



Beyond transfer stations → What's next?

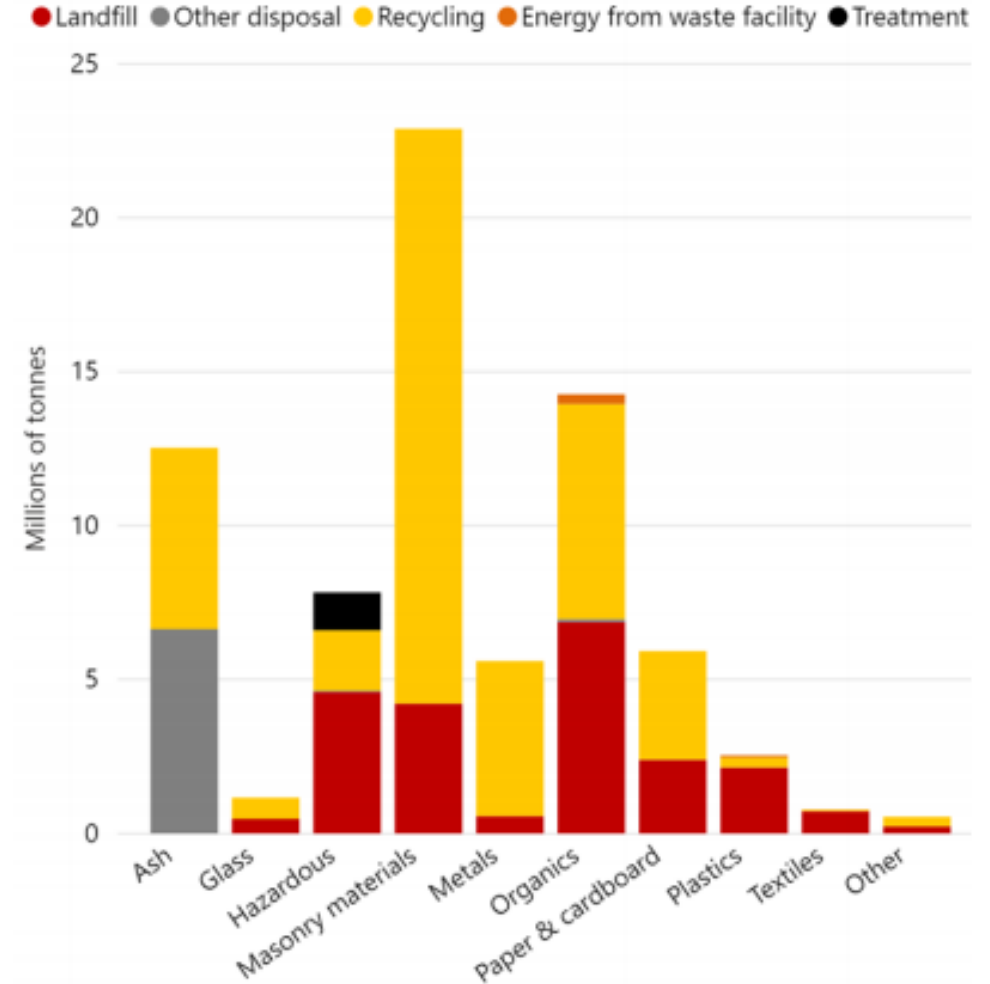
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Welcome

Council challenges

Can include:

- Diminishing local landfill airspace
- Increasing cost of managing or using landfills
- May no longer operate own landfill
- Wish to increase resource recovery
- Existing facilities don't address MSW and C&I waste streams



New roles for transfer stations?



- Some Councils no longer operate their own landfills, and are sending their wastes unprocessed to regional landfills or to landfills operated by other Councils.
- Transfer stations now become the only point at which waste is received, and where the main opportunity is to recover resources.
- Can transfer stations be redesigned or reconfigured to help regional Councils reach their resource recovery targets?
- What other reasons are there to do more?

Why do more?

