

### An Overview

# of How to Ensure the Successful Conversion

from Manual to Automated Collection



- 1. What is Automated Collection?
- 2. Benefits of Automated Collection
- 3. Disadvantages of Automated Collection
- 4. Is Automated Collection Right for US?
- 5. Paying for the Equipment
- 6. How to implement the program



Upper Township Public Works Trash & Recycling Collection: **Conversion** to Automation What is Automated Collection?

A collection system consisting of specially-designed wheeled carts and refuse and/or recyclables collection vehicles equipped with automated arms. **Residents** place these carts in designated spots on the curbside. Then a single operator picks up and dumps the carts using an articulated arm, controlled from within the cab.

Higher Productive 
Increased Efficiency Increased Workers' Safety



As you know, automated collection has been around for almost 35 years:







How will changing our refuse collection system affect costs?

- Increased productivity (more houses per day)
- Decreased labor costs (less collection related injury, less workers)



Upper Township Public Works Trash & Recycling Collection:

**Conversion to Automation** How can automated collection work in our narrow crowded street?

Many small and large cities do have those similar physical constraints Santa Cruz, CA ~ Bettendorf, IA ~ Lansing, MI

South San Francisco, CA

# How can automated collection work in our rural routes?

Many communities do have those similar business constraints

Falls River, MA ~~ Cape Cod, MA ~~ Franklin Twp, NJ Toms River, NJ ~~ Brick Twp, NJ



Upper Township Public Works Trash & Recycling Collection: Conversion to Automation Isn't automation all about cutting jobs? Automation is a huge improvement on collection related injury

> "One back injury is worth two (2) automated trucks", Roy Springmeyer, Director, General Services Visilia, CA

MUNICIPALITY	LOST DAYS DUE TO INJURY
Little Egg Harbor, NJ	From 200 to 0
Port Coquitlam, BC	From 250 to 0
Santa Cruz, CA	From 300 to 0
South San Francisco, CA	From 700 to 0



## **Benefits of Automation**

It lowers overall collection costs while enhancing customer service and municipality's appearance

- Reduction in number of trucks and drivers
- Reduction in injury and compensation claims
- Reduction of employee turnover
- Increase of diversion rate
- Enhanced towns appearance



### Designated spot on the curb/ edge of road





### Single-driver operated automated truck





Upper Township Public Works Trash & Recycling Collection: Conversion to Automation Disadvantages to Automation

- Upfront Costs
  - More expensive equipment (carts & trucks) than manual or semiautomated vehicles
    - But fleet size is typically reduced because of increased productivity

#### Maintenance

- Maintenance costs reported to be higher because of increased hydraulic complexity
  - But fleet size is typically reduced, so fewer vehicles are usually maintained

#### Customer Training

- Fully-automated systems rely on customers placing containers in accessible locations
  - A well set educational campaign and short term benefits such as neighborhood appearance are keys

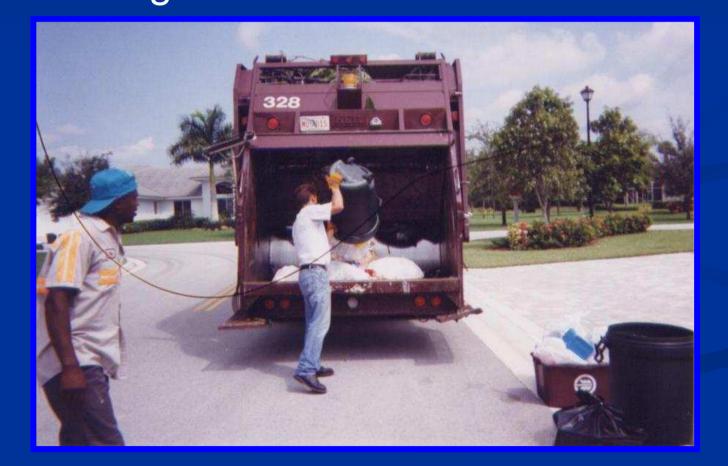


**Upper Township Public Works** Trash & Recycling Collection: **Conversion to Automation** We have a new opportunity.....





