Big Picture Recycling

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Outline

• Why Recycle?
• Past Five Years at PHL
• PHL’s Current Program
• Best Practices
• Future Best Practices at PHL
• Next Steps – What’s Next for PHL?
Why Recycle?

• STATE
  ◦ 25 PA Code §272 (Municipal Waste Planning, Recycling & Waste Reduction)

• LOCAL
  ◦ Philadelphia Code (§10-700)
  ◦ Philadelphia Greenworks Plan
    *Goal to divert 70% of solid waste from landfill*

• IT’S THE RIGHT THING TO DO – reduce waste, reduce energy, improve quality of life

What is Recyclable?

• Plastics #1 – 7 (#3-7 added in 2010)
• Mixed Paper
• Cardboard
• Glass
• Metals

• NOT RECYCLABLE:
  ◦ Styrofoam
  ◦ Aluminum foil
  ◦ Napkins/tissues
  ◦ Wax coated coffee cups
  ◦ Photographs
  ◦ Plastic bags
## RECYCLABLE ITEMS
- Newspapers, magazines, telephone books, paperboard items
- Soda cartons / juice boxes
- Tissue, gift, or food boxes (remove the plastic liner)
- Computer paper, flyers, wrapping paper
- Cardboard
- Plastics #1 through #7 (containers like water or soda bottles, milk or water jugs, and bottle caps and yogurt cups can be recycled)
- All tin and aluminum cans
- Glass bottles and jars

## NON-RECYCLABLE ITEMS
- Aluminum foil
- Plastic wrap
- Plastic bags (other than clear bags used to dispose of recyclables)
- Food packaging
- Coffee cups with liners
- Styrofoam cups/containers
- Facial tissues
- Paper towels
- Paper napkins
- Photographs
- Aerosol cans
- Oil rags/cans
- Construction and demolition waste
- Batteries (universal waste)
- Fluorescent bulbs
- Printer/toner cartridges
- NO HAZARDOUS WASTE – gasoline/oil/paints, etc.

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### Past Five Years at PHL
- Waste audits performed
- Organics pilot conducted
- City expanded program (plastics #1-7)
- Improved performance metrics tracking
- Switched to larger compactors
- Added new waste streams and areas to recycling program tracking:
  - Parking areas, train platforms, etc.
  - Street sweeping debris
  - C&D recycling
  - Universal waste (electronics, batteries)
Waste Sorts

2010 Waste Audit Findings

<table>
<thead>
<tr>
<th>Categories</th>
<th>Arrivals Road</th>
<th>Departures Road</th>
<th>Train Platforms</th>
<th>Employee Parking Lot</th>
<th>S. Comm Rd (Taxi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed Paper</td>
<td>20%</td>
<td>5%</td>
<td>11%</td>
<td>11%</td>
<td>9%</td>
</tr>
<tr>
<td>Commingled</td>
<td>16%</td>
<td>14%</td>
<td>13%</td>
<td>19%</td>
<td>18%</td>
</tr>
<tr>
<td><strong>Total Available for Recycling</strong></td>
<td><strong>36%</strong></td>
<td><strong>19%</strong></td>
<td><strong>24%</strong></td>
<td><strong>30%</strong></td>
<td><strong>27%</strong></td>
</tr>
</tbody>
</table>

AVERAGE RECYCLABLE MATERIAL = 27%
2010 Waste Audit Findings

<table>
<thead>
<tr>
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<th>Departures Road</th>
<th>Train Platforms</th>
<th>Employee Parking Lot</th>
<th>S. Comm Rd (Taxi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid</td>
<td>7%</td>
<td>28%</td>
<td>18%</td>
<td>10%</td>
<td>6%</td>
</tr>
<tr>
<td>Organics</td>
<td>22%</td>
<td>16%</td>
<td>27%</td>
<td>22%</td>
<td>19%</td>
</tr>
<tr>
<td>Other Materials</td>
<td>35%</td>
<td>37%</td>
<td>32%</td>
<td>38%</td>
<td>48%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>64%</td>
<td>81%</td>
<td>76%</td>
<td>70%</td>
<td>73%</td>
</tr>
</tbody>
</table>

- Implemented recycling at employee parking lot and train platforms

Compostable Waste Pilot

**Funding:** $15,000 EPA grant

**Purpose:** To assess feasibility of airport-wide food waste composting collection program

**Study:** Included pre-consumer compostable food scraps, along with soiled paper products and soiled/waxed cardboard discarded from six restaurants

**Collection Location:** Terminal A West

**Composting Location:** Wilmington Organics Recycling Center

**Duration:** 2 weeks
Compostable Waste Pilot

• In 2012, a report was issued on the Organic Food Waste Composting Pilot initiative.

