



Maryland
Department of
the Environment

APPENDIX D

WORKERS CONDITIONS, WAGES,
AND BENEFITS



FINAL NEEDS ASSESSMENT | MARYLAND STATEWIDE RECYCLING NEEDS ASSESSMENT





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1 Introduction

Solid waste and recycling collection and processing jobs are dangerous and demanding, and workers' conditions are oftentimes challenging. Solid waste and recycling workers are responsible for driving vehicles long distances, operating in hard to collect areas, completing physically difficult tasks, manually extracting tangles from machinery at facilities, and being exposed to potentially hazardous materials. The solid waste industry has historically been a dangerous industry and continues to be nationally: recent Bureau of Labor Statistics (BLS) data indicates that waste and recycling collection was the fourth deadliest occupation in 2023, with 41.4 fatalities per 100,000 employees.¹

Safety is critical for all aspects of the solid waste industry, as lack of safety contributes to challenges related to workforce development, employee recruitment, and retention. Workforce development and employee recruitment encompasses the entire hiring process from initial screening to integrating new workers into an organization. The solid waste industry, like many others, aims to have a high retention rate, meaning workers stay at their jobs for long periods of time. Worker recruitment and retention is difficult in the solid waste industry and these challenges illustrate potential opportunities for improvement in areas of the State with high recycling service demand.

To fully understand the current conditions, it is important to detail work conditions, wages, and benefits.² Wages are paid on an hourly basis and benefits are provided based on the employer and position.

This memo presents information about industry standards and includes key findings from outreach conducted with various sectors of the solid waste industry. This information aims to provide insight into current conditions in the State of Maryland (State) and highlight concerns or issues, as well as opportunities for improvements throughout the system. The State desires to understand the industry's current working conditions as it plans for future changes and improvements to all aspects of the solid waste system.

1.1 Background

Workers within the solid waste industry include collections drivers and crew (for trash and recycling) and facility staff at drop-off stations, material recovery facilities (MRFs), compost facilities transfer stations, and landfills. Workers in the industry are often exposed to difficult working conditions including long shifts, physical demands, extreme temperatures, and difficult conditions. Workers are required to be skilled in vehicle and machinery operations specific to their job responsibilities. Benefits and wages for workers may vary greatly and can be impacted by unions, private or public employers, job specifications and training, and other factors. Recent examples of worker conditions of concern indicate opportunities for improvement to address these challenges.

¹ U.S. Bureau of Labor Statistics. Graphics for Economic News Release. [Civilian occupations with high fatal work injury rates](#)

² Working conditions are defined as the working environment, characteristics and all existing circumstances affecting labor in the workplace, including job hours, physical aspects, legal rights and responsibilities. Working conditions can vary widely among laborers in the solid waste and recycling industry ranging from a temporary labor on the back of a collection vehicle to operating rolling stock at facilities.

COVID-19 Pandemic

The COVID-19 pandemic illustrates the key role solid waste collections and operations workers play within our communities and the necessary services they provide. Solid waste workers were required to continue their normal operations while much of the country changed their normal routines. Due to the demand for these workers and the expectations to continue service, their importance to our communities was better understood. Worker conditions have been examined more closely in recent years due to the COVID-19 pandemic, with a focus on safety and improving overall conditions for these key positions. There is a medium-term impact from the COVID-19 pandemic on recycling programs that were suspended or discontinued due to labor shortages. The public's trust in recycling is dependent on consistent and reliable service to reinforce that recycled material is truly diverted from landfills.

Labor Strikes

Some instances of extreme working conditions have led to employees going on strike to communicate their frustrations with their roles. Curbside collection workers in Anne Arundel County recently went on strike, protesting for improved working conditions related to wages and safety and demanding that necessary personal protective equipment (PPE) be provided.³

Strikes in various industries can have significant impact on the transportation and distribution of recycling materials. During recent labor strikes at the ports there were major disruptions in the ability to transport bales of recyclables to end markets.⁴ At least 25,000 port workers at the Port of Baltimore went on strike in October 2024 demanding higher wages and a guarantee their jobs wouldn't be subject to automation. This causes bales to remain at processing facilities longer than typically and introduces risks of storing material improperly or generating fires.

Facility Fires

Solid waste facilities are prone to fires due to the types of materials being managed and improper disposal of hazardous materials, including common items like batteries. In August 2024, a major fire occurred in a MRF in Montgomery County, Maryland. There is no indication of what caused this fire, but this incident highlighted potentially hazardous working conditions.

Extreme Weather

A City of Baltimore employee died from heat stress on the job in August 2024.⁵ The working conditions included extreme heat with temperatures over 100 degrees and no water available. Following his death, the community gathered to demand better working conditions for Department of Public Works (DPW) employees. A report requested by the Baltimore City DPW analyzed worker conditions and revealed a lack of procedures related to heat and heat-related illnesses, a lack of training, inadequate facilities, and an environment that discouraged employees from voicing safety concerns. Baltimore City's Administrator has created a

³ Pamela Wood. November 23, 2024. Anne Arundel trash, recycling services to return to normal after strike ends. [Anne Arundel trash, recycling services to return to normal after strike ends - The Baltimore Banner](#)

⁴ Dennis Valera. October 1, 2024. Port of Baltimore workers are now on strike. Here's when we can start feeling the effects. [Port of Baltimore workers are now on strike. Here's when we can start feeling the effects. - CBS Baltimore](#)

⁵ A condition that occurs when the body becomes severely dehydrated and includes symptoms such as cramps, fainting, exhaustion, and stroke.

statewide Heat Illness Protection Plan intended to be implemented by the summer of 2025 as a result of this case and similar situations. ⁶