**Upper Township Public Works** Trash & Recycling Collection: **Conversion to Automation** Converting from this .....





or this .....





To this .....





# **Upper Township Public Works** Trash & Recycling Collection: **Conversion to Automation Process to Implement Program**

- Collect and validate all pertinent data related to your current system and its costs
- Review elements of 'going automated' and compare results 2.
- Consult and question fellow automation users 3.
- Elaborate type of collection 4.
- Optimize wheeled cart options 5.
- Obtain participants' consensus
- Set objectives
- Elaborate public education campaigns 8.
- Choose the appropriate unit and type of collection 9.
- Ensure a solid training program for all participants 10.



Collect data on current and projected costs

Cost Comparison between Automation & Existing Collection

Existing Trash & Capital Costs	Recycling Fleet						
	Repl Year Chassis	Boo	dy Parts	Misc	Tota	I	
24 2001	2009 \$ 70,000.00	\$	32,000.00	\$ 5,000.00	\$	107,000.00	
20 2002	2011 \$ 75,000.00		01,000,00	\$ 5,000,00	ŝ	80,000.00	
16 2002	2012 \$ 75,000.00			\$ 5,000.00		80,000.00	
	2012 \$ 75,000.00	\$	40,000.00	\$ 5,000.00	\$	120,000,00	
3 2005	2015 \$ 80,000.00	Ψ	40,000.00	\$ 5,000.00	\$	85,000.00	
15 2005	2017 \$ 80,000.00			\$ 5,000.00	ŝ	85,000.00	
	2018/2019 \$ 85,000.00	\$	40,000.00	\$ 5,000.00	ŝ	130,000.00	
2 2008 2	2016/2019 \$ 85,000.00	φ	40,000.00	φ 0,000.00	Ŷ	100,000.00	
					\$	687,000.00	
	Annual Budget fo	r	10	Years	ŝ	68,700.00	
	Airidai budget io		10	, our o		,	
Labor Costs							
Truck Driver	4 at	\$	45,185.00		\$	180,740.00	
	8 at	ŝ	44,045.00		ŝ	352,360.00	
Laborer	oal	Ψ	44,040.00		\$	533,100.00	
			Benefits	35%	\$	186,585.00	
			Denents	Labor	\$	719,685.00	
				Equip	\$	68,700.00	
				Total	¢.	788.385.00	
Automation Capital Costs Trucks Carts trash recycling spares	3 at 5000 at 10000 at 1000 Annual Budget fc	\$ \$ \$ \$	250,000.00 55.00 55.00 55.00	) Years	\$ \$ \$ \$ \$ \$	750,000.00 275,000.00 550,000.00 55,000.00 1,630,000.00 <b>1630,000.00</b>	
Labor Costs						100 000 00	
Automated Driver	3 at	\$	46,561.00		\$	139,683.00	
					\$	139,683.00	
			Benefits		\$	48,889.05	
				Labor	\$	188,572.05	
				Equip	\$	163,000.00	
				Total	\$	351,572.05	

Yearly Savings \$ 436,812.95

#### COST COMPARISON SUMMARY

	REAR LOADER SYSTEM	AUTOMATED YEARS 1-5	AUTOMATED YEARS 6-10	
Cost per home per month Total number of employees Total number of trucks Total monthly collection cost Total annual collection cost	\$7.55 6 2 \$37,768 \$453,218	\$3.12 1 \$15,600 \$187,196	\$2.34 1 \$11,713 \$110,554	
MONTHLY SAVINGS		\$22,16	9	
ANNUAL SAVINGS	(Years 1-5)	\$266,02	2	
5 YEAR SAVINGS		\$1,330,11	1	
ANNUAL SAVINGS	(Years 6-10)	\$312,66	4	
10 YEAR SAVINGS		\$2,893,43	2	

#### Additional Savings Not Shown

Reduction in annual workers compensation based on reduction in number of employees

