Towards Zero Waste Strategy Magnetic Island (Yunbenun) 2025-2030

Technical Report

Towards Net Zero Community Action Climate Project

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Magnetic Island (Yunbenun) - Wulgurukaba Country Acknowledgement

We acknowledge the Wulgurukaba people as the traditional custodians of Magnetic Island (Yunbenun) and value our collaboration with them. We recognise their continuing connection to the land and waters and thank them for protecting this coastline and its ecosystems since time immemorial. We pay our respects to elders past and present and extend that respect to all First Nations people present today.

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ACRONYMS

APC	APC Waste Consultants
CBA	Cost benefit analysis
COFO	Commercial food organics
CRS	Container Refund Scheme
C4C	Containers for Change
ESD	Ecologically Sustainable Development
EWC	End of Waste Code
EPS	Expanded polystyrene
FO	Food Organics
FOGO	Food organics and garden organics
GHG	Greenhouse gas
GO	Garden organics
GBRF	Great Barrier Reef Foundation
GBRMPA	Great Barrier Reef Marine Park Authority
MGB	Mobile garbage bins
MI	Magnetic Island
MICDA	Magnetic Island Community Development Association
MIRRA	Magnetic Island Residents and Ratepayers' Association
MRF	Material Recovery Facility
MSW	Municipal solid waste
NQROC	North Queensland Regional Organisation of Councils
NWP	National Waste Policy
Qld	Queensland
RVM	Reverse Vending Machine
SDG	Sustainable Development Goals
SUP	Single-use plastics
TEL	Townsville Enterprise Limited
TCC	Townsville City Council
TS	Transfer station
UNESCO	United Nations environmental, scientific and cultural organisation
WRR	*Waste Reduction and Recycling Act*
ZWMI	Zero Waste Magnetic Island

WASTE TERM DEFINITIONS

Contaminant: Item that is not accepted for processing in the bin it is placed in.

Commingled recycling: mixed dry recyclable materials.

FO – food organics bin typically used in commercial premises for food waste recovery.

FOGO – food organic and garden organics typically processed into a compost product.

Diversion rate: The percentage of the total waste stream diverted from disposal

$$\text{Diversion rate (proportion of waste diverted from landfill)} = \frac{\text{Weight of recyclables and recoverables}}{\text{(Weight of total waste + recyclables + recoverables)}} \times 100$$

Packaged food: container with residual food aid that would be considered a contaminant in a recycling or waste treatment facility if not decanted .

Recyclable: Able to be recovered, processed and used as a raw material for the manufacture of useful new products through a commercial process.

Recycling stream: Material source-separated for the purposes of recycling.

Recovery rate:* The amount of material recovered from a product group as a percentage of overall consumption.

$$\text{Recovery rate} = \frac{\text{Weight of recyclables in recycling bin}}{\text{(Weight of recyclables in recycling bin + weight of recyclables in general waste bin)}} \times 100$$

Source separation: Physical sorting of the waste stream into its components at the point of generation.

Total waste stream: The combined waste and recycling streams.

Total organics – all organics materials in the waste stream

Waste composition: Component material types by proportion of weight or volume .

1. INTRODUCTION

Situated within the World Heritage-listed Great Barrier Reef area, Magnetic Island is 8 kilometres off the coast of Townsville and is administered by the Townsville City Council (TCC). Approximately 78% of the island landmass is a declared national park and the surrounding coastline is a dedicated marine park. Magnetic Island is home to a permanent population of 2,475 residents. The Tourism Master Plan states the island hosted 290,000 visitors staying 880,000 bed-nights in 2023 and estimate by 2025 320,000 visitors with projections of 400,000 visitors by 2030.

The Magnetic Island Community Development Association (MICDA) secured a Community Climate Action Grant from the Great Barrier Reef Foundation (GBRF) to implement a *Towards Net Zero Magnetic Island (Yunbenun) Climate Action Project*. A component of this is to develop a *Towards Zero Waste Magnetic Island Waste Strategy* to accelerate community climate action by reducing waste and greenhouse gas emissions across households, businesses and the tourism sector.

Waste is produced by every individual, every day. As a society, we need to consider what we buy, how we use it, and when and how we discard items, we no longer want or need. Taking actions based on the waste hierarchy of refuse, reduce, reuse, recycle, return and re-manufacture help to save raw materials, energy, water and greenhouse gases used in manufacturing items.

Organic materials, including paper, cardboard, garden waste, food, timber and textiles break down in landfill, creating methane, a greenhouse gas 23 times more potent than carbon dioxide and a major contributor to climate change. The Queensland and Commonwealth governments have announced policies seeking to halve the amount of food waste generated by 2030 and reduce the amount of waste to landfill by 80% by 2050.

The *Towards Zero Waste Magnetic Island Waste Strategy* (the Strategy) draws on both qualitative and quantitative data. Qualitative data was collected during the community consultation through focus groups, community and visitor surveys, and stakeholder engagement. A detailed waste audit provides an evidence base for understanding of what we do, how much waste we generate, the types of waste produced, and how well we separate our waste at households, hospitality venues, accommodation, litter bins, and at selected events - including the annual 2 Bays Trail Run and weekly Sunday markets are Horseshoe Bay.

Magnetic Island's small population presents the added challenge of the management of waste generated by the 290,000 visitors per annum who stay the equivalent of 880,000 bed-nights.

This discussion paper provides a summary of 'where we are' and 'where we want to be', based on the principles of a circular economy which aims to keep resources in use, and waste out of the environment. It focuses on the waste hierarchy actions of Rethink, Refuse, Reduce, Reuse, Repair, Refurbish, Remanufacture, Repurpose, Regift, Recycle and Recover.

The Strategy aims to be environmentally sustainable, politically acceptable, socially responsible and economically viable, while reflecting the community's priorities and aspirations. It aims to guide the island's waste management programs, polices, and projects from 2025 to 2030.

The Strategy includes a target based on best practice and aligned with state and commonwealth government policy.

2. THE APPROACH

MICDA engaged APC Waste Consultants (APC) — industry experts with extensive experience and expertise in waste management on islands and remote communities — to guide the development of a new waste management strategy. The project has been delivered in seven stages, as shown below:

Stage 1: Site visit – A site familiarisation trip was conducted to observe waste infrastructure and meet with key stakeholders, to gain an understanding and appreciation of both the island and its relationship to waste management.

Stage 2: Zero Waste (ZW) planning workgroup and stakeholder identification – This was held with TCC, MICDA, Zero Waste Magnetic Island (ZWMI) and Plastic Free NQ representatives to inform stage 4.

Stage 3: Waste audit – Townsville City Council (TCC) commissioned a waste audit to support the development of the waste strategy and provide an evidence base for decision-making. The audit, conducted in May 2024, provided detailed granular data on waste generation and composition across a range of sources. Refer section 5.

Stage 4: 'Rethinking Waste' Community consultation and stakeholder engagement – The Rethinking Waste consultation was held in November 2024, using a combination of a presentation to the Residents and Ratepayers' Association, focus groups, stakeholder meetings, and surveys of residents and visitors. Refer section 6.

Stage 5: Technical Paper – This report sets the scene for 'where we are' and discusses a range of options to get to 'where we want to be' while identifying both opportunities and constraints. It provides the background for the strategy.

Stage 6: Draft Towards Zero Waste Strategy – This draft document for community consultation sets out the strategic framework and a roadmap, including a detailed action plan with timeframes and responsible parties for implementing each action to achieve the stated vision, mission, gaols, and targets.

Stage 7: Community and stakeholder consultation on draft Strategy – To be held during July 2025 and subject to a separate report.

Stage 8: Prepare final strategy – Based on the feedback from the consultation phase and any other new developments.

Stage 9: **Launch** – the Towards Zero Waste Strategy will be launched at an event on 6 September 2025 on Magnetic Island.

3. GUIDING PRINCIPLES AND CURRENT POLICY APPROACHES

Different communities face different waste issues and have different motivations therefore require tailored solutions. While recognising the need for flexibility based on economic, social, and environmental conditions, the overarching principles of any waste strategy should be the Principles of Ecologically Sustainable Development (ESD) and the waste hierarchy.