Unsafe Working Conditions

A City of Baltimore employee was hit and killed by a trash truck on the job in November of 2024. This situation highlights the dangerous nature of solid waste collection due to the proximity to trucks, large equipment, and fast-moving environments. Workers are exposed to potential risks and dangerous working conditions. ⁷

Worker Benefits, Education, and Training

Solid waste worker benefits vary greatly by employer and concerns about adequate benefits have recently been highlighted. On October 1st, 2024, the Baltimore Office of Inspector General published a report detailing discrepancies in health coverage for solid waste employees throughout Baltimore City. A significant finding revealed that 134 solid waste employees lacked health insurance and were unaware of their eligibility for a waiver credit offered to employees with alternative health coverage. Poor communication and accessibility issues with the City's workday system were identified as barriers during the onboarding and benefits enrollment processes. Many employees reported minimal orientation or support, leading to gaps in understanding their benefits. ⁸

1.2 Methodology

Hauler Survey

The team created and distributed a survey to gain insight into topics related to current conditions and the landscape of solid waste and recycling in Maryland from the perspective of waste haulers and facility operators. A detailed survey was distributed to waste haulers across the state, requesting information about current worker conditions, concerns, and opportunities for improvement in the future. This survey aimed to gather authentic information from waste haulers, who have vast knowledge of daily operations and understand the challenges faced by employees within the industry.

Stakeholder Interviews

The project team also conducted detailed stakeholder interviews to gather additional information about specific aspects of the industry. The team identified a comprehensive list of trade and stakeholder organizations with broad representation, including government and planning agencies, recycling-focused nonprofits, and chambers of commerce serving diverse regions and constituencies across the state. The team conducted one-hour interviews with these stakeholders, centering discussions on key topics such as their level of interest and involvement in Extended Producer Responsibility (EPR), perceptions of industry readiness,

⁶ Max Hauptman. August 6, 2024. Baltimore City worker died from overheating, according to medical examiner findings. [Baltimore city employee died from overheating, medical report says](#)

⁷ Cayla Harris. November 21, 2024. Baltimore Trash Collector Who Died From On-The-Job Injuries Remembered as Caring, Generous. [Trash collector who died from on-the-job injuries - The Baltimore Banner](#)

⁸ Office of Inspector General. October 1, 2024. Investigative Report Synopsis. [City of Baltimore Office of Inspector General-October 1st, 2024-OIG Case #25-0004-I](#)

worker conditions, existing partnerships and collaboration efforts, and other relevant issues critical to understanding the current landscape and perspectives on EPR efforts in the state.

Desktop Research and Outreach

To supplement the survey and stakeholder interviews, the project team conducted significant research involving a review of publicly available information and online data. The project team conducted a thorough overview of online resources related to current conditions in Maryland within the solid waste and recycling industry. The data review included scholarly databases, online articles, and available research. Additional sources identified during the review were surveyed for relevant data for this memorandum. The completed research included national databases, statewide and county-specific resources, recent articles or news reports related to the industry, university resources, and more. Below is a list of data sources used; however, this list is not exhaustive. Detailed information about specific sources are identified through footnotes.

- National Data Sources. US Bureau of Labor Statistics
 - SWANA
 - US Department of Justice
 - OSHA
 - RAND
 - Teamsters Union
 - ZipRecruiter
- Statewide Data Sources. Maryland Department of the Environment, Maryland Department of Labor, Maryland Correctional Enterprises, University of Maryland library resources, University of Maryland – Baltimore County library resources, John Hopkins library resources, Maryland Recyclers Network⁹, MD Recycles.org
- Recent Articles and News Sources. US News
 - W US 9 News
 - American Economic Review
 - Capital Gazette
 - Baltimore Sun
 - Baltimore Banner
 - Mount Airy News and more.

Desktop research also focused on understanding the involvement of labor unions, collective bargaining agreements, and organizational groups. Extensive desktop research was conducted to identify unions within the state and to understand their role, as well as the impact of collective bargaining agreements and organizing efforts within the industry.

⁹ The Maryland Recyclers Network is a membership organization comprised of individuals and organizations to promote recycling throughout communities in the State. Members can access several benefits that are all related to further education in the field. First, members have access to educational materials including webinars, conferences, facility tours, and numerous online and physical resources focused on promoting and improving recycling. Opportunities to learn about recycling technology, training in marketing, operations, regulations, policies, etc. are also available. Membership also provides opportunities to connect with members and leaders in the recycling community.

2 Worker Conditions

Worker conditions and safety statistics were identified for each operation within the value chain of recycling. This included the operations for collection services and processing facilities. For the purposes of this evaluation, secondary processors (e.g., glass recovery facilities, secondary plastics processors, paper mills, etc.) were not evaluated. Suboptimal or dangerous working conditions are common for most occupations in the solid waste and recycling industry and contribute to its rank as the 4th most deadly industry in the U.S. with 41.4 fatalities per 100,000 employees.¹⁰ Even though injury and fatality rates for all waste and recycling workers are high, the industry has made a sustained and committed effort to reduce injury rates (e.g., the Slow Down to Get Around national safety campaign).¹¹

2.1 Curbside Collection Conditions

Curbside collection workers' conditions can vary greatly depending on the type of vehicle used and the customers that are serviced. Collection routes may start early in the morning (as early as 4 AM), depending on the customer sector. Vehicles can be categorized as manual or automated collection based on how the collection containers are emptied.

Manual collection vehicles typically require two staff, with one driving the vehicle and the other manually moving collection containers to the truck for emptying. Manual collection is physically straining and potentially dangerous, with workers operating outside of the collection vehicle to complete service. Additionally, there is a higher risk of pinching or crushing injuries to collection workers providing rear load collection services. Manual collection requires employees to move carts and containers to be emptied, which is physically demanding and leads to lifting, crushing, or other overuse injuries. Employee injuries are common and frequent, particularly from repetitive motions from long-term employment. Collection drivers that are not operating automated collection vehicles (e.g., automated side loaders, front loaders) must exit the cabs of the vehicle or a second worker may ride on the back of the vehicle, and are exposed to the weather, both hot and cold climates. Collection crews with manual collection labor are required to be outside for long periods, often in and out of vehicles regularly.

