

SAFETY AND COSTS CONTROL BENEFITS OF AUTOMATED & SEMI-AUTOMATED WASTE & RECYCLING COLLECTION

SSI SCHAEFER
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Understanding the complete safety benefits of both automated and semi-automated waste collection.

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INTRODUCTION



We have all seen them. Waste collection workers riding on the back of trucks, moving back and forth from curb to truck. We see them lifting, carrying, dragging, and throwing our bags, bins, and cans filled with our household trash and recycling. Let's not forget, they perform this work in all weather conditions and traffic conditions. Throw in the increasingly disturbing issue of distracted drivers, and it becomes clear why waste collection and disposal has long been cited in the top 5 most hazardous occupations in the U.S.

Sprains, strains, and overexertion are common, resulting in lost worker time, employee turnover, higher worker

compensation claims, and insurance costs, all having a negative personal and financial impact. Most recently, with the challenges of COVID-19, the industry faced a renewed awareness of worker exposure to other hazards harmful to their health. Additionally, today's workforce is not attracted to the type of work required by the waste and recycling industry and creates a greater demand for both public and private sector to provide a safer work environment.

There is good news that we cannot overlook. Employers in the industry have a long history of making safety their top priority and continue to take on the challenges of an evolving workplace and workforce. There are many success



stories. The best employers in the industry are creating a culture of safety in their operations with increased safety awareness, communication, training, rewarding safe behavior, and providing a safe work environment through well-maintained equipment and safe operational systems. Results demonstrate that fully automated and semi-automated operational systems with roll out carts, greatly reduce worker exposure to the common hazards of the job, control costs, and add to employee retention.

A fully automated system, sometimes referred to as “one arm bandits” or “grabbers,” is a system that requires only a driver. From the cab of the truck, the driver operates an

extending arm and grabber that lifts and dumps curbside carts into the truck hopper.

Semi-automated systems require a worker outside of the truck who rolls carts from the curb to the side or back of the collection vehicle where lifting equipment (cart tipper) is located. The worker requires no lifting.

This discussion will explore the challenges and benefits of creating a safer work environment through automated collection.



CHALLENGES

Conceptually, you are confident that your community or your company will realize the safety and cost saving benefits of converting over to some version of automated collection. You've seen it work for others and now you must find out what will be required to make the switch in your town or business. Your findings will identify the challenges and help to determine the proper solution, fully automated or semi-automated—or a combination of both.

What is right for your town and collection routes?

An initial consideration is the geographical make up of your town and current collection routes. You must do your operational due diligence and consider factors effecting your collection routes. Examples of these can include, one-way streets, alley collections, on street parking, congested

traffic areas, length of driveways, overhead clearances, dead ends, and weather conditions. Identifying and understanding these factors will help to determine where fully automated and semi-automated can be implemented.

Is there “buy-in” from stakeholders? Do current contracts, ordinances and municipal codes present challenges?

Municipal ordinances and third party collection contracts present specific challenges that require careful consideration. Do the municipal leaders and elected official have buy-in and agree that improving worker safety benefits all stakeholders? Does the current contract allow for changes? Can changes be made in anticipation of future contracts? Converting to carts and automated collection may require changes to operational details such as set out limits, set out location, collection day changes, bulk item collection and price. Implementation of these operational changes may require amendments to current ordinances or code enforcement and regulations.

A “one-size-fits-all” solution to automated collection is rare and most successful programs provide allowances for cart

sizes and quantities. The common cart size considerations are for elderly, low volume generators, and those who may have space constraints for storing their cart(s). These factors then require the option for different cart sizes. Taking a “best guess” at how many of each size cart you will need usually does not work and leads to unnecessary spending. A common and successful solution is to set “base” sizes for each waste stream and then allow for exceptions based on pre-set requirements, such as age, neighborhood, space limitations, etc. A detailed survey of your residents /customers is required to accurately determine cart size requirements and quantities.

What do private haulers need to consider when converting to an automated collection system?

Private haulers with subscription customer bases will have many of the same operational considerations as do public sector or municipal contracts relative to set out limits, collection days, and geographical limitations.