3.1 Principles

3.1.1 Ecologically Sustainable Development (ESD)

The principles of ESD have been incorporated into several Australian state and federal environmental laws. They provide guidance on the management of waste and the facilities that recover, treat, or contain it. The principles of ESD are:

- The precautionary principle
- Intergenerational equity
- Conservation of biological diversity and ecological integrity
- Polluter-pays principle

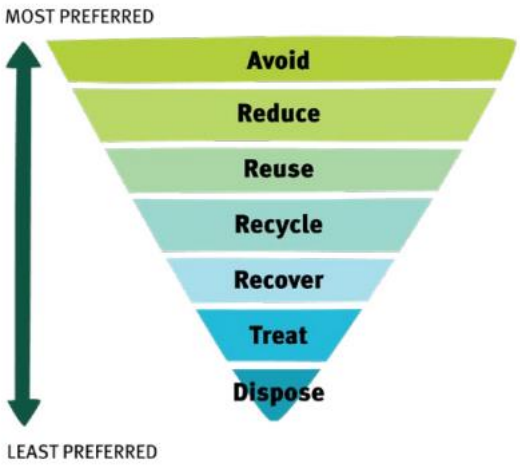
The four principles aim to govern waste management by ensuring that:

- Waste does not cause negative or unintended consequences to the wider environment
- Waste does not affect biodiversity and ecological integrity
- Waste is the burden of the current generation and not shifted to future generations
- The generator of the waste bears the full cost of the treatment and management

3.1.2 Waste Hierarchy

The waste hierarchy is an internationally accepted guide for prioritising waste management practices. The hierarchy has evolved over the past four decades and sets out the most-to-least-preferred methods for waste management in 7 steps, as depicted in the following diagram.

Figure 1 Waste Hierarchy



3.1.3 Queensland Government Draft Waste Strategy, 2025–2030 principles

The Draft Waste Strategy, 2025–2030 – Less Landfill, More Recycling enshrines these principles, as outlined below:

Figure 2 Draft Waste Strategy, 2025–2030 – Less Landfill, More Recycling principles

To achieve our waste recovery rates all levels of government and the private sector need to work together to make recycling easier for Queenslanders. The following principles underpin our approach:

Collaboration

- Collaborative approaches will drive innovation, investment, information sharing and communicate opportunities.
- Aim to be outcomes focused.
- Initiatives and investments will target delivery against the Waste Strategy targets.
- Implementation is actively inclusive of diverse, economic, social, cultural and environmental perspectives so solutions are functional and resilient.

Accountability

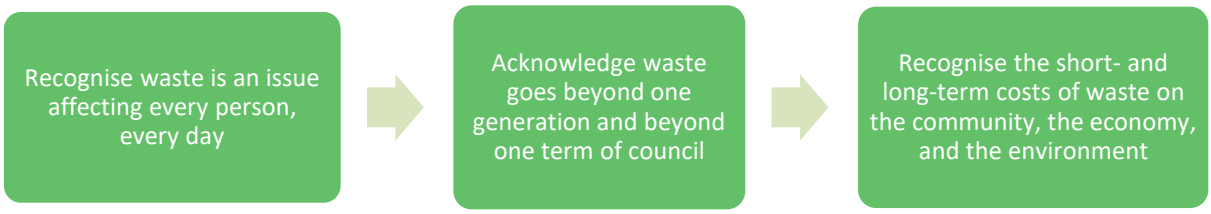
- Roles and responsibilities for specific priorities are clearly assigned.
- Progress towards priorities are monitored and reported regularly.

Transparency

- The draft new Queensland Waste Strategy is underpinned by a clear framework and enabling initiatives.
- Information on implementation of priorities, actions, sequencing and funding are clearly communicated.

3.1.4 Council and community principles

It is expected that Council and the community will:

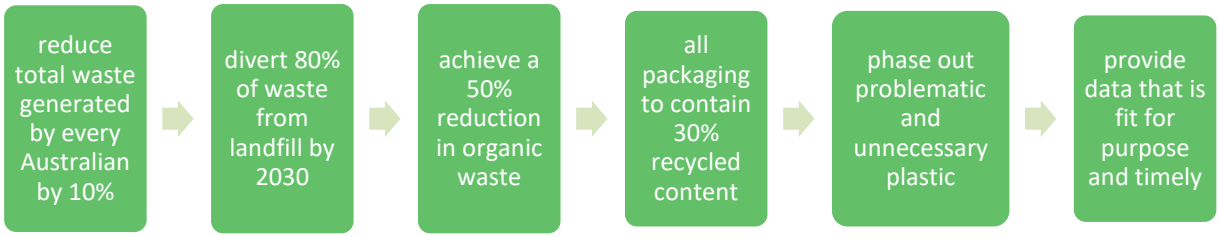


3.2 Current relevant national policies

Any local strategy needs to consider the agenda and policy directions of other tiers of government.

3.2.1 National Waste Policy

In 2018, the federal government released an updated national waste policy with key targets to be achieved by 2030, including:



The National Waste Policy (NWP) 2018 links Australia's commitment to the United Nations (UN) 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDG), and our obligations under the UN Framework Convention on Climate Change in reducing greenhouse gas emissions primarily through the diversion of food waste from landfill. The policy commits circular economy principles to a whole-of-waste-management system.

The latest report released in December 2024 for the year 2022–23 shows Australia produces 75.6 million tonnes of waste each year, which equates to 2.8 tonnes per person, per year. We recover 63% of our waste through recycling and the generation of energy-from-waste[1].

3.2.2 The National Food Waste Strategy (2017)

The strategy focuses on activities to reduce Australia's food waste by 50% by 2030, by establishing four priority areas: policy, market development, business improvement and behaviour change.

3.2.3 National Soil Strategy (2021)

Australia's first national policy on soil sets out how Australia will value, manage, and improve its soil for the next 20 years. This includes Goal 2d – increase and maintain soil organic carbon.

3.2.4 Reef 2050

The Reef 2050 Plan[2] is Australia's overarching strategy to improve the Reef's health and resilience and sets out how we will work together to protect and manage the Great Barrier Reef to 2050 based on scientific research, analysis, and lessons learnt. Its focus is delivering coordinated local, national, and global action in key areas through a series of 5-year objectives and goals which are reviewed every 5 years to respond to current and emerging issues.

The Plan has 5 priority areas for action:

1. limit the impacts of climate change
2. reduce the impacts from land-based activities
3. reduce impacts from water-based activities
4. influence the reduction of international sources of impact
5. protect, rehabilitate and restore.

Relevant to this current plan 2021-2025 is to the following goal:

- Reducing marine debris, rubbish pollution, and at-sea disposal of waste - particularly plastic- is important because these issues cause environmental, economic, aesthetic, and human health impacts. The most common marine debris found in the Great Barrier Reef Region are plastic remnants (including lids, wrap and containers), rope and net scraps, cigarette butts, and rubber footwear[3].

3.2.5 Thrive 30

The Commonwealth tourism strategy aiming to return the sector to pre-pandemic levels with 40% of this visitor spend being in regional Australia.

[1] National waste and resource recovery report 2024

[2] Reef 2050 Long-Term Sustainability Plan

[3] Plastics in our oceans and waterways - DCCEEW

3.3 Current relevant Queensland policies

3.3.1 Draft Queensland Waste Strategy 2025–2030 – *Less Landfill, More Recycling*

The Queensland Government has released its new draft five-year strategy which sets out a vision for waste reduction and recycling and contains ambitious targets around a framework for reducing waste, boosting recycling, and supporting jobs in a more circular economy.

Figure 3 Waste reduction, diversion and recycling targets in Waste Strategy

	2025		2030		2040		2050	
	Divert target 2	Recycle target 3	Divert target 2	Recycle target 3	Divert target 2	Recycle target 3	Divert target 2	Recycle target 3
MSW	55%	50%	70%	60%	90%	65%	95%	70%
C&I	65%	53%	80%	60%	90%	65%	95%	>65%
C&D	75%	75%	85%	80%	85%	>80%	85%	>80%
ALL	65%	60%	80%	65%	85%	70%	90%	75%
Household waste reduction[4]	10%		15%		20%		25%	

It states that the Queensland Government will continue to work in partnership with industry, local government, and the community to facilitate solutions that fit local contexts, acknowledging that everyone has a role to play in improving the management of Queensland's resources to protect the environment.