Automated collection utilizes technology on the truck by way of an arm to grab the collection container and empty it, without the need for a worker outside of the collection vehicle. Benefits to automated vehicles include faster collection time, improved safety, reduced labor costs, and reduced carbon footprint. Automated vehicles are often more costly up front. Most new collection programs utilize automated vehicles. These technologies reduce the need for workers to be outside the truck, which significantly reduces the potential for injuries.

Other collection technologies that support worker safety include methods to track collected waste materials and identify potential hazards, cameras located inside and outside the vehicle, and on-board tablets and other vehicle technology that optimizes collection routes and increases customer service capabilities.

¹⁰ Bureau of Labor Statistics. 2023. Civilian Occupations with High Fatal Work Injury Rates. [Civilian occupations with high fatal work injury rates](#)

¹¹ National Waste & Recycling Association. Slow Down to Get Around Campaign. [Slow Down to Get Around - National Waste & Recycling Association](#)

Solid waste collection vehicles have historically run on diesel fuel but there is a growing trend for fleets to use alternative fuels like compressed natural gas (CNG). CNG-fueled solid waste collection vehicles operate more quietly than diesel-fueled solid waste collection vehicles and emit fewer tailpipe emissions, which benefit the health and safety of collection workers.

In 2023, the solid waste collection injury rate among workers was 4.3 cases per 100 Full Time Equivalent (FTE) employees. 24 of the 35 fatalities in 2023 were attributed to transportation incidents. Another four were attributed to exposure to harmful substances or environments. The total recordable illness rate for solid waste collection workers was 13.8 per 100 FTE employees, up significantly from 5.8 in 2022. The incidence rate was 2.0 for respiratory conditions and 1.3 for skin “diseases or disorders,” but most related illnesses were listed in the “other” category.^{12 13}

Both Waste Management (WM) and Republic Services, two large solid waste management companies, set Environmental, Social, Governance (ESG) goals to achieve a total recordable incident rate of 2.0 or lower by 2030.¹⁴ WM reported a rate of 3.08 in 2023, up slightly from its 3.02 rate in 2022 and 3.0 rate in 2021. Republic Services reported a rate of 2.8 in 2023, down slightly from 2.9 in 2022 and 3.6 in 2021.

Overall, collection workers are generally subject to challenging and unsafe working conditions. Broken air conditioning in vehicles, lack of water and ice, sparse PPE, and hot temperatures have all been reported, and contribute to the incident rates reported on an annual basis.

2.2 Facilities

Facilities within the solid waste industry include drop-off stations, processing facilities, and disposal facilities including sanitary landfills. Occupations in this category refer to workers responsible for collecting and managing solid waste including equipment operators, temporary laborers, and material sorters.

2.2.1 Drop-Off Stations

Drop-off stations allow residents to conveniently dispose of various materials in an organized and convenient way. Staff at drop-off sites are typically working on a part-time basis outdoors, working to move materials and interacting with customers that self-haul materials. Drop-off stations are typically owned and operated by public sector organizations that may have limited funding to support enclosures, air conditioning, key utility infrastructure (e.g., 3-phase power), and upgraded roadways and wayfinding to support safe traffic flows and installment of equipment that minimize hazards.

At drop-off stations without enclosures, working conditions require staff to be exposed to weather conditions. Staff are required to move material and likely operate various heavy

¹² Megan Quinn. 2023. Injury rates for waste industry workers fell in 2023, but illnesses rose. [Injury rates for waste industry workers fell in 2023](#)

¹³ Cole Rosengren. 2023. Waste and Recycling Collection Was Fourth Deadliest Occupation in 2023. [Waste and recycling collection was fourth deadliest occupation in 2023: BLS | Waste Dive](#)

¹⁴ The Occupational Safety and Health Administration (OSHA) requires many employers to record serious work-related injuries and illnesses. A recordable injury is any work-related fatality, injury or illness resulting in loss of consciousness, days away from work, restricted work, or transfer to another job.

equipment such as forklifts or loaders to move materials. Staff may be required to handle potentially hazardous materials (e.g., antifreeze, used oil, etc.) and other problem materials, leading to potential harm or unsafe working conditions.

2.2.2 Recycling Processing

MRFs process recycling materials for delivery to end markets. The fleet of MRFs in the State are aging and there are ongoing considerations for facility upgrades to install automated processing technology. These upgrades reduce the need for manual sorting, although manual material sorting is still required at facilities. Worker conditions in MRFs include concerns related to facility age, fires, and injury. In 2022 the MRF worker injury rate across the nation was 4.4 per 100 FTE employees.

Older MRFs with fewer automated processes require more temporary labor and hand-picking materials from conveyor belts, resulting in increased potential dangers due to having an increased number of workers on the sorting line. The ergonomics of a sort line do not favor the sorting employees. Staff are standing for long periods of time, reaching over conveyor belts and searching for contaminants and hazards to remove from the processing line. With the addition of robotic arms, staff responsibilities can change, and their efforts can be used for quality checking. Shift times could be reduced due to fewer personnel being required, which could allow for longer physical breaks from the sorting process or possible utilization elsewhere proactive maintenance is needed.

Some facilities in the State have over 30 line pickers exposed to the continuous process typically operated at MRFs. High contamination rates across the recycling industry can elevate the concern for potential hazards by exposing workers to needles and other medical waste that should not be in the recycling streams, along with other potentially hazardous and problem materials that may impact workers' health.