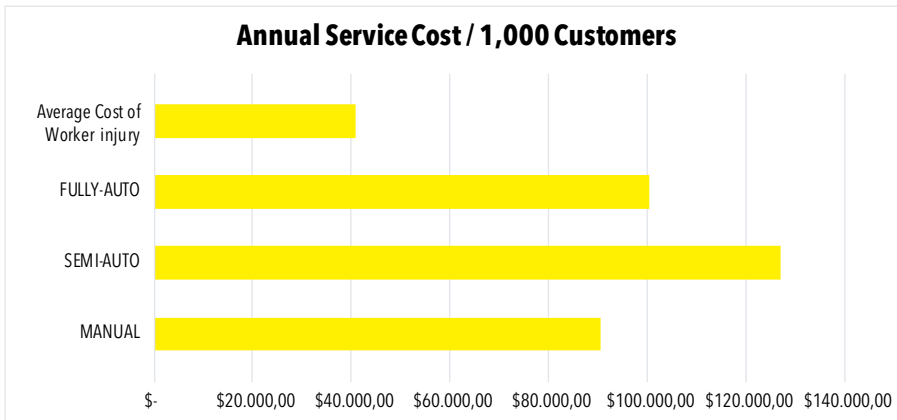
Market conditions are an additional concern for private haulers. Will converting to automation put your service offering in a more favorable position to grow your business?



What is the cost of converting equipment over to automated systems?

Equipment is of course a major consideration. The conversion to automated collection and roll out carts represents a significant investment in equipment. A fully automated collection truck may cost in the range of \$290k to over \$320k. Adding cart tipplers to existing rear load trucks is a cost consideration of \$4k - \$6k per tippler. In addition to the cost of purchasing roll out carts, there will

be the cost to have these carts assembled and delivered to the customers. As the chart below depicts, the cost from manual to fully-automated represents the difference of approximately \$20,000. However, the cost per just one worker injury or an unfortunate death would negate any savings.



Regarding an unfortunate event of a fatality, the cost of operations can reach approximately \$1.2 million as per the 2020 National Safety Council. The cost per work injuries in 2018 exceeded \$170 billion. This figure includes wage and productivity losses of \$52.4 billion, \$35 billion in medical expenses, and \$57.6 billion in administration expenses.

Will customers be required to do things differently?

Converting to an automated collection system will require that your customers make changes to their set out routine and communicating new guidelines are critical.

Communicating the changes and benefits to customers does deserve careful consideration and must be rolled out in a clear and timely manner.



SOLUTIONS & BENEFITS

Conducting an operational due diligence into each of the challenges you have identified will be the basis for supporting your case for converting to automated collection. You have identified equipment needs, possible rule changes, communication, educational requirements, and the associated costs. Now you can translate this information into the resulting safety and cost saving benefits.

Reduction in workforce size:

Manual collection systems require a driver and a loader for each route. In some cases, there are two loaders. A fully automated system requires just a driver, reducing required route manpower by at least one worker. In 2018, the U.S. Department of Labor Statistics cited the annual mean wage of a waste collection worker as \$38,870. In some instances, the conversion from manual recycling collection using small bins to automated collection and larger carts allow you to shift from weekly collection to every other week. Again, this reduces the numbers of workers required or creates an opportunity to use workers for new business growth or added service offerings.

Reduction in accidents & injuries:

A fully automated collection route requires only one person, a driver, who operates a joystick to control the mechanical lifting arm and grabber that will lift and dump the trash or recycling cart. The math simply works! Reducing the number of workers on the route reduces the opportunity and frequency of injuries. Compare digging ditches every day with a shovel to sitting on a backhoe and operating the arm and bucket to dig the ditch. It's obvious which method results in more wear and tear on the body. Similarly, a waste collection worker briskly walking, lifting, carrying, and dumping tons of waste everyday exposes himself or herself to bodily injury at a much higher rate than one who rolls a cart to the mechanical cart tipper, lifts and dumps the cart into the truck simply by pulling a control handle mounted to the truck.

Typically, manual waste collection workers are performing their work at the rear of the truck. Think of a scenario where a distracted motorist approaches from the rear, fails to stop in time and collides with the garbage truck. Where is that collision occurring? We know the unfortunate and possibly fatal answer. Fully automated collection systems virtually eliminate this scenario as all that is required is a driver who does not or rarely leaves the cab of the truck. Some semi-automated collection systems have cart tippers located on the curb or right hand side of the truck. This also reduces circumstances that can lead to worker injury or worse.

