incentives (such as discounted rates on leases or discounted rates on waste collection) that could be provided to vendors if they agree to actively participate in recycling and/or composting programs[21].

Green Squad can help DIA improve the current tenant education program by developing educational materials and training to help enhance tenant recycling knowledge and determine opportunities for improvement. Green Squad is currently in the process of working with DIA to develop a vendor survey that will help identify barriers that impede recycling efforts with the intention of identifying solutions to overcome them. Green Squad is looking forward to working with DIA to use the results of this information to further enable vendor recycling participation.

Work with Vendors to Reduce use of single Use Items and Limit Items Given to Passengers

In an effort to reduce the amount of material waste generated within the airport, Green Squad also recommends working with vendors, particularly food vendors, to reduce the number of single-use items given to passengers. Working with vendors to reduce single-use items could also reduce the amount of waste generated. In addition, vendors could be encouraged to reduce the amount of napkins, bags or other containers offered.

Education of Airport Employees

WM Green Squad is aware that DIA continuously engages in ongoing education with DIA employees to encourage them to participate in DIA's recycling program. To build upon this engagement, Green Squad recommends that all employees be provided with DIA-created educational materials to be posted within each central employee work location that promote DIA's Zero Waste mission, informs employees of what can be recycled and encourages them

[21] Note that San Francisco Oakland airport offers a Green Restaurant Certification program to airport restaurants that provide restaurants with lower rates for waste collection if they actively participate in recycling and composting programs.

to do so. The goal of such materials is to ensure that education is consistent and frequent and that all new and existing employees are trained on the program so that there aren't any 'knowledge gaps'. Green Squad also recommends delivering regular communications that can consist of quarterly presentations, email alerts or other in-person meetings to update employees of DIA's progress toward its Zero Waste Goal while also serving as a forum for feedback. Green Squad also recommends incentivizing employees or departments to participate by creating contests and/or developing other incentive benefits. WM Green Squad is happy to help DIA expand on the current airline employee education program if, and when, needed. Green Squad can develop informational literature to enhance employee understanding of what to recycle, how to separate, and where, highlighting current areas in need of improvement.

Education of Airline Employees

While WM Green Squad recognizes the challenges in airline staff education, it is important to develop an outreach program to airline staff to maintain an ongoing dialogue with them about DIA's recycling efforts. Green Squad understands that DIA has been working with the airlines to improve recycling efforts. To enhance participation, Green Squad recommends working together to reach out to the individual airlines to identify what barriers exist to increase diversion and perhaps identify individuals who are willing to champion diversion initiatives. WM Sustainability Solutions would like to work with DIA to put together a formal program for identifying barriers and successes to increased airline waste diversion with the intention of using that information to improve recycling of airline waste.

4. Implement an Airport-Wide Pre- and Post-Consumer Food Waste Composting Program

Green Squad identified that compostable organics represented 1560 lbs (28.9%) of the residual waste stream. Lavatory Waste (primarily paper towels and tissues) however, constituted 456.1 lbs (8.5%) of the total solid waste stream but 29.2% of the total Organics category waste stream. Liquids found in bottles constituted 253.2 lbs (4.7%) of the total solid waste stream but 16.2% of the total Organics category waste stream. The following table illustrates the potential reduction that could be achieved if an airport-wide pre and post consumer organics program were to be implemented.

Table 16 Potential Solid Waste Reduction with Implementation of Pre/Post Consumer Composting Program

Organics Collection	Waste Assessment Weight (lbs)	Waste Assessment %	Annual Weight (lbs)	Annual Weight (Tons)
[1] Food Waste Including Food Contaminated Napkins and Compostable Packaging	750.7	13.91%	3,018,880	1,509.4
[2] Wax Cups	100.0	1.85%	402,146	201.1
Total Potential Reduction [1,2]	**850.7**	**15.76%**	**3,421,026**	**1,710.5**
[3] Lavatory Waste	456.1	8.45%	1,834,188	917.1
Total Potential Reduction [1,2,3]	**1306.8**	**24.2%**	**5,255,214**	**2627.6**
[4]Liquid Waste	253.2	4.7%	1,018,234	509.1
Total Potential Reduction [1,2,3,4]	**1560.0**	**28.9%**	**6,273,448**	**3,136.7**
Total Sample Weight (lbs	**5395.5**			

DIA currently has a pre-consumer organics collection program for the Terminal concessionaires and a post consumer organics collection program in three AOB city employee break rooms. Based on the waste assessment percentages, DIA has the potential to divert up to 28.9% of its current waste stream (3,136.7 tons of material on an annual basis) if a pre and post consumer composting program were to be implemented throughout the airport.

WM Green Squad has been advised that the cost to transport composted material to A1 Organics composting facility (the current composting provider) currently totals $44 per ton. This cost is $13.50 less than the cost to take this material to landfill. Given this information, if DIA were able to capture and compost the additional compostable material found in the waste stream, under the current pricing structure[22], DIA could save over $42,000 in hauling and tipping fees[23].

[22] We have been advised that this price differential is likely to decrease as DIA goes to bid for a new composting contract.
[23] 28.9% of tons of annual waste totals 3136.7 tons of compostable material. At a savings of $13.50 per ton this amounts to $42,346 annually.

Table 17 Potential Diversion and Cost Savings Potential with Composting Program

Item	Waste Reduction Potential (%)	Waste Reduction Potential (Tons)	Potential Cost Savings
Implement Pre and Post Consumer Composting Collection Program for Food Waste and Wax Cups*	15.77%	1710.5	$23,092
Eliminate Paper Towel Waste From Solid Waste Stream – Compost[1]*	8.45%	917.1	$12,381
Compost Liquids In Load [2]*	4.7%	509.1	$6,873
Total	28.9%	3,136.7	$42,346

[1] Paper Towel Waste can also be eliminated by installing high efficiency driers and this alternative is discussed later

[2] Green Squad recognizes that it could be difficult to collect this material

*Savings are $13.50 per ton composted which is the cost savings associated with composting versus landfill at current rates. Composting is currently $44 per ton while landfill is $57.50

In order for a pre and post consumer composting program to work, several important barriers would need to be overcome. These barriers are listed below:

1. *Food Concessionaires Using Compostable Products* - Because plastic ware can seriously contaminate composting operations, all food concessionaires would need to agree to move to biodegradable or compostable packaging and flatware. Green Squad is currently working with DIA to identify the likelihood of this scenario.

2. *New Food Waste Collection Bins* – DIA would need to purchase a minimum of 100 new food waste collection bins to accompany the current recycling bins. These food waste bins would need to be co-located with all trash and recycling bins in order to maximize the potential diversion rate. Additional bins would also add to the cost of the program. Further research is needed to identify associated costs.

3. *New Signage and Educational Materials* – DIA would need to create new signage and educational materials and launch an airport-wide educational campaign in order to ensure that airport visitors, vendors, employees and airline staff were aware of composting requirements and learn how to dispose of items appropriately. Signage and educational materials would also add to the initial cost of the composting program and further analysis is needed to determine cost benefit

Green Squad has been advised that Waste Management is in the process of permitting a composting facility at Denver Arapahoe Disposal Site (DADS), which is the same facility location where DIA currently disposes of its solid waste. Once up and running, this facility

will be located approximately 23 miles closer than the current composting disposal facility. Green Squad would like to encourage DIA to consider composting closer to DIA. As the desire to compost food waste often stems from a desire to reduce waste and lessen environmental impact, from an environmental standpoint, the ability to reduce 23 miles off each compost load trip would be a substantial environmental improvement.

5. Consider Implementing a Program to Eliminate Liquids in the Load

A substantial number of beverage bottles that were discarded in the residual waste stream were partially filled with liquids that were emptied for the waste assessment. This liquid waste represented 253.2 lbs or 4.7% of the total waste stream from all compactors. Extrapolating this amount to an annual figure, yields a total of 509 tons, resulting in an approximate cost of over $29,200 annually to haul and deposit this material to the landfill[24]. Given the cost of hauling this liquid, DIA might want to consider developing educational materials encouraging waste generators to empty liquids. DIA might want to simply include this information with any educational materials it develops associated with Recommendation #2. Moreover, because this is an annual cost that is only likely to increase with passenger volume, DIA might want to consider implementing a program that makes it easy for waste generators to dispose of liquid waste. DIA might consider implementing an engineering solution that either crushes or punctures bottles. Green Squad recommends further research to explore whether emptying these liquids is cost-feasible.

The other solution to eliminate liquids in the load is to compost them. The savings associated with composting these liquids are listed above in Table 17.

Table 18 Potential Diversion and Cost Savings of Eliminating Liquids from Load

Item	Waste Reduction Potential (%)	Waste Reduction Potential (Tons)	Potential Cost Savings
Eliminate Liquids From Load – Through Engineering Solution or Education*	4.7%	509.1	$29,274
*It currently costs $57.50 per ton to haul and deposit each ton of solid waste to Denver Arapahoe Disposal Site (DADS). Savings are based on eliminating 509.1 tons at a cost of $57.50 per ton to landfill.			

6. Consider Eliminating Paper Towel Waste from Bathrooms

The results of the waste assessment indicated that 456.1 (8.5%) of the waste generated from all compactors was lavatory waste. This material was primarily paper towel waste. Based on assessment percentages, extrapolating this amount to an annual figure, yields a total of 917.1 tons, and an approximate cost of over $52,733 annually to haul and deposit this material to the landfill[25]. To correlate this information with the weights of actual paper

[24] 4.7% of 11668 tons total totals 548 tons. Hauling and tipping fees are $57.50 per ton to dispose of this waste. Not having to dispose of this material therefore totals $31,530 annually.
[25] 917.1 tons at an avoided cost of $57.50 to landfill equals $52,733

towels purchased at DIA Green Squad obtained information from DIA related to annual bathroom paper towel purchases. Using the weights calculated from disposing of all dry paper towels purchased annually, the associated annual disposal weight was equivalent to 158.2 tons and would cost $9,096.50 annually[26]. While the weights found during the assessment are approximately 5 times greater than the dry paper towel waste weights calculated, it is important to recognize that this could very well be the case due to variation in saturation and contamination of disposed paper towels. For this reason, the total cost of actually disposing of this material can be much greater than what would be calculated for disposing of dry paper towel waste.

In addition to the disposal costs associated with using paper towels in the bathrooms, there are also the costs of purchasing the paper towels and labor costs for replenishing depleted paper towel supplies and emptying trash bag waste. These additional costs can be substantial. Green Squad therefore recommends installing high efficiency electric driers in airport bathrooms. New high efficiency driers, such as the Dyson Airblade[27], use very little electricity, are very quiet and are extremely hypoallergenic.

