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How do Cities Collect their Waste and Recyclables?

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

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GBB Quality – Value – Ethics – Results



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



AIChE Terry Schweitzer, Vice President
Gershman, Brickner & Bratton



Early in my career, I recognized a need to improve solid waste collection. At GBB, I help private and public entities become good environmental and financial stewards.

Terry Schweitzer, Vice President
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AIChE **OUTLINE**

-  MSW in the U.S.
-  How Does Waste and Recycling Collection Stack Up?
-  The Costs of Collection
-  What's in the News



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MUNICIPAL SOLID WASTE (MSW) IN THE U.S.

Infrastructure and Trends

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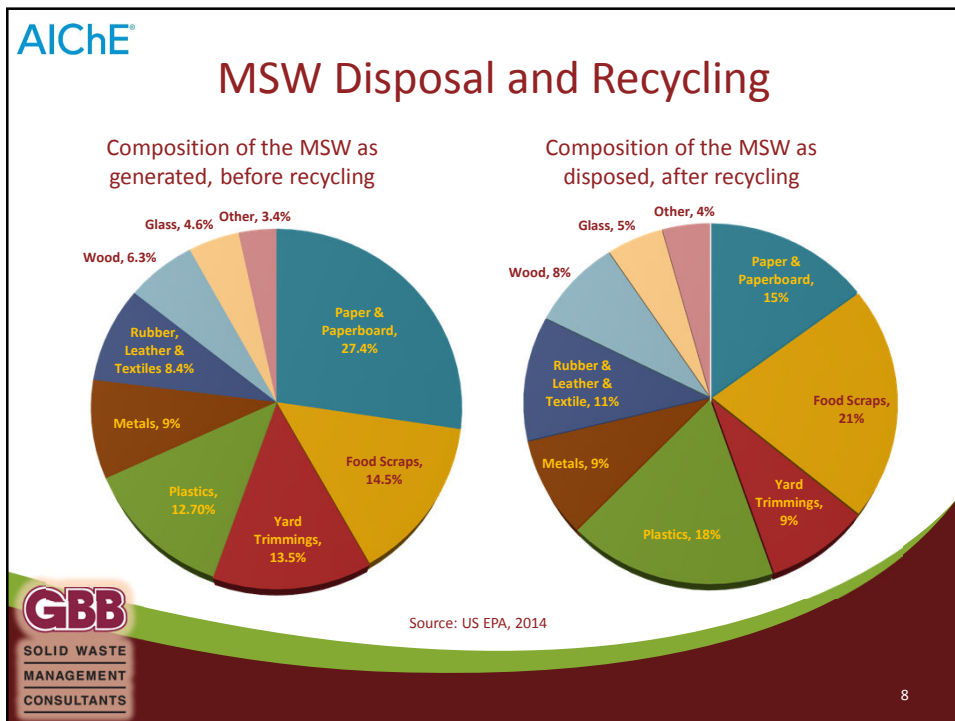
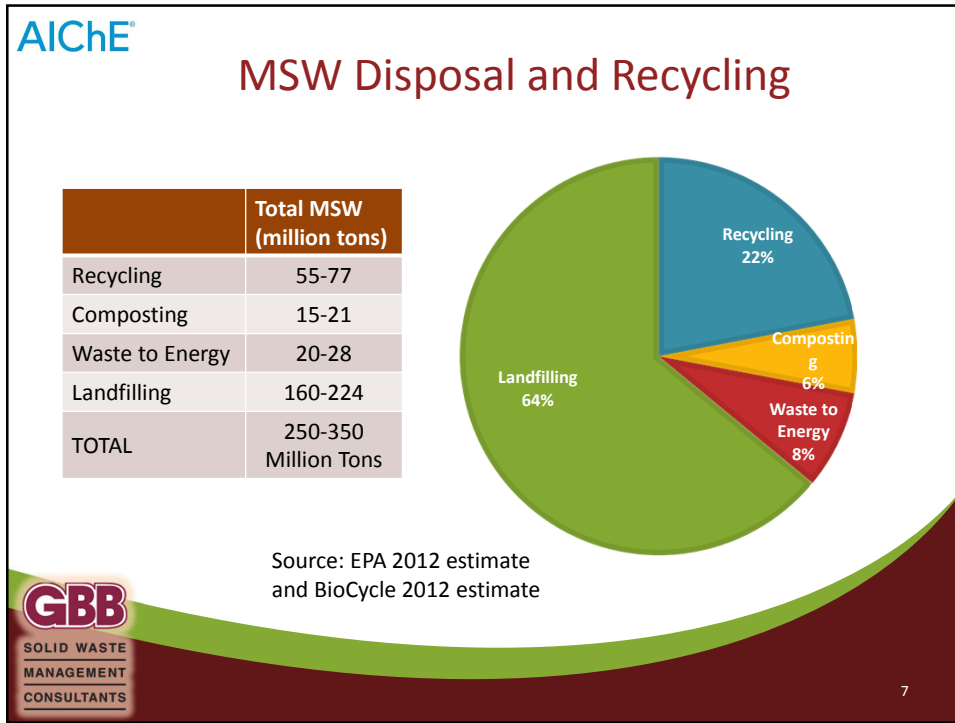
