

# Careers in Recycling

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**W**hat happens to the things you throw away? If you dispose of them in the trash, your old stuff will probably end up sitting in a landfill. But if you recycle, the materials you got rid of yesterday could end up back on a store's shelf in the future.

Recycling is the practice of reusing materials in existing products to create new ones. This can be accomplished in expected ways—such as using recycled paper as packaging material—or unexpected ways—such as using recycled glass to make artificial turf. Recycling helps to conserve limited resources, and—its proponents argue—it has other environmental benefits as well. For example, reusing existing materials means that fewer new ones have to be produced, which can lower factory emissions, reduce the need for new natural resources, and lower dependence on landfills.

Many different kinds of materials are recyclable. Some materials, including plastic, metal, glass, and paper, are commonly recycled. Disposing of these recyclable materials is relatively easy—they can be deposited for pickup or dropped off at recycling centers. Specialized electronics, such as laptops or cell phones, are also recyclable but require special handling because of the potentially dangerous chemicals contained in their batteries.

Recycling has become an increasingly important issue in the United States as both the population and the

amount of waste each person generates continue to increase. Municipal solid waste (MSW) includes items that are normally thrown in the trash, such as food packaging or scraps, old furniture, tires, or yard clippings. According to a study by the Environmental Protection Agency (EPA), municipal solid waste generation increased from 2.68 to 4.34 pounds per person per day between 1960



Many different kinds of materials can be recycled

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and 2009. Collectively, Americans generated about 243 million tons of MSW in 2009.<sup>1</sup> (See chart 1.) Over the last several years, however, municipal solid waste generation has decreased, apparently a result of the recent economic recession in the United States.<sup>2</sup>

Although overall waste generation has increased, recycling has also become more widely practiced. In 2009, about 61 million tons—or 25 percent of the MSW—was recovered through recycling.<sup>3</sup> In 1960, Americans recycled 6.4 percent of their waste.<sup>4</sup> Recycling has grown as more communities, recognizing the environmental benefits, have made collecting recyclables commonplace. Businesses that use recyclables as raw materials and an educated public that values recycled products have also contributed to the growth of recycling.

Recycling is more common in some regions of the United States, especially the West Coast and Northeast.<sup>5</sup> In addition to recycling, some areas practice other methods of waste management, including composting, putting the waste into landfills, or burning waste to produce energy.

This report provides information on various career opportunities in the recycling industry. The first two sections provide an overview of the industry. The third

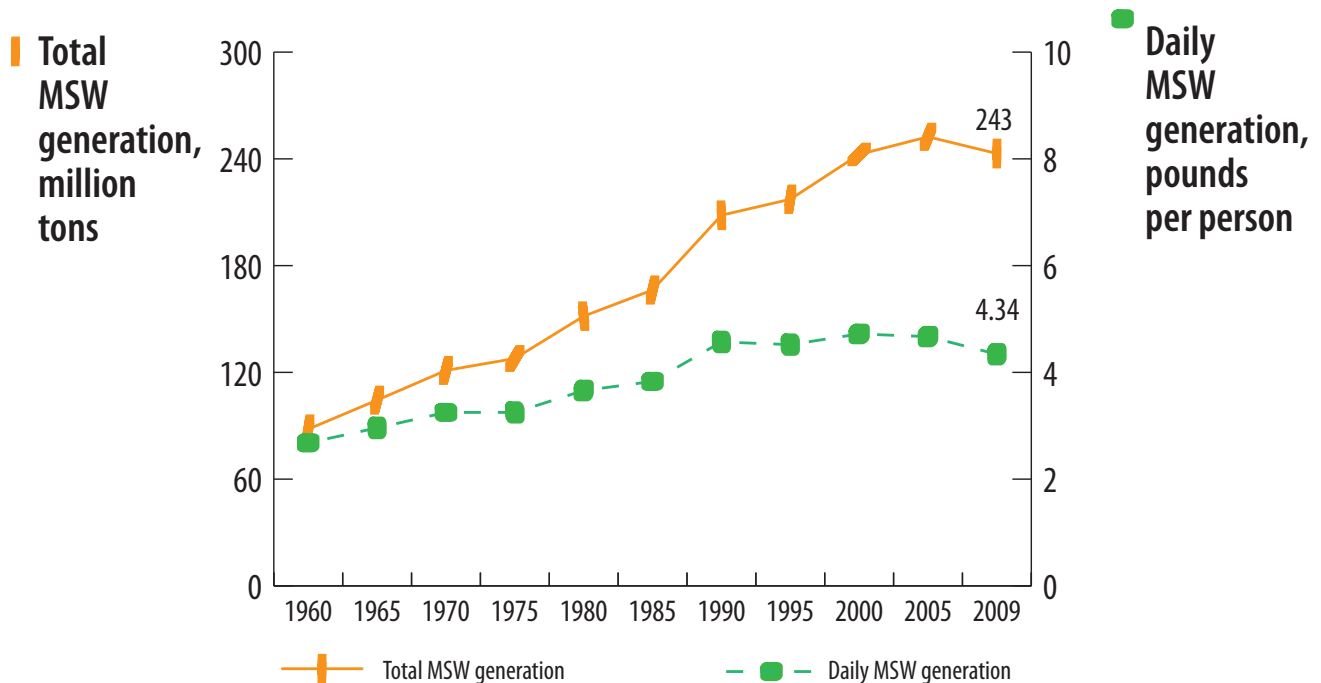
section details a number of occupations involved in collecting and processing recyclables. For each of these occupations, it provides a description of the job duties, the credentials required (e.g., education, training and licensure), and information on wages.