The document is currently out for consultation until 26 June 2025.

Figure 4 Actions based on waste hierarchy to meet targets in waste strategy

Reduce

- the need for single-use items such as plastic bags, coffee cups, and excess packaging is eliminated
- items are borrowed, rented, or shared rather than purchasing brand new
- product design uses recycled materials, reduces packaging and is designed for recyclability as much as possible.

Reuse

- items are repaired rather than purchasing brand new
- product design allows for repair, reuse, and recycling, and aims for efficient and safe disassembly at the end of the product's life.

Recycle

- waste is sorted into recyclable components to improve reuse and recycling
- cutting edge technology for collection and recycling of products is utilised and innovation supported
- markets are developed for recycled products.

Harness economic opportunity

- new jobs and industries are a created from reducing, reusing and recycling materials
- increased economic opportunities are created from innovation in manufacturing
- more regional and remote job opportunities are created by growing recycling infrastructure.

3.3.2 Other state-based policies and programs

The following significant policies have been introduced in Queensland:

- 1 July 2018 – plastic bags ban
- 1 November 2018 – Container Refund Scheme (CRS) for eligible used beverage containers
- 7 November 2019 - Tackling Plastic Waste: Queensland's Plastic Pollution Reduction Plan – the Plastics Plan
- 1 September 2021 – single-use plastic (SUP) ban on straws, plastic stirrers, plates and bowls, cutlery, and expanded polystyrene (EPS) takeaway food containers and cups
- 1 September 2023 – cotton buds (plastic stems), EPS loose packaging, and heavy-weight plastic shopping bags ban
- 1 November 2023 – CRS extended to include wine and spirt containers in glass

3.3.3 Destination 45 Tourism masterplan

The Queensland Government has released a 20-year tourism roadmap to increase tourism with an emphasis on low impact, nature-based travel for the eco-conscious traveller which matches the MI profile. With the Olympics in 2032 brings a potential surge in profile and visitation.

3.4 Regional plans

3.4.1 North Queensland Regional Waste and Resource Recovery Plan

The North Queensland Regional Organisation of Councils (NQROC) including Townsville City Council developed a Waste and Resource Recovery Strategy to guide the region over the next 20 years. NQROC's plan outlines the priorities and actions that member councils will endeavour to deliver over the next eight years, subject to funding by the state government.

This plan focuses on the following key areas and outputs:

- **Education** – the development of a regional education strategy and behaviour change activities focusing on the benefits of recycling correctly to reducing kerbside recycling bin contamination rates, while aiming to capture more recyclable material that is currently sent to landfill in the general waste bin. Food waste avoidance education will also be developed.

- **Improved organic waste management** – TCC have the scale to introduce a kerbside organic waste collection service pending business case development and Council approval. For areas where a kerbside service is not viable, the Queensland Government will support composting through community gardens or composting hubs, or by encouraging at-home composting via compost bins or worm farms.

- **Improved material recovery and recycling** – Townsville is identified as a major hub for establishing new processing infrastructure for organic waste, glass, paper and cardboard waste, construction and demolition waste, tyres, mattresses, e-waste, and solar panels. Transfer stations may include community recycling hubs, hazardous-waste facilities, and circular economy solutions, such as repair facilities, supported through programs led by the Queensland Government.

- **Waste disposal** – Stuart Landfill in Townsville does not have capacity for further expansion and the cost of landfilling is expected to increase. Future regional options include identifying a new landfill site and obtaining necessary approvals or sending some waste to a waste-to-energy or fuel-from-waste facility.

3.5 Local plans

3.5.1 Townsville City Council

TCC currently manages five transfer stations and the Stuart Landfill, plus the collection of kerbside waste and recycling bins. Council manages more than 370,000 tonnes of material each year, of which more than half is landfilled, and the remainder recovered, reprocessed or is used for on-site operational purposes. The TCC Waste Strategy 2020–2026 focuses on resource recovery and waste minimisation to move towards a circular economy where materials are kept in the economy for as long as possible, with a target to divert 60% of material from landfill by 2026.

This will be achieved by:

- promoting actions associated with the 5 Rs: Refuse, Reduce, Reuse, Repurpose and Recycle
- introducing a kerbside collection for organics
- developing a resource-recovery precinct to facilitate local reprocessing of materials
- educating the community and raising awareness about correct waste practices
- conducting field checks on waste bins to identify common mistakes and contamination, aiming to improve recycling practices
- helping develop local markets for recovered materials to support local businesses and jobs.

TCC's 2021–2026 Corporate Plan set a goal of establishing a circular economy that advances business and moves toward zero waste. In 2022, TCC endorsed a new Waste and Resource Recovery Infrastructure Plan to guide investment in facilities, processes and approaches to resource recovery through to 2040.

A cornerstone of the plan is to identify a preferred site for a regional waste and resource recovery precinct to service the Townsville region. A commitment to invest $11.2 million to 2030 in infrastructure was made.

3.5.2 Magnetic Island (Yunbenun) Tourism Masterplan

The Magnetic Island Tourism Masterplan is a blueprint designed to ensure visitor growth is managed to protect the natural environment and delivers a world-class, best-in-Australia experience that aligns with the values and vision of the community, increases the economic return from tourism, and attracts private investment to the island.

The island hosted 290,000 visitors in 2023 staying the equivalent of 880,000 bed nights. Available visitor accommodation is estimated to be 720 rooms consisting of 600 rooms in 11 hotels, resorts and hostels; 40 Air BnB properties with an estimated 120 bedrooms and occupancy rates of 82%; and two backpacker/hostels with 270 beds and a camping ground with 36 sites.

The Tourism Master Plan projects 320,000 visitors by 2025 with projections of 400,000 visitors by 2030.

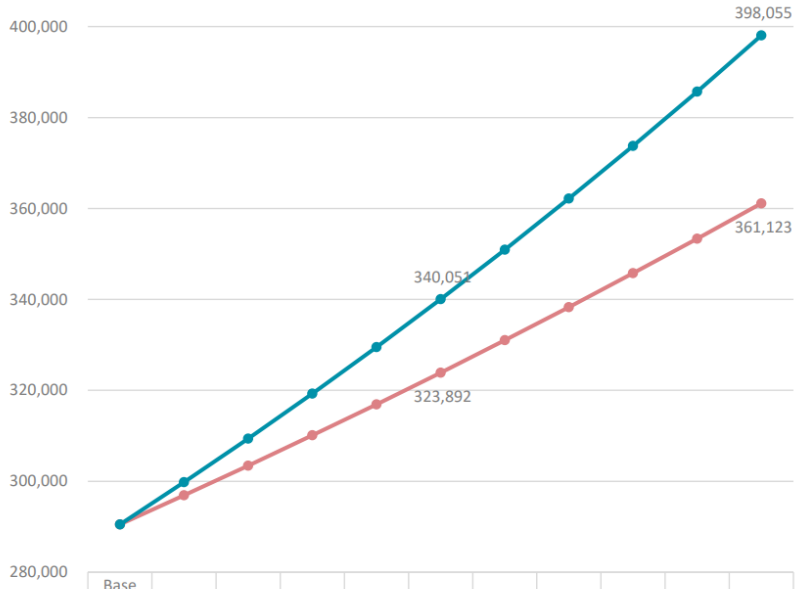
Figure 5 Magnetic Island Masterplan Visitor Economy

The masterplan has the following shared vision: ***We want Magnetic Island to be a world-leading sustainable island destination, inspiring land and reef stewardship that enhances the quality of life of our community and strengthens the cultural identity of our island home.***

This plan articulates the tourism objectives for the 10 years from 2022 as:

increase visitor numbers by 100,000 → increase visitor nights by 300,000 → visitor expenditure will increase by $50M → need additional 236 rooms – new and upgrades

Figure 6 Visitor growth – 10-year projection scenarios



	Base 2019	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Scenario 1: Current Trends	290,500	296,891	303,423	310,098	316,920	323,892	331,018	338,300	345,743	353,349	361,123
Scenario 2: New Experiences	290,500	299,796	309,389	319,290	329,507	340,051	350,933	362,163	373,752	385,712	398,055

Source: MCa modelling & analysis, September 2022

3.5.3 Decarbonisation of Great Barrier Reef Islands Whole-of-Community Pilot Project

This report of 2020 aims to identify and support businesses and the community to transition to a low or zero-carbon future and become more resilient to changes in climate by reducing greenhouse gas emissions and increasing resilience, reduced energy costs and increased self-sufficiency. This project focused on five key areas at a whole of community level; energy (generation and efficiency), water (supply and treatment), waste, transport (inter and intra-island), and resilience to the effects of climate change. After extensive consultation, eighteen final project options to decarbonise were developed. Three projects relate directly to waste management:

1. Waste Transfer Station Installation of Solar PV - The installation of solar panels at the existing waste transfer station with possible future battery integration, reducing dependence on grid power and cutting emissions.