Daily maintenance operations of unclogging machinery by hand are also required due to recycling contamination that may result in crushing injuries. As many facilities in the State have not been retrofitted with robotics, workers are responsible for separating these contaminants from the system. Tangles are long stringy items that can easily clog or damage equipment. Some facilities have stated that during designated breaks, employees are using their time to unclog machinery to have a more productive shift.

Appropriate fire control, including necessary equipment and fire-fighting equipment (e.g., fire rovers) is necessary in case of fires, which are increasingly occurring at MRFs in part due to batteries and other flammable materials.¹⁵ Recently, MRF fires have become more common due to the rise of lithium-ion batteries in many materials that end up at MRFs. Lithium-ion batteries are a significant safety concern across the industry, particularly in facilities where they can catch fire in equipment or on the sorting line. Batteries can start fires in all areas in the system including trucks, MRFs, and landfills if not removed and disposed of properly. The rate of fires at facilities in Maryland is like those in the surrounding region. The rate of fires in MRFs was lower last year compared to multiple previous years, but there is no indication as to

¹⁵ Resource Recycling. 2021. MRFs Face "Brunt of the Negative Impact: From Battery Fires. [MRFs face 'brunt of the negative impact' from battery fires](#)

why this occurred. Most recently, in August of 2024, the Montgomery County transfer station and recycling center caught fire due to unknown sources.¹⁶

Many MRFs in the State have limited storage capacity for baled materials. Without sufficient space, material may be stored outdoors or in locations that cause safety hazards. If bales are stacked too high, these can result in crushing injuries if bales fall on facility operators or temporary laborers.

WM is constructing a new MRF in Elkridge, Maryland which will feature new, automated machinery, resulting in a reduction of required temporary labor (staff that is paid on an hourly or seasonal basis working under 1,000 hours per year) by about 40%. This shift to automated machinery is described as a solution to recover larger volumes of cleaner recycled material and will require the transition of jobs to higher skilled positions such as equipment operators, mechanics, and maintenance staff.

Facilities such as the WM facility support worker safety and reduce challenges with working conditions through the implementation of technology such as artificial intelligence, optical sortation, and other automation that reduces the need for worker labor and temporary labor in undesirable positions. Such technologies can also improve sorting efficiency and material handling, improving the overall operations at facilities. Technology focused on higher automation does come with increased maintenance and requires higher pay for operators' positions, which can also be a more desirable position. Proper training and safety protocols can reduce incidents and unsafe working conditions, improving facility operations.

2.2.3 Organics Processing

Organics processing facilities receive and process various types of wet and dry materials, typically in large windrows that required significant outdoor space. There are other types of organics processing technology such as aerated static piles or anaerobic digestion which may have enclosed buildings. At outdoor facilities, employees are exposed to elements, and indoor facilities subject workers to odors and emissions that may be harmful over prolonged exposure. Regarding composting facilities in the State, 4.1 FTE jobs are required per 10,000 tons per year of composted material.¹⁷

Equipment in use at organics processing facilities includes scales, screens, windrow turners, grinders, repackaging machines, separators, skid-steers, roll-off trucks, and front-end loaders. These pieces of equipment present potential dangers when in operation. Drivers bringing materials to compost facilities must be acutely aware of their surroundings when disposing of feedstock. Proper signage and assistance from site workers can reduce the risk of accidental collisions of equipment or injuries to workers.

Like MRFs, contamination represents a key hazard at organics processing facilities. If staff need to manually remove contaminants from inbound feedstock or during material processing, they may be subject to abrasive materials, puncture hazards, and heat hazards (e.g., the internal temperature of a composting pile can exceed 150 degrees Fahrenheit). Additional education may be needed for workers to better understand what materials should and should

¹⁶ Sophie Rosenthal. August 5, 2024. Large Fire at Montgomery County Transfer, Recycling Station. [Large fire at Montgomery Co. transfer station](#)

¹⁷ Brenda Platt. May 8, 2013. Composting Makes \$en\$: Jobs through Composting and Compost Use. [Composting Makes \\$en\\$: Jobs through Composting & Compost Use - Institute for Local Self-Reliance](#)

not be accepted at organics processing facilities. As more compostable packaging products are made available to the public for purchase, additional educational materials should be provided to workers, customers and haulers to ensure only acceptable materials are being disposed of at organics facilities.

Many organics processing facilities in Maryland have plans to expand their current site and processes which would require additional staff and equipment to operate and maintain the facility. Adding more capacity and staff may provide opportunities to improve workers' conditions, including safety and exposure to weather conditions.

2.2.4 Transfer Stations

Operations at transfer station facilities are primarily indoors and typically have significant solid waste vehicle traffic. There can be significant safety concerns if residents or self-haul vehicles tip material at the same location as the heavy-duty solid waste vehicles. The key safety concerns at transfer stations are related to vehicle collisions and high volumes of traffic that can result in operator injuries and customer injuries. Typically, there are multiple solid waste collection vehicles entering and exiting facilities at the same time and emptying vehicles. Drivers must be acutely aware of where their vehicle is positioned in relation to other heavy equipment in operation and other drivers walking outside of their vehicle.

Additional staff called spotters can reduce risks of equipment damage and worker injuries while vehicles are backing in and out of tipping floors or working faces. Accidental injuries are more likely to occur when workers are in a rush.

Like MRFs, transfer stations receive materials containing batteries, hazardous materials, and other materials that can be potentially harmful or cause fires. Due to the exposure to such materials, transfer stations can be potentially dangerous places for employees and come with elevating risks and necessary safety protocols. Transfer stations can become especially dangerous if they are inundated with material. This causes large piles to be stored on the tip floors and increases the risk of crushing injuries or pile fires, which are exceptionally challenging to put out.