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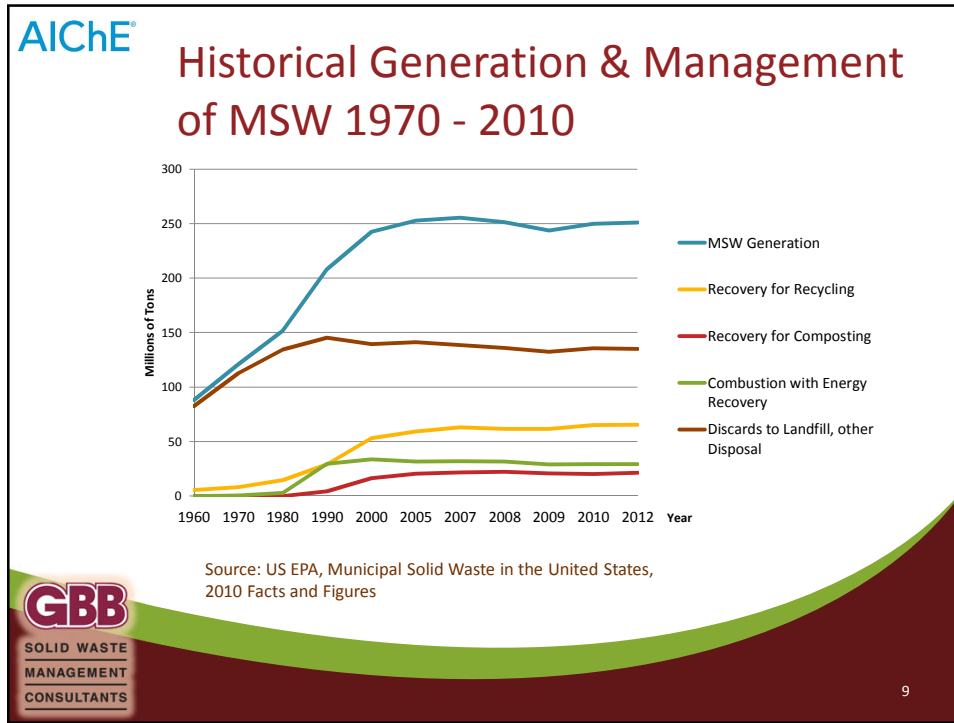
Trash History



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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

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AIChE Recycling and Material Recovery Facilities

MRF Type	Number of MRFs	
	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

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

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AIChE Sample Dual Stream Set-outs

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Single Stream Set-outs

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Recycling Plastics from MSW

- Many plastic grades still not accepted in curbside collection programs
- Markets for mixed grades weak
- 'Avid' recyclers still throw non-recyclable 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

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HOW DOES WASTE AND RECYCLING COLLECTION STACK UP?