2. Organic Waste Recycling Feasibility Study to undertake collection and composting of organic waste on the island to reduce transport and landfill emissions and provide a product for soil conditioning on the island.

3. Glass Recycling Feasibility Study to investigate initiatives to increase the volume of glass recycled and reused on Magnetic Island.

3.5.4 Magnetic Island Community Development Association (MICDA) Action Plan

MICDA has developed a Whole of Island Sustainability Plan and established eleven community-based Working Groups to identify and create solutions to address a sustainable future for Magnetic Island. The plan aims to help preserve, remediate, restore, and enhance the Island's World Heritage Values within the World Heritage listed Great Barrier Reef.

The plan seeks to ensure the island has:

- satisfactory range of facilities and services,
- caring for the unique world heritage, and
- maintains the village-like environment.

Zero Waste Magnetic Island (ZWMI) was established in 2018 as a dedicated island voluntary community working group under the auspices of MICDA. ZWMI is resourced by volunteers' information with a motto "*Magnetic Island TOO GOOD TO WASTE*". ZWMI vision is to reduce landfill, promoting circular economies, saving energy and resources, lessening the impact of climate change, and achieving carbon neutral from waste activities. The ZWMI volunteers are passionate about engaging with the community at all levels, including the local state school, day care centre and other Island groups. They work collaboratively with a broad range of stakeholders including Townsville City Council, Boomerang Alliance/Plastic Free Townsville, other MICDA projects like Reef Assist.

4. SITUATION ANALYSIS

Waste management is an essential service, and its operation is subject to regulation and compliance. Penalties exist for non-compliant activities. As landfill capacity reduces, costs to the community begin increase and consequently waste avoidance, reduction, reuse and recycling becomes paramount.

Before we move forward, a sound understanding of the current situation is imperative. This section outlines the current services, infrastructure and resources that support local waste management on Magnetic Island.

4.1 Waste generation

Based on the 2023-34 data provided by Council the island community generated approximately 5,750 tonnes of waste per annum.

Table 1 Waste generation 2023-2024

Waste stream	Tonnes
Garden waste	3,195
Recycling	875
Landfill	1,677
Totals	**5,747**

Based on the data the island is currently diverting 71% of all waste from landfill. The Queensland Draft Waste Strategy 2025–2030 sets an *80% diversion target by 2030. B*ased on last year's waste data, the island needs to recover and recycle an additional 527 tonnes of waste per annum, with no net increase in waste generation.

4.2 Waste collection services

TCC provides a weekly general waste service and a fortnightly recycling service to all households and businesses using standard mobile garbage bins (MGBs). These bins are serviced by a side-loader collection vehicle. Council provides MGB size options of 140 litres (L) or 240 L for general waste and 240 L or 360 L for recycling. The cost differential between 140 L and 240 L general waste is only $15 per annum. The extra capacity of a 360 L recycling bin is provided at no additional cost.

Figure 7 Fees and charges for residential bin services

240L waste and 240L recycle wheelie bin	$262	Additional permanent 240L wheelie bin	$186
240L waste and 360L recycle wheelie bin	$262	Additional permanent 140L wheelie bin	$175
140L waste and 240L recycle wheelie bin	$249	Additional permanent 240L recycle wheelie bin	$75
140L waste and 360L recycle wheelie bin	$249	Additional permanent 360L recycle wheelie bin	$108

Source: TCC schedule of fees and charges June 2024/25

Council also services public place litter bins and recycling bins at some sites located across the island.

Magnetic Island Skip Services provides skip bins and a kerbside service for commercial premises and the building and construction sector. Collections are carried out using a rear-loader vehicle.

4.3 Waste transfer station and resource recovery

All collected waste is taken to the waste transfer station in Picnic Bay, owned and operated by TCC. This facility replaces the previous landfill on the island. Opening hours are Monday, Wednesday and Friday from 7 am to 3.45 pm and Saturday and Sunday from 9 am to 12 noon.

Figure 8 Map of Magnetic Island with waste transfer station (WTS) identified

Map courtesy of GHD.

All deliveries of general waste are unloaded and reloaded into compactor bins at the transfer station for transportation to the mainland for disposal at landfill. Recyclables and cardboard are placed in designated compactors and shipped to the Townsville Material Recovery Facility (MRF), owned and operated by Regroup, for processing and on-selling to the market for use in remanufacturing.

The waste transfer station has facilities to separate a range of materials including:

- Garden waste – processed on the island and provided back to community for free
- Scrap metals and white goods – degassed prior to consolidation
- Cardboard
- Recyclable containers – plastics, glass, aluminium and steel
- Batteries – used lead-acid and household
- Fluorescent bulbs and tubes
- E-waste – computers and TVs
- Tyres
- Used motor oil
- Solar panels
- Fire extinguishers
- Gas bottles
- Paint
- Marine flares
- Mattresses – shredded with metal recovered and floc to landfill

Items not accepted at the waste transfer station include:

- Asphalt and concrete
- Chemical waste
- Liquids and solvents.

Magnetic Island does not have a weighbridge. All general waste fees are charged based on Schedule 27 of TCC Fees and Charges, using estimates of the average load weight by vehicle type which is then multiplied by the disposal rate. There is no fee for some recyclable items, for example, cardboard or green waste.

Image 1 Magnetic Island transfer station

The total budget for freight of waste and recycling from the island to the mainland is approximately $700,000 per annum or $250 per tonne, excluding wages and transport to the barge. A special barge is chartered approximately 3 times per fortnight, subject to island activity and seasonality. This has a load capacity of 28 tonnes per trip and a cost of $7,000 per trip. In addition, some waste is transported on the passenger barge. A gate fee per tonne delivered is charged at the landfill or recycling plant.

On-island processing of materials has the potential to reduce barge costs and disposal or processing fees. Currently, TCC processes delivered garden organics into mulch on the island.

4.4 Bio-Regen

A small bio-regen unit has been installed as a demonstration unit at the old schoolhouse at Horseshoe Bay, funded by TCC and operated by MICDA's Reef Assist Project. The unit has a processing capacity of 500 kgs per week and converts household food waste (and one café's food waste at Horseshoe Bay) into a liquid garden fertiliser using an inoculant XLR8. Currently, the unit is only operating at 12% of its capacity due to restrictions imposed by TCC on operating hours, throughput (limited to 60 kilograms per week) and outputs. An inoculate Xlr8 is added to IBCs where the food waste is converted to soil enhancer. A replacement unit is being installed in early June 2025. Since September 2023, the unit has processed 1.6 tonnes of food scraps, converting it into more than 11,000 litres of soil enhancer, which is bottled and distributed to the community.

4.5 Litter

Litter bins are situated around the island at high-traffic areas including retail, picnic, and beach areas. Most, but not all, bins are housed within stainless steel stands. Some bin stations provide a recycling bin with an opening that restricts deposits to containers only. These bins are serviced by Council as an extension of the household collection service.

Image 2 Public-place litter station with recycling bin

4.6 Container refund scheme

Queensland's Container Refund Scheme (CRS), called 'Containers for Change' (C4C), started on 1 November 2018. This scheme aims to reduce litter and increase recycling by offering a 10-cent refund for eligible empty beverage containers returned to authorised locations.

