How do Cities Collect their Waste and Recyclables?

Presented by: Terry Schweitzer Vice President, Gershman, Brickner & Bratton, Inc.

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AIChE[®] GBB Quality – Value – Ethics – Results



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MANAGEMENT

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- Established in 1980
- Solid Waste
 Management and
 Technology
 Consultants
- Helping Clients Turn Problems into Opportunities

AIChE[®] Terry Schweitzer, Vice President Gershman, Brickner & Bratton





AIChE[®] OUTLINE



MSW in the U.S.



How Does Waste and Recycling Collection Stack Up?



The Costs of Collection



What's in the News





MUNICIPAL SOLID WASTE (MSW) IN THE U.S. Infrastructure and Trends





Trash History









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MSW Disposal and Recycling

| | Total MSW (million tons) | |
|-----------------|-----------------------------|--|
| Recycling | 55-77 | |
| Composting | 15-21 | |
| Waste to Energy | 20-28 | |
| Landfilling | 160-224 | |
| TOTAL | 250-350 Million Tons | |





Source: EPA 2012 estimate and BioCycle 2012 estimate

MSW Disposal and Recycling

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Historical Generation & Management of MSW 1970 - 2010



Source: US EPA, Municipal Solid Waste in the United States, 2010 Facts and Figures

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AIChE[®] U.S. Waste Management Infrastructure

| Technology | Number |
|--|--------|
| Transfer Stations | 3,350 |
| Material Recovery Facilities (MRF) | 586 |
| Curbside Recycling Programs | 9,000+ |
| Mixed Waste Processing Facilities (MWPF) | 51 |
| Composting | 2,300 |
| Anaerobic Digestion | 19 |
| WTE | 84 |
| Landfills | 1,908 |

Source: GBB Master Waste Collections Database



AIChE[®] Recycling and Material Recovery Facilities

| MRF Type | Number of MRFs | | |
|-------------------------------------|----------------|------|--|
| Year: | 2006 | 2012 | |
| Single Stream | 144 | 263 | |
| Dual Stream | 227 | 228 | |
| Source Separated, Other Programs | 127 | 95 | |
| All MRFS | 437 | 586 | |

Source: Materials Recycling and Processing in the United States (BERENYI, 2012)

| Recycling Service in the U.S. | Dual Stream | Single Stream |
|-------------------------------------|-------------|------------------|
| Grand Total | 52 | 239 |

Source: GBB Master Waste Collections Database

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Many communities have
shifted from dual-stream
collection methods to
single-stream recycling to
reduce collection costs and
capture more materials for
recycling

AIChE[®] Sample Dual Stream Set-outs





Single Stream Set-outs





Recycling Plastics from MSW

 Many plastic grades still not accepted in curbside collection programs

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- Markets for mixed grades weak
- 'Avid' recyclers still throw nonrecyclable plastics in the bin, contaminate stream

| Resin Code | Examples | Accepted for Recycling | Recycling Product Market |
|-------------------------|---------------------------|---------------------------|--------------------------------|
| 1 PETE | Soda/water bottles | YES | HIGH |
| 1 PETE | Deli Containers | SOME | WEAK |
| 2 HDPE | Milk Jugs | YES | HIGH |
| 2 HDPE | Take-out-containers | SOME | WEAK |
| 3 PVC | Shampoo bottles | YES | WEAK |
| 3 PVC | Various tubs and trays | SOME | WEAK |
| 4 LDPE | Soft sided juice bottles | YES | WEAK |
| 2 or 4 | Shopping and Grocery bags | SOME | WEAK |
| 5 PP | Various bottles/jugs | YES | WEAK |
| 5 PP | Margarine Tubs | SOME | WEAK |
| 6 PS (non- expanded) | CD Cases | NO | WEAK |
| 7 Other | Various Bottles/Jugs | YES | WEAK |
| 7 Other | Various tubs and trays | SOME | NONE |
| None | Mail order packaging | NO | WEAK |
| None | Caps, lids, crates | NO | WEAK |
| None | Disposable cups | NO | WEAK |
| None | Houseware, toys | NO | WEAK |
| None | Garbage bags, wraps | NO | WEAK |



HOW DOES WASTE AND RECYCLING COLLECTION STACK UP?



The Industry

 Solid waste collection is the largest segment in the waste management services industry with estimated \$50 billion in 2014 total revenues and a 9.4% average gross profit margin.

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AVG Net Profit Margin for Industry



Data Source: IBISWorld.com



Major Companies

 Waste management companies throughout the U.S. have franchise agreements with counties and cities that allow them to be the exclusive hauler for solid waste, recyclables and green waste.

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- Waste Management, Inc. largest trucking fleet in the U.S. with over 21,000 collection and transfer vehicles.
- Republic Services Services more than 28,000 communities in the U.S.



Residential Collection Methods



Top Residential Service Methods in the U.S.

