

### 3.1.3 Demand for Existing Roles

Career levels referenced throughout this paper are defined as follows according to SkillsFuture Singapore (SSG).

As seen below, these are the 3 tracks under Waste Management sector such as Waste Collection, Materials Recovery and Treatment and Disposal. We will analyse the degree of impact on job roles in these categories when key notable trends like AI, Data Analytics and Automation takes place in the near future.

Trends/Job Families	Waste Collection				Materials Recovery			Treatment and Disposal		
	Waste and Recyclables Collection Attendant	Weighbridge Operator	Mechanical Operator/Waste and Recyclables Collection Truck Driver	Operations Director/General Manager	Waste Recycling Sorter	Waste Recycling Machine Operator	Operations Director/General Manager	Waste Treatment Worker/Waste Disposal Worker	Waste Treatment Executive/Waste Disposal Executive	Operations Director/General Manager
Autonomous Vehicles	▶	▶	▼	▶	▲	▼	▶	▲	▶	▶
Wireless Sensor	▼	▼	▲	▶	▼	▲	▶	▼	▲	▶
RFID	▲	▶	▲	▶	▲	▶	▶	▲	▲	▶
Artificial Intelligence (AI)	▼	▲	▼	▲	▼	▲	▶	▼	▲	▶
Big Data and Data Analytics	▶	▲	▲	▲	▶	▲	▲	▶	▲	▲
Outsourcing	▼	▼	▼	▲	▼	▼	▲	▼	▼	▲
Sustainability	▶	▲	▼	▲	▶	▲	▲	▶	▲	▲

Figure 6: Demand for Existing Roles

▼ Skill redundancy or threat of job loss    ▲ Opportunity for skill adjacency, wage progression or increase in mobility demand    ▶ Nominal or minimal impact

The **Mechanical Operator/Waste and Recyclables Collection Truck Driver** carries out operational duties using mechanical motorised vehicles in accordance with the assigned schedules. He/she pulls and manage heavy equipment and objects, estimates the weight load to ensure compliance with load limitations, sweeps roads and roadsides while operating a mechanical and motorised vehicle. With the introduction to Automated Vehicles, such roles may be at risk of redundancy since the number of truck drivers required will be significantly reduced. Additionally, with sensor-equipped bins, demand for existing roles such as **Waste Collection Attendant** would fall with reduced collection trips.



Figure 2: Side loader with a robotic lifting arm attached to the side of the truck

In the area of Job and Skills, changes in job roles have emerging. The role of a Waste and Recyclables Collection Trunk Driver has become more manpower-lean through the introduction of a Side loader which is an idea supported by the Singapore Economic Development Board (EDB)<sup>1</sup>. Collection around blocks can now be completed by a single truck driver from the comfort of his trunk cabin as compared to a two- men collection crew running from one recycling bin to the next previously. This has effectively helped waste management firms like 800 Super Waste Management to improve the working conditions of its staff by being less labour intensive throughout Singapore.

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<sup>1</sup><https://www.towardszerowaste.gov.sg/zero-waste-masterplan/chapter5/>

## INDUSTRY TRANSFORMATION REPORT

### Section 3: Impact of ES ITM on Job Roles

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In the case of **Waste Collector Truck Driver**, which is at risk of redundancy, a Smart Waste Collection Administrator role can be created to operate Claw Controllers to pick up discards. This Administrator will operate his tasks within his truck rather than undertake the manual collection and transfer which is a time-consuming activity. The use of sensor-equipped bins will enable dynamic routing and increase the efficiency of route collection. Such technology will improve the working environment and will uplift the skills of the workforce.