Eligible containers include beverages packaged in glass, plastic, aluminium, steel, or liquid paperboard, between 150 millilitres and 3 litres in volume. Alcoholic drinks (including wine and spirits) and non-alcoholic drinks (except pure juice and milk bottles more than 1 litre) are included in the scheme.

The community has three options to gain or donate eligible used beverage containers for the refund. Return-It operates the local scheme. Residents sign up using a bar code on a bag, with funds then sent to a nominated bank account or donated to a local charity or school. Return-It currently offers four options to redeem containers:

1. A mobile pick-up every Tuesday from 8 am to 11 am at Nelly Bay and from 12 pm to 1 pm at Horseshoe Bay. Pick up times vary based on barge times and tides. Truck capacity and weight issues occasionally affect the service, as the CRS expansion deemed wine and spirit bottles eligible.
2. A Return-It pod is located behind the school to accept bag drop-offs.
3. Return-It bins are located at the kindy where containers can be donated.
4. Several dedicated bins are situated around the island for donations by charities including the local museum, and the Magnetic Island Network for Turtles (MINT) have bins at specific venues and locations for fundraising activities.

The CRS scheme is now an essentail part of local fundraising and the community can donate their container to one of four local charitites as detailed on the poster below.

Figure 9 Charities to donate used containers

4.7 Recycling

Apart from the extensive range of items that can be separated for recovery and recycling at the transfer station, several additional recycling initiatives exist both on and off the island, including:

On-island

- Toner cartridge recycling – post office
- Batteries – transfer station
- Blister pack recycling – local pharmacy

Figure 10 Blister Pack recycling results

Off-island - Townsville

- Batteries, pens, markers, e-waste (computers, laptops, keyboards, cables, chargers and mobile phones, etc.) – Officeworks
- Batteries – Woolworths, Coles, Aldi, Battery World, Chemist Warehouse

Other opportunities by postal service

- Upparel – purchase label for $35 to send up to 10 kilograms of used textiles in any box
- Textile Recyclers Australia – home collection services for textiles in any condition, including clothing, shoes and linen for a fee in a pre-ordered box
- TerraCycle – For many products the manufacturer pays for the postage and recycling. Users need to register, print a prepaid postage sticker, affix it to any container and take to the post office for free postage[4]. Products and items covered include: Gillette razor, Glad food care, coffee capsules – Nescafe, L'OR, Bic pens, Burts Bees products, Finish, Dish and Air care soft plastics and Open Farm pet food soft plastics

For large quantities and some problematic items, you need to purchase a specific box, fill it, and return it to the post office for free shipping. The cost depends on the item and box size.

[4] https://www.terracycle.com

4.8 Reuse

Reuse is encouraged and promoted by a range of avenues:

- **Tip shop** – a well-managed 'tip shop' operates under TCC management at the waste transfer station to salvage saleable preloved household items for reuse. Items include books, CDs, VHS, kitchenware, household furniture, sporting goods and building materials.
- **Charity op shop** – Vinnies is located at Nelly Bay for donation of good-quality, saleable, wearable clothing, as well as books, CDs, VHS tapes, manchester and bric-a-brac.
- **Reusables rebate** – TCC offers a 'reusables rebate' to offset the costs of purchasing reusable products which is extremely popular, and funds are typically exhausted in the first three to six months of the program. Residents can apply for a rebate of 50% of the purchase price of these eligible reusable products to a maximum rebate of $200 on reusable cloth nappy products and $100 on other eligible reusable products (maximum total rebate is $300). Eligible products include cloth nappies, reusable inner liner for nappies, reusable wipes and reusable nursing breast pads. This is an annual rebate and available until allocated funds are exhausted.
- **Local Facebook pages**
  There are a number of social media platforms and sites providing events and reuse including:
  Zero Waste Magnetic Island, Magnetic Island Freecycle, Magnetic Island Buy/Swap/Sell, Maggie Island Buy Swap and Sell, Buy, Sell and Swap on Magnetic Island and Magnetic Island Locals Buy And Sell

4.9 Education and outreach

Education and information are critical to not only inform but also motivate the community to do the right thing in relation to all waste products. Outreach plays a key role. The island does not have a newspaper, community radio station or notice board in each village. The older demographic is not always internet savvy and internet on the island is often poor quality and not universal. The islands primary social media presence is Facebook-based, which does not have a large youth following as they tend to use platforms like TikTok. Outreach and education are therefore challenging. For visitors, there is a lot of private web sites providing information but very little of that information is around sustainability or waste reduction and is often out of date. Council information is usually mainland centric.

4.9.1 Townsville City Council

TCC has a suite of resources, newsletters and activities aimed at improving community understanding of waste services but are retained on the Council web site and tend to be Townsville focussed rather than specific to Magnetic Island. Further, these resources are not shared by Council onto Island social media pages. The resources include:

- Let's Get it Sorted Townsville Flipbook
- Promoting the Recycle Mate and Saveful apps
- A–Z Guide to Waste and Recycling
- General Waste Sticker
- Love Food Hate Waste Factsheet
- Love Food Hate Waste Meal Planner Template
- Food Waste Avoidance Guide
- DIY Composting factsheet
- DIY Worm Tube factsheet

This year, council has initiated a quarterly island newsletter, which is letterbox-dropped to all households on the island, focusing on infrastructure issues. This newsletter is a valuable TCC resource and should also be used to provide up to date and regular information around waste management and resource recovery.

4.9.2 Zero Waste Magnetic Island (ZWMI)

Zero Waste Magnetic Island (ZWMI) is a dedicated island voluntary community working group under the auspices of MICDA which is the umbrella not for profit association. ZWMI is resourced by volunteers' information with a motto Magnetic Island TOO GOOD TO WASTE! The group advocates waste minimisation and resource recovery with the aim to 'reduce the island's waste by making it easy, appealing and fun to recycle, reduce and reuse.'

The group has a proven record of outreach engaging with community, schools, kindergarten students and teachers running creative 'Upcycle, Recycle, Remake' workshops and hosts a stall at the Horseshoe Bay Markets on the first Sunday of the month.

Image 3 ZWMI stall at Horseshoe Bay Sunday Markets

The group produces a regular newsletter emailed to those who opt-in and hosts a website with information, resources and ideas. ZWMI were instrumental in these initiatives:

- water refill stations and island map
- waste-to-art competitions
- YouTube series 'Little Things Matter'
- plastic-free July activities.

4.9.3 Magnetic Island Community Development Association (MICDA)

In July 2022 MICDA secured a Community Sustainability Action Grant to establish and work with community-based Working Groups, to create a Whole of Island (WOI) plan to address a sustainable future for Magnetic Island. The community Working Groups continue as part of a holistic approach to our Island's sustainable future. Ten groups were established including: Energy, Health, Marine, Sustainable Planning, Sustainable Tourism, Terrestrial Ecosystems, Traditional Owners, Transport, Waste and Water. MICDA operate the bio-regen facility to process food waste and secured a Community Climate Action Grant from the Great Barrier Reef Foundation (GBRF) to undertake a *Towards Net Zero Magnetic Island (Yunbenun) Climate Action Project*. A component of this is to develop a *Towards Zero Waste Strategy.*

4.9.3.1 Business adviser – The grant enabled the employment of a part-time business adviser to work with Magnetic Island businesses free of charge, until October 2025, in consultation with Zero Waste Magnetic Island. Together with Plastic Free NQ, the adviser can:

- Consult about waste generation and disposal
- Provide practical and cost-effective solutions to reduce waste generation and disposal
- Help with sustainability related grant, subsidy and rebate applications
- Help set up the collection of recycled goods
- Look at opportunities to be involved with the current food waste or green waste conversion projects
- Provide practical help for the wider plan for Magnetic Island to be free of single-use plastic
- Provide advice and practical actions to reduce waste and reduce costs.

Figure 11 Initiatives of ZWMI and MICDA

4.9.3.2 Training – In response to the community, MICDA conducted a free composting workshop with funding the Great Barrier Reef Foundation on 31 May 2025. This was popular and attended by 35 people and it is hoped more training can be provided in the future subject to funding.