• Provided an analysis of sample group of concessions’ food waste generation

• Provided recommendations for implementing a permanent, expanded composting program.

• PHL currently in bid process for concessions program contract renewal

Compostable Waste Pilot Findings

• Food waste accounted for 37% of all waste
  ◦ Recycling 36%
  ◦ Waste 27%

• 1 out of the 6 pilot restaurants averaged diversion rate of 91%

• Concessions program looked into using biobins as space is limited to collect/transport food waste
Current Recycling & Waste Program

Annual Total Solid Waste and Recycling Quantities

<table>
<thead>
<tr>
<th>Year</th>
<th>Trash (Tons)</th>
<th>DDA Special Cleanups (Tons)</th>
<th>Recycling (Tons)</th>
<th>C&amp;D Recycling (Tons)</th>
<th>Trash (Target)</th>
<th>Recycling (Target)</th>
<th>Diversion Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2,252</td>
<td>264</td>
<td>62</td>
<td>0</td>
<td>2,252</td>
<td>62</td>
<td>5%</td>
</tr>
<tr>
<td>2007</td>
<td>1,594</td>
<td>701</td>
<td>106</td>
<td>0</td>
<td>2,139</td>
<td>112</td>
<td>6%</td>
</tr>
<tr>
<td>2008</td>
<td>1,535</td>
<td>219</td>
<td>268</td>
<td>0</td>
<td>2,032</td>
<td>114</td>
<td>15%</td>
</tr>
<tr>
<td>2009</td>
<td>1,242</td>
<td>184</td>
<td>301</td>
<td>0</td>
<td>1,901</td>
<td>212</td>
<td>20%</td>
</tr>
<tr>
<td>2010</td>
<td>1,178</td>
<td>162</td>
<td>320</td>
<td>0</td>
<td>1,834</td>
<td>206</td>
<td>21%</td>
</tr>
<tr>
<td>2011</td>
<td>1,116</td>
<td>184</td>
<td>320</td>
<td>0</td>
<td>1,743</td>
<td>201</td>
<td>21%</td>
</tr>
<tr>
<td>2012</td>
<td>1,096</td>
<td>162</td>
<td>305</td>
<td>0</td>
<td>1,655</td>
<td>192</td>
<td>24%</td>
</tr>
<tr>
<td>2013</td>
<td>0</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>0</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>0</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Tons

Diversion Rate: 5% to 24%

3/24/2014
How Are We Doing? 
2012 Vs. 2013

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid Waste</td>
<td>1,116</td>
<td>1,096</td>
</tr>
<tr>
<td></td>
<td>tons</td>
<td>tons</td>
</tr>
<tr>
<td>Special Waste</td>
<td>184</td>
<td>162</td>
</tr>
<tr>
<td></td>
<td>tons</td>
<td>tons</td>
</tr>
<tr>
<td>Single Stream</td>
<td>305</td>
<td>339</td>
</tr>
<tr>
<td>Recycling</td>
<td>tons</td>
<td>tons</td>
</tr>
<tr>
<td>C&amp;D Recycling</td>
<td>92</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>tons</td>
<td>tons</td>
</tr>
<tr>
<td>DIVERSION RATE</td>
<td>21%</td>
<td>24%</td>
</tr>
</tbody>
</table>

- Note: C&D recycling increases 2012 diversion rate to 26% when included

Recent Program Improvements

- Compactors switched to “Fullness Usage” system with pressure gauge
- Pilot tenant program – includes training
- Orientation for new employees
- Separation of OCC – generates more revenue
- Tracking paper (shredded for security reasons) and other resources at Warehouse
Pressure Gauge “Fullness Usage” System