Based on the Project Team's experience during the waste characterization, field staff at transfer stations in the State indicated that there did not seem to be excessive backlog of material or staffing shortages. However, they also did not observe the major availability of tipping floor space. If recycling materials were to be processed at transfer stations in the state, it would likely require the expansion of existing transfer station buildings and additional staff and equipment to manage the materials.

2.2.5 Landfills

Solid waste disposal at landfills is another key location where work conditions should be considered. Landfills are outdoors and workers are exposed to weather conditions throughout the year. Landfills have high volumes of truck traffic for delivering waste and trash is moved throughout the working area regularly. Workers are likely in vehicles most of the workday, moving waste and supervising the delivery of waste at the landfill. Worker conditions at landfills have the potential to expose staff to hazardous materials in the waste stream and can be

prone to fires due to flammable materials. Like transfer stations, fires occurring at landfills are incredibly challenging to extinguish.

Vehicle operators at landfills manage materials on uneven working surfaces, which causes movement in the cab of front-end loaders and compactors. Prolonged operation of these equipment types can cause lumbar injuries and overuse injuries over time.

The State has three incinerators that employ 1.2 jobs per 10,000 tons per year of material. The state has 22 solid waste landfills. Six of these landfills employ 2.1 jobs per 10,000 tons per year landfilled. Nationally, the injury rate for landfill workers is 3.6 per 100 FTE employees. This was slightly down from previous years. Landfill workers' illness rate was 4.9 in 2023, while the 2022 rate was 8.6.¹⁸

Based on the Project Team's experience during the waste characterization, field staff at landfills in the State did not identify unsafe working conditions such as constrained working faces, excess or uncontrolled traffic, or combined self-haul and solid waste vehicle disposal areas. While there may be queues that form during busier times, there were no instances recorded when facilities seem to be operating in an unsafe manner.

2.3 Overtime

Solid waste workers are often expected to work overtime, particularly in larger urban areas and during peak times, such as during holiday seasons and during storm clean-ups. These workers are often required to work more to account for the additional waste that needs to be collected or processed. Overtime needs arise when the demand for waste collection exceeds the normal amount, such as with unexpected hazardous weather (e.g., ice storms, flooding, etc.) or equipment breakdowns. While there is no specific data on the overtime needs for waste disposal workers in the State, the nature of solid waste collection often necessitates additional working hours to ensure timely collection of waste.

When working hours exceed a typical 40-hour week, it may result in strained working conditions and may lead to additional injury as workers become overtired. Additionally, significant amounts of overtime strains solid waste budgets.

2.4 Education and Training

Education and training for solid waste workers and managers is critical to support safer operating procedures and overall improve working conditions. Solid Waste Association of North America (SWANA) offers various trainings including events, self-paced online courses, group trainings, and many certifications. SWANA provides training and certificates that allow for career development and potential increased career path opportunities.

Class categories include Collection & Transfer, Landfill & Landfill Gas, Manager of Landfill Operations (MOLO), Planning & Management, Sustainable Materials Management, and Safety Trainings. These training courses include safety protocols, providing instructions on proper lifting techniques, use of PPE, procedures to prevent injuries, training related to proper equipment operation, and waste handling procedure training.

¹⁸ Megan Quinn. November 8, 2024. Injury rates for waste industry workers fell in 2023, but illnesses rose. [Injury rates for waste industry workers fell in 2023, but illnesses rose | Waste Dive](#)

The National Waste and Recycling Association provides comprehensive safety program for members. These include:

- Safety Monday, weekly safety tips
- Safety manuals for drivers and workers
- Temporary worker safety training
- Commercial vehicle safety training
- Safety seminars
- Online safety webinars

The ANSI Z245 Standards are national standards set by the National Waste & Recycling Association for waste and recycling equipment, facilities, and operations including:

- Mobile Refuse Collection and Transportation Equipment
- Stationary Compactors
- Water Container Safety
- Facility Safety
- Bailing Equipment
- Waste Container Compatibility Dimensions
- Size Reduction Equipment
- Landfill Operation – Safety Requirements

As technological innovations are introduced in the solid waste field, these standards will need to be updated to support the effective use of new equipment. Learning and training on the job are typical in the solid waste and recycling industry, but training provided by industry groups additionally promotes safe work practices and provides important value to solid waste workers.

2.5 Key Findings

The following presents findings related to worker conditions in the solid waste and recycling industry:

- **Solid waste and recycling workers operate in challenging and potentially unsafe working conditions.** Broken air conditioning in vehicles, lack of water and ice, sparse PPE, and hot temperatures have all been reported, and contribute to the incident rates reported on an annual basis. In 2023, the solid waste collection injury rate among workers was 4.3 cases per 100 FTEs, contributing to the solid waste and recycling industry being ranked the 4th most dangerous job in the U.S.
- **Manual collection of solid waste and recycling increases safety challenges.** Collection drivers that are not operating automated collection vehicles (e.g., automated side loaders, front loaders) must exit the cabs of the vehicle or a second worker may ride on the back of the vehicle and are exposed to the weather, both hot and cold climates. Collection crews with manual collection

labor are required to be outside for long periods, often in and out of vehicles regularly. These tasks are physically demanding and increase safety concerns.