Figure 12 Compost training

5. WASTE AUDIT

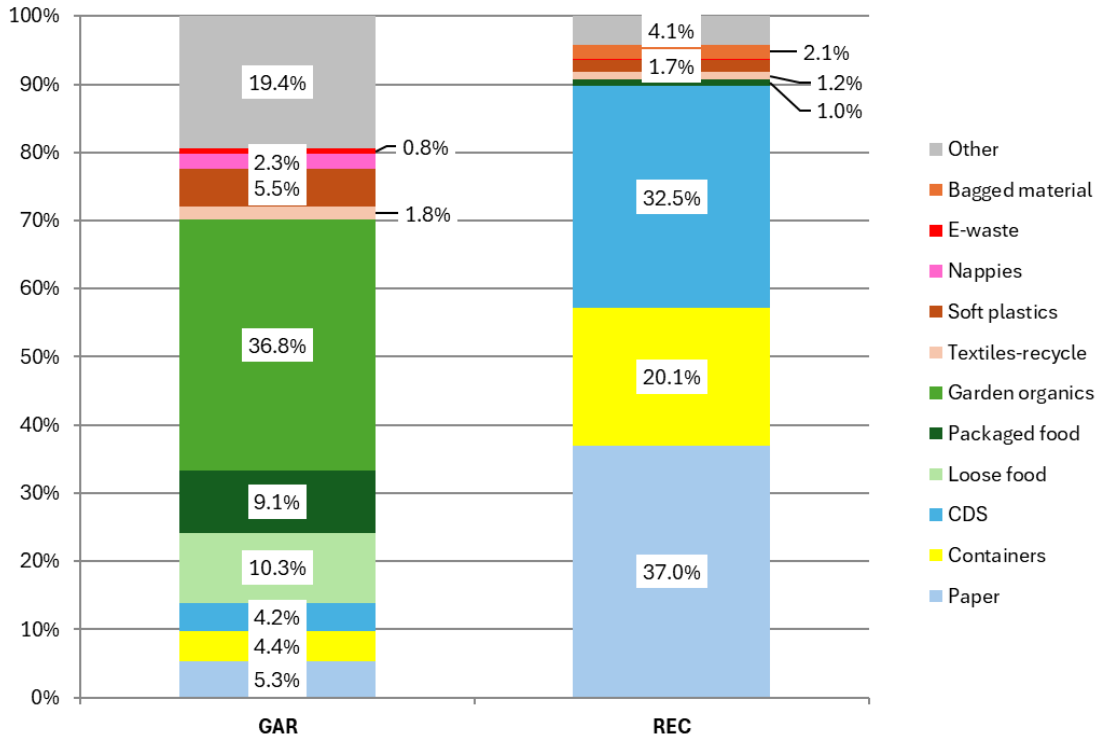
The waste audit identified the types and quantities of waste in general waste and recycling bins across various locations on Magnetic Island. All waste was sorted into 35 categories to assess community interaction and engagement with the existing waste system and to identify opportunities for improved waste diversion. Over the course of one week, APC Waste Consultants (APC) collected random and representative samples of waste and recycling from a range of locations, facilities and events including 200 households, 1 commercial accommodation premises, 12 hospitality venues, 14 litter bins, 2 public events and 2 days at the local transfer station.

5.1 Households

The waste audit found that in houses:

- Garden waste is the largest single material at 37%
- Food waste, loose and packaged, comprised 19%
- Recyclable items – that should be in the recycling bin was 14%
- Eligible beverage containers with a 10-cent refund makes up 4%
- Contamination in the recycling bin is 10%, including bagged material, loose and packaged food, garden waste, soft plastics, non-recyclable plastic items and textiles.

Figure 13 Household waste composition



At home units:

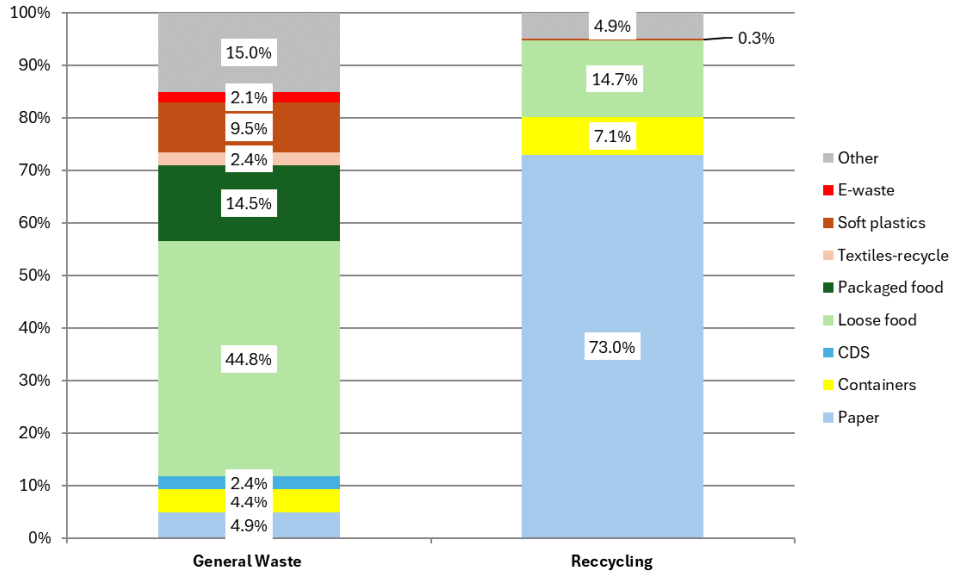
- Food waste comprised 49%
- General waste bin contained 25% recyclables, not separated
- Recycling bin contamination is 17%, including food, garden waste, non-recyclable plastics and textiles.

5.2 Commercial hospitality

The waste audit found that:

- Food waste, loose and packaged, comprises 60%
- Recyclable items that should be in the recycling bin is 12%
- Eligible beverage containers with a 10-cent refund is 2%
- Contamination in the recycling bin is mainly loose food at 20%.

Figure 14 Commercial waste composition

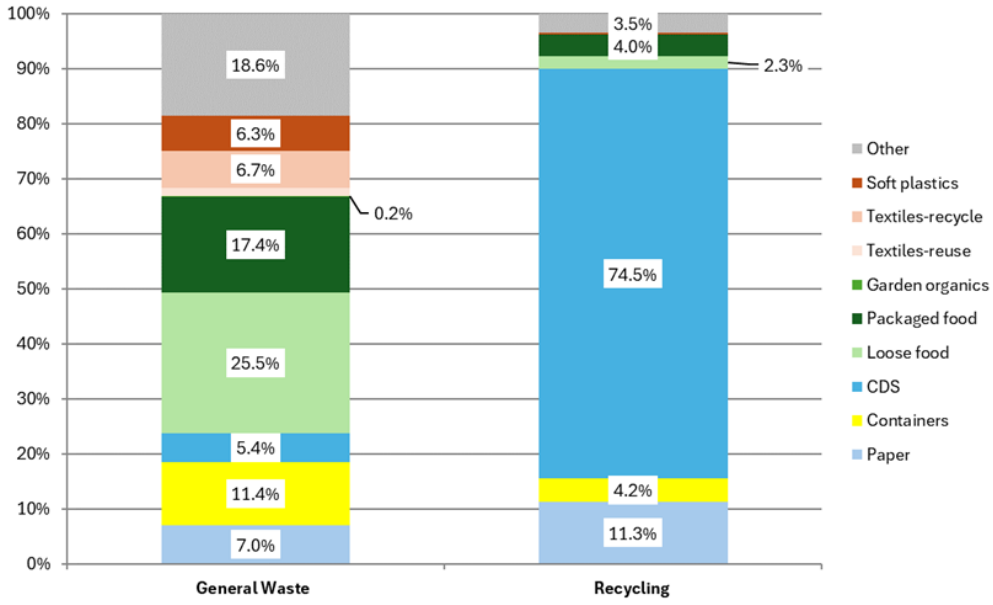


5.3 Commercial accommodation

The waste audit found that:

- Food waste, loose and packaged, comprises 43%
- Recyclable items that should be in the recycling bin is 24%
- Eligible beverage containers with a 10-cent refund is 5%
- Contamination in the recycling bin is 10% and mainly packaged food.