Exposure to the elements:

Winter, Spring, Summer, and Fall—each season offers conditions that challenge the manual waste collection worker. Temperatures hot and cold, surfaces wet, slippery and frozen, wind, rain, and snow. All opportunities for illness and injury. Fully automated collection keeps the driver relatively comfortable, dry, and safe in the cab of the truck.





Exposure to other health hazards:

What's inside that plastic garbage bag? Needle pricks continue to be a hazard to manual waste collection workers. Other hazards can include broken glass, metals, other sharp objects, potentially hazardous cleaning products, automotive fluids, pesticides, medical wastes, or biohazards—the list can go on. These could be inside plastic garbage bags or homeowner cans. Yes, there are "rules" as to how homeowners are to properly dispose of these types of household hazardous wastes, but as we know, the rules can be broken, and it's the waste collector who is at risk. Fully automated collection and the use of issued carts eliminates the risk of handling potentially hazardous materials. Semi-automated collection and the use of carts reduces worker exposure due to bags that may tear or open when handling.

Employee Retention and Recruiting Tool:

The high demand and competition for drivers with CDLs is well documented and is an ongoing challenge for the waste industry. In my personal interactions—both in private and public sectors—I am frequently asked if I know of any new or creative recruiting ideas. This competition for CDL drivers has given rise to creative incentives to attract new drivers. Consider the reaction to an offer that allows a CDL driver to operate a fully automated truck and service his or her entire route from the cab of the truck and be home every night. This scenario is much more attractive than one that requires a driver to enter and exit the truck all day, and one that has them manually service customers' waste and recycling, or an "over-the-road" job that requires time away from home.

An American household generates approximately 40 lbs. of trash (not including recyclable materials) per week. It is common for a waste collection route to service 500 - 1000 homes per day. So, on a given work day, a worker who performs manual collection may move, lift, throw, and dump as much as 10 - 20 tons per day. Given the current labor pool, finding folks who are willing to do this kind of work is getting more difficult. However, if the collection system is semi-automated, the physical demands of the job are reduced with a wheeled cart that is lifted and dumped with a mechanical cart tipper.

Employers in the waste industry who convert over to either fully automated or semi-automated collection are creating work environments that reduce exposure to the physical health hazards, accidents, and injuries present in manual collection systems, resulting in reduced workforce turnover.

Improved customer satisfaction and reduced customer churn:

The mechanical lifting equipment used on fully automated and semi-automated waste collection trucks will attract attention and interest with your customers who are paying attention. But, it may not be a factor in how your customers perceive the value of their service. So, what are the benefits of automated service that directly impacts your customers? We are hopeful that some may see the safety and health benefits provided the worker, but the reality is that customers will be most interested in how this type of service impacts them directly.

Providing curbside collection carts provides convenience and cost savings for your customers. Commercial quality carts are durable and will last many years more than containers that a homeowner will repeatedly purchase from the home stores. A single 95 gallon cart occupies less space than three 32 gallon containers. The wheels and tight fitting lids make them easy to move and help to reduce blown litter and odors. Uniform sizes and colors of carts improve neighborhood aesthetics. These are the benefits that your customers will find value and make it less likely for them to switch to another provider who is not offering automated services or complain about the cost of service.

All of the solutions and benefits presented here must be detailed in a conversion plan that demonstrates to stakeholders the value of employee safety and costs controls.

WHAT TO LOOK FOR IN A VENDOR

Expertise in Project Management Experience

Converting an entire town or even just a few collection routes requires detailed planning and timelines. A solid cart vendor should be able to demonstrate experience in leading successful large- and small-scale cart deployment projects.

Decades of waste industry experience is a must. Manufacturing of carts is only one element in a conversion project. A cart vendor should have staff who have experience and an intimate understanding of the waste collection industry and challenges that go with it.

Communication and educational resources for residents and customers are also needed. A city or independent hauler may not be experienced in methods and tools available that are required to communicate a change in service to its customers. An expert cart vendor should be equipped with the resources to assist with this critical task.