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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.

AVG Net Profit Margin for Industry

Segment	AVG Net Profit Margin
Disposal	12.4%
Collection	9.4%
Remediation	8.7%
Recycling	8.6%

Data Source: IBISWorld.com

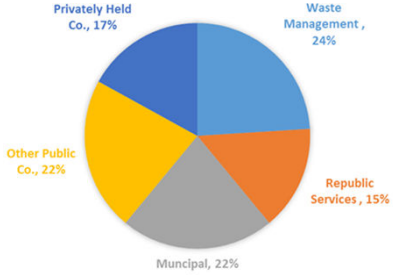
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Major Companies

- 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.
- 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.



Company	Percentage
Waste Management	24%
MunicipaI	22%
Other Public Co.	22%
Privately Held Co.	17%
Republic Services	15%

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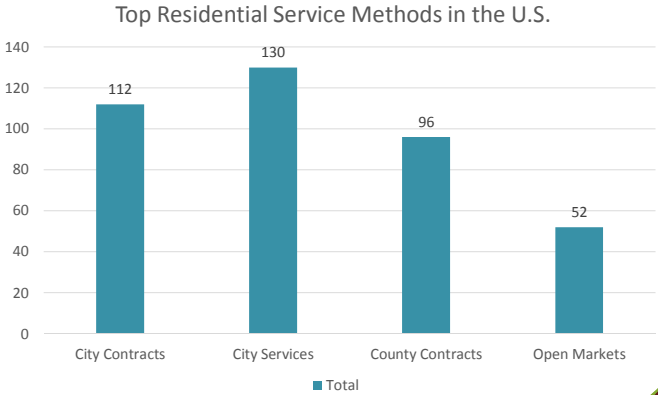
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Residential Collection Methods

Top Residential Service Methods in the U.S.

- Manual Collection
- Semi-Automated Collection
- Fully-Automated Collection



Method	Total
City Contracts	112
City Services	130
County Contracts	96
Open Markets	52

Source: GBB Master Waste Collections Database

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AIChE[®] Collection Vehicles Single Compartment



AIChE[®] Collection Vehicles Dual Compartment



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Carts, RFID Tags, etc

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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, 96-gallon)

3 Cart Curbside Service

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Bulk Collection

APPLIANCES	FURNITURE	E-WASTE	OTHER
STOVES WASHERS & DRYERS DISHWASHERS REFRIGERATORS	COUCHES TABLES CHAIRS MATTRESSES	TELEVISIONS COMPUTERS MONITORS ELECTRONICS	BUNDLED TREE BRANCHES (48" MAX LENGTH) BAGGED YARDWASTE BAGGED TRASH CAR TIRES



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 states	2.74 million households	739,800 tons in 2014
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THE COSTS OF COLLECTION




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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:
 - Community size
 - Government structure
 - Politics
 - Facilities used
 - Waste supply agreements
 - Revenue sharing back to customer

Cost of collection and disposal broken down by service

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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
- ✓ 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

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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



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The Solution: The Smart Truck



Real Time Data Transmission

Photographic Proof


Safe Driving

Fleet Maintenance

Onboard Computing

Scales Integration

RFID



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WHAT'S IN THE NEWS



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Home World U.S. Politics Economy **Business** Tech Markets Opinion Arts Life Real Est

Unprofitable Recycling Weighs On Waste Management
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



American recycling is stalling, and the big blue bin is one reason why

“Once a profitable business for cities and private employers alike, recycling in recent years has become a money-sucking 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)



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Examples of S-S Contamination Issues



Food Waste & Vegetation

Contaminated Material & Food Waste

ONP Screen Jammed w/Plastic Waste

Household Trash, Electronics and Hoses

Source: ReCommunity

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Key Findings of the Report



The average MSW stream is half recyclables

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

There is economic value in extracting additional recyclables from automated MWPFS

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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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