Figure 15 Commercial accommodation waste composition

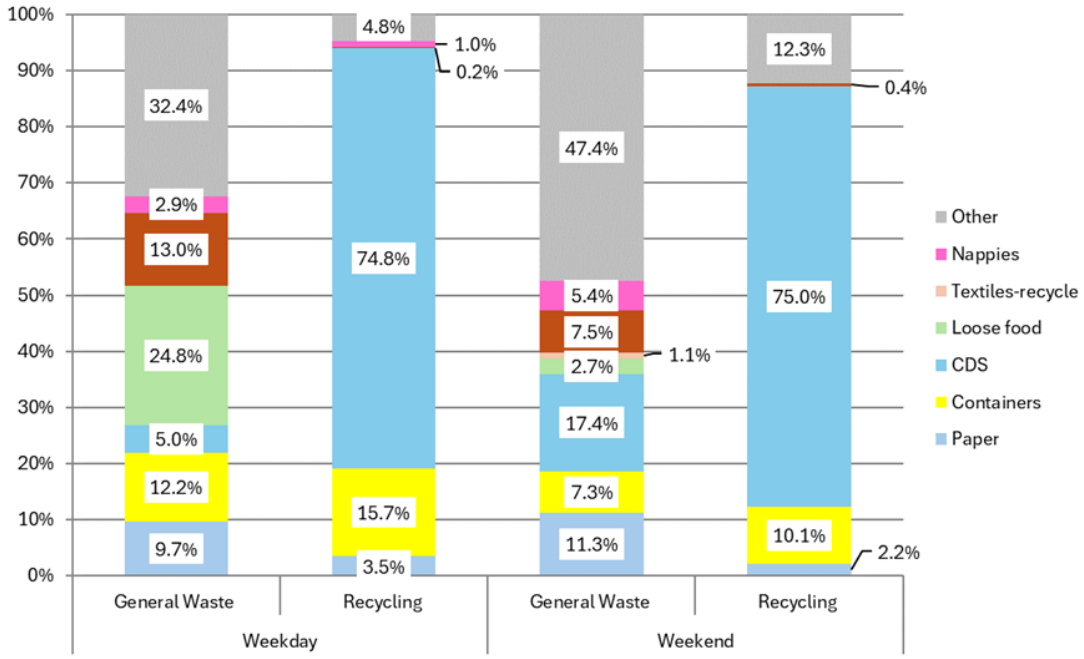


5.4 Litter bins

Litter bins at Horseshoe Bay foreshore were sampled on weekdays and the weekend. The key findings:

- General waste bin contains 17 to 25% recyclable containers and 10.5% paper.
- Recycling bins contain 75% eligible containers with a 10-cent value

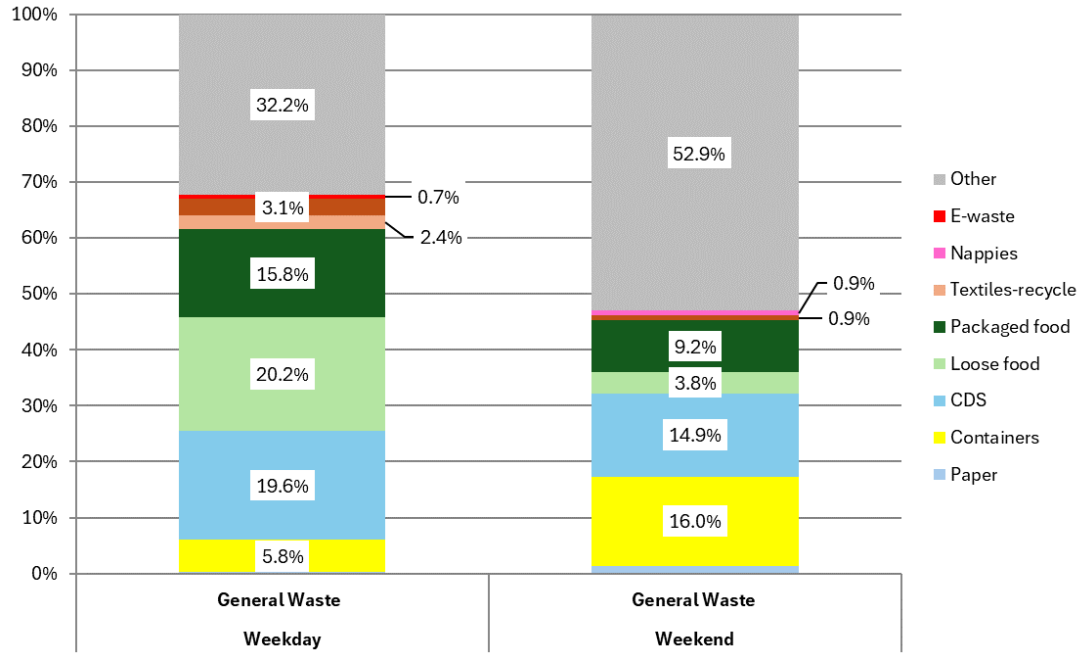
Figure 16 Litter bins waste composition



Litter bins at Ferry terminal were sampled on weekdays and the weekend. There is no recycling bins installed at this location. The key findings:

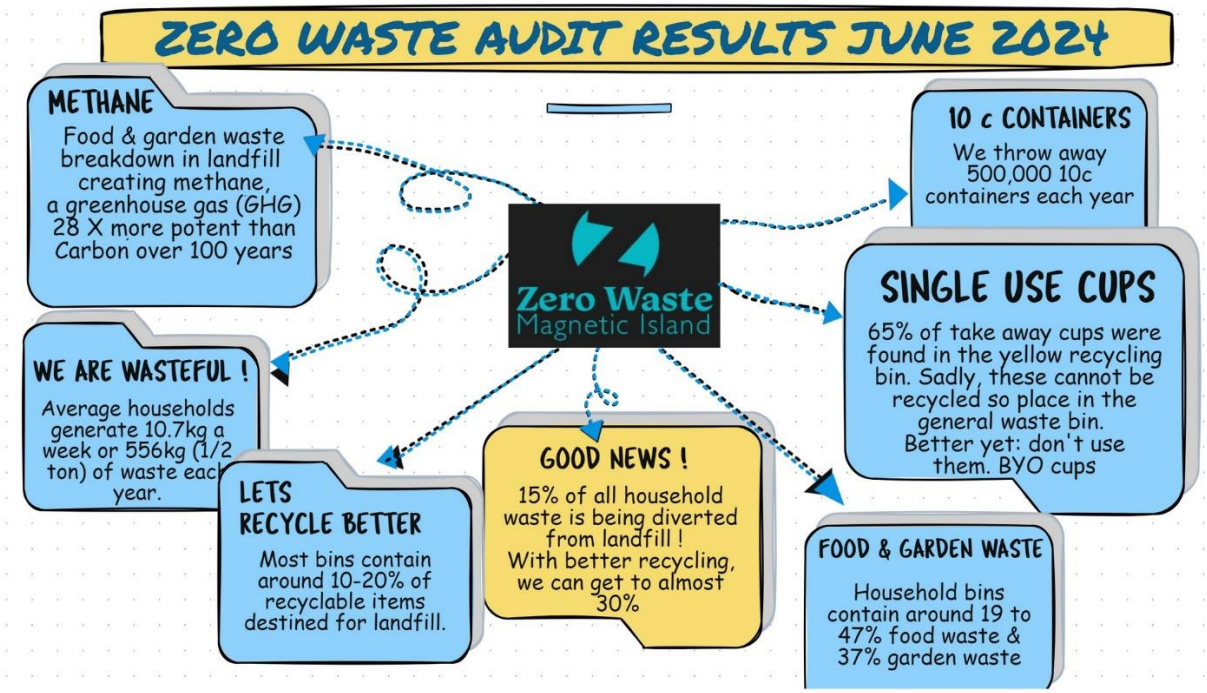
- General waste bin contains 25% to 31% recyclable containers
- 15% - 21% are eligible containers with a 10-cent value

Figure 17 Ferry Terminal litter bins waste composition



As part of the climate action grant, there was extensive social media and messaging around the findings of the audit to help inform and educate island residents, visitors and businesses. An example of the audit results is depicted below.

