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# **To Single Stream or Not to Single Stream?**

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**SWANA**

**U.S EPA Meeting**  
**July 19, 2007 Philadelphia, PA**



# SWANA

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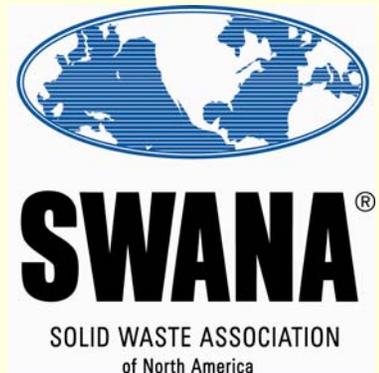
- Leading Organization For Solid Waste Management Professionals in North America
- Over 7,700 Members in 45 Chapters
- 8 Technical Divisions, Including:
  - Waste Reduction and Recycling
  - Waste-To-Energy
  - Landfill Disposal



# SWANA's Mission

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Advance the Practice of Environmentally and Economically Sound Management of Solid Waste



# Way We Accomplish This

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- Education
  - Training
  - Conferences
  - Information Exchange
- Research
- Advocacy
  - In 2003 Prepared a Research Memorandum on Single Stream Recycling for its Recycling Group Subscribers



# Presentation Outline...

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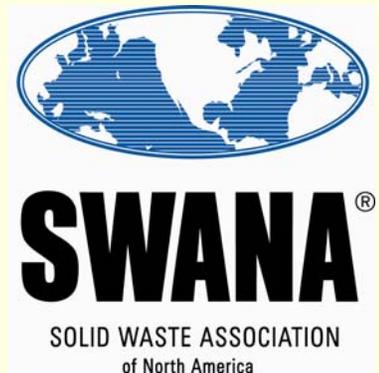
- Trends
- Advantages
- Disadvantages
- Productivity & Cost comparisons



# Significant Growth...

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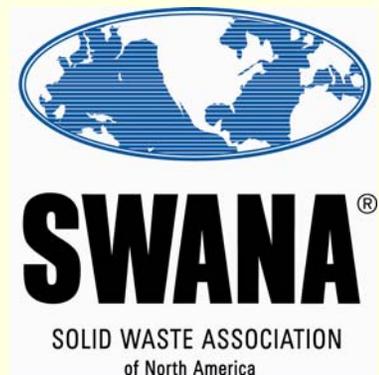
- Over 500 collection programs in operation (Conservatree, 2007)
- 160 single stream MRFs in operation
  - Up from 70 four years ago
  - Additional 30 facilities expected to come online (Berenyi, 2007)
- 27% of U.S. population with curbside collection have access to single stream recycling (AF&PA, 2005)



# Factors Contributing to Growth...

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- Desire to increase quantity of recyclables
- Residents desire for convenience and ease
- Improvements in MRF processing technologies
- Widespread use of automated collection technologies
- Pressure to reduce overall system costs



# Advantages to Single Stream...

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- More convenient for residents/greater participation
  - Ability to collect more materials
  - Increased diversion from disposal facilities
- Collection costs reduced
- Automated collection
  - Reduction of scavenging
  - Less wind scatter and litter
  - Protect fiber from precipitation
  - Standardized collection trucks



# Disadvantages of Single Stream...

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- Less quality control at curb
- Recovered material contamination
  - Glass in paper
- Lower value of materials collected
- Higher MRF capital and operating costs
- Low recovery of glass by color
- Increase in MRF residuals



# Types of Single Stream...

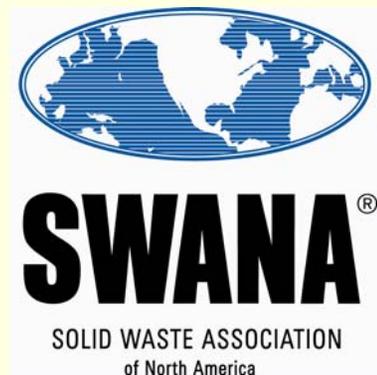


# Productivity: Single Stream vs. Dual Stream

<b>COLLECTION METHODS</b>	<b>Total Time per Stop (seconds)</b>	<b>Households Served per on route hour</b>
<b>Single Stream</b>		
-Automated	26	171
-Semi-Automated	39	122
<b>Dual Stream</b>		
-One Bin	61	82
-Two Bins	36	130