- Reduction in work related accidents resulting from elimination of manual loading
- Reduction in lost work days due to on-the-job injuries
- Increase in attendance due to improved working conditions

Decrease in required supervision due to reduction in laborers

Automated Cost Analysis - Upper Township NJ 22 5-14-99agis 1



Automation Costs

# Upper Township Public Works Trash & Recycling Collection: Conversion to Automation

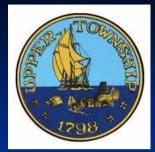
### Collect data on current and projected costs

Automation Costs		Savings		
Capital Costs		Staff Retirement - Year 1		
THONG	280,000.00 \$ 840,000.00	Stan Retirement - real 1 Salary	Longevity Benefits	Total
Carts trash 5000 at \$	56.00 \$ 280,000.00			
recycling 10000 at \$	56.00 \$ 560,000.00		\$ 3,000.00 \$ 13,908.69	
spares 1000 \$ education & training \$	56.00 \$ 56,000.00 14,000.00 \$ 14,000.00	Truck Driver \$ 46,766.00	+	
education & training \$	14,000.00 \$ 14,000.00 \$ 1,750,000.00		\$ 3,000.00 \$ 13,975.39	65,166.39
	\$ 1,750,000.00			5 295,115.72
	\$ 87.500.00	Staff Retirement - By Year 5	E	
Bond Down payment 5%	÷ ,		\$ 3,000.00 \$ 15,358.98	5 71,320.98
Recycling Grant Fund Balance to pay 5% down payment rec	quired for bond \$ 166,000.00 1% Interest	(2) Laborers \$ 80,000.00		
5 year bond life	1% interest			5 194,520.98
Yearly Ye	early Payment \$ 332,500.00		Gallons Price/ gallon	
Balance Interest		Fuel Savings	8,000.00 \$ 2.78	\$ 22,240.00
\$ 1,662,500.00 \$ 16,625.00		-		
\$ 1,330,000.00 \$ 13,300.00		Maintenance costs	3@\$ 350.00 /mc	\$ 12,600.00
\$ 997,500.00 \$ 9,975.00				
\$ 665,000.00 \$ 6,650.00		Equipment Savings		
\$ 332,500.00 \$ 3,325.00				
\$ 49.875.00 Total Intere	st	3 Packers		\$ 75,000.00
φ <del></del>		D-6 Bulldozer		\$ 40,000.00
		Truck Replacement		\$ 343,500.00
				\$ 458,500.00
				\$ 91,700.00
			over 5 years	
	Automation Costs	Savings		
Dow	npayment \$ 87,500.00			
	Year 1 \$ 349,125.00	\$ 421,655.72		
	Year 2 \$ 345,800.00	\$ 421,655.72		
	Year 3 \$ 342,475.00	\$ 421,655.72		
	Year 4 \$ 339,150.00	\$ 492,976.70		
	Year 5 \$ 335,825.00	\$ 616,176.70		
	Year 6 \$ -	\$ 524,476.70		
	Year 7 \$ -	\$ 524,476.70		
	Year 8 -	\$ 524,476.70		
	Year 9 \$ -	\$ 524,476.70		
,	Year 10 \$ -	\$ 524,476.70		
		Program Savings	s	
	\$ 1,799,875.00	\$ 4,996,504.06 \$ 3,196,629.06	per year = \$ 319,662.91	



#### • Comparing Current Costs versus Expected Results:

- Labor costs
  - Drivers' & Helpers' monthly wages
  - Number of drivers and helpers
- Equipment costs
  - Replacement cost per truck
  - Number of trucks
- Maintenance costs
  - Number of trucks
  - Monthly cost per truck
- Cost summary
  - Labor, equipment and maintenance per month
- Total cost per home per month



**Representative ranges of Service Stops for Various Collection Systems Designs** 

Design	Manual 2- person Crew		Automated 1		Fully automated 1- person Crew
Number of stops	500-700	700-900	400-500	600-800	800-1,100