- **Drop-off stations that accept chemicals or hazardous waste may increase risk to staff.** Staff may be required to handle potentially hazardous materials (e.g., antifreeze, used oil, etc.), leading to potential harm or unsafe working conditions.
- **Older MRFs with fewer automated processes require more temporary labor and hand picking materials from conveyor belts, resulting in increased potential dangers.** Daily maintenance operations of unclogging machinery by hand are also required due to recycling contamination that may result in crushing injuries. As many facilities in the State have not been retrofitted with robotics, workers are responsible for separating these contaminants from the system manually.
- **Contamination at organics processing facilities represents a key hazard.** If staff need to manually remove contaminants from inbound feedstock or during material processing, they may be subject to abrasive materials, puncture hazards, and heat hazards (e.g., the internal temperature of a composting pile can exceed 150 degrees Fahrenheit).
- **Loads containing batteries, hazardous materials, and other materials can be potentially harmful or cause fires at transfer stations.** Due to the exposure to such materials, transfer stations can be potentially dangerous places for employees and come with elevated risks and necessary safety protocols. Transfer stations can become especially dangerous if they are inundated with material. This causes large piles to be stored on the tip floors and increases the occurrences of crushing injuries or pile fires, which are exceptionally challenging to extinguish.
- **Prolonged operation of compactors and front end loaders at landfills can cause lumbar injuries and overuse injuries over time.** Vehicle operators at landfills manage materials on uneven working surfaces, which cause movement in the cab of front end loaders and compactors. Repetitive motions can lead to long-term injuries.
- **As technology innovations are introduced in the solid waste field, training and education standards will need to be updated to support the effective use of new equipment.** Learning and training on the job is typical in the solid waste and recycling industry but can be supplemented by formal training provided by industry groups.

3 Labor Considerations

The solid waste and recycling industry is heavily dependent on labor to manage operations effectively and efficiently. This section details key considerations including wages and benefits for solid waste and recycling labor, labor representation (e.g., unions), recruitment and retention of labor, and labor pools that support solid waste and recycling operations including prison labor.

3.1 Salary and Wages

Solid waste workers are typically wage workers, or labor that is paid on an hourly or seasonal basis. **Table 1** compares the average annual wages of refuse and recycling workers in the State and nationally.

Table 1: Average National and Maryland State Wages for Waste Workers

Occupation	Maryland Annual Average Wage	National Annual Average Wage	Percentage Difference
Vehicle Operators	\$54,688	\$56,348	3.0%
Sorters	\$30,847	\$30,776	-0.2%
Mechanics, Technicians, and Machinery Maintenance Workers	\$52,404	\$52,283	-0.2%
Facility Managers	\$82,149	\$84,642	3.0%
Route Managers	\$57,505	\$69,265	20.5%
Sales Representatives	\$76,024	\$75,848	-0.2%

Annual average salary information was retrieved from Maryland-specific and national annual averages on Ziprecruiter.com.

The national average for annual wages exceeds the same positions in the State for drivers (3.0%), facility managers (3.0%), and route managers (20.5%). **Table 2** presents the average salary for solid waste recycling managers and recycling coordinators by region in the State.¹⁹

Table 2: Average Annual Salary by Region

Region	Solid Waste and Recycling Manager	Recycling Coordinator
Western Maryland	\$75,585	\$47,415
Washington Metro	\$173,325	\$114,180
Baltimore Metro	\$146,455	\$101,920
Southern Maryland	\$88,212	\$80,740
Upper Eastern Shore	\$91,350	Not Available
Lower Eastern Shore	\$69,800	\$53,600

This data focuses on manager roles only, as they are more typically salaried positions compared to other positions such as drivers or equipment operators.

¹⁹ Maryland Association of Counties. 2024. Fiscal Year 2024 Survey of County Employee Salaries. [Maryland Association of Counties-2024-Fiscal 2024 Survey County Employee Salaries](#)

The average annual salary in the Washington metro and Baltimore metro regions is significantly higher (e.g., more than double in some cases) than salaries in the Western Maryland, Upper Eastern Shore, and Lower Maryland regions. This may be due to the higher population density in the Washington and Baltimore Metro areas, requiring that solid waste and recycling managers and coordinators have more people and equipment to manage. Further discussion and detail on demographics in the State is provided in **Appendix H: Equity Within Recycling Systems**.

3.2 Benefits

Benefits for recycling employees include employer sponsored non-cash compensation such as healthcare, retirement savings plans, and other insurance policies. While many public entities and private waste management companies offer similar if not the same types of benefits for their employees, the value and types of these benefits can range widely.

Public sector employees often enjoy pension plans that have historically provided a key incentive for retention, as they are fully funded by employers. Recently, there has been a trend where employers are turning to 401K style plans, which shifts the burden of funding retirement accounts to the employee. The following lists benefits that are provided by both public and private sector organizations²⁰:

- Health Insurance
- Dental Insurance
- Vision Insurance
- Employee Assistance Program
- Disability Insurance
- Flexible Spending Accounts
- Training Programs
- Wellness Programs
- Paid Time Off
- Overtime²¹
- Tuition Reimbursement
- 401K
- Pension Plans

²⁰ The Project Team reviewed benefit options in jurisdictions that provide solid waste and recycling services including: City of Annapolis, City of Baltimore, City of College Park, City of Greenbelt, City of Takoma Park, Charles County, Montgomery County, St Mary's County, Talbot County.

²¹ The State of Maryland defines overtime as payment to an employee of one and one-half (1.5) times the regular hourly wage for work performed more than 40 hours per day in a 7-day week. For some occupations in Maryland, overtime is calculated based on a different period. This aligns with the federal Fair Labor Standards Act (FLSA). (Maryland Department of Labor. 2024. [Overtime: In General, The Maryland Guide to Wage Payment and Employment Standards.](#))

3.3 Unions

Unions are a critical stakeholder within the State’s solid waste and recycling systems. Unions represent workers' collective interest, allowing groups of workers to achieve more advantageous wages, benefits, and working conditions. The Project Team did not engage directly with any unions but has summarized key organizations within the State, as shown in **Table 3**.