## How recycling works

It's no small task to get recyclables back to manufacturers, where they can be reused in new products. The recyclables have to be collected from many sources, including households, businesses, and construction sites. Collectively, these sources are referred to as consumers of recycling services. The recyclables that consumers produce are collected and transported to a Materials Recovery Facility (MRF), where they are sorted and processed, before being sent to manufacturers.

In some areas, people have to sort their own recyclables before they can be collected. For example, aluminum cans and newspapers are placed into different bins and collected separately. Increasingly, however, recycling is becoming “single-stream,” which means that all recyclables are collected together. The different types are then sorted later.

**Chart 1. Municipal solid waste (MSW) generation and generation rates, selected years, 1960–2009**



Source: U.S. Environmental Protection Agency

Drop-off centers are commonly used to collect recyclables



There are several different methods of collection. The three most common are curbside pickup, drop-off centers, and deposit systems.

In areas with curbside pickup, consumers treat their recyclables much as they do traditional waste. They place recyclables in a bin issued by their local government or a private company. This bin is placed near the curb of the street on a designated day or days of the week, and recycling workers empty the bins into a truck that transports the recyclables to an MRF. Curbside pickup has grown more prominent as single-stream recycling has become more common. In 2009, more than 9,000 curbside pickup programs were reported in the United States. An American Beverage Association study estimated that 74 percent of the United States population had access to curbside pickup programs in 2009.<sup>6</sup>

As an alternative or supplement to curbside pickup programs, drop-off recycling centers are also very widely used. Consumers are responsible for transporting and depositing their own recyclables at drop-off centers. These recyclables are collected regularly and taken to an MRF. Drop-off centers are popular because they are cheaper than providing curbside pickup. The American Beverage Association study estimated that 83 percent of the United States population had access to drop-off recycling centers.<sup>7</sup> However, drop-off centers also fail to return as many recyclables as curbside pickup programs. Many communities have both curbside pickup and drop-off centers.

Deposit systems, found only in some states, provide consumers with a financial reason to recycle. When consumers bring certain recyclables, such as glass bottles or aluminum cans, to specified locations for collection, they are given a small amount of money in return. Recyclables that can earn money from deposit systems are marked with the state's abbreviation and the amount of money it is worth. The money consumers earn through deposit systems comes from their own wallets. For example, in some states an empty glass bottle might earn 5 cents. Those 5 cents are added to the cost of a bottle when it is purchased. Consumers are depositing money when they purchase a recyclable item; they receive their money back when they recycle it.

At construction sites and locations where many people recycle, like schools, hospitals, or airports, the volume and size of recyclables make normal collection impossible. In such circumstances, recyclables are usually pooled together in large dumpsters, where they are regularly picked up by large trucks.