Green Squad has been provided with information related to the actual costs of DIA bathroom paper towel purchases and has performed a preliminary financial analysis for DIA quantifying the savings associated with switching to electric hand driers. This analysis has identified that DIA could save over $1.2 million over a 2 period with a 7 month return on investment if it were to install high efficiency driers in all of its airport bathrooms. Please see Appendix D for this analysis. The table below reflects the savings DIA could achieve from avoided disposal costs only.

Table 19 Diversion and Cost Saving Potential of Replacing Paper Towels with Electric Hand Driers

Item	Waste Reduction Potential (%)	Waste Reduction Potential (Tons)	Potential Cost Savings
Eliminate Paper Towel Waste From Bathrooms - Replace with Electric Hand Driers[1]*	8.5%	917.1	$52,733

[1] The other alternative to eliminate this waste stream is to compost it as indicated above
*It currently costs $57.50 per ton to haul and deposit each ton of solid waste to Denver Arapahoe Disposal Site (DADS). Savings are based on eliminating 917.1 tons at a cost of $57.50 per ton to landfill

7. Work to Improve Cardboard Collection Program

Green Squad found 415.6 lbs (7.7%) of OCC in the residual waste stream. While OCC is accepted in the single-stream recycling program, DIA is also paid separately for OCC that is compacted separately. The average rebate for OCC, since DIA's new contract has been in

[26] Green Squad has been advised that DIA purchases 320 cases of 6 rolls each week at a weight of 3.17 lbs per roll.
[27] http://www.dysonairblade.com/homepage.asp

effect, is $108.54. Extrapolating the amount of OCC found in the solid waste stream to an annual figure yields a total of 836 tons. Given that DIA can save $37 for every ton of OCC they compact as oppose to send to landfill, if DIA was able to capture all of this OCC material in the compactor, DIA could save over $30,900 annually[28]. Moreover, while DIA does not currently have a baler onsite to bale cardboard, baled cardboard typically receives a greater rebate value than loose or compacted cardboard. However, it is important to note that under DIA's current contract, it does not appear that baling cardboard would be cost advantageous[29].

8. Consider Baling Aluminum

65.3 lbs (1.2%) of the waste stream consisted of aluminum, primarily in the form of beverage cans. Extrapolating, based on waste assessment percentages, to an annual figure, yields a total of 130 tons of aluminum. While aluminum is currently included in DIA's single-stream program, aluminum and particularly baled aluminum tends to command a fairly high market value. Under current market conditions, baled aluminum is currently worth approximately $1120 per ton[30]. While DIA's current contract pays DIA for aluminum as part of the single-stream program, at today's rates, if this material were to be baled separately, DIA could receive a potential annual rebate of approximately $145,800 for this material before handling and labor. Green Squad therefore recommends returning to this consideration only after Green Squad has conducted an assessment of DIA's recyclables to ensure that the aluminum is accurately represented.

9. Work with Maintenance to Recycle Construction & Demolition Debris

During the waste assessment, Green Squad noticed a large amount of concrete rubble in the Maintenance Center's waste stream. This material could be diverted to the airports C&D recycling program. The sample of material for the assessment weighed 47.5 lbs (.9%) of the total solid waste stream. While the presence of this material could have been a singular event, if the deposition of this material in the solid waste stream does regularly occur then it could represent both a waste and cost burden. Extrapolating, based on waste assessment percentages, to an annual figure yields a total of 95.5 tons . Green Squad did not have access to the cost and rebate structure of the C&D Recycling Program so we could not identify the cost savings/loss that would be recognized by recycling this material as opposed to sending it to landfill. However, we do know that DIA could have the potential to eliminate up to .9% of the total waste stream by diverting this material to the C&D program

[28] It currently costs $57.50 per ton to haul and deposit each ton to Denver Arapahoe Disposal Site (DADS). It currently costs $129 to haul recyclables. However, the average rebate for April and May, 2010 was paying $108.54 per ton of OCC compacted yielding an overall cost of recycling of $20. Therefore DIA would saved $37 for every ton it recycled as opposed to sent to the landfill. At 898 tons per year the savings totals $33,261.

[29] DIA's 5 year solid waste and recycling contract with WM for recycling involves a $129 transport and processing fee and a pre-formulated rebate structure. If DIA were to bale their own cardboard prices would need to be renegotiated with WM and balers would need to be implemented with additional labor costs in order to identify the final cost differential. Currently DIA pays $169 for hauling, processing and storing cardboard and is currently receiving ~$108 p/ton rebate resulting in a total cost of $21 for cardboard. The current rebate for baled cardboard is $65 per ton. At a hauling cost of $44 it would also cost $21 to haul baled cardboard.

[30] Per Clint Morford of WM Recycle America on July 9, 20110

and reduce hauling and disposal costs by $5,490[31]. Green Squad therefore recommends working with the Maintenance Center to ensure that C&D material is diverted to the existing program.

Table 20 Potential Diversion and Cost Savings of Recycling C&D Material

Item	Waste Reduction Potential (%)	Waste Reduction Potential (Tons)	Potential Cost Savings
Recycle Construction & Demolition (C&D) Debris*	.9%	95.5	$5,492
**It currently costs $57.50 per ton to haul and deposit each ton of solid waste to Denver Arapahoe Disposal Site (DADS). Savings are based on eliminating 95.5 tons at a cost of $57.50 per ton to landfill			

10. Implement an Airline Textiles Collection and Donation (Reuse) Program

The 'All Other Organics' category primarily consisted of items that could be reused and diverted from the solid waste stream if they were donated to homeless shelters and/or charity organizations in the area. These items, which constituted 85 lbs (1.6%) of the total solid waste stream, consisted of textiles such as reusable napkins, eyeshades, socks, blankets, pillows and other clothing items. Extrapolating this amount to an annual figure, yields a total of 171 tons, resulting in an approximate cost of over $9,800 annually to haul and deposit this material in the landfill[32]. Green Squad observed that the majority of this material appeared to come from airline discards. Green Squad therefore recommends considering the establishment of an airline textiles collection and donation program that could involve collection boxes with regular or on-call pickups to reduce this waste stream.

Table 21 Diversion and Cost Savings of Implementing an Airline Textile Collection Program

Item	Waste Reduction Potential (%)	Waste Reduction Potential (Tons)	Potential Cost Savings
Implement Airlines Textile Collection Program for Reuse through Donation	1.6%	187	$ 10,700
**It currently costs $57.50 per ton to haul and deposit each ton of solid waste to Denver Arapahoe Disposal Site (DADS). Savings are based on eliminating 170.1 tons at a cost of $57.50 per ton to landfill			

11. Work with Airlines to Eliminate E-Waste from Solid Waste Stream

A total of 12 lbs of e-waste was found during the course of this assessment (.2% of the total

[31] On an annual basis the concrete material could amount to 102.7 tons. At a hauling and tipping rate of $57.50 the savings are equal to $5,900.
[32] 170.1 tons at an avoided cost of 57.50 to not haul and tip at landfill totals $9,827

weight of the waste stream). The majority of e-waste consisted of discarded airline headphones. Extrapolating, based on waste assessment percentages, to an annual figure, the amount of e-waste found annually could total more than 24 tons. Hauling and depositing this material to the landfill translates into an approximate cost of $1,300 annually to DIA[33]. Disposing of e-waste in the landfill can result in negative harmful environmental consequences, and it should not be deposited in the waste stream. DIA currently has an e-waste recycling program in place that this material could be diverted to. Green Squad recommends working with the airlines to establish an e-waste collection program.

Table 22 Diversion and Cost Savings of Recycling E-waste

Item	Waste Reduction Potential (%)	Waste Reduction Potential (Tons)	Potential Cost Savings
Recycle E-waste from Airline	.2%	24.1	$ 1,387

12. Consider Recycling Film Plastic for Air Cargo

While it represents a very small percentage of the total waste stream (.8%), clean film plastic collected from Air Cargo could potentially be recycled. The amount of clean film plastic found at Air Cargo was equivalent to 44.4 lbs (20.8%). Based on waste assessment percentages, extrapolating this clean film plastic material out to an annual figure yields a total of 89.3 tons of film plastic. While this material couldn't be captured in the existing single-stream program, film plastic is recyclable when it is clean. If the airport were to expand its recycling program to capture film plastic from the Air Cargo area the airport could receive additional rebates on this material. Moreover, baled film plastic, receives a higher rebate than un-baled film plastic. While hauling and baling charges would also need to be considered, the potential rebate on this amount of material on an annual basis is $5,350[34]. In order to obtain this rebate rate, DIA would also need to invest in a baler, incur labor costs and store this material at some location. DIA will need to consider whether baling this material and recycling it is worth the additional investment. However, while this material represents only a small potential reduction in the solid waste stream, diverting it would move DIA closer to its Zero Waste goal.

[33] 24.1 tons at an avoided cost of 57.50 to not haul and tip at landfill totals $1,387

[34] According to Clint Morford at WMRA, the current pricing for baled film plastic is $60 per ton (min of 500 pounds each). Hauling costs and baler costs would also need to be considered for actual savings.

Table 23 Diversion and Cost Savings of Recycling Air Cargo Film Plastic

Item	Waste Reduction Potential (%)	Waste Reduction Potential (Tons)	Potential Cost Savings
Bale and Divert Film Plastic	.8%	89.3	$ 5,357

Summary

In conclusion, as a result of this assessment, Green Squad believes that DIA has a significant opportunity to move closer to its Zero Waste goal by increasing the effectiveness of its current single-stream recycling program, diverting recyclable materials such as e-waste and C&D debris to other existing DIA recycling programs, expanding its current composting program and implementing new programs for some reusable materials.

Out of the residual waste stream that WM Green Squad analyzed we believe that DIA has the following opportunities. Summary tables listing these opportunities, along with the associated waste reduction and cost saving potentials associated with implementing different scenarios are listed on the following page.

Opportunity: Up to an additional 28.9% of the residual waste stream can be diverted. This 28.9% represents recyclable material that can be diverted through the existing single-stream recycling program. In order to reach this goal, DIA will need to transition the current multiple bin recycling system to a one-container single-stream recycling bin, increase recycling education and awareness throughout the entire airport, and initiate a substantial recycling marketing campaign to drive participation.