Table 3: Summary of Unions Representing Solid Waste and Recycling Workers in the State

Union	Local Chapter	Location	Number of Members
International Brotherhood of Teamsters	No 992	10312 Remington Drive, Hagerstown, MD 21740	1,267
	No 570	6910 Eastern Ave, Baltimore, MD 21224	3,203
	No 355	1030 S Dukeland St, Baltimore, MD 21223	6,572
American Federation of State, County and Municipal Employees (AFSCME)	Maryland Council #3	1410 Bush Street, Suite A Baltimore, MD 21230	Unknown, it represents nearly 45,000 members.
	Local #44		Not Publicly Disclosed, Part of the broader council #3
Laborers International Union of North America (LIUNA)	Local # 572	Camp Springs, MD	2,814
	Local # 616	Cresaptown, MD	294
	Local # 710	3200 Wilkens Avenue Baltimore, MD 21229	663

This list provides a snapshot of information on unions in the State based on data summarized from Unionfacts.com

While specific data comparing union and non-union wages for solid waste and recycling workers in the State is not publicly available, unionized positions generally offer higher wages and more competitive benefits due to Collective Bargaining Agreements (CBAs). These unions have established CBAs with both public and private employers in Maryland's solid waste and recycling industries, ensuring that workers receive fair compensation and benefits.

While primarily representing state employees, the American Federation of State, County and Municipal Employees (AFSCME) has been involved in negotiations affecting workers in

various sectors, including waste management. In March 2024, they signed a new three-year agreement with the State of Maryland, securing pay increases and improved working conditions for state employees.

Wages can be lower than industry averages, resulting in issues with employee retention and recruitment. Recent strikes have occurred for curbside collection workers in Maryland, most recently in Anne Arundel County. Workers reported low wages, safety concerns, and lack of PPE were as reasons for this strike.

3.4 Incarcerated and Formerly Incarcerated Labor

Incarcerated individuals (laborers that are currently in jail or prison) and formerly incarcerated individuals (laborers that have previously been in jail or prison) are key elements of the solid waste and recycling labor pool. Generally, there are two categories for workers that are currently incarcerated:

- **Work Release:** Inmates that were working jobs they had prior to being incarcerated and jobs obtained by inmates specifically through ‘workforce development job sources.’
- **Work Detail:** Assigned jobs within County operation. Baltimore City specifically has a work detail program that includes a recycling center in Baltimore. Workers at this center make \$20 a day and regularly work nine-to-ten-hour shifts.

The Maryland Department of Public Safety (DPS) and Correctional Services has a Rehabilitation Work Release program that enables inmates to work for a private employer in the community. **Table 4** shows the participating institutions in the DPS work release program.

Table 4: Participating Institutions in DPS Work Release

Institution	Providing Employment Opportunities In:
Baltimore Pre-Release Unit 926 Greenmount Avenue Baltimore, Maryland 21202 410-234-1878	Baltimore City, Baltimore, Harford, Lower part of Carroll and Upper part of Anne Arundel Counties Public transportation within 2 hours transporting time.
Baltimore Pre-Release Unit for Women 301 N. Calverton Road Baltimore, Maryland 21223 410-223-2260	Baltimore City, Anne Arundel, Baltimore, Frederick, Carroll, Howard, and parts of Prince George’s Counties Public transportation within 60 miles of facility.
Eastern Pre-Release Unit 700 Flat Iron Square Road Church Hill, Maryland 21623 410-810-5400	Caroline, Kent, Queen Anne’s and Talbot Counties Operations - Corrections Transportation.
Jessup Pre-Release Unit 2000 Toulson Road Jessup, Maryland 20794 410-540-2700	Anne Arundel, Howard and Prince George’s Counties Operations - Corrections Transportation

<p>Maryland Correctional Training Center Harold E. Donnell Building 18800 Roxbury Road Hagerstown, Maryland 21746 240-420-1601</p>	<p>Washington County Operations - Corrections Transportation</p>
<p>Poplar Hill Pre-Release Unit 24090 Nanticoke Road Quantico, Maryland 21856 410-845-4580</p>	<p>Wicomico, Worcester, Somerset and Lower part of Dorchester Counties Operations - Corrections Transportation</p>
<p>Southern Maryland Pre-Release Unit 14320 Oakes Road Charlotte Hall, Maryland 20622 301-274-4701</p>	<p>Prince George's, Calvert, Charles and St. Mary's Counties Operations - Corrections Transportation</p>

In 2014 the State utilized prison labor to dismantle and recycle the vacant Maryland Correction Housing in Jessup, Maryland. This process was described as a cost-effective strategy, a process that provided job and skills training for incarcerated individuals, and allowed for increased ability to recycle materials, making the project more environmentally friendly.²²

The Partnership for Re-Entry Programming (PREP) (at the Maryland Department of Public Safety and Correctional Services) focused on providing inmates with necessary skills/training/etc. for re-entry. One of the four components is employment readiness and career development.²³

The C.A.R.E.S. Program (Continuing Allocation of Reentry Services) is a reentry program that has a curriculum including an Employment Readiness Workshop (ERW) class for program participants. The program provides “interviewing skills, a typed self-created resume, labor market information, job searching strategies, general information, and skill building in ‘soft skills’ required in today’s workplace”.²⁴

There are several regional and national programs related to helping inmates and returning citizens get jobs that include jobs in solid waste and recycling including:

- Jails2Jobs is a national program that runs second chance hiring programs across the country. This program has an online database of resources for individuals to find jobs specific to the environmental, green, and energy fields.
- Second Chance Employers Network is a program for employers that join this second chance hiring program. Johns Hopkins in Baltimore is a highlighted employer partaking in this program. Hopkins personally “conducted a five-year study of nearly 500 people it hired with records that showed a lower turnover during the first 40 months of employment than that of non-offenders”. Hopkins partners with other local nonprofits/agencies to oversee and implement special

²² Becky Lewis. April 2018. Inmates Dismantle a Prison – With Administrative Approval. [Inmates Dismantle a Prison - With Administration Approval | Office of Justice Programs](#)