Recycling Streams (DOA and Public Areas)
Other Airport Waste Streams

- **Waste Grease (Concessions)**
  - >11,000 gal recycled

- **Deicing Fluid**
  - 50,000 – 150,000 gallons of glycol collected annually (mild - severe winter)

- **Universal Waste (batteries, electronics, lamps)**
  - 19 tons of electronics recycled
  - 440 lbs batteries recycled

Financial Aspects of Recycling
Recycling Costs vs. Revenue

<table>
<thead>
<tr>
<th>Item</th>
<th>Estimated Annual Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hauling</td>
<td>($20,000)</td>
</tr>
<tr>
<td>Compactor Rental</td>
<td>($58,000)</td>
</tr>
<tr>
<td>Recycling Rebates + Avoided Landfill Fees</td>
<td>+$30,000</td>
</tr>
<tr>
<td>Repairs/Maintenance (partially covered under warranties)</td>
<td>(&lt;$5,000)</td>
</tr>
<tr>
<td>Labor (recycling only - excludes SW handling)</td>
<td>($175,000)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>($228,000) / YR</td>
</tr>
</tbody>
</table>

Recycling Challenges

- Rebate per ton decreasing
  - 2013 Rates: $20-25
  - 2014 Q1 Rate: $14
- Contaminated loads are treated as waste – no rebate received
- Equipment lease vs. ownership
  - Compactor rental rate: $600/month
- City Procurement Process
  - Waste/recycling vendors often tied to city-wide contracts
Recycling Positives

- Environmental compliance (no fines)
- Reduced recycling pick-up fees
- Avoided landfill disposal fees
- Good public relations/Positive image
- Contributes to City’s sustainability plan goals

Best Practices

Industry Resources
Outreach/Education
Tracking Improvement
Agency Coordination
Celebrating Success
Environmental Protection Agency

Ten Steps to Establishing an Airport Recycling Program

1. Obtain commitment from upper management
2. Organize a green team
3. Identify types and sources of waste
4. Assess current waste collection contracts
5. Develop a plan
6. Educate staff and customers
7. Monitor and refine the plan
8. Measure performance
9. Promote successes
10. Expand the program

Source: Developing and Implementing an Airport Recycling Program, EPA, 2009

Transportation Research Board
ACRP Report 100

Best Practices

- Airlines, airports, and flight kitchens all influence the recycling of materials that enter aircraft cabins and the waste that is deplaned. Thus, best practices for recycling include activities undertaken by each of these parties. This guidebook focuses on five key best practices—identified through industry research—that are advancing aviation recycling across the country:
  - Best Practice #1. Secure top-down and bottom-up commitment to boost recycling participation and results.
  - Best Practice #2. Make purchasing choices that facilitate recycling and reduce waste.
  - Best Practice #3. Maximize recycling by separating materials in flight.
  - Best Practice #4. Track, evaluate, and share data on program performance to promote transparency and support continuous improvement.
  - Best Practice #5. Make recycling part of everyday business and celebrate success.

FAA Office of Airports

10 Steps to Design and Implement an Effective Airport Recycling/Waste Minimization Program

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


Public Education/Involvement

- Professional Recyclers of Pennsylvania (PROP)
- Waste Watchers Award for Public Education
- Staff participation in Recycling Video
Employee Training & Education

Tools
- New Employee Orientation
- Recycling Video created
- Posters/flyers
- Training for tenants
- Two annual outreach/education events

Recycling Committee
- Group of volunteers
- Dedicated Recycling Coordinator
- Quarterly meetings held starting in 2009
- Team leaders and educators at unit level.
Educational Signage

Shuttle Bus Messaging Boards

- Promoting the three “R’s,” Reduce, Reuse, Recycle
- Visibility to all riders on PHL shuttle buses that circulate between the terminal and the employee parking lot, the economy parking lot, and Cargo City.