- Some extracted materials will pay for themselves and make a profit e.g., metals
- Others will provide a potentially useful product e.g., MWOO for landfill daily cover
- Car batteries are valuable
- Some materials may become valuable in future e.g., plastics
- New energy from waste facilities will require “clean” and pre-sorted fuels to meet the NSW Energy from Waste Guidelines (<1% chlorine, no hazardous materials)
- The NSW Energy from Waste Guidelines allow 100% of the municipal residual waste from a “processing facility” to go to an EfW facility, if a Council has recyclables and FOGO collections – otherwise only 40% or 25%

Table 1: Resource recovery criteria for energy recovery facilities

Mixed wastes		
Waste stream	Processing facility	% residual waste allowed for energy recovery
Mixed municipal waste (MSW)	Facility processing mixed MSW waste where a council has separate collection systems for dry recyclables and food and garden waste	No limit by weight of the waste stream received at a processing facility
	Facility processing mixed MSW waste where a council has separate collection systems for dry recyclables and garden waste	Up to 40% by weight of the waste stream received at a processing facility
	Facility processing mixed MSW waste where a council has a separate collection system for dry recyclables	Up to 25% by weight of the waste stream received at a processing facility
Mixed commercial and industrial waste (C&I)	Facility processing mixed C&I waste	Up to 50% by weight of the waste stream received at a processing facility
	Facility processing mixed C&I waste where a business has separate collection systems for all relevant waste streams	No limit by weight of the waste stream received at a processing facility
Mixed construction and demolition waste (C&D)	Facility processing mixed C&D waste	Up to 25% by weight of the waste stream received at a processing facility
Residuals from source-separated materials		
Source-separated recyclables from MSW	Facility processing source-separated recyclables from MSW	Up to 10% by weight of the waste stream received at a processing facility
Source-separated garden waste	Facility processing garden waste	Up to 5% by weight of the waste stream received at a processing facility
Source-separated food waste (or food and garden waste)	Facility processing source-separated food or source-separated food and garden waste	Up to 10% by weight of the waste stream received at a processing facility

Needs and aspirations

Key objectives for a new transfer station could include:

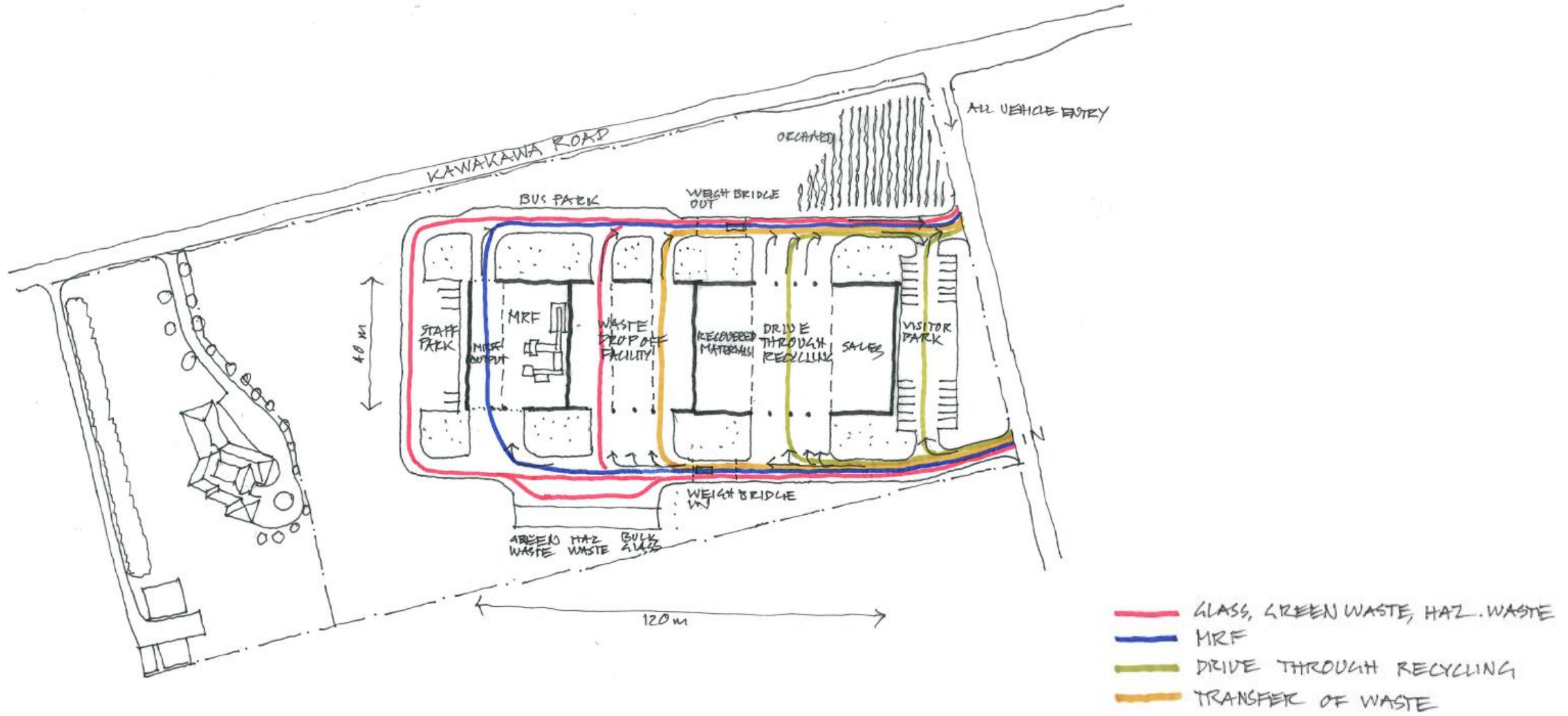
- Provide long term community access to a high quality waste management facility
- Capacity to receive municipal waste for transfer to processing facilities or landfill (post FOGO)
- Capacity to recover various waste streams from MSW and C&I waste
- A flexible space that can accommodate different sorting equipment based on availability of markets for resource streams
- Ability to educate the community on circular economy and sustainability principles