No matter how recyclables are collected, though, they need to be taken to an MRF to be sorted and processed. According to the Bureau of Labor Statistics, there were 906 MRFs owned by private companies and local governments in 2009.<sup>8</sup> At MRFs, workers unload the recycling trucks, and dump the recyclables onto slow moving conveyor belts. As the recyclables move down the conveyor belt, they are sorted into different groups

by their material. For example, all paper products will end up in one group, while all glass ends up in another.

Sorting recyclables might be more labor intensive at some MRFs than at others. In older MRFs, sorters separate the different types of recyclables by hand. But newer MRFs feature technologies that automatically separate certain types of recyclables from the others. For example, powerful magnets might be used to pull different metal products out of the main stream of recyclables. Strong fans are frequently used to blow paper products free from other recyclables.

Once the recyclables have been sorted by material, they need to be processed into a useable form. Machines at the MRF condense the recyclables into a shape more easily shipped. For example, paper is frequently shredded and baled, whereas aluminum cans are crushed together and bundled. Sales agents negotiate contracts to sell the processed recyclables from the MRFs to manufacturers. These bulk recyclables are sold and transported to manufacturers to use as the raw material for new products.

## Who takes the recycling?

Recycling, like general waste management, is handled by both the public and private sectors. A local government might be responsible for collecting, processing, and selling recyclables, or it might hire private contractors to carry out these duties. Recycling doesn't have to be handled entirely by public or private entities, however. Municipalities might hire contractors for some duties but not for others. For example, a local government might be responsible for collecting the recyclables and delivering them to a privately owned and operated MRF. The division of duties between the public and private sectors varies among communities.

Contractors might be paid with funds from the local government or through the proceeds from processed recyclables sold to manufacturers. The relationship between the community and the contractor is generally specified in a contract between the two parties.

Depending on local regulations, construction companies might be responsible for hiring contractors to pick up recyclable construction materials.

## Occupations in recycling

Getting recyclables from waste bins to manufacturers requires different types of workers. Drivers collect the recyclables and transport them to a MRF, at which sorters, plant managers, and technicians and mechanics work. Skilled personnel in support roles, such as sales and logistics, are also essential to the recycling industry. Larger recycling firms also employ workers in many other occupations, including management and human resources, but these occupations are not covered in this report.

For each of the occupations discussed in this section, the job duties, necessary credentials, and wage data are presented. Unless otherwise specified, the wages for each occupation are median annual wages within the remediation and other waste services industry group, which includes recycling.

### Drivers

Recycling companies or local governments offering home pickup services employ drivers, also called recyclable material collectors, to pick up and transport recyclables to an MRF.



Drivers may use trucks with hydraulic lifting mechanisms

## Job duties

Several drivers usually work together as a team to collect recyclables. One drives the truck, stopping alongside each recycling bin, while the other workers ride inside the cabin or hold onto the side of the truck. At each stop, at least one worker exits the vehicle, grabs the curbside recycling bin, and empties it into the bed of the truck. When the truck finishes its assigned route, the workers return to the MRF where the recyclables are unloaded.

Depending on the type of truck used, workers might have to lift and empty the recyclables from the bin themselves. Other vehicles have hydraulic lifting mechanisms—in either the rear or front of the truck—that can be used to empty the bins automatically. To protect themselves from accidents around the trucks and lift systems, drivers follow detailed safety procedures.

Drivers are required to collect recyclables year-round and in all weather conditions. And, in order to pick up recyclables along long routes, some workers begin shifts as early as 5 or 6 a.m.

Recycling companies that offer services to construction firms pick up recyclable materials from construction sites. Because of the high volume and large size of construction waste, these workers might drive roll-off trucks, which can haul the large dumpsters used on construction sites back to special construction and demolition debris facilities.

Drivers are responsible for inspecting their vehicles at both the beginning and end of every workday. They inspect the tire pressure, fluid levels, safety equipment, and all gauges and controls.

## Credentials

Drivers should have at least a high school education or a G.E.D. To be certified to handle large recycling trucks, drivers must have a Class A or B Commercial Driver's License with airbrake endorsement. Recycling companies prefer drivers who have several years of experience with large commercial trucks.