Opportunity: Up to an additional 15.8% of the residual waste stream can be diverted. This 15.8% is organic material that includes food waste and wax cups that can be diverted if the current composting collection program is expanded to include pre-consumer and post-consumer food waste throughout the entire airport.

Opportunity: Approximately 8.5% of the residual waste stream can be diverted. This includes lavatory (organic) waste consisting of primarily paper towels that can be composted. This material could also potentially be eliminated if the airport were to replace paper towels in the bathrooms with high efficiency electric hand dryers

Opportunity: Reducing liquid waste can potentially eliminate 4.7% of total waste generated at DIA. This 4.7% is liquid (organic) waste that was found in bottles. Implementing a program to encourage users to empty beverage bottles prior to disposal could minimize the amount of liquid waste making its way into the residual stream. Patrons could be

encouraged to empty this material with compost. Other opportunities exist to crush or puncture plastic bottles which would result in the liquids being emptied. Other technological or engineering solutions might also be possible to eliminate this waste stream but these would need to be evaluated.

Opportunity: Up to .9% of material can be diverted through improved C&D recycling. DIA will need to work with Maintenance Center employees to divert this material into the existing C&D recycling program.

Opportunity: DIA can divert an additional 1.6% of the total material through textile collection and donation. DIA will need to work with Airline employees to divert this material through donations to charity or homeless shelters. Textiles are often recyclable and select manufacturers will except used textiles for the purposes of creating new ones. DIA should explore all textile recycling options in the Denver area.

Opportunity: A total of .2% of the entire waste sample consisted of e-waste. DIA currently operates an e-waste recycling program and can potentially capture the e-waste that is not making it to a recycling container. DIA will need to work with Airline employees to divert this additional material.

Opportunity: Clean plastic film made up .8% of the total waste sample analyzed for this assessment. This material could be diverted if DIA were to implement plastic film collection in the Air Cargo area. DIA would need to work with Air Cargo employees to collect, bale and divert this material.

Tables 24 and 25 below indicate the potential waste stream diversion that DIA can achieve with the associated cost savings. These savings are reflected in two different scenarios. Please be advised that all savings are based on DIA's current contractual rates for hauling, landfilling, recycling and composting and current OBM recycling rates for April and May 2010. Because rates are subject to change and additional costs will be incurred in order to implement programs, the savings included below are intended to serve as a guide to the potential savings that could be achieved under different scenarios. Further analysis will be needed in order to calculate actual savings and payback periods for program implementation.

Table 24 Total Diversion Potential with Cost Savings - Scenario 1- All Composting

Item	Waste Reduction Potential (%)	Waste Reduction Potential (Tons)	Potential Cost Savings
Divert Recyclables to Existing Single Stream Program	29.8%	3,229.5	$88,811
[Alternative 1] Implement Pre and Post Consumer Composting Collection Program for Food Waste and Wax Cups	15.77%	1,710.5	$23.092
[Alternative 1] Eliminate Paper Towel Waste From Solid Waste Stream - Compost	8.5%	917.1	$12,381
[Alternative 1] Eliminate Liquids From Load by Composting	4.7%	509.1	$6,873
Recycle Construction & Demolition Debris	0.9%	95.5	$5,492
Implement Airlines Textile Collection Program for Reuse through Donation	1.6%	170.9	$9,827
Recycle E-waste from Airlines	0.2%	24.1	$1,387
Bale and Recycle Film Plastic	0.8%	89.3	$5,357
Total Savings [Alternative 1]	**62.2%**	**6,746**	**$153,220**
*Does not include savings associated with improving cardboard collection or recycling more aluminum as listed in recommendations 7 & 8 respectively			

Table 25 Total Diversion Potential with Cost Savings - Scenario 2[35]

Item	Waste Reduction Potential (%)	Waste Reduction Potential (Tons)	Potential Cost Savings
Divert Recyclables to Existing Single Stream Program	29.8%	3,229.5	$88,811
[Alternative 2] Implement Pre and Post Consumer Composting Collection Program for Food Waste and Wax Cups	15.77%	1710.5	$23,092
[Alternative 2] Eliminate Paper Towel Waste From Bathrooms - Replace with Electric Hand Driers	8.5%	917.1	$52,733
[Alternative 2] Eliminate Liquids in Load - Engineering or Educational Solution	4.7%	509.1	$29,274
Recycle Construction & Demolition Debris	0.9%	95.5	$5,492
Implement Airlines Textile Collection Program for Reuse through Donation	1.6%	170.9	$9,827
Recycle E-waste from Airlines	0.2%	24.1	$1,387
Bale and Recycle Film Plastic	0.8%	89.3	$5,357
Total Savings [Alternative 2]*	**62.2%**	**6,746**	**$215,973**
*Does not include savings associated with improving cardboard collection or recycling more aluminum as listed in recommendations 7 & 8 respectively			

In total, WM Green Squad has identified that Denver International Airport can divert its waste stream by over 62%. By taking full advantage of its existing single-stream, e-waste and C&D recycling programs; expanding its organics collection program to include pre and post consumer food waste and implementing new programs to capture additional reusable materials, DIA can move substantially closer to its Zero Waste goal and also save over $200,000 in the process. We are confident that DIA can achieve this success and look forward to working together with DIA to achieve this potential.

[35] Actual savings will vary. Savings represent the avoided hauling and disposal costs and where applicable the savings benefit of recycling and/or composting. Values do not include the costs associated with implementing the program, or additional savings resulting from reduced purchases.

Appendix A Waste Characterization Data

Table 26 Waste Assessment Data A41, A30, A46

C	D	AM	AN	AO	AP	AQ	AR
DIA Waste Audit							
2010 Audit Categories**		A Terminal					
MATERIALS	CATEGORIES & DESCRIPTION	Origination		Origination		Origination	
		A41		A30		A46	
Total Weight of Load/Ticket (Tons)		8.94		4.29		5.9	
Total Weight of Load/Ticket (lbs)		17880		8580		11800	
		Weight (lbs)	% of Sample (%)	Weight (lbs)	% of Sample (%)	Weight (lbs)	% of Sample (%)
GLASS							
Glass Food & Beverage Containers	All colors of food & beverage containers	2.7	1%	8.7	3%	2.1	1%
All Other Glass	Non-fluorescent light bulbs, glassware, window glass, ceramic dishware	0	0%	0	0%	0	0%
Total Glass		2.7	1%	8.7	3%	2.1	1%
		PLASTICS					
#1 Plastic Bottles	PETE Polyethylene Terephtalate (Bottles with Small Neck)	18.1	6%	7.6	2%	6.7	3%
#2 Plastic Bottles	HDPE High Density Polyethylene (Bottles with Small Neck)	1	0.3%	0.3	0.1%	0.7	0.3%
C	D	AM	AN	AO	AP	AQ	AR
Total Plastic Bottles	Any bottles with necks/openings narrower than body including beverage containers and cleaning containers (Resins #1 & #2)	19.1	7%	7.9	3%	7.4	3%
Plastic #1 (Non Bottle)	PETE Polyethylene Terephthalate (cups, cup lids, plates, food packages)	1.5	1%	0	0%	0.9	0%
Total Plastics #1	ALL PETE including bottles, cups, plates, food packages	19.6	7%	7.6	2%	7.6	3%
Plastic #2 (Non Bottle	HDPE High Density Polyethylene (cleaning containers, pails, motor oil bottles)	1.2	0%	1.3	0%	0	0%
Total Plastics #2	ALL HDPE including all containers and bottles	2.2	1%	1.6	1%	0.7	0%
Total Plastic #3	PVC Polvinyl Chloride	0	0%		0%	0	0%
Total Plastic #4	LDPE Low-density Polyethylened (Plastic wrap, grocery bags, sandwhich bags from large & small packaging, including clear garbage bags/liners)	17.4	6%	10.9	4%	6.9	3%
Total Plastic #5	PP Polypropylene (including cups, food containers)	2.5	1%	4.5	1%	5.3	2%
Plastic #6 Styrofoam ONLY	PS Polystyrene (Styrofoam) including cups, foam food trays, packing peanuts	3	1%	5.2	2%	4.8	2%
Plastic #6 (not including Styrofoam -other #6 plastics)	Other #6 plastics including cups, food packaging, cup lids	3.5	1%	0.1	0%	1	0%
Total Plastics #6	ALL PS including Styrofoam and other plastics	6.5	2%	5.3	2%	5.8	2%
Total Plastic #7	Other including biodegradable, PLA, cups, bottles, food containers	0	0%	0	0%	0	0%
Other Plastic	Foams, etc.	0	0%	0	0%	0	0%
Total Plastic		48.2	17%	29.9	10%	26.3	11%
Total Recyclable Plastic	All plastics excluding Styrofoam and Other	27.8	10%	13.8	4%	14.6	6%
		METAL					
Steel/Tin	tin, steel	10.5	4%	0	0%	0	0%
Aluminum	Aluminum Cans/foil	2.5	1%	1	0%	0.9	0%
Aerosol Cans		0	0%	0	0%	0	0%
All Other Metal	Non-food containers, all scrap metal & items that are primarily metal, container lids/caps - excluding aerosols still containing product (to Special Waste)	0	0%	0	0%	0	0%
Total Metal		13	4%	1	0%	0.9	0%
		FIBER					
OCC Corrugated Cardboard	Unwaxed/uncoated corrugated containers and boxes	34	12%	15.6	5%	30.1	13%
Newspaper	All newspaper including inserts (glossy & otherwise)	15.4	5%	11.2	4%	13.1	6%

Mixed Paper	Office paper (except fluorescent), envelopes, junk mail, telephone directories & paperboard	6.4	2%	11.4	4%	0.6	0%
Magazines & Catalogues	All magazines	0	0%	5	2%	0	0%
Waxed Cups	All wax coated drinking cups	3.4	1%	10.3	3%	6.3	3%
Total Fiber		59.2	20%	53.5	17%	50.1	21%
		ORGANICS					
Food Waste	All food/beverage waste (out of containers where possible) including bones & rinds, including food contaminated paper towels and napkins	28.6	10%	46.7	15%	21.5	9%
Lavatory Waste	Primarily paper towels & tissues	57	20%	58.1	19%	43.8	18%
Liquid Waste	All liquid emptied from bottles and drinking containers	8.5	3%	8.5	3%	6.5	3%
All Other Organics	Textiles including cloth napkins, blankets, clothing, hats, safety vests, rubber, broken wood etc.	8	3%	2	1%	0	0%
Total Organics		102.1	35%	115.3	37%	71.8	30%
		MISCELLANEOUS WASTES					
Hazardous Waste	Any material that requires special handling	0	0%	0	0%	0	0%
Ewaste	electronics including headphones, cell phones	3	1%	3.4	1%	0	0%
Construction & Demolition (C&D)							
Universal Waste	bulbs, batteries, etc.	0	0%	0	0%	0	0%
		TRASH					
Residual Waste	All materials not classified elsewhere, materials that are not recyclable and/or were too soiled or contaminated to be repurposed (includes soiled food containers, nitrile gloves, wax food wrappers, etc.)	62.6	22%	97.3	31%	86.1	36%
	Total Weight of Sample (lbs)	290.8	100%	309.1	100%	237.3	100%