Options for transfer stations

#	Option	Description
1	Bulk Transport	<ul style="list-style-type: none"> • Minimal intervention approach • Limited manual recovery of resources takes place on tipping floor, remaining material is loaded for bulk haul to landfill or regional waste-to-energy facility
2	Active Resource Recovery	<ul style="list-style-type: none"> • Recovery of specific resource types, separating recyclable materials • Level of investment in automated sorting equipment subject to market demand and prices for different resources • Remaining material loaded for bulk haul to landfill or regional waste-to-energy facility • May require waste sterilization as initial process
3	Engineered Fuel Production	<ul style="list-style-type: none"> • Active resource recovery, followed by shredding of remaining waste to produce processed engineered fuel (PEF) • Require strong market for PEF, or dedicated customer to justify purchasing or operating a shredder and associated equipment • May require waste sterilization as initial process

Integrated facility



Requirements for resource recovery centres



- Space – resource recovery activities require large floor areas
- Ideally, single level building, large span
- External buffer zones – noise and odour
- Ventilation – negative air pressure and biofilter
- May be suitable for industrial areas

Economics

- The economics depend upon a number of factors, including the capital costs of equipment and extra building area, and operating costs (energy, labour)
- Markets for outputs such as fuel or RDF/PEF, potential utilization of byproducts such as MWOO are also important
- Metals, batteries and other materials may be worth recovering
- Simple processing of wastes makes 100% of residuals eligible for EfW
- Joint facilities between smaller Councils may improve economics
- Simple versions involving more manually based approaches may be feasible



