



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

**An Overview
of How to Ensure the Successful
Conversion
from Manual to Automated Collection**



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

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**



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





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*How will changing our refuse collection system
affect costs?*

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



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*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 Visalia, 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



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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



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Designated spot on the curb/ edge of road





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

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 semi-automated 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



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We have a new opportunity.....





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

Converting from this





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

or this





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

To this





Upper Township Public Works Trash & Recycling Collection:

Conversion to Automation Process to Implement Program

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



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

Collect data on current and projected costs

Cost Comparison between Automation & Existing Collection

Existing Trash & Recycling Fleet

Capital Costs

Truck #	Year	Repl Year	Chassis	Body Parts	Misc	Total
24	2001	2009	\$ 70,000.00	\$ 32,000.00	\$ 5,000.00	\$ 107,000.00
20	2002	2011	\$ 75,000.00		\$ 5,000.00	\$ 80,000.00
16	2003	2012	\$ 75,000.00		\$ 5,000.00	\$ 80,000.00
27	2003	2013/2014	\$ 75,000.00	\$ 40,000.00	\$ 5,000.00	\$ 120,000.00
3	2005	2015	\$ 80,000.00		\$ 5,000.00	\$ 85,000.00
15	2005	2017	\$ 80,000.00		\$ 5,000.00	\$ 85,000.00
2	2008	2018/2019	\$ 85,000.00	\$ 40,000.00	\$ 5,000.00	\$ 130,000.00

Annual Budget for 10 Years \$ 687,000.00
\$ 68,700.00

Labor Costs

Truck Driver	4 at	\$ 45,185.00	\$ 180,740.00
Laborer	8 at	\$ 44,045.00	\$ 352,360.00
			\$ 533,100.00
		Benefits 35%	\$ 186,585.00
		Labor	\$ 719,685.00
		Equip	\$ 68,700.00
		Total	\$ 788,385.00

Automation

Capital Costs

Trucks	3 at	\$ 250,000.00	\$ 750,000.00
Carts	5000 at	\$ 55.00	\$ 275,000.00
recycling	10000 at	\$ 55.00	\$ 550,000.00
spares	1000	\$ 55.00	\$ 55,000.00
			\$ 1,630,000.00
		Annual Budget for 10 Years	\$ 163,000.00

Labor Costs

Automated Driver	3 at	\$ 46,561.00	\$ 139,683.00
			\$ 139,683.00
		Benefits 35%	\$ 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	\$7.55	\$3.12	\$2.34
Total number of employees	6	1	1
Total number of trucks	2	1	1
Total monthly collection cost	\$37,768	\$15,600	\$11,713
Total annual collection cost	\$453,218	\$187,196	\$140,554

MONTHLY SAVINGS

\$22,169

ANNUAL SAVINGS

(Years 1-5)

\$266,022

5 YEAR SAVINGS

\$1,330,111

ANNUAL SAVINGS

(Years 6-10)

\$312,664

10 YEAR SAVINGS

\$2,893,432

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



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			
Trucks	3 at	\$ 280,000.00	\$ 840,000.00	Supervisor	Salary \$ 70,350.00	Longevity \$ 3,000.00	Benefits \$ 20,401.50
Carts trash	5000 at	\$ 56.00	\$ 280,000.00	Sr. Inspector	\$ 47,961.00	\$ 3,000.00	\$ 13,908.69
recycling	10000 at	\$ 56.00	\$ 560,000.00	Truck Driver	\$ 46,766.00	\$ -	\$ 24,562.14
spares	1000	\$ 56.00	\$ 56,000.00	Truck Driver	\$ 48,191.00	\$ 3,000.00	\$ 13,975.39
education & training		\$ 14,000.00	\$ 14,000.00				
			\$ 1,750,000.00				\$ 295,115.72
Bond Down payment	5%	\$ 87,500.00		Staff Retirement - By Year 5			
Recycling Grant Fund Balance to pay 5% down payment required for bond		\$ 166,000.00		Supervisor	\$ 52,962.00	\$ 3,000.00	\$ 15,358.98
5 year bond life	1% Interest			(2) Laborers	\$ 80,000.00	\$ -	\$ 43,200.00
							\$ 71,320.98
							\$ 123,200.00
							\$ 194,520.98
Yearly				Gallons Price/ gallon			
Balance	Interest	Yearly Payment \$ 332,500.00		Fuel Savings	8,000.00	\$ 2.78	\$ 22,240.00
\$ 1,662,500.00	\$ 16,625.00			Maintenance costs	3 @	\$ 350.00 /mc	\$ 12,600.00
\$ 1,330,000.00	\$ 13,300.00			Equipment Savings			
\$ 997,500.00	\$ 9,975.00			3 Packers	3 @	\$ 25,000.00	\$ 75,000.00
\$ 665,000.00	\$ 6,650.00			D-6 Bulldozer	1 @	\$ 40,000.00	\$ 40,000.00
\$ 332,500.00	\$ 3,325.00			Truck Replacement	5 @	\$ 68,700.00	\$ 343,500.00
	\$ 49,875.00 Total Interest						\$ 458,500.00
							\$ 91,700.00
						savings per year over 5 years	
Automation Costs				Savings			
Downpayment	\$ 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					
	\$ 1,799,875.00	\$ 4,996,504.06		Program Savings			
					per year =	\$ 319,662.91	



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

- 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



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

Representative ranges of Service Stops for Various Collection Systems Designs

Design	Manual 2- person Crew	Manual 3- person Crew	Semi- Automated 1- person Crew	Semi- automated 2- person Crew	Fully automated 1- person Crew
Number of stops	500-700	700-900	400-500	600-800	800-1,100



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

Type of collection:

Trash

Recycling





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Here we are today!

Obtain participants' consensus

Set objectives



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Conversion to Automation Process to Implement Program

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Automizer Right-Hand™

Tapered body for easier unloading

Straight frame body style

300 gal round or rectangular container grabber option

Available in Single or Co-Mingle version

Available in single or tandem chassis

Shorter wheelbase with Right-Hand™ Automated Arm under the hopper





Movie

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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



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

- 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



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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 ~ 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



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Thank You!

Questions ??