Table 27 Waste Assessment Data B30, B44, B52

C	D	AA	AB	AC	AD	AE	AF
DIA Waste Audit							
2010 Audit Categories**							B T
MATERIALS	CATEGORIES & DESCRIPTION	Origination		Origination		Origination	
		B30		B44		B52	
Total Weight of Load/Ticket (Tons)		4.96		6.05		4.59	
Total Weight of Load/Ticket (lbs)		9920		12100		9180	
		Weight (lbs)	% of Sample (%)	Weight (lbs)	% of Sample (%)	Weight (lbs)	% of Sample (%)
GLASS							
Glass Food & Beverage Containers	All colors of food & beverage containers	9	2%	15.8	6%	2.6	1%
All Other Glass	Non-fluorescent light bulbs, glassware, window glass, ceramic dishware	0	0%	0	0%	0	0%
Total Glass		9	2%	15.8	6%	2.6	1%
#1 Plastic Bottles	PETE Polyethylene Terephtalate (Bottles with Small Neck)	4.9	1%	2.4	1%	5.9	2%
#2 Plastic Bottles	HDPE High Density Polyethylene (Bottles with Small Neck)	2.6	0.7%	0	0.0%	1.1	0.5%

Total Plastic Bottles	Any bottles with necks/openings narrower than body including beverage containers and cleaning containers (Resins #1 & #2)	7.5	2%	2.4	1%	7	3%
Plastic #1 (Non Bottle)	PETE Polyethylene Terephthalate (cups, cup lids, plates, food packages)	1	0%	3.7	1%	5.2	2%
Total Plastics #1	ALL PETE including bottles, cups, plates, food packages	5.9	2%	6.1	2%	11.1	5%
Plastic #2 (Non Bottle	HDPE High Density Polyethylene (cleaning containers, pails, motor oil bottles)	0	0%	0	0%	1.2	0%
Total Plastics #2	ALL HDPE including all containers and bottles	2.6	1%	0	0%	2.3	1%
Total Plastic #3	PVC Polyvinyl Chloride	0	0%	0	0%	0	0%
Total Plastic #4	LDPE Low-density Polyethylened (Plastic wrap, grocery bags, sandwhich bags from large & small packaging, including clear garbage bags/liners)	14.1	4%	14.3	6%	8.5	4%
Total Plastic #5	PP Polypropylene (including cups, food containers)	2.9	1%	2.1	1%	1.4	1%
Plastic #6 Styrofoam ONLY	PS Polystyrene (Styrofoam) including cups, foam food trays, packing peanuts	10.1	3%	5.5	2%	4.4	2%
	C	AA	AB	AC	AD	AE	AF
Plastic #6 (not including Styrofoam -other #6 plastics)	Other #6 plastics including cups, food packaging, cup lids	1	0%	1	0%	0.8	0%
Total Plastics #6	ALL PS including Styrofoam and other plastics	11.1	3%	6.5	3%	5.2	2%
Total Plastic #7	Other including biodegradable, PLA, cups, bottles, food containers	0	0%	0	0%	0	0%
Other Plastic	Foams, etc.	0	0%	0	0%	0	0%
Total Plastic		36.6	9%	29	11%	28.5	12%
Total Recyclable Plastic	All plastics excluding Styrofoam and Other	12.4	3%	9.2	4%	15.6	6%
Steel/Tin	tin, steel	0	0%	0	0%	5	2%
Aluminum	Aluminum Cans/foil	1.2	0%	0.4	0%	2.5	1%
Aerosol Cans		0	0%	0	0%	0	0%
All Other Metal	Non-food containers, all scrap metal & items that are primarily metal, container lids/caps - excluding aerosols still containing product (to Special Waste)	0	0%	0	0%	0	0%
Total Metal		1.2	0%	0.4	0%	7.5	3%
OCC Corrugated Cardboard	Unwaxed/uncoated corrugated containers and boxes	35.3	9%	2.7	1%	11.9	5%
Newspaper	All newspaper including inserts (glossy & otherwise)	12.2	3%	5.5	2%	3.4	1%
Mixed Paper	Office paper (except fluorescent), envelopes, junk mail, telephone directories & paperboard	14.1	4%	13.3	5%	14.9	6%
Magazines & Catalogues	All magazines	9.1	2%	2.9	1%	0	0%
Waxed Cups	All wax coated drinking cups	3.6	1%	7.1	3%	5.3	2%
Total Fiber		74.3	19%	31.5	12%	35.5	15%
Food Waste	All food/beverage waste (out of containers where possible) including bones & rinds, including food contaminated paper towels and napkins	78.1	20%	56.7	22%	48.8	20%
Lavatory Waste	Primarily paper towels & tissues	63.3	16%	18.2	7%	29.7	12%
Liquid Waste	All liquid emptied from bottles and drinking containers	7.9	2%	2.9	1%	12.5	5%
All Other Organics	Textiles including cloth napkins, blankets, clothing, hats, safety vests, rubber, broken wood etc.	2.8	1%	0	0%	4.8	2%
Total Organics		152.05	39%	77.8	30%	95.8	40%
Hazardous Waste	Any material that requires special handling	0	0%	0	0%		0%
Ewaste	electronics including headphones, cell phones	0	0%	0	0%		0%

Construction & Demolition (C&D)							
Universal Waste	bulbs, batteries, etc.	0	0%	0	0%		0%
Residual Waste	All materials not classified elsewhere, materials that are not recyclable and/or were too soiled or contaminated to be repurposed (includes soiled food containers, nitrile gloves, wax food wrappers, etc.)	115.2	30%	103.2	40%	70.59	29%
	Total Weight of Sample (lbs)	388.3	100%	257.7	100%	240.49	100%

Table 28 Waste Assessment Data B36, B39, B24

C	D	U	V	W	X	Y	Z
DIA Waste Audit							
2010 Audit Categories**							
MATERIALS	CATEGORIES & DESCRIPTION	Origination		Origination		Origination	
		B36		B39		B24	
Total Weight of Load/Ticket (Tons)		6.62		5.94		2.5	
Total Weight of Load/Ticket (lbs)		13240		11880		5000	
		Weight (lbs)	% of Sample (%)	Weight (lbs)	% of Sample (%)	Weight (lbs)	% of Sample (%)
GLASS							
Glass Food & Beverage Containers	All colors of food & beverage containers	64.2	27%	14.7	4%	10.9	3%
All Other Glass	Non-fluorescent light bulbs, glassware, window glass, ceramic dishware	0	0%	0	0%	0	0%
Total Glass		64.2	27%	14.7	4%	10.9	3%
#1 Plastic Bottles	PETE Polyethylene Terephtalate (Bottles with Small Neck)	7.1	3%	3.2	1%	5.7	2%
#2 Plastic Bottles	HDPE High Density Polyethylene (Bottles with Small Neck)	1	0.4%	0.8	0.2%	1.6	0.5%
Total Plastic Bottles	Any bottles with necks/openings narrower than body including beverage containers and cleaning containers (Resins #1 & #2)	8.1	3%	4	1%	7.3	2%
Plastic #1 (Non Bottle)	PETE Polyethylene Terephthalate (cups, cup lids, plates, food packages)	1.3	1%	1.1	0%	0	0%
Total Plastics #1	ALL PETE including bottles, cups, plates, food packages	8.4	4%	4.3	1%	5.7	2%
Plastic #2 (Non Bottle	HDPE High Density Polyethylene (cleaning containers, pails, motor oil bottles)	0.2	0%	0	0%	0.4	0%
Total Plastics #2	ALL HDPE including all containers and bottles	1.2	1%	0.8	0%	2	1%
Total Plastic #3	PVC Polyvinyl Chloride	0	0%	0	0%	0	0%
Total Plastic #4	LDPE Low-density Polyethylened (Plastic wrap, grocery bags, sandwhich bags from large & small packaging, including clear garbage bags/liners)	9.1	4%	15	4%	10.7	3%
Total Plastic #5	PP Polypropylene (including cups, food containers)	0.2	0%	8	2%	2	1%
Plastic #6 Styrofoam ONLY	PS Polystyrene (Styrofoam) including cups, foam food trays, packing peanuts	5.3	2%	6	2%	2.4	1%

Plastic #6 (not including Styrofoam -other #6 plastics)	Other #6 plastics including cups, food packaging, cup lids	3.4	1%	2	1%	2.5	1%
Total Plastics #6	ALL PS including Styrofoam and other plastics	8.7	4%	8	2%	4.9	1%
Total Plastic #7	Other including biodegradable, PLA, cups, bottles, food containers	0	0%	0	0%	0	0%
Other Plastic	Foams, etc.	0	0%	0	0%	0	0%
Total Plastic		27.6	12%	36.1	11%	25.3	7%
Total Recyclable Plastic	All plastics excluding Styrofoam and Other	13.2	6%	15.1	4%	12.2	3%
Steel/Tin	tin, steel	0	0%	0	0%	0	0%
Aluminum	Aluminum Cans/foil	1	0%	1	0%	1	0%
Aerosol Cans		0	0%	0	0%	0	0%
All Other Metal	Non-food containers, all scrap metal & items that are primarily metal, container lids/caps - excluding aerosols still containing product (to Special Waste)	0	0%	0	0%	0	0%
Total Metal		1	0%	1	0%	1	0%
OCC Corrugated Cardboard	Unwaxed/uncoated corrugated containers and boxes	20	8%	29.5	9%	26.8	8%
Newspaper	All newspaper including inserts (glossy & otherwise)	0	0%	0.6	0%	13.8	4%
Mixed Paper	Office paper (except fluorescent), envelopes, junk mail, telephone directories & paperboard	7.7	3%	2.4	1%	8.9	3%
Magazines & Catalogues	All magazines	0	0%	2	1%	15.9	5%
Waxed Cups	All wax coated drinking cups	2.7	1%	7.4	2%	11.4	3%
Total Fiber		30.4	13%	41.9	12%	76.8	22%
Food Waste	All food/beverage waste (out of containers where possible) including bones & rinds, including food contaminated paper towels and napkins	30.6	13%	100.4	30%	54.1	15%
Lavatory Waste	Primarily paper towels & tissues	10.1	4%	5.3	2%	55	16%
Liquid Waste	All liquid emptied from bottles and drinking containers	3.7	2%	1.6	0%	14.8	4%
All Other Organics	Textiles including cloth napkins, blankets, clothing, hats, safety vests, rubber, broken wood etc.	0	0%	0	0%	11.9	3%
Total Organics		44.35	19%	107.3	32%	135.8	38%
Hazardous Waste	Any material that requires special handling	0	0%	0	0%		0%
Ewaste	electronics including headphones, cell phones	0	0%	0	0%	1.1	0%
Construction & Demolition (C&D)							
Universal Waste	bulbs, batteries, etc.	0	0%	0	0%		0%
Residual Waste	All materials not classified elsewhere, materials that are not recyclable and/or were too soiled or contaminated to be repurposed (includes soiled food containers, nitrile gloves, wax food wrappers, etc.)	72.2	30%	136.8	40%	102.4	29%
	Total Weight of Sample (lbs)	239.7	100%	337.8	100%	353.3	100%

