

How to Choose Automated Refuse Collection Vehicles

Research required to maximize collection efficiency.

Whether your community already has an automated refuse collection system in place or you are in the process of going automated, proper equipment selection is crucial to the success of the program. Automated refuse collection vehicles that are well-suited for the environment in which they are used will enhance productivity. However, vehicles that are poorly matched to the routes they must serve or that are frequently down for repair are inefficient and will hamper productivity.

The first step in selecting new automated side loaders is research. Start by gathering and reviewing information about all available automated refuse collection vehicles. Check the manufacturers' Web sites, read the brochures, talk to the sales representatives, and ask your colleagues about equipment they use or have used in the past. Visit other communities that use the vehicles you are considering. Watch the vehicles on their routes, and talk to the operators and the maintenance personnel. Compare the data for each vehicle against your com-

munity's specific needs.

Learn as much as you can about each company as well. Look into their manufacturing processes, industry experience, size, and long-term stability. Services from credit-checking organizations can provide insight into a manufacturer's financial health. Compare warranty policies from the manufacturers under consideration.

Also important is the availability of local service and support. Find out how warranty claims, parts orders, maintenance issues, training, and emergencies are handled. Will someone be available locally to provide parts and service or will everything have to be routed through a single national location?

Ask your local representative to arrange a visit for you to the manufacturing facility. Watching a company's production, testing, and quality control processes; talking with its engineers; and reviewing its parts inventory can be enlightening.

The three major elements of automated side loaders are the automated arm, truck body, and truck chassis. These three parts must work together as a unit.

Automated Arm

The automated arm extends from the vehicle body, grabs and lifts the residential refuse container, dumps the cart's contents into the vehicle hopper, and places the cart back on the ground, all in ten seconds or less. Well-designed arms will even return the cart with its lid closed.

The most important factors to consider when comparing automated arms



With automated refuse collection vehicles, the automated arm, truck body, and truck chassis are required to work together to be effective.

are those that affect productivity. Productivity is usually measured in terms of how many homes per hour or day the vehicle can collect. Look for a long reach plus the ability to make close-in pick-ups. A fast cycle time (the time it takes to pick up, dump, and put down a single cart) has an obvious productivity benefit. The “kick-out” of the arm as the cart is lifted also is significant in some communities. Arms that “kick” or swing the container away from the truck as it is being lifted often cannot be used in alleys or near walls, high curbs, or other barriers. Also consider maintenance costs and lift capacity. Make sure the arm’s grabbers are compatible with the carts used in the community.

Some of the specific elements to compare among automated arms include:

- Cycle times.
- Projected maintenance costs.
- Frequency of repair.
- Parts costs.
- Arm kick out.
- Overhead clearance.
- Container size capability (30 to 300 gal).
- Arm geometry and whether the lift closes the lids when returning the cart to the ground.
- Smoothness.
- Ease of operation and maintenance.

Body

Once refuse is dumped into the hopper, it is pushed into the body where it is packed (compressed) to achieve maximum payload. The hopper has to be sized properly to keep up with the speed of the arm. This means that refuse should be moved into the body at a pace that eliminates any need to stop on a route to let the hopper clear before picking up another cart. This will maximize the vehicle’s productivity.

Another important factor is quality of materials used to construct the body. Look at the grade of steel. Most parts of the body should be made of at least high-tensile steel (50,000 psi) to withstand the constant internal pressure.



Operate-at-idle systems permit the refuse collection vehicle to lift and empty carts and compact refuse while the vehicle is at idle.

Also compare hydraulic cylinders, sub-frame construction, and manufacturing methods. Robotically welded components are more consistent and stronger than those welded by hand. Some paint processes produce a finish that is more resistant to wear and damage than others. Laser cut components offer a superior fit and finish.

Consider whether the vehicle comes with an operate-in-gear-at-idle system. Operate-at-idle systems enable the refuse collection vehicle to perform all of its functions, including lifting and emptying carts and compacting refuse, at standard operating speeds while the vehicle is at idle. The result is significant fuel savings, increased productivity, and much quieter operation.

Some of the specific elements to compare among automated refuse collection vehicle bodies include:

- Hopper capacity.
- Body capacity.
- Payload.
- Cycle times.
- Projected maintenance costs.
- Compaction rates.
- Frequency of repair.
- Resale value.