- Manual Collection
- Semi-Automated Collection

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• Fully-Automated Collection

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AIChE[®] Collection Vehicles Single Compartment





AIChE[®] Collection Vehicles Dual Compartment





Carts, RFID Tags, etc

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AIChE[®] Collection of Garbage, Recyclables, Organics

- Some residents are offered three service options of garbage, recycling, and yard waste collections.
- Collection can be weekly or bi-weekly
- Monthly rates can depend on the size of cart desired (32-gallon, 64-gallon, 96gallon)

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3 Cart Curbside Service



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Bulk Collection



NO TOXIC, HAZARDOUS, OR LIQUID WASTE WILL BE COLLECTED

- Bulky items are usually too large or heavy to place in a trash or recycling bin.
- Most cities provide bulky item pickup services to residential and commercial properties



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Residential Food Waste Collection and Processing Growing

Source: BioCycle Magazine, January 2015

198 communities offer curbside collection of residential food waste

19
states2.74
million
households739,800
tons in 2014



THE COSTS OF COLLECTION



AIChE[®] Collection Cost Elements

- Collection vehicle cost
 - Amortized capital cost
 - Fuel and other expendables
 - Maintenance
- Crew costs
 - Salary
 - Benefits
 - Overhead
- Container costs
 - Amortized capital cost includes delivery
 - Maintenance
- Yard costs



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Cost of Collection and Disposal

- Collection
 - Residential solid waste : \$10 \$40 USD\$ per month per household
 - Residential recycling \$2 \$4 per month per household
- Commercial waste
 - Charged on a per month per box basis, and may include a separate pass-through cost for disposal charges.
 - 2 cubic yard box serviced once per week = \$60 \$140 per month
 - 6 cubic yard box serviced once per week = \$130 \$280 per month
- WTE tipping fee \$68/ton
- Landfill tipping fee \$48/ton
- Costs and revenues affected by:



Cost of collection and disposal broken down by service



AIChE[®] Best Practices Reduce Collection Costs

- ✓ Match service level to the need
 - Twice per week Once per week
 - Once every two weeks Once per month
 - On demand, call in
- ✓ Large carts for residents to place single stream materials
- ✓ Local MRF, landfill and/or transfer station
- Closed market collection services provided efficiently by municipality or under long-term contract with private hauler
- ✓ Pay as you throw charging system or user fees
- \checkmark Sustained and excellent public education program
- Supportive public officials
- Urban or suburban environment
- High avoided disposal costs Ocean County Landfill tipping fee is \$82 per ton
 - Shared services economies of scale



AIChE[®] Best Practices Reduce Collection Costs

- There is better technology today hardware and software
- The public *can compete with the private* sector
- Controlling who collects should lower costs; set up franchises and/or contract areas
- Charge the customer for service and by each service
- Measure operations efficiency



The Solution: The Smart Truck

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WHAT'S IN THE NEWS





Average prices of recycled commodities fell 14% from January to March

"Recycling is in a crisis," Mr. Steiner said in an interview. "It isn't profitable for us, and we have to react to that by shutting down plants."

Wall Street Journal, April 2015

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"Once a profitable business for cities and private employers alike, recycling in recent years has become a moneysucking enterprise."

Washington Post, June 2015

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Sharon Kneiss, President of the National Waste & Recycling Association...the trade association that represents the private sector solid waste and recycling industry

"In my discussions with reporters from across the country, it was amazing to me to hear just how surprised so many of them were about the true cost of recycling. Too many Americans think that recycling is free and are under-informed about their role in making recycling both ecologically and economically sound..."

Note: Underlining added for emphasis by GBB



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ReCommunity August 27, 2014 Press Release

Title: ReCommunity says recycling quality must improve ---

...says "non-conforming materials are inundating facilities nationwide"

Jeff Fielkow, Chief Sales and Marketing Officer published a "QUALITY ALERT"

Note: They operate 32 S-S MRF's (13% of US total)



Examples of S-S Contamination Issues



Food Waste & Vegetation



ONP Screen Jammed w/Plastic Waste



Contaminated Material & Food Waste



Household Trash, Electronics and Hoses

Source: ReCommunity



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Key Findings of the Report

The average MSW stream is half recyclables

There is economic value in extracting additional recyclables from automated MWPFs

MWPFs working in tandem with MRFs could significantly increase landfill diversion

Contaminated waste streams, particularly paper and fibers, will affect quality, marketability, and commodity values



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What GBB is Saying

- States keep increasing recycling goals/mandates
- Too much Garbage in single-stream recyclables
- Too many recyclables still in remaining MSW
- Citizens need to be continually educated
- Recyclables collection is expensive
- Recyclable material markets are volatile
- Recycling was never FREE
 - Charges bundled
 - Messaging makes recycling appear FREE
 - Services fees bundled causing issues
 - Service fee formulas and market risk sharing needed more



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Thank you!!

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