²³ Maryland Department of Labor. Maryland Re-Entry Initiative- Workforce Development & Adult Learning. [Maryland Re-Entry Initiative - Division of Workforce Development and Adult Learning](#)

²⁴ Maryland Correctional Enterprises. Reentry Resources. [MCE- Reentryhttps://mce.md.gov/Reentry](https://mce.md.gov/Reentry)

non-job-related training and services (Living Classroom, Pivot, Catholic Charities, Helping Up Mission, etc.) while they provide the on-the-job trainings.²⁵

- Roots of Success is a nationwide organization that prepares youth and adults from low-income communities and communities with high unemployment for jobs in the environmental field through their Environmental Literacy and Job Training Program. This program includes a curriculum specifically for current and formerly incarcerated individuals. The State of Maryland is a participating state, although their level of involvement is unclear in our research.²⁶
- Gatekeepers is a nonprofit organization based in Hagerstown, Maryland that works with Returning Citizens in all aspects of life, including workforce entry/reentry through a holistic curriculum called 'Business of Living'. This curriculum focuses on educational, occupational, personal, and spiritual life aspects.²⁷

This is not a comprehensive list of resources providing job opportunities for inmates and returning citizens. The Project Team chose to focus on the above programs because they were identified desktop research and each mentioned services or partnerships with the State of Maryland.

3.5 Recruitment & Retention

Nationally, there is a desire to increase recruitment and retention in the solid waste and recycling industry. Despite higher demand for solid waste and recycling jobs, the industry has ongoing challenges with recruitment and retention due to an aging workforce and competitors in other industries competing for the same labor pool (e.g., delivery drivers such as Amazon and FedEx). In 2020, the COVID pandemic exacerbated the issue, and as a result, national solid waste management companies such as WM, Republic Services, Waste Connections, GFL Environmental, and Casella Waste Systems have made recruitment and retention a key priority, especially for younger potential employees entering the workforce.

Based on interviews with key stakeholders, the Project Team discussed ongoing challenges with retention. While retention of truck drivers decreased significantly over the COVID-19 pandemic, it has been rising in recent years.

A key example of a recruitment and retention strategy from the public sector is the City of Baltimore, whose DPW has had 71% of their leadership leave the department since March 2023, but sought to retain vehicle operators by implementing a \$10,000 signing bonuses for Commercial Driver License (CDL) vehicle drivers.^{28 29}

²⁵ Jails to Jobs. Second Chance Employer Profile- RecycleForce. [RecycleForce - Jails to Jobs](#)

²⁶ Roots of Success. About Roots of Success. [About - Roots of Success](#)

²⁷ Gatekeepers. Gatekeepers. [Re-entry | Gatekeepers | Hagerstown.](#)

²⁸ Tolly Taylor. November 20, 2024. Exclusive: 71% of Baltimore DPW's executive leadership departed since March 2023. [Exclusive: 71% of DPW leaders have departed since March 2023.](#)

²⁹ City of Baltimore. March 15, 2023. Mayor Scott Joins DPW, DGS, BCRP, DOT, and DHR to Announce Bonus for CDL Drivers. [Mayor Scott Joins DPW, DGS, BCRP, DOT and DHR to Announce Bonus for CDL Drivers | Mayor Brandon M. Scott](#)

Additionally, a Teamsters union representative advocated for increased retention strategies including seniority bonuses and tenure for employees noting that this would increase retention rates.³⁰

3.6 Key Findings

The following presents findings related to labor considerations in the solid waste and recycling industry:

- **The national average for annual wages exceeds some key waste management positions in the State.** Drivers and facility managers' annual average wages are 3% lower than the national average, and route managers are about 20% lower than the national average.
- **Salaries in the Washington and Baltimore Metro regions are significantly higher (e.g., more than double in some cases) than salaries in the Western Maryland, Upper Eastern Shore, and Lower Maryland regions.** This may be due to the higher population density in the Washington and Baltimore Metro areas, requiring that solid waste and recycling managers and coordinators have more people and equipment to manage
- **Unionized positions generally offer higher wages and more competitive benefits due to CBAs.**
- **Wages and employee benefits in the solid waste and recycling industry can be lower than industry averages, resulting in issues with employee retention and recruitment.** Despite higher demand for solid waste and recycling jobs, the industry has ongoing challenges with recruitment and retention due to an aging workforce and competitors in other industries competing for the same labor pool (e.g., delivery drivers such as Amazon and FedEx). In 2020, COVID-19 exacerbated the issue and as a result, national solid waste management companies such as WM, Republic Services, Waste Connections, GFL Environmental, and Casella Waste Systems have made recruitment and retention a key priority, especially for younger potential employees entering the workforce.
- **Recent strikes have occurred for curbside collection workers in Maryland,** most recently in Anne Arundel County. Workers reported low wages, safety concerns, and lack of PPE as reasons for the strike.
- **Incarcerated individuals and formerly incarcerated individuals are key elements of the solid waste and recycling labor pool.** Generally, there are two categories for workers that are currently incarcerated including work release and work detail.
- **As the state begins to plan for and implement EPR, there is an opportunity to improve worker conditions, wages, and benefits throughout the solid waste industry by supporting advances in technology, increases in wages and benefits.** Worker conditions are of concern across the state and have been

³⁰ Cole Rosengren. January 19, 2023. As some labor strains ease, the waste and recycling industry has further opportunity to grow its ranks. [As some labor strains ease, the waste and recycling industry has further opportunity to grow its ranks | Waste Dive](#)



recently discussed more publicly due to worker injuries and union strikes. The State's commitment to improving worker conditions can be supported through new technology that can minimize safety concerns and move towards more automated systems, increasing the demand for skilled workers.