

SORTING METHODS AND TECHNOLOGIES

Separating the different elements found in waste streams is essential for enabling the recovery of useful materials and minimising the amount of material sent to landfill.

This document will give you a brief introduction to the main methods and technologies currently used in New Zealand, as well as some of the main issues to consider when choosing the appropriate method for your site and/or project.

AUTOMATED VERSUS MANUAL SORTING SYSTEMS

There is a wide variety of sorting systems and technologies used in New Zealand. These range from basic manual systems, usually operated by smaller contractors, often community-owned, through to large automated systems operated by local authorities or multi-national corporations. There are advantages and disadvantages to both systems. Some automated systems that had been in place for many years are now going back to manual sorting of glass at the collection point.

MANUAL SYSTEMS

Manual collection systems are normally referred to as those systems that sort material at the kerbside or at the time of collection.

Recyclable materials are put out by householders at the kerbside in open crates or bins, with paper and cardboard generally bundled separately and set next to the bin. Bins and bundles are picked up by runners and sorted at source into compartmentalised trucks. When the truck arrives at the processing centre to unload, the material is already sorted and can be unloaded in a sorted or semi-sorted form. In some systems materials are sorted further on the truck while it is still moving.

Materials are then baled or put in containers and sent to domestic and international markets for further processing.

Advantages:

- Low set-up costs, which makes it possible for small local contractors to bid for collection contracts
- Low contamination rates because of source-separation
- Flexibility - new materials can be added to collections at short notice
- High labour requirements – good for local employment.

Disadvantages:

- Not as visually impressive as automated options
- Usually smaller crates or bins must be used and carried to the kerbside by householders
- Potential littering from wind or overflowing bins
- There are greater health and safety issues for runners getting on and off vehicles and handling material.

AUTOMATED SYSTEMS

Most large cities and towns have introduced automated systems where household recyclables are put in one wheelie bin which is picked up with an automated side-loader truck. This is often called single stream recycling. In some cases material is compacted when the collection vehicle is full causing breakage of glass and loss of potentially recyclable product as well as contamination of other material. All the material is transported to a Materials Recycling Facility (MRF). The contents of the truck is emptied onto a tipping floor and moved by conveyor to a pre-sorting area where large contaminants can be removed by hand. The material can then be sent along on a series of trommels and conveyors to separate out glass, paper, cardboard etc. This normally goes past workers that hand sort the material.

Some MRF's use magnets to remove ferrous metals and eddy current separators to remove non-ferrous (aluminium) materials. Further mechanical separation can occur with near-infra-red sorting devices to separate paper from plastics as well as different types and colours of plastics. There are some facilities that can use optical sorting to separate glass into colours and they will even detect and sort small pieces of broken glass. Materials are then baled or put in containers or sorting bunkers and sent to domestic and international markets.

Advantages:

- Convenience for householders as everything goes into one bin
- Improved health and safety for contractors since there are no runners on the road. The driver generally does not ever leave the vehicle
- Less litter than a crate system
- Larger bins (wheelie bins) can be used making the collections more cost effective and less frequent
- MRF's can handle large volumes of material

Disadvantages:

- High set-up costs for specialised trucks and facilities which means only large businesses can bid for contracts
- Long contracts (often 10 to 15 years) limiting flexibility to react to changes to material types collected
- Potential for diminished public confidence as recyclables can end up in landfill because of contamination or unmarketability.
- Generally lower quality commodities produced due to the inability to separate to as high a standard as a manual process.
- Fewer opportunities for employment



SORTING AT SOURCE

A key principle of resource recovery is keeping materials clean and separated so they get recycled. If they are not contaminated with other products it also gives the commodities a higher value once they are processed. By encouraging those who generate waste (householders, businesses, schools etc) to sort it correctly at source, cleaner commodities are available at the time of collection.

For example, collecting glass separately from domestic and commercial co-mingled collections means, other materials do not get contaminated with broken glass. Many local authorities and private companies that provide kerbside recycling services are now looking at collection services that separate glass at the source of the collection.

The advantages in sorting at source include:

- Cleaner and higher value materials through less contamination
- Cheaper processing equipment and lower processing costs needed
- Creates more employment opportunities for collectors
- Hands-on participation by everyone who produces waste.



CONTAMINATION

Contamination occurs when one material is mixed in with another, lowering the value of everything. In general, the cleaner or less contaminated the recycled material, the better the price paid for it. Also, less contamination means more material collected can be recycled and less sent to landfill.

Some materials, such as glass, have more contamination issues than others. For example, it takes only a very small amount of pyrex or window glass for a whole glass shipment to be rejected and sent to landfill. Glass can also be a contaminant when shards from broken bottles get embedded in paper and cardboard.

Organic waste (such as green waste and food waste) is another material that is easily contaminated, making it unfit for processing into compost.