Table 29 Waste Assessment Data B15, B16, B81

C	D	AG	AH	AI	AJ	AK	AL
DIA Waste Audit							
2010 Audit Categories**		B Terminal					
MATERIALS	CATEGORIES & DESCRIPTION	Origination		Origination		Origination	
		B15		B16		B81	
Total Weight of Load/Ticket (Tons)		1.78		0.96		7.62	
Total Weight of Load/Ticket (lbs)		3560		1920		15240	
		Weight (lbs)	% of Sample (%)	Weight (lbs)	% of Sample (%)	Weight (lbs)	% of Sample (%)
GLASS							
Glass Food & Beverage Containers	All colors of food & beverage containers	8.3	4%	3.4	1%	3.4	1%
All Other Glass	Non-fluorescent light bulbs, glassware, window glass, ceramic dishware	0	0%	0	0%	0	0%
Total Glass		8.3	4%	3.4	1%	3.4	1%
						PLASTICS	
#1 Plastic Bottles	PETE Polyethylene Terephtalate (Bottles with Small Neck)	9.7	5%	8.2	3%	8.8	3%
#2 Plastic Bottles	HDPE High Density Polyethylene (Bottles with Small Neck)	0	0.0%	0.2	0.1%	1.4	0.4%
Total Plastic Bottles	Any bottles with necks/openings narrower than body including beverage containers and cleaning containers (Resins #1 & #2)	9.7	5%	8.4	3%	10.2	3%
Plastic #1 (Non Bottle)	PETE Polyethylene Terephthalate (cups, cup lids, plates, food packages)	0.8	0%	0	0%	0.3	0%
Total Plastics #1	ALL PETE including bottles, cups, plates, food packages	10.5	5%	8.2	3%	9.1	3%
Plastic #2 (Non Bottle	HDPE High Density Polyethylene (cleaning containers, pails, motor oil bottles)	0.3	0%	0.2	0%	0	0%
Total Plastics #2	ALL HDPE including all containers and bottles	0.3	0%	0.4	0%	1.4	0%
Total Plastic #3	PVC Polvinyl Chloride	0	0%	0	0%	0	0%
Total Plastic #4	LDPE Low-density Polyethylened (Plastic wrap, grocery bags, sandwhich bags from large & small packaging, including clear garbage bags/liners)	3.7	2%	7.2	3%	25.2	8%
Total Plastic #5	PP Polypropylene (including cups, food containers)	2.4	1%	1.5	1%	12.2	4%
Plastic #6 Styrofoam ONLY	PS Polystyrene (Styrofoam) including cups, foam food trays, packing peanuts	1.6	1%	1.5	1%	2.3	1%
Plastic #6 (not including Styrofoam -other #6 plastics)	Other #6 plastics including cups, food packaging, cup lids	0.2	0%	0.2	0%	0.5	0%
Total Plastics #6	ALL PS including Styrofoam and other plastics	1.8	1%	1.7	1%	2.8	1%
Total Plastic #7	Other including biodegradable, PLA, cups, bottles, food containers	0	0%	0	0%	0	0%
Other Plastic	Foams, etc.	0	0%	0	0%	0	0%
Total Plastic		18.7	10%	19	8%	50.7	16%
Total Recyclable Plastic	All plastics excluding Styrofoam and Other	13.4	7%	10.3	4%	23.2	7%
						METAL	
Steel/Tin	tin, steel	0.5	0%	0	0%	0	0%
Aluminum	Aluminum Cans/foil	7.1	4%	1.5	1%	13.6	4%
Aerosol Cans		0	0%	0	0%	0	0%
All Other Metal	Non-food containers, all scrap metal & items that are primarily metal, container lids/caps - excluding aerosols still containing product (to Special Waste)	0	0%	0	0%	0	0%
Total Metal		7.6	4%	1.5	1%	13.6	4%
						FIBER	
OCC Corrugated Cardboard	Unwaxed/uncoated corrugated containers and boxes	4.4	2%	3.6	1%	62.3	19%
Newspaper	All newspaper including inserts (glossy & otherwise)	28.7	15%	87.1	35%	30	9%

Mixed Paper	Office paper (except fluorescent), envelopes, junk mail, telephone directories & paperboard	4.4	2%	12.5	5%	3.9	1%
Magazines & Catalogues	All magazines	2.4	1%	19.5	8%	8.6	3%
Waxed Cups	All wax coated drinking cups	2.6	1%	2	1%	4.8	1%
Total Fiber		42.5	22%	124.7	50%	109.6	34%
						ORGANICS	
Food Waste	All food/beverage waste (out of containers where possible) including bones & rinds, including food contaminated paper towels and napkins	5.4	3%	8.4	3%	13.2	4%
Lavatory Waste	Primarily paper towels & tissues	14.7	8%	0	0%	5	2%
Liquid Waste	All liquid emptied from bottles and drinking containers	14.5	7%	30.8	12%	29.3	9%
All Other Organics	Textiles including cloth napkins, blankets, clothing, hats, safety vests, rubber, broken wood etc.	0.4	0%	7.8	3%	0	0%
Total Organics		35	18%	47	19%	47.5	15%
						MISCELLANEOUS WASTES	
Hazardous Waste	Any material that requires special handling	0	0%	0	0%	0	0%
Ewaste	electronics including headphones, cell phones	0.6	0%	0	0%	0	0%
Construction & Demolition (C&D)							
Universal Waste	bulbs, batteries, etc.	0	0%	0	0%	0	0%
						TRASH	
Residual Waste	All materials not classified elsewhere, materials that are not recyclable and/or were too soiled or contaminated to be repurposed (includes soiled food containers, nitrile gloves, wax food wrappers, etc.)	82.5	42%	51.9	21%	96.9	30%
	Total Weight of Sample (lbs)	195.2	100%	247.5	100%	321.7	100%

Table 30 Waste Assessment Data Sum of B, Sum of B15 & B16

C	D	BQ	BR	BX	BY
DIA Waste Audit					
2010 Audit Categories**		Sum of B		Sum of B15 and B16	
MATERIALS	CATEGORIES & DESCRIPTION	Origination		Origination	
		Sum of B		Sum of B15 and B16	
Total Weight of Load/Ticket (Tons)		41.02		2.74	
Total Weight of Load/Ticket (lbs)		82040		5480	
		Weight (lbs)	% of Sample (%)	Weight (lbs)	% of Sample (%)
GLASS					
Glass Food & Beverage Containers	All colors of food & beverage containers	132.3	5.1%	11.7	3%
All Other Glass	Non-fluorescent light bulbs, glassware, window glass, ceramic dishware	0	0%	0	0%
Total Glass		132.3	5.1%	11.7	3%
PLASTICS					
#1 Plastic Bottles	PETE Polyethylene Terephtalate (Bottles with Small Neck)	55.9	2%	17.9	4%
#2 Plastic Bottles	HDPE High Density Polyethylene (Bottles with Small Neck)	8.7	0.3%	0.2	0.0%

Total Plastic Bottles	Any bottles with necks/openings narrower than body including beverage containers and cleaning containers (Resins #1 & #2)	64.6	3%	18.1	4%
Plastic #1 (Non Bottle)	PETE Polyethylene Terephthalate (cups, cup lids, plates, food packages)	13.4	1%	0.8	0%
Total Plastics #1	ALL PETE including bottles, cups, plates, food packages	69.3	3%	18.7	4%
Plastic #2 (Non Bottle	HDPE High Density Polyethylene (cleaning containers, pails, motor oil bottles)	2.3	0%	0.5	0%
Total Plastics #2	ALL HDPE including all containers and bottles	11	0%	0.7	0%
Total Plastic #3	PVC Polyvinyl Chloride	0	0%	0	0%
Total Plastic #4	LDPE Low-density Polyethylened (Plastic wrap, grocery bags, sandwhich bags from large & small packaging, including clear garbage bags/liners)	107.8	4%	10.9	2%
Total Plastic #5	PP Polypropylene (including cups, food containers)	32.7	1%	3.9	1%
Plastic #6 Styrofoam ONLY	PS Polystyrene (Styrofoam) including cups, foam food trays, packing peanuts	39.1	2%	3.1	1%
Plastic #6 (not including Styrofoam -other #6 plastics)	Other #6 plastics including cups, food packaging, cup lids	11.6	0%	0.4	0%
Total Plastics #6	ALL PS including Styrofoam and other plastics	50.7	2%	3.5	1%
Total Plastic #7	Other including biodegradable, PLA, cups, bottles, food containers	0	0%	0	0%
Other Plastic	Foams, etc.	0	0%	0	0%
Total Plastic		271.5	11%	37.7	9%
Total Recyclable Plastic	All plastics excluding Styrofoam and Other	124.6	5%	23.7	5%
METAL					
Steel/Tin	tin, steel	5.5	0%	0.5	0%
Aluminum	Aluminum Cans/foil	29.3	1%	8.6	2%
Aerosol Cans		0	0%	0	0%
All Other Metal	Non-food containers, all scrap metal & items that are primarily metal, container lids/caps - excluding aerosols still containing product (to Special Waste)	0	0%	0	0%
Total Metal		34.8	1%	9.1	2%
FIBER					
OCC Corrugated Cardboard	Unwaxed/uncoated corrugated containers and boxes	196.5	7.6%	8	1.8%
Newspaper	All newspaper including inserts (glossy & otherwise)	181.3	7.0%	115.8	26.2%
Mixed Paper	Office paper (except fluorescent), envelopes, junk mail, telephone directories & paperboard	82.1	3.2%	16.9	3.8%
Magazines & Catalogues	All magazines	60.4	2.3%	21.9	4.9%
Waxed Cups	All wax coated drinking cups	46.9	1.8%	4.6	1.0%
Total Fiber		567.2	22.0%	167.2	37.8%
ORGANICS					
Food Waste	All food/beverage waste (out of containers where possible) including bones & rinds, including food contaminated paper towels and napkins	395.6	15%	13.8	3%
Lavatory Waste	Primarily paper towels & tissues	201.3	8%	14.7	3%
Liquid Waste	All liquid emptied from bottles and drinking containers	118	4.6%	45.3	10%
All Other Organics	Textiles including cloth napkins, blankets, clothing, hats, safety vests, rubber, broken wood etc.	27.7	1.1%	8.2	1.9%
Total Organics		742.6	29%	82	19%
MISCELLANEOUS WASTES					
Hazardous Waste	Any material that requires special handling	0	0%	0	0%
Ewaste	electronics including headphones, cell phones	1.7	0.07%	0.6	0%