Technology

Technology required for a cart conversion project comes in many forms. Whether it is communication, RFID, database management, routing and asset management technologies, a capable cart vendor will supply, manage, and execute the technologies required for a smooth roll out.

Manufacturing

Quality is key when searching for a cart provider. The difference between a good cart vendor and a great one is the manufacturing operation. Manufacturing operations should meet or exceed ISO 9001 certification standards, and the cart product will meet all ANSI standards and testing. A proven track record of durability can be obtained through references.

Check and see if the cart vendor owns the assets needed to manufacture a cart order. Does the cart vendor own the molds, presses, or factory, where your carts are being manufactured? Or, do they own only the mold and subcontract the manufacturing process? A vendor who owns the assets required for the entire process can more confidently control the progress and completion of your project.

Look for the capacity to complete your order on time. Your order, whether large or small, is the most important order for you. A quality cart manufacturer has the capacity to maintain smooth, reliable order completion timelines. A very large order from another customer should not mean that your order takes a back seat.

Continuous improvement and innovation is an indication of best practices. Consider the manufacturers' product history. Has the manufacture continually explored new designs and technologies that result in a cart product that meets and exceeds the needs of the industry?

Other Resources

Can your cart manufacturer demonstrate that they have solid relationships with quality vendors who will be required to perform various functions like RFID chip manufacturing or in-mold labels. Examples could be as basic as reliable shipping companies or the team who will deliver the carts to your customers.

Financial Stability

What is the financial and ownership status of the cart vendor? Careful consideration must be given to both. Are they owned by a private equity firm, funded with venture capital money, or do they have a track record of success in the industry? You need your vendor to be around for today's project and tomorrow's challenges.



CONCLUSION

As professionals and leaders in the waste and recycling industry, it is our responsibility to provide a safe environment for our workers and customers. One that gives workers the best chance to return home each day to their families, healthy and satisfied with their days work and one that offers a convenient and sanitary service for our customers. Considering the troubling statistics of worker safety in our industry, we should all be open to a thoughtful review of our current programs, prepared to make changes, and to be a champion of a greater safety culture with elected officials, residents, and private industry customers. Automated collection systems are not new! There are many successful programs in the industry today that can be used as a resource and template for making a positive change in your program.

Sources

Kaiser Family Foundation; National Opinion Research Center; HRET; Greenwald & Associates

U.S. Bureau of Labor Statistics
53-7081 Refuse and Recyclable Material Collectors



DON ISABELLA

Don Isabella has been a waste and recycling industry professional for over two decades. His knowledge spans both cart manufacturing and hauler expertise, as well as post collection. His career has lead him to become a champion of change management and process improvement within the industry and works with various organizations to help move initiatives forward.

Currently, Don is a board member of the Professional Recyclers of Pennsylvania and is a member of good standing with the Maryland Recycling Network, National Waste & Recycling Association, and the Northeast Recycling Council as well as the Pennsylvania Independent Waste Haulers Association. Don continues to build strong partnerships with innovative solutions for automated collection programs with municipalities and haulers throughout the Northeast region.





REASONS TO PARTNER WITH SCHAEFER

- **Stability:**

As a financially independent family business, SSI SCHAEFER is committed to long-term solutions. You can trust that our team of experts will be there for you tomorrow and in years to come.

- **Efficiency:**

SSI SCHAEFER solutions are scalable and can grow as business increases. Updates for cart programs are always available to meet customer demands and changing sanitation regulations.

- **Quality:**

As a waste industry expert, SSI SCHAEFER provides an array of best-in-class products, services, and technologies with guaranteed delivery when you need it.

- **Assembly and Distribution:**

SSI SCHAEFER provides turnkey assembly and distribution services to ensure smooth and timely program implementation.

- **Technology:**

SSI SCHAEFER solutions are always up-to-date with the latest technology. WISTAR® enables real-time asset visibility. With auditing capabilities, service verification, field-generated work orders, and reporting, it's the leading cart technology in the industry.

- **Global Network:**

SSI SCHAEFER owns manufacturing facilities worldwide, with two dedicated North America locations to service municipalities and haulers.

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