Figure 18 Waste Audit Summary



6. COMMUNITY CONSULTATION RESULTS

Extensive community consultation and stakeholder engagement was carried out in November 2024. The consultants attended the monthly meeting of the Magnetic Island Residents and Ratepayers' Association (MIRRA), held nine focus groups, and twelve stakeholder meetings. These meetings examined current issues and discussed future options with the waste audit results providing context around waste generation and disposal behaviour on the island.

The community and visitors completed 456 surveys, offering valuable insight into current behaviours, future priorities, and willingness to pay.

This section provides a summary of the main results from the consultation and ideas for future improvements grouped by themes.

6.1 Residents' feedback

6.1.1. Current issues and challenges

- Bulky garden waste – transport to the transfer station is problematic without a trailer
- Batteries – confusion about where to recycle these items
- Horseshoe Bay – yachts have no dedicated bins for waste and use public litter bins
- Containers for Change (C4C) scheme – mobile collection times change due to tides and barge times. Confusing for residents, as patrons turned away because truck is full, or load will exceed allowed barge weight, frustrating lack of mobile coverage to Horseshoe Bay residents
- Variable bin sizes – significant number of residents were not aware variable bin sizes were available. Fifty-five per cent (55%) indicated they could downsize their general waste bin, while 18% expressed an interest in increasing the size of their recycling bin.

6.1.2 Future waste infrastructure and service improvements

1. **Batteries** – battery recycling at Horseshoe Bay, Arcadia, Nelly Bay and at the transfer station to promote ease of access.
2. **Containers for Change (C4C) scheme**:
    - Establish a permanent location to receive, pay for, and process containers
    - Horseshoe Bay needs access to a mobile service or permanent site
    - Wire cages/ baskets be installed on litter bins to capture eligible containers
3. **Household bins** – need uniform colour scheme for all waste receptacles on the island to enable generic communication
4. **Food and garden waste (FOGO)** –introduction of a FOGO service is supported by 74% of residents surveyed, with 63% supporting weekly collection of FOGO and a fortnightly general waste bin collection. Key concerns were around odour, vermin, lack of general waste bin space with reduced service frequency, and insufficient organic waste to use a FOGO service because organics currently managed on site by composting
5. **Food waste processing** – establish large-scale food-waste-to-compost facility on island
6. **Garden waste** – need a larger mobile garbage bin (360 L) for palm fronds or a monthly bulky waste collection for palm fronds only
7. **Community garden** – strong support for community garden and community information hub with a paid co-ordinator and management plan.

8. **Compost training workshops** – supported by TCC with subsided composting bins/worm farms after workshop attendance
9. **Litter bins –** need a recycling and litter bin at high-profile bus stops to reduce littering; need recycling bins at the ferry terminal
10. **Textiles** – need a recovery program for soiled/old textiles, i.e. Upparel.com.au
11. **Single-use plastic cups and containers** – phase out and promote alternatives
12. **Beach litter** – install see-through beach litter bins as an education tool
13. **Reuse glass** – start glass crushing on the island to replace imported aggregates
14. **Share-economy options** – general support for repair café, bulk food outlet, Library of Stuff (share library) or specific tool library, toy library, clothing swaps, garage sale trail, community garden and food exchange
15. **Communication channels** – residents prefer the following (in descending order): direct email, hard copy by post, council newsletter, community social media, i.e. Facebook and Council's social media.

6.1.3 Willingness to pay – 60% of residents indicated willingness to pay for a FOGO service, with 29% indicating an extra $1 per week, 22% stating $2 per week and 9% indicating $5 per week; 32% were against this action.

6.1.4 Waste strategy

- **Targets** – community agreed on an aspirational target that could be attained through improved recycling efforts and the introduction of a FOGO service and other initiatives
- **Implementation** – a paid co-ordinator to be employed to maintain momentum.

6.2 Visitor feedback

The Magnetic Island visitor survey profile revealed that visitors are predominantly either first-timers or had visited more than 10 times, with the majority staying 1 to 2 nights (70%). Day-trippers made up 30%. Most visitors were from Townsville (47%), then international (21%), interstate (16%) or from elsewhere in Queensland (15%).

6.2.1 Current issues and challenges

- **Recycling information** – 52% indicated no information was provided by their accommodation about what could be recycled, and they relied on prior knowledge and did as they would at home.
- **Accommodation venues recycling bins** – only 14.5% had a recycling bin inside, 13% indicated no recycling was provided or found at their accommodation.
- **Signage** – the use of symbol-based information is imperative given the significant proportion of international visitors.
- **Water refill stations** – visitors need to be reassured that MI water is safe to drink; 81% did not know about the map of refill station locations.
- **Lack of understanding about MI waste management** – 57% didn't know what happened to waste from MI and 9% thought there was landfill on the island.

6.2.2 Behaviour change options

1. Provide twin bins or similar configurations to promote separation of recyclables at accommodation venues
2. Provide clear instructions, using compendiums, fridge magnets, posters, and stickers to communicate what can be recycled, with a specific '**no bin liners'** for recycling bins
3. Offer food waste separation opportunities at accommodation

4. Offer more public-place recycling opportunities
5. Promote reusables as a souvenir, i.e. branded keep-cup or water bottle
6. Ban on single-use coffee and drink cups and promote a reusable cup/cup library.

6.2.3 Communication

- **Channels** – the best way to communicate information is at the time of booking, on ferries, at ferry terminals, social media/websites, and at accommodation premises.

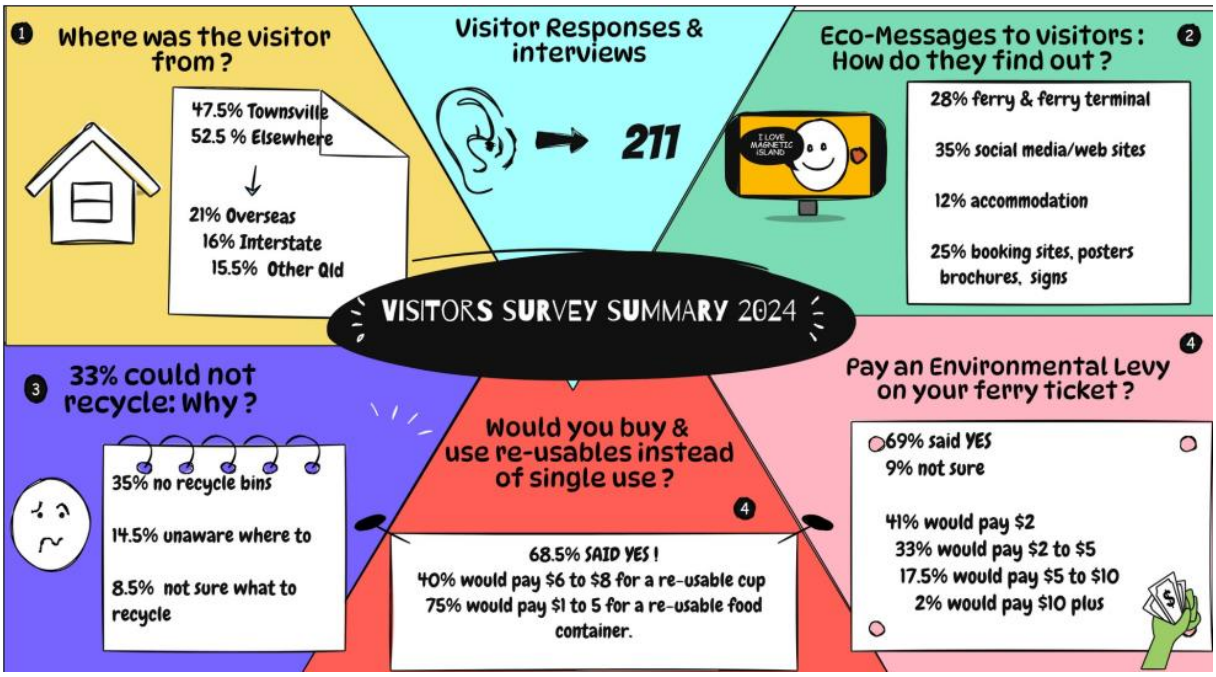
- **Branding** – develop a unique brand for environmental programs, focusing on respect and appreciation of Magnetic Island's precious natural assets.