Construction & Demolition (C&D)					
Universal Waste	bulbs, batteries, etc.	0	0%	0	0%
TRASH					
Residual Waste	All materials not classified elsewhere, materials that are not recyclable and/or were too soiled or contaminated to be repurposed (includes soiled food containers, nitrile gloves, wax food wrappers, etc.)	831.59	32%	134.4	30%
	Total Weight of Sample (lbs)	2581.69	100%	442.7	100%

Table 31 Waste Assessment Data Air Cargo, C46, C39

C	D	K	L	M	N	O	P
MATERIALS	CATEGORIES & DESCRIPTION	Origination		Origination		Origination	
		Air Cargo		C46		C39	
Total Weight of Load/Ticket (Tons)		0.46		4.2		5.8	
Total Weight of Load/Ticket (lbs)		920		8400		11600	
		Weight (lbs)	% of Sample (%)	Weight (lbs)	% of Sample (%)	Weight (lbs)	% of Sample (%)
GLASS							
Glass Food & Beverage Containers	All colors of food & beverage containers	0.4	0.2%	2.7	1%	4.5	2%
All Other Glass	Non-fluorescent light bulbs, glassware, window glass, ceramic dishware	0	0.0%	0	0%	0	0%
Total Glass		0.4	0.2%	2.7	1%	4.5	2%
#1 Plastic Bottles	PETE Polyethylene Terephtalate (Bottles with Small Neck)	4.1	1.9%	6.8	3%	4.8	2%
#2 Plastic Bottles	HDPE High Density Polyethylene (Bottles with Small Neck)	3.3	1.5%	0.1	0.0%	0	0.0%
Total Plastic Bottles	Any bottles with necks/openings narrower than body including beverage containers and cleaning containers (Resins #1 & #2)	7.4	3.5%	6.9	3%	4.8	2%
Plastic #1 (Non Bottle)	PETE Polyethylene Terephthalate (cups, cup lids, plates, food packages)	0.5	0.2%	2.2	1%	0	0%
Total Plastics #1	ALL PETE including bottles, cups, plates, food packages	4.6	2.2%	9	4%	4.8	2%
Plastic #2 (Non Bottle	HDPE High Density Polyethylene (cleaning containers, pails, motor oil bottles)	0.1	0.0%	0.7	0%	0	0%
Total Plastics #2	ALL HDPE including all containers and bottles	3.4	1.6%	0.8	0%	0	0%
Total Plastic #3	PVC Polyvinyl Chloride	0	0.0%	0	0%	0	0%
Total Plastic #4	LDPE Low-density Polyethylened (Plastic wrap, grocery bags, sandwhich bags from large & small packaging, including clear garbage bags/liners)	44.4	20.8%	9.2	4%	12.4	6%
Total Plastic #5	PP Polypropylene (including cups, food containers)	1.2	0.6%	1.7	1%	10	5%
Plastic #6 Styrofoam ONLY	PS Polystyrene (Styrofoam) including cups, foam food trays, packing peanuts	3.8	1.8%	0.9	0%	0.4	0%
Plastic #6 (not including Styrofoam -other #6 plastics)	Other #6 plastics including cups, food packaging, cup lids	0.7	0.3%	0.5	0%	0	0%
Total Plastics #6	ALL PS including Styrofoam and other plastics	4.5	2.1%	1.4	1%	0.4	0%
Total Plastic #7	Other including biodegradable, PLA, cups, bottles, food containers	0	0.0%	0	0%	0	0%
Other Plastic	Foams, etc.	16.8	7.9%	0	0%	0	0%
Total Plastic		74.9	35.1%	22.1	9%	27.6	14%
Total Recyclable Plastic	All plastics excluding Styrofoam and Other	54.3	25.5%	12	5%	14.8	8%

Steel/Tin	tin, steel		0.0%	0	0%	0	0%
Aluminum	Aluminum Cans/foil	2.9	1.4%	1.4	1%	9.1	5%
Aerosol Cans			0.0%	0	0%	0	0%
All Other Metal	Non-food containers, all scrap metal & items that are primarily metal, container lids/caps - excluding aerosols still containing product (to Special Waste)	1.2	0.6%	0	0%	0	0%
Total Metal		4.1	1.9%	1.4	1%	9.1	5%
OCC Corrugated Cardboard	Unwaxed/uncoated corrugated containers and boxes	30	14.1%	19.8	8%	15.4	8%
Newspaper	All newspaper including inserts (glossy & otherwise)	7.4	3.5%	54.4	22%	18	9%
Mixed Paper	Office paper (except fluorescent), envelopes, junk mail, telephone directories & paperboard	7.2	3.4%	6.1	2%	3.4	2%
Magazines & Catalogues	All magazines	1.6	0.8%	7.5	3%	11.5	6%
Waxed Cups	All wax coated drinking cups	0.4	0.2%	1.8	1%	4.2	2%
Total Fiber		46.6	21.9%	89.6	36%	52.5	27%
Food Waste	All food/beverage waste (out of containers where possible) including bones & rinds, including food contaminated paper towels and napkins	6.91	3.2%	18.225	7%	6.8	4%
Lavatory Waste	Primarily paper towels & tissues	0	0.0%	22.6	9%	14.5	7%
Liquid Waste	All liquid emptied from bottles and drinking containers	8.4	3.9%	33	13%	8.7	4%
All Other Organics	Textiles including cloth napkins, blankets, clothing, hats, safety vests, rubber, broken wood etc.	9	4.2%	5.9	2%	0	0%
Total Organics		24.31	11.4%	79.725	32%	30	15%
Hazardous Waste	Any material that requires special handling	0	0.0%	0	0%	0	0%
Ewaste	electronics including headphones, cell phones	0	0.0%	3.9	2%	0	0%
Construction & Demolition (C&D)							
Universal Waste	bulbs, batteries, etc.	0	0.0%	0	0%	0	0%
Residual Waste	All materials not classified elsewhere, materials that are not recyclable and/or were too soiled or contaminated to be repurposed (includes soiled food containers, nitrile gloves, wax food wrappers, etc.)	62.79	29.5%	47.775	19%	70.2	36%
	Total Weight of Sample (lbs)	213.1	100%	247.2	100%	193.9	100%

Table 32 Waste Assessment Data C38, C34, Sum of Terminal C

MATERIALS	CATEGORIES & DESCRIPTION	Origination C38		Origination C34		Origination Sum of C	
Total Weight of Load/Ticket (Tons)		8.81		5.63		41.69	
Total Weight of Load/Ticket (lbs)		17620		11260		83380	
		Weight (lbs)	% of Sample (%)	Weight (lbs)	% of Sample (%)	Weight (lbs)	% of Sample (%)
GLASS							
Glass Food & Beverage Containers	All colors of food & beverage containers	10.8	3%	1.3	1%	19.3	1.9%
All Other Glass	Non-fluorescent light bulbs, glassware, window glass, ceramic dishware	0	0%	0	0%	0	0.0%
Total Glass		10.8	3%	1.3	1%	19.3	1.9%
PLASTICS							
#1 Plastic Bottles	PETE Polyethylene Terephtalate (Bottles with Small Neck)	10.2	3%	2	1%	23.8	2%
#2 Plastic Bottles	HDPE High Density Polyethylene (Bottles with Small Neck)	0.5	0.1%	2.9	1.4%	3.5	0.3%
Total Plastic Bottles	Any bottles with necks/openings narrower than body including beverage containers and cleaning containers (Resins #1 & #2)	10.7	3%	4.9	2%	27.3	3%