Drivers need to pass drug screening and background checks. They should have clean driving records. Drivers must also be physically capable of lifting, pushing, and pulling full recycling bins repeatedly throughout the day.

## Wages

BLS does not have data specifically for drivers of recycling trucks; however, these workers are included in the occupation refuse and recyclable material collectors. The

median annual wage for refuse and recyclable material collectors in the remediation and other waste management services industry group was \$29,610 in May 2010. The wage is the median annual wage for the entire United States. Wages vary by employer and location.

## Sorters

In single-stream recycling systems, many different kinds of recyclables are collected together. Sorters separate the various types of recyclables so they can be processed.

## Job duties

Sorters work along conveyer belts in MRFs. As waste materials come down the conveyer belt, sorters pull out any items that cannot be recycled and should be disposed of. They sometimes work as quality control inspectors and remove unwanted materials from a single stream. For example, they might remove paper products from a stream of plastic containers.

At older MRFs, sorters are also responsible for separating all the different types of recyclables by material type. MRFs are increasingly relying on automated equipment as a faster way to sort recyclables. Even in these plants, however, sorters are necessary to ensure that no stray recyclables fall into the wrong group. Sorters also monitor the waste stream before it reaches the automated equipment to pull items that could damage the machinery, such as garden hoses, from the conveyer belt.

## Credentials

There are no specific education requirements for sorters. Many companies conduct drug tests and background checks on prospective employees. Sorters need to be



Sorters remove separate unwanted materials from recyclables

physically capable of working on their feet for the entire day. They also need strong backs to handle repeatedly bending over to pick items off the conveyor belts. Sorters must have excellent vision to spot items as they come down the conveyor belt.

## Wages

BLS does not have data specifically for recycling sorters at MRFs; however, these workers are included in the occupation laborers and freight, stock, and material movers, hand. The median annual wage for laborers and freight, stock, and material movers, hand in the remediation and other waste management services industry group was \$23,570 in May 2010. The wage is the median annual wage for the entire United States. Wages vary by employer and location.

## Mechanics, technicians, and machinery maintenance workers

Recycling operations rely on various kinds of mechanics, technicians, and machinery maintenance workers to inspect and repair the automated equipment in MRFs and to maintain recycling trucks.

## Job duties

Mechanics and technicians monitor and operate the machines in MRFs, including balers (compactors) that

shape the recyclables into a form to simplify shipping to and use by manufacturers. They also regularly inspect the machinery and diagnose and repair any problems with the electrical or hydraulic systems of the compactors. They record their work in detailed logs.

Other mechanics, technicians, and maintenance workers are needed to repair and maintain the recycling trucks. They run inspections and diagnostic tests and perform preventative maintenance and vehicular repairs. Truck technicians also document vehicular part usage and repair times. They may be required to make emergency roadside calls if recycling trucks experience problems while out on collection.

## Credentials

Whether they work on machinery or recycling trucks, mechanics and technicians should have at least a high school education or a G.E.D. They should also have at least a year of formal education and experience performing repairs on machines or vehicles. Workers can learn these technical skills through vocational training programs or apprenticeships. While mechanics used to specialize in one area, many now have knowledge of multiple disciplines, including electricity, electronics, hydraulics, and computer programming. Machinery maintenance workers usually receive on-the-job training that lasts for a few months or a year.

Mechanics and technicians are required to pass drug tests and background checks. They should have clean driving records and need to be able to move equipment that weighs up to 50 pounds.

## Wages

BLS does not have data specific to mechanics, technicians, and machinery maintenance workers at MRFs. However, these workers are included in the occupations industrial mechanics; maintenance workers, machinery; and bus and truck mechanics and diesel engine specialists. Table 1 shows wages for these occupations in the remediation and other waste management services industry group. The



Well-maintained recycling trucks are critical for an MRF's operations

wage is the median annual wage for the entire United States. Wages vary by employer and location.

Table 1. Selected mechanics and maintenance occupations	Median annual wages, 2010 <sup>1</sup>
Industrial machinery mechanics	\$47,280
Maintenance workers, machinery <sup>2</sup>	41,870
Bus and truck mechanics and diesel engine specialists	38,780

<sup>1</sup> Occupational Employment Statistics data are available at [www.bls.gov/oes](http://www.bls.gov/oes). The data do not include benefits.