- Parts costs.
- Hopper throughput. (For example, if the lift is faster than the hopper can process, total productivity will be limited by the packing mechanism.)
- Overhead clearance.
- Dump or eject unit.

Chassis

The chassis consists of the truck cab and the platform upon which the body (and arm) is mounted. A key consideration to selecting a chassis and body combination is travel time to and from the local disposal site. Short travel times mean that it is possible to concentrate on maneuverability and increased productivity when specifying the chassis/body combination. But longer travel times may mean that some vehicle maneuverability could be sacrificed to maximize payload and limit the number of trips to unload.

In areas where street or alley configurations make maneuverability critical, a single-axle chassis may be preferred. For applications where turning radius is not as much of an issue, tandem-axle chassis, which can carry larger payloads, may be the better choice. Another possibility is a semi-trailer refuse collection system

which combines a tractor-mounted arm with a trailerized body. This design offers an extremely tight turning radius for easy maneuvering in cul-de-sacs and other tricky areas. Plus, the trailers can be disconnected when full and the tractor simply hooked up to an empty trailer to continue on the route. The full trailers can then be pulled in tandem to the landfill with any non-collection tractor, greatly reducing the haul costs.

Vehicle weight can also be a concern in some parts of the United States. Single-axle chassis with medium compaction bodies are the popular choice in these situations. Generally, cab-over-engine chassis offer the greatest maneuverability and the most balanced axle-loading conditions, but they do involve a greater initial capital outlay than a conventional chassis.

Many new automated equipment operators are more comfortable driving on the left-hand side of the vehicle. Although most automated refuse collection vehicles can only be operated from the right-hand side, left-hand side or dual-drive operation is possible with the right body, chassis, and lift configuration.

Some of the specific elements to compare among chassis to be used for automated refuse collection vehicles include:

- Payload.
- Projected maintenance costs.
- Frequency of repair.
- Resale value.
- Parts costs.
- Kind of operator license required.

■ Ergonomics and operator comfort.

Total Cost of Ownership

When comparing automated refuse collection vehicles, it is important to look beyond initial purchase price to the total cost of ownership or long-term return on investment of each. While upfront price differences are easy to see, what are not always as clear are the factors that truly affect long-term total cost of ownership as defined by productivity minus maintenance costs. The cheapest upfront solution is not always the least expensive over the life of the refuse collection vehicle. Breaking down the overall expense into unit cost, such as cost per home per month, can be helpful in

putting expenditures into perspective.

Analyze



Heil's STARR™ System is a semi-trailer refuse collection system. When trailers become full they can be disconnected and the tractor hooked to an empty trailer so the operator can continue on his route. The trailer serves as a mini-transfers station; full trailers can be pulled as doubles to the landfill with non-route trucks.

the lifecycle costs of the equipment, including acquisition costs, maintenance projections, longevity, and resale value.

Financial factors also must be weighed against performance. A vehicle that costs less but that will not be able to efficiently operate in your community's particular circumstances or that is frequently down for repair is not a good solution.

Demos and Pilot Programs

To properly evaluate automated refuse collection vehicles, they must be seen in

action. Once you have narrowed your choices, ask for a demonstrator unit of the vehicles under consideration. Have your operators try them on some of your existing routes. This is the time to make sure the automated arm will not kick out too far for alley collection, that the vehicle can maneuver on a particular route's narrow streets, and that it meets the specific needs of the community.

If you are preparing to make the move to automation and have not yet set up automated collection routes, on-site demos will not accurately convey a particular vehicle's productivity capabilities. For this, you may want to visit a community where the vehicle is in use and follow it on a route.

If more "real-world" testing is required, you may want to consider setting up a pilot program. Usually you must negotiate with the refuse collection vehicle manufacturer and the cart manufacturer to use

the automated refuse collection vehicle under consideration along with several hundred of the carts you are evaluating. A single automated route is then set up

and run for several months. At the end of the pilot, a review of productivity studies and a customer-satisfaction survey provide insight into how well the system will work for the community.

Taking the time upfront to thoroughly research all the automated refuse collection vehicle options available will pay you back with a collection system that is productive, efficient, and tailored to your community's special needs. **GE**

The preceding was supplied by Heil Environmental. For further information, go to www.heil.com.