Plastic #1 (Non Bottle)	PETE Polyethylene Terephthalate (cups, cup lids, plates, food packages)	1.7	0%	1.2	1%	5.1	1%
Total Plastics #1	ALL PETE including bottles, cups, plates, food packages	11.9	3%	3.2	1%	28.9	3%
Plastic #2 (Non Bottle	HDPE High Density Polyethylene (cleaning containers, pails, motor oil bottles)	0.7	0%	0	0%	1.4	0%
Total Plastics #2	ALL HDPE including all containers and bottles	1.2	0%	2.9	1%	4.9	0%
Total Plastic #3	PVC Polyvinyl Chloride	0	0%	0	0%	0	0%
Total Plastic #4	LDPE Low-density Polyethylened (Plastic wrap, grocery bags, sandwhich bags from large & small packaging, including clear garbage bags/liners)	19.8	5%	20.6	10%	62	6%
Total Plastic #5	PP Polypropylene (including cups, food containers)	0	0%	1	0%	12.7	1%
Plastic #6 Styrofoam ONLY	PS Polystyrene (Styrofoam) including cups, foam food trays, packing peanuts	3.3	1%	3.5	2%	8.1	1%
Plastic #6 (not including Styrofoam -other #6 plastics)	Other #6 plastics including cups, food packaging, cup lids	5.8	2%	0.1	0%	6.4	1%
Total Plastics #6	ALL PS including Styrofoam and other plastics	9.1	3%	3.6	2%	14.5	1%
Total Plastic #7	Other including biodegradable, PLA, cups, bottles, food containers	0	0%	0	0%	0	0%
Other Plastic	Foams, etc.	0	0%	0	0%	0	0%
Total Plastic		42	12%	31.3	15%	123	12.1%
Total Recyclable Plastic	All plastics excluding Styrofoam and Other	18.9	5%	7.2	3%	52.9	5%
	METAL						
Steel/Tin	tin, steel	0.9	0%	0	0%	0.9	0%
Aluminum	Aluminum Cans/foil	4.2	1%	0.8	0%	15.5	2%
Aerosol Cans		0	0%	0	0%	0	0%
All Other Metal	Non-food containers, all scrap metal & items that are primarily metal, container lids/caps - excluding aerosols still containing product (to Special Waste)	0	0%	0	0%	0	0%
Total Metal		5.1	1%	0.8	0%	16.4	1.6%
	FIBER						
OCC Corrugated Cardboard	Unwaxed/uncoated corrugated containers and boxes	30.3	8%	20.7	10%	86.2	8.5%
Newspaper	All newspaper including inserts (glossy & otherwise)	13.5	4%	0.7	0%	86.6	8.5%
Mixed Paper	Office paper (except fluorescent), envelopes, junk mail, telephone directories & paperboard	1.5	0%	15.6	7%	26.6	2.6%
Magazines & Catalogues	All magazines	0	0%	1.5	1%	20.5	2.0%
Waxed Cups	All wax coated drinking cups	9.2	3%	2.4	1%	17.6	1.7%
Total Fiber		54.5	15%	40.9	19%	237.5	23.3%
	ORGANICS						
Food Waste	All food/beverage waste (out of containers where possible) including bones & rinds, including food contaminated paper towels and napkins	90.1	25%	85.6	40%	200.8	19.7%
Lavatory Waste	Primarily paper towels & tissues	3.9	1%	13.6	6%	54.6	5.4%
Liquid Waste	All liquid emptied from bottles and drinking containers	3.9	1%	3.5	2%	49.1	4.8%
All Other Organics	Textiles including cloth napkins, blankets, clothing, hats, safety vests, rubber, broken wood etc.	7.2	2%	1.3	1%	14.4	1.4%
Total Organics		105.145	29%	104.0325	48%	318.9025	31.3%
	MISCELLANEOUS WASTES						
Hazardous Waste	Any material that requires special handling	0	0%	0	0%	0	0%
Ewaste	electronics including headphones, cell phones	0	0%	0	0%	3.9	0.38%
Construction & Demolition (C&D)							
Universal Waste	bulbs. batteries. etc.	0	0%	0	0%	0	0%
	TRASH						
Residual Waste	All materials not classified elsewhere, materials that are not recyclable and/or were too soiled or contaminated to be repurposed (includes soiled food containers, nitrile gloves, wax food wrappers, etc.)	146.1	40%	36.4	17%	300.4	29%
	Total Weight of Sample (lbs)	363.6	100%	214.7	100%	1019.4	100%

Table 33 Waste Assessment Data AOB, East West Overflow Parking & Maintenance

MATERIALS	CATEGORIES & DESCRIPTION	Origination		Origination		Origination	
		AOB		East West Overflow		Maintenance	
Total Weight of Load/Ticket (Tons)		4.29		1.4		11.02	
Total Weight of Load/Ticket (lbs)		8580		2800		22040	
		Weight (lbs)	% of Sample (%)	Weight (lbs)	% of Sample (%)	Weight (lbs)	% of Sample (%)
	GLASS						
Glass Food & Beverage Containers	All colors of food & beverage containers	40.2	16%	5.8	3%	8.4	3%
All Other Glass	Non-fluorescent light bulbs, glassware, window glass, ceramic dishware		0%	0	0%	0	0%
Total Glass		40.2	16%	5.8	2.7%	8.4	2.99%
#1 Plastic Bottles	PETE Polyethylene Terephtalate (Bottles with Small Neck)	6.9	3%	12.3	6%	12.3	4%
#2 Plastic Bottles	HDPE High Density Polyethylene (Bottles with Small Neck)	0.7	0%	0.5	0.2%	4.1	1.5%
Total Plastic Bottles	Any bottles with necks/openings narrower than body including beverage containers and cleaning containers (Resins #1 & #2)	7.6	3%	12.8	24%	16.4	6%
Plastic #1 (Non Bottle)	PETE Polyethylene Terephthalate (cups, cup lids, plates, food packages)	0.6	0%	1.1	1%	1.2	0%
Total Plastics #1	ALL PETE including bottles, cups, plates, food packages	7.5	3%	13.4	6%	13.5	5%
Plastic #2 (Non Bottle	HDPE High Density Polyethylene (cleaning containers, pails, motor oil bottles)	0.5	0%	0.2	0%	0.5	0%
Total Plastics #2	ALL HDPE including all containers and bottles	1.2	0%	0.7	0%	4.6	2%
Total Plastic #3	PVC Polyvinyl Chloride	0	0%	0	0%	0	0%
Total Plastic #4	LDPE Low-density Polyethylened (Plastic wrap, grocery bags, sandwhich bags from large & small packaging, including clear garbage bags/liners)	13.8	5.5%	12.1	6%	7.8	3%
Total Plastic #5	PP Polypropylene (including cups, food containers)	1.1	0.4%	2.4	1%	2.3	1%
Plastic #6 Styrofoam ONLY	PS Polystyrene (Styrofoam) including cups, foam food trays, packing peanuts	2.8	1.1%	2	1%	4.7	2%
Plastic #6 (not including Styrofoam -other #6 plastics)	Other #6 plastics including cups, food packaging, cup lids	0.3	0.1%	0.2	0%	0.4	0%
Total Plastics #6	ALL PS including Styrofoam and other plastics	3.1	1.2%	2.2	1%	5.1	2%
Total Plastic #7	Other including biodegradable, PLA, cups, bottles, food containers	0.3	0.1%	0	0%		0%
Other Plastic	Foams, etc.						

Total Plastic		27	10.7%	30.8	14.6%	33.3	11.8%
Total Recyclable Plastic	All plastics excluding Styrofoam and Other	10.4	4.1%	16.7	7.9%	20.8	7.40%
Steel/Tin	tin, steel	0	0%		0%	0	0%
Aluminum	Aluminum Cans/foil	2.5	1%	6.6	3%	4.1	1%
Aerosol Cans			0%		0%	0	0%
All Other Metal	Non-food containers, all scrap metal & items that are primarily metal, container lids/caps - excluding aerosols still containing product (to Special Waste)		0%		0%	0	0%
Total Metal		2.5	1%	6.6	3.1%	4.1	1.46%
OCC Corrugated Cardboard	Unwaxed/uncoated corrugated containers and boxes	4.1	1.6%	6.9	3.3%	12.22	4.3%
Newspaper	All newspaper including inserts (glossy & otherwise)	8.1	3.2%	9.3	4.4%	12.8	4.6%
Mixed Paper	Office paper (except fluorescent), envelopes, junk mail, telephone directories & paperboard	1.5	0.6%	13.2	6.3%	6.5	2.3%
Magazines & Catalogues	All magazines	0	0%	7.5	3.6%		0.0%
Waxed Cups	All wax coated drinking cups	4	2%	5.5	2.6%	5.6	1.99%
Total Fiber		17.7	7%	42.4	20.1%	37.12	13.20%
Food Waste	All food/beverage waste (out of containers where possible) including bones & rinds, including food contaminated paper towels and napkins	29	12%	8.9	4.2%	12.7	4.5%
Lavatory Waste	Primarily paper towels & tissues	35.8	14%	0	0.0%	5.5	2.0%
Liquid Waste	All liquid emptied from bottles and drinking containers	11.3	4%	19.3	9.1%	23.6	8.4%
All Other Organics	Textiles including cloth napkins, blankets, clothing, hats, safety vests, rubber, broken wood etc.		0%	23.9	11.3%		0%
Total Organics		76.1	30%	52.08	24.7%	41.8	14.86%
Hazardous Waste	Any material that requires special handling	0	0%	0	0%	0	0%
Ewaste	electronics including headphones, cell phones	0	0%	0	0%	0	0%
Construction & Demolition (C&D)						47.5	16.9%
Universal Waste	bulbs, batteries, etc.	0	0%	0	0%	0	0%
Residual Waste	All materials not classified elsewhere, materials that are not recyclable and/or were too soiled or contaminated to be repurposed (includes soiled food containers, nitrile gloves, wax food wrappers, etc.)	88.4	35%	73.32	34.7%	109	38.8%
	Total Weight of Sample (lbs)	251.9	100%	211	100%	281.22	83%

Table 34 Waste Assessment Data Sum of All Compactors, Extrapolated Annual Weights, Sum of A