Waste streams and products

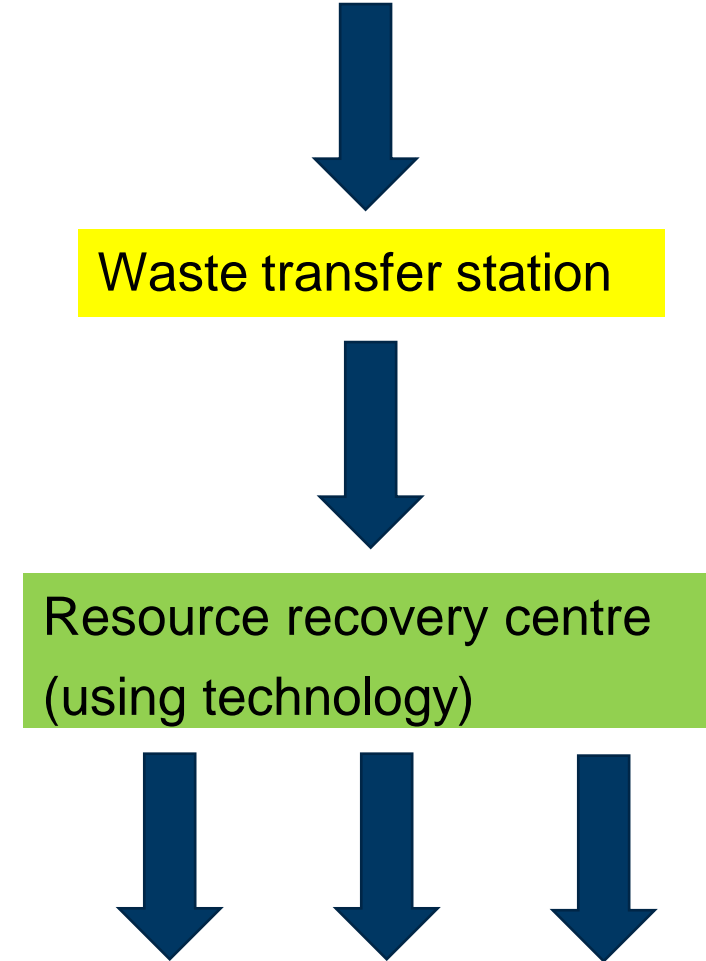
MSW and wet commercial waste stream:

- Dirty MRF
- Waste sterilization (auto claving)
- Fuel production

Dry commercial waste stream:

- C&I MRF
- Fuel production
- Combination of above (MRF and fuel production)

All options require a Resource Recovery Centre to be connected to the transfer station building, or integrated within it.



Dirty MRF

- Enables metals, plastics, cardboard to be recovered from MSW and commercial waste
- Potential issues with odour (OHS and environmental) due to remaining food in waste streams (despite FOGO)
- Residuals may be suitable as fuel for energy from waste plants
- Plants can be mainly manual and target specific materials, or more sophisticated (to extract broader range of materials)



MRF operations

- Simple system could be as follows:
 - Manual removal or bulky wastes
 - Bag opener
 - Conveyor with hand picking of hazardous items
 - Magnet above belt to remove ferrous metals
 - Eddy current above belt to remove non-ferrous metals
- Remaining material can either:
 - Go directly to landfill
 - Be sent to an EfW facility
 - Be processed into RDF
 - Have organics extracted to produce MWOO (for daily cover)
- Sterilisation of the waste using autoclaving, or by drying the waste, may be undertaken either before or after resource extraction



Source: Wastech

Autoclaving

Biomass Coffs Harbour facility in NSW

- Processes approx. 40,000 tpa. of ‘red bin’ material
- Involves injecting waste with steam to kill pathogens and turn into mulch
- Enables plastics and metals to be easily recovered
- Region has FOGO scheme, however still a lot of food related material in waste
- Significant recovery of metals and MWOO used for landfill daily cover



Source: Biomass Resources

Fuel production

- Simplest option – manual separation of combustibles and baling of material, for offsite processing
- Alternatively, size reduction can take place on site, to produce more sophisticated fuel product such as PEF
- With increasing level of complexity, capital and operation costs increase
- Basic separation may be most suitable option for smaller Councils unless specific customers such as cement kilns require PEF
- Energy from waste plants use moving grate infeed system, so do not require fuel to be presented as small fragments i.e. PEF



Conclusions

- Transfer stations integrated with resource recovery technologies provide the best opportunity for Councils to divert waste MSW and C&I streams from landfill
- Extraction of metals, plastics, and other recyclables, conversion of combustible material to fuel, and production of alternative daily cover for landfilling are possible
- Processing of wastes require significant building areas, labour, energy, and a suitable location
- Business case needs to consider both short and long term financial and environmental goals
- More challenging than business as usual, however ultimately rewarding!





*** Thank You**