<sup>2</sup> Wage data for this occupation are not available in the remediation and other waste management services industry group, so the dollar amount shown is the wage in the waste management and remediation services industry subsector.

## Material recovery facility managers

Keeping a constant flow of recyclables collected, sorted, processed, and sold requires a proficient staff—and experienced MRF managers to supervise it.

### Job duties

MRF managers keep the recycling facilities working efficiently and safely. They have a broad range of responsibilities, including overseeing site improvements, submitting budgets, and developing long-term goals for the facility. MRF managers might also work with the sales team to identify new clients who might be interested in purchasing recyclables. When it is necessary to deal with the public or press, MRF managers are the face of the recycling operation.

MRF managers are also responsible for recruiting, hiring, and training employees. They evaluate employees' performances and offer feedback to senior managers on how to reward and compensate employees. Finally, because heavy machinery and large vehicles at an MRF can pose a risk to employees, a substantial part of MRF managers' jobs concerns workplace safety, such as providing employees with regular safety briefings and reviewing technicians' inspection and maintenance reports.

### Credentials

Positions for MRF managers may require education beyond a bachelor's degree. Many MRF

managers have earned a master's degree in business administration (MBA) or a master's degree in industrial engineering. Management experience, especially in the waste industry, can sometimes be substituted for education. A combination of a graduate degree and several years of experience is ideal.

### Wages

BLS does not have data specifically for MRF managers; however, these workers are included in the occupation general and operations managers. The median annual wage for general and operations managers in the remediation and other waste management services industry group was \$90,790 in May 2010. The wage is the median annual wage for the United States as a whole; wages vary by employer and location.

## Route managers

To collect recyclables in the most efficient way possible, route managers plan routes and schedules for recycling trucks to follow.

### Job duties

Using maps and customer data, route managers choose the best schedule and routes for collecting recyclables from customers. They determine the most efficient routes and assign them to drivers. Route managers monitor drivers' routes and might solicit their feedback before making changes. They record statistics, including the length of each route, the time it takes to run each route, number of homes serviced, and the amount of



Route managers choose the most efficient schedules for recyclable collection

recyclables collected. If the recycling service changes its collection plan—such as the day on which recyclables are collected—route managers inform customers of this change through the customer service department.

At some MRFs, route managers may also supervise recycling truck workers. If so, they monitor the hours that the drivers work to keep them below regulatory limits. Route managers also ensure that drivers receive regular training and drug and alcohol tests.

## Credentials

Route managers need at least a high school diploma or a G.E.D. Many have associate's degrees and several years of experience in transportation, logistics, or waste management. They also use communication skills to interact with recycling truck workers.

## Wages

BLS does not have data specifically for recycling route managers; however, these workers are included in the occupation logisticians. The median annual wage for logisticians in the remediation and other waste management services industry group was \$67,720 in May 2010. The wage is the median annual wage for the United States as a whole; wages vary by employer and location.

## Sales representatives

Sales representatives, also called account managers, are responsible for finding purchasers for both recycling services and processed recyclables.

## Job duties

Companies selling recycling services use sales representatives to sell their services to either an entire municipality or individual consumers. The sales representatives need to know what services their company offers: collection services, sorting and processing services at an MRF, or both. Sales workers are the point of contact between the community and the recycling company. If there are any changes or problems with the recycling service, sales workers need to explain these issues to their clients.

Sales workers also sell recyclables—after they have been sorted and processed at an MRF—to manufacturers to be used as the raw material in new products. To find new clients, sales representatives might have to make sales pitches over the phone or perform in-person presentations. They research their