	C	D	AS	AT	AU	AV	AW	AX	BN	BO	B
1	DIA Waste Audit										
2	2010 Audit Categories**		Totals			Extrapolated Annual Weights			Sum of A		
3	MATERIALS	CATEGORIES & DESCRIPTION	Origination			Origination			Origination		
4			All Compactors			All Compactors			Sum of A		
5	Total Weight of Load/Ticket (Tons)		101.76						19.13		
6	Total Weight of Load/Ticket (lbs)		203520						38260		
7			Weight (lbs)	% of Sample (%)		Weight (lbs)	Weight (Tons)		Weight (lbs)	% of Sample (%)	
8	GLASS										
9	Glass Food & Beverage Containers	All colors of food & beverage containers	219.9	4.1%		884,319	442		13.5	1.6%	
10	All Other Glass	Non-fluorescent light bulbs, glassware, window glass, ceramic dishware	0	0.0%		-	-		0	0.0%	
11	Total Glass		219.9	4.1%		884,319	442		13.5	1.61%	
12	PLASTICS										
13	#1 Plastic Bottles	PETE Polyethylene Terephtalate (Bottles with Small Neck)	147.7	2.7%		593,970	297		32.4	3.9%	
14	#2 Plastic Bottles	HDPE High Density Polyethylene (Bottles with Small Neck)	22.8	0.4%		91,689	46		2	0.2%	
15	Total Plastic Bottles	Any bottles with necks/openings narrower than body including beverage containers and cleaning containers (Resins #1 & #2)	170.5	3.2%		685,659	343		34.4	4.1%	
16	Plastic #1 (Non Bottle)	PETE Polyethylene Terephthalate (cups, cup lids, plates, food packages)	24.3	0.5%		97,721	49		2.4	0.3%	
17	Total Plastics #1	ALL PETE including bottles, cups, plates, food packages	172	3.2%		691,691	346		34.8	4.2%	
18	Plastic #2 (Non Bottle	HDPE High Density Polyethylene (cleaning containers, pails, motor oil bottles)	7.5	0.1%		30,161	15		2.5	0.3%	
19	Total Plastics #2	ALL HDPE including all containers and bottles	30.3	0.6%		121,850	61		4.5	0.5%	
20	Total Plastic #3	PVC Polvinyl Chloride	0	0.0%		-	-		0	0.0%	
21	Total Plastic #4	LDPE Low-density Polyethylened (Plastic wrap, grocery bags, sandwhich bags from large & small packaging, including clear garbage bags/liners)	283.1	5.2%		1,138,475	569		35.2	4.2%	
22	Total Plastic #5	PP Polypropylene (including cups, food containers)	64.7	1.2%		260,188	130		12.3	1.5%	
23	Plastic #6 Styrofoam ONLY	PS Polystyrene (Styrofoam) including cups, foam food trays, packing peanuts	73.5	1.4%		295,577	148		13	1.6%	
24	Plastic #6 (not including Styrofoam -other #6 plastics)	Other #6 plastics including cups, food packaging, cup lids	24.2	0.45%		97,319	49		4.6	0.5%	
25	Total Plastics #6	ALL PS including Styrofoam and other plastics	97.7	1.8%		392,897	196		17.6	2.1%	
26	Total Plastic #7	Other including biodegradable, PLA, cups, bottles, food containers	0.3	0.01%		1,206	1		0	0.0%	
27	Other Plastic	Foams, etc.	16.8	0.3%		67,561	34		0	0.0%	
28	Total Plastic		664.9	12.3%		2,673,869	1,337		104.4	12.5%	
29	Total Recyclable Plastic	All plastics excluding Styrofoam and Other	291.5	5.4%		1,172,256	586		56.2	6.7%	
30	METAL										
31	Steel/Tin	tin, steel	16.9	0.3%		67,963	34		10.5	1.3%	
32	Aluminum	Aluminum Cans/foil	65.3	1.2%		262,601	131		4.4	0.5%	
33	Aerosol Cans		0	0.0%		-	-		0	0.0%	
34	All Other Metal	Non-food containers, all scrap metal & items that are primarily metal, container lids/caps - excluding aerosols still containing product (to Special Waste)	1.2	0.02%		4,826	2		0	0.0%	
35	Total Metal		83.4	1.55%		335,390	168		14.9	1.8%	
36	FIBER										
37	OCC Corrugated Cardboard	Unwaxed/uncoated corrugated containers and boxes	415.62	7.7%		1,671,399	836		79.7	9.5%	
38	Newspaper	All newspaper including inserts (glossy & otherwise)	345.2	6.4%		1,388,208	694		39.7	4.7%	
39	Mixed Paper	Office paper (except fluorescent), envelopes, junk mail, telephone directories & paperboard	155.5	2.9%		625,337	313		18.4	2.2%	
40	Magazines & Catalogues	All magazines	95	1.8%		382,039	191		5	0.6%	
41	Waxed Cups	All wax coated drinking cups	100	1.853%		402,146	201		20	2.39%	
42	Total Fiber		1111.32	20.60%		4,469,129	2,235		162.8	19.45%	
43	ORGANICS										

44	Food Waste	All food/beverage waste (out of containers where possible) including bones & rinds, including food contaminated paper towels and napkins	750.6925	13.913%	3,018,880	1,509	96.8	11.6%
45	Lavatory Waste	Primarily paper towels & tissues	456.1	8.453%	1,834,188	917	158.9	19.0%
46	Liquid Waste	All liquid emptied from bottles and drinking containers	253.2	4.693%	1,018,234	509	23.5	2.8%
47	All Other Organics	Textiles including cloth napkins, blankets, clothing, hats, safety vests, rubber, broken wood etc.	85	1.6%	341,824	171	10	1.2%
48	Total Organics		1544.9925	28.63%	6,213,126	3,107	289.2	34.54%
49		MISCELLANEOUS WASTES						
50	Hazardous Waste	Any material that requires special handling	0	0.0%	-	-	0	0.0%
51	Ewaste	electronics including headphones, cell phones	12	0.22%	48,258	24	6.4	0.8%
52	Construction & Demolition (C&D)		47.5	0.88%	191,019	96		
53	Universal Waste	bulbs, batteries, etc.	0	0.0%	-	-	0	0.0%
54		TRASH						
55	Residual Waste	All materials not classified elsewhere, materials that are not recyclable and/or were too soiled or contaminated to be repurposed (includes soiled food containers, nitrile gloves, wax food wrappers, etc.)	1711.53	31.72%	6,882,850	3,441	246	29.4%
56		Total Weight of Sample (lbs)	5395.5	100.0%			837.2	100.0%
57		Sample Weight as % of Total Load (%)	2.65%				2.19%	
58								
59		Annual Weight of Trash Hauled from Location (lbs)		21,697,960	21,697,960	10,849	3777540	
60								

Appendix B Materials By Diversion Potential

All Airport			
Material	**Program Material Can be Diverted To**	**Waste Reduction Potential (%)**	**Waste Reduction Potential (Tons)**
Glass	Single Stream	4.1%	442.2
Plastic - Recyclable in Single Stream	Single Stream	5.4%	586.1
Plastic #4 - Recyclable from Air Cargo	Air Cargo Plastic	0.82%	89.3
Metals - Steel Tin	Single Stream	0.3%	34.0
Metals - Aluminum	Single Stream	1.2%	131.3
Metals - All Other	Single Stream	0.02%	2.4
OCC Corrugated Cardboard	Single Stream	7.7%	835.7
Newspaper	Single Stream	6.4%	694.1
Mixed Paper	Single Stream	2.9%	312.7
Magazines & Catalogues	Single Stream	1.8%	191.0
Waxed Cups	Composting	1.9%	201.1
Food Waste	Composting	13.9%	1509.4
Lavatory Waste	Composting	8.5%	917.1
Liquid Waste	Composting	4.7%	509.1
All Other Organics	Reusable Textile	1.6%	170.9
Hazardous Waste	N/A	0.0%	0.0
E-waste	E-waste Recycling	0.2%	24.1
Construction & Demolition (C&D)	C&D	0.88%	95.5
Universal Waste	N/A	0.0%	0.0
Trash	Solid Waste	37.8%	4103.0
Totals		100.0%	10849.0

**Waste Reduction Potential (Tons) based on % Waste Reduction Potential multiplied by DIA Annual Tonnage (10,849 tons)*

Appendix C Material Categories by Program Diversion Potential

Material	Can be Recycled Using Single-Stream, C&D or Ewaste Program (%)	Could be Recycled with Air Cargo Film Collection Program (%)	Could be Composted with Expanded Composting Program (%)	Could be Diverted if New Textile Collection Program were Implemented (%)	Residual material with no potential for recycling or reuse (%)
Glass	4.1%				
Plastic - Recyclable in Single Stream	5.4%				
Plastic #4 - Recyclable from Air Cargo		0.82%			
Plastics-Non Recyclable					6.1%
Metals - Steel Tin	0.3%				
Metals - Aluminum	1.2%				
Metals - All Other	0.0%				
OCC Corrugated Cardboard	7.7%				
Newspaper	6.4%				
Mixed Paper	2.9%				
Magazines & Catalogues	1.8%				
Waxed Cups			1.9%		
Food Waste			13.9%		
Lavatory Waste			8.5%		
Liquid Waste			4.7%		
All Other Organics				1.6%	
Hazardous Waste					
E-waste	0.2%				
Construction & Demolition (C&D)	0.9%				
Universal Waste					
Trash					31.7%
Totals	30.9%	0.8%	28.9%	1.6%	37.8%

Appendix D Replacing Paper Towels in Airport Bathrooms with Electric Driers

Table 1 Year 1 Annual Economic Impact of Replacing 1 Paper Towel Dispenser with 1 Electric Hand Drier -Dyson Airblade™

Item	Electric Dryer	InMotion Paper Towels
1 Dyson Airblade Dryer Units™	$1,330.00	
Installation of 1 Dyson Airblade™[1]	$1,440.00	
Maintenance Labor Costs[2]		$1,095.00
Annual Electricity Costs[3]	$117.89	
Annual Paper Towel Cost[5]		$3,552.64
Waste Disposal Costs[4]		$45.50
Total Annual Costs	**$2,887.79**	**$4,693.14**
Cost Savings Year 1	**$1,805.34**	
Payback Period[6]	**7.4 Months**	

[1] Assumes 8 hours of labor required for engineer at $150 p/hr plus 20% benefits
[2] Labor required to change out paper towels 1.5 times per day at 15 minutes each change at wage of $10 plus 20% benefits
[3] Assumes average electricity rate of 10 cents per kWh
[4] This conservative estimate assumes weight of paper towel roll at .001585 tons and disposal costs of $57.50 and is dry. Wet or contaminated towels with substantially increase disposal costs.
[5] Assumes annual paper towel purchases for all bathrooms is $710,528 based on 320 cases ordered per week at a cost of $16,640 (information provided by Ronald Patterson)
[6] Payback Period calculated by dividing cost of implementation divided by costs avoided

Table 2. Year 2 and Beyond Annual Economic Impacts of Replacing 1 Paper Towel Dispenser with 1 Electric Dryer - Dyson Airblade™

Item	Electric Dryer	InMotion Paper Towels
1 Dyson Airblade Dryer Units™		
Installation of 1 Dyson Airblade™[1]		
Maintenance Labor Costs[2]	$180.00	$1,095.00
Annual Electricity Costs[3]	$117.79	
Annual Paper Towel Cost		$3,552.64
Waste Disposal Costs[4]		$45.50
Total Annual Costs	**$297.79**	**$4,693.14**
Cost Savings for Year 2	**$4,395.34**	

[1] Assumes 1 hours of labor required for engineer at $150 p/hr plus 20% benefits
[2] Labor required to change out paper towels 1.5 times per day at 15 minutes each change at wage of $10 plus 20% benefits and Labor Required to maintain electric driers 1 hour per year at salary of $150 plus 20% benefits
[3] Assumes average electricity rate of 10 cents per kWh
[4] Assumes weight of paper towel roll at .001585 tons and disposal costs of $57.50

Table 3 2+ Year Economic Impacts of Using 200 Dyson Airblade™ Electric Dryers versus Paper Towels

Year	Electric Dryer	InMotion Paper Towels	Savings of Switching to Electric Dryer
Year 1	$577,558.53	$938,627.17	$376,389.53
Year 2 and Beyond	$59,558.53	$938,627.17	$894,389.53
Total Cost	**$637,117.07**	**$1,877,254.34**	**$1,240,137.27**