## Assumptions:

- Time between stops is assumed 12 seconds
- Set out rate is assumed to be 65%



# Look at the Costs...

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- REDUCED collection costs!
- Increased Vehicle Capital and Maintenance Costs
- HIGHER processing costs



# Look at the Costs...

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- REDUCED collection costs!
  - Labor significantly reduced
  - Insurance rates decrease
  - Fewer workers comp claims
  - Reduces number of trucks on road
- \$10-20/ton



# Look at the Costs...

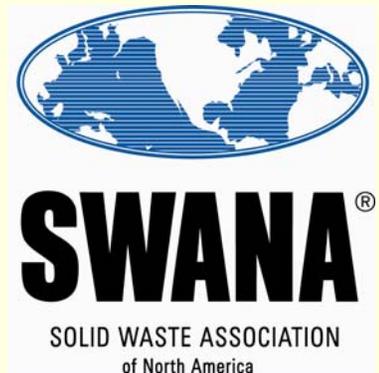
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- Collection Vehicle Capital Costs
  - \$145,000 for automated single stream
  - \$120,000 for manual collection
  
- Vehicle Maintenance Costs per year
  - \$25,000 for automated single stream
  - As low as \$6,000 for other types
  
- Collection Cart/Bin Costs
  - \$48 per cart for single stream
  - \$4 per container for 18 gallon bin



# Look at the Costs...

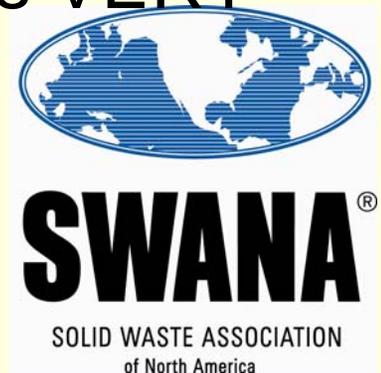
<u>Processing Costs:</u>	<u>\$/ton:</u>
Curb-sort Cost	\$35
Added Costs switching to Dual Stream	+ \$15-25
Added Costs switching to Single Stream	+ \$10-20
<b>Total Processing Cost Single Stream</b>	<b>\$60-80</b>



# Contamination remains a problem...

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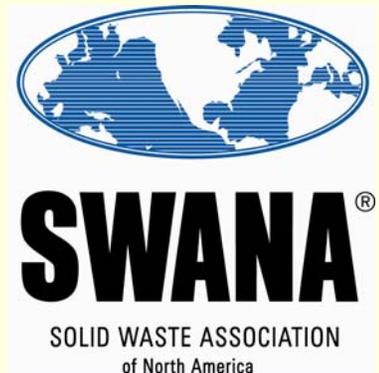
- Increased non-recyclables in stream, especially when coupled with PAYT
- Glass, plastic and metals contaminate paper – in some cases up to 20% by volume
- Recyclable “contaminants” are usually landfilled, skewing recycling rates
- Sophisticated technology exists but is VERY expensive



# Recycling is Collaborative...

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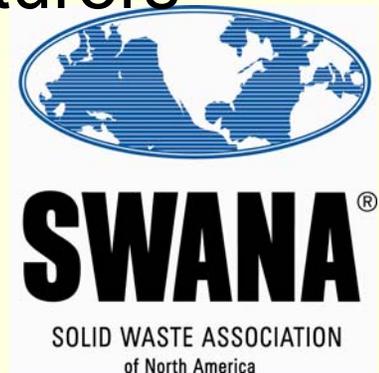
- Collectors need to collect material that can be processed through the MRF
- Processors need to employ technology to produce the cleanest commodity
- Manufacturers need to expand use of recycled materials in products



# Conclusions...

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- Trend towards single stream is likely to continue
- Single stream is not appropriate for every community
- Single stream reduces collection costs while requiring more processing
- Collectors, Processors and Manufacturers need to work together when shifting to a single stream program



# Thank You...

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