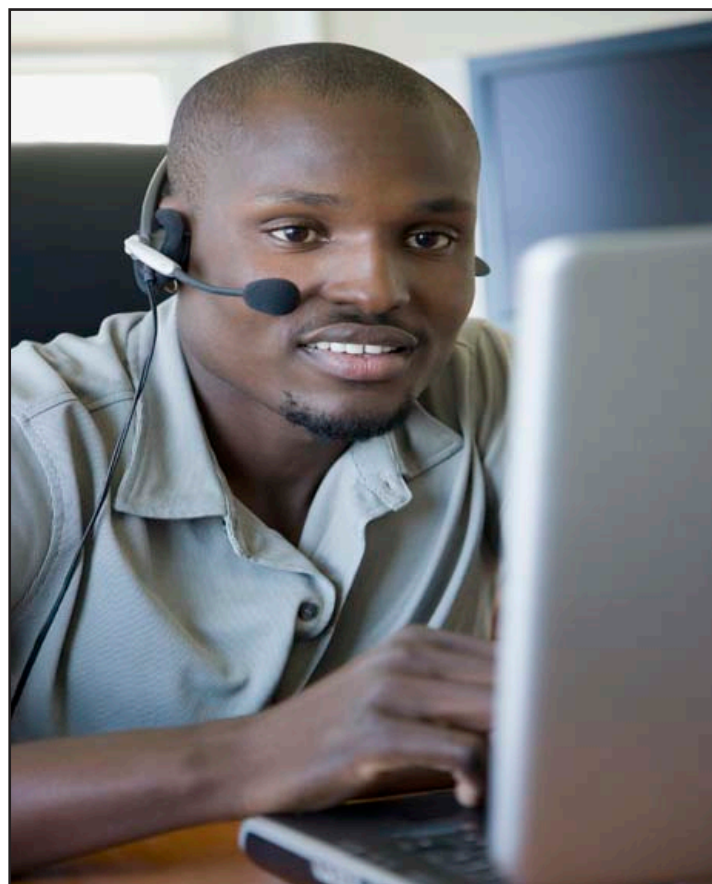
potential clients and devise ways to convince them to use recycled materials in their products. Depending on the recycling contractor, these sales workers might be the same as or different from the sales workers who sell recycling services.

## Credentials

Sales representatives are usually required to have at least a bachelor's degree. Experience in sales, especially waste management sales, is very useful. Communication skills are also extremely important for sales workers. They must be able to find clients and negotiate with them effectively.

## Wages

BLS does not have data specifically for sales representatives working in recycling. However, these workers are included in the occupations sales representatives, services, all other; and sales representatives, wholesale manufacturing, except technical and scientific products. Table 2 shows wages for these occupations in the remediation and other waste services industry group. The wage is the



Sales representatives might sell collection services or sorted recyclables



median annual wage for the United States as a whole; wages vary by employer and location.

Table 2. Selected sales occupations	Median annual wages, 2010 <sup>1</sup>
Sales representatives, services, all other	\$52,540
Sales representatives, wholesale manufacturing, except technical and scientific products	56,150

<sup>1</sup> Occupational Employment Statistics data are available at [www.bls.gov/oes](http://www.bls.gov/oes). The data do not include benefits.

## Conclusion

As recycling continues to grow, more workers will be needed to collect, sort, and process recyclables. Recycling jobs require people with a broad range of skill levels. For example, becoming a sorter has few specific skill requirements, but mechanics and technicians in the recycling industry are highly skilled. MRF and route managers usually have at least a bachelor’s degree. But whether driving large vehicles or operating an MRF, prior work experience—particularly in other areas of waste management—is helpful for those seeking to make a career in the recycling industry.

## Notes

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<sup>1</sup> *Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2009* (U.S. Environmental Protection Agency, December 2010), pp. 1–2, <http://www.epa.gov/osw/nonhaz/municipal/pubs/msw2009-fs.pdf>.

<sup>2</sup> *Municipal Solid Waste in the United States: 2009 Facts and Figures* (U.S. Environmental Protection Agency, December 2010), p. 4, <http://www.epa.gov/osw/nonhaz/municipal/pubs/msw2009rpt.pdf>.

<sup>3</sup> *Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2009*, p. 2.

<sup>4</sup> *Municipal Solid Waste in the United States: 2009 Facts and Figures*, p. 171.

<sup>5</sup> *Ibid.*, p. 156.

<sup>6</sup> *Ibid.*, p. 157.

<sup>7</sup> *2008 ABA Community Survey* (RW Beck, 2009), p. ES-2, <http://www.recycletogether.com/sites/default/files/ABA%20Final%20Report09-28-09.pdf>.

<sup>8</sup> Quarterly Census of Employment and Wages. <https://www.bls.gov/cew>.