Tracking Improvement

- Environmental Management System – SharePoint
- Monthly Diversion Rate Tracking
- Annual Recycling Report
Agency Coordination

- **SEPTA**
  - Recycling on all SEPTA train platforms initiated in 2012

- **TSA**
  - Security checkpoint recycling
  - TSA using DOA compactor for office/break room recyclables

- **FAA**
  - CEP ROD includes hazardous waste/remediation mitigation

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Earth Day Celebration

Earth Day Award Winners

- Division of Aviation Exhibit
- Philadelphia RecycleBank
America Recycles Day

Educational Displays

ARD Participants

Streets Dept Curby Bucket Mascot

Future Best Practices at Philadelphia International Airport

Centralized Recycling Program
Source Separation
Bottle Refilling Stations
Food Waste Disposal
Centralized Recycling Program

- Centralized waste management unifies the process.
- Requires increased coordination between Airport, Tenants and Airlines – MOU
- Larger amount of waste under one contract benefits with economies of scale.

Centralized Recycling Program

- Less truck traffic in airfield, less fuel use, reduced risk of airfield collisions.
- Airlines with smaller volume of waste can recycle with fewer overhead costs.
- By directly billing tenants and airlines, airport can develop incentives to promote recycling.
Source Separation Facilities

- On-site separation of all materials (food, recyclables, waste)
- Implemented at CLT and FLL

Considerations
- Environmental permitting needed
- Property lease conditions/term
- Bird attractants (must be enclosed)

Source Separation Facilities

- Can Be Quickly Permitted Under PA SWMA (Permit by Rule)
- Easily Set Up – Labor Intensive Operation
- Minimal Technology Investment Needed
- Handles Wide Range of Waste Materials
- Can Supply Composting Operation
Source Separation Facilities

**Advantages**
- Achieves Maximum Diversion Rate
- Can Be Easily Permitted with PADEP
- Eliminates Multiple Collection Operations
- Can Be Used By All Site Waste Generators
- Creates Number of Jobs

**Disadvantages**
- Has To be Run Correctly At All Times
- Permanent Permit Loss if Problems
- Need Reliable Workforce
- Fluctuation in Rebate for Recycled Material
- Base of Operations Restricted to Permitted Property
- Negative Influence on Off-Site Recycling Behavior

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**Source Separation Facilities Flowchart**

Co-mingled Waste: 20 tons/day

- **Aluminum Extraction**: 0.2 tons/day
- **Cardboard Extraction**: 0.5 tons/day
- **Paper Extraction**: 1.1 tons/day
- **Plastic Extraction**: 4.0 tons/day
- **Iron / Tin Extraction**: 0.2 tons/day
- **Misc. Extraction**: 0.2 tons/day
- **Liquid Extraction**: 5 tons/day

Non-Recyclable Solid Waste: 5 tons/day

Approved Landfill

Approved Solid Waste Disposal Facility
Bottle Refilling Stations

- Installation of Bottle Refilling Stations after Security
- Helps eliminate contaminated recycled material (liquids)
- Reduce liquid filled bottles at checkpoints

Design Considerations:
*Recycling Efforts must begin with Airport Infrastructure*
- Plumbing for water disposal sinks and refilling fountain
- Signage

Food Waste Disposal

- Separating food waste for composting, reduces amount of waste transferred to landfill.
- Concerns of sanitation, safety, efficiency, cost-effectiveness.

Design Considerations:
- Where to keep the food/composted materials
- Prevent access from vermin, insects and animals
- Storage area accessible on a regular basis (airside/landside)
- Digestive containers – still need to account for placement of containers. Provide access to sewage line if necessary.
Food Waste Disposal

Airports participating in composting or digestion programs:

- Orlando
- Charlotte
- Denver
- Minneapolis–St. Paul
- Seattle–Tacoma
- San Francisco
- John Wayne
- Airport, Orange County

What’s Next?

PHL Recycling Program
Challenges and Objectives
Program Challenges

- Behavior Modification – More Outreach and Education Needed
- Asset Management...Big Picture
  - Continue improvement of data collection for DOA waste streams
  - Tenant waste tracking
  - Spatial analysis of equipment/inventory
  - Reduce tons/passenger generated

Program Objectives

1. Support development of an airport-wide food waste recycling program
2. Expand partnering opportunities to identify new stakeholders & partners to continue to broaden recycling efforts at PHL
3. Strive towards a more centralized management structure of the waste and recycling streams through various means, including new MOU’s with airport tenants
4. Evaluate feasibility of developing several hydration stations within PHL’s main terminal complex area
5. Reduce overall program costs
QUESTIONS?

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