# Type of collection:

Trash Recycling







# Here we are today!

# Obtain participants' consensus

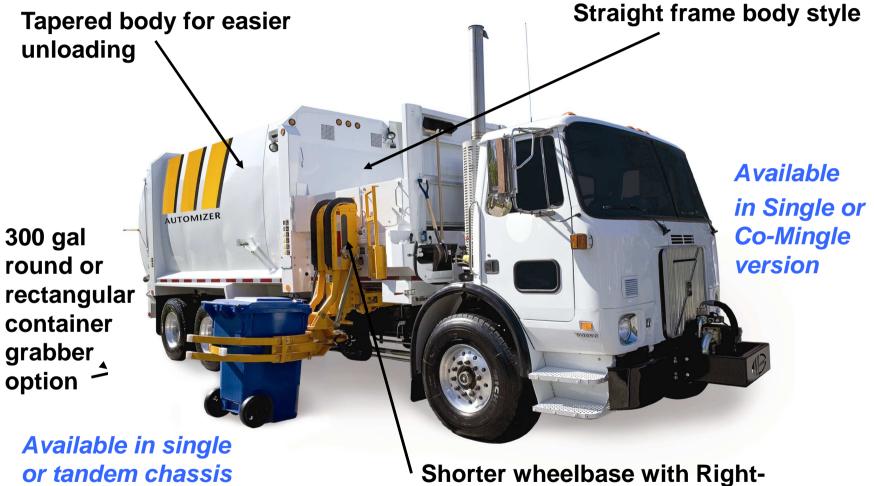
Set objectives



# **Upper Township Public Works Trash & Recycling Collection: Conversion to Automation Process to Implement Program**

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# Automizer Right-Hand<sup>™</sup>



Shorter wheelbase with Right-Hand<sup>™</sup> Automated Arm under the hopper



# Movie

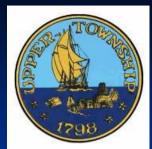


# Implementation

- An automated collection program is only as effective as its weakest component
  - Communication
- Changing a waste collection system often generates resistance from the residents
  - Need for a strategy to communicate the benefits
    - Ahead of time to help ensure a smooth transition to a new collection program



- An expectation that the reduction in costs should translate into tax cuts, lower collection charges, or some other form of customer rebate;
- "Ugly monster" carts being hard to maneuver, especially for elderly or physically disabled residents;
- Not having enough room for all of a household's refuse in a single cart;
- Displacement of workers;
- Questioning why a system that "works fine" should be changed



Upper Township Public Works **Trash & Recycling Collection: Conversion to Automation Communication Tools** 

### Informative letters from Township Committee

- FAQ leaflets and brochures that coax residents
  - "Just push it to the curb and we'll take it from there" are great for starters
- Posters hung in local recreation centers, libraries and other public meeting sites
- Calendars
  - Made in participation with some organization
    - Promoting the new program
    - Informing residents of collection days in their neighbourhood
- Ads in local papers  $\sim$  UTTV2 96
- Trash Collection Guides and reminders in Tax Bills



# Upper Township Public Works Trash & Recycling Collection: Communication Efforts

- While on their routes, drivers will place "Oops" tags to residents whose carts are misplaced or contain inappropriate materials
  - These "Oops" tags have the applicable brochure attached explaining how to correct the mistake
  - Usually one tag is enough to get them to comply
- The newly distributed carts can also include a note: "Please give this new curb side collection service a 30-day trial. If it doesn't meet your expectations, call XXX-XXXX. Let's make this automated trash collection program work, together!"
- We could spray a red spot at the curb side where the cart should be placed is a great way to train residents!



Upper Township Public Works Trash & Recycling Collection: Communication Efforts

- Residents are a big part of the new automated trash collection program's implementation and continued success
- It is imperative to team up to answer phone calls and assist customers while making adjustments to the new program
  - Interns or part-time workers can be hired to participate in an evening training program along with Public Works Department staff



# Thank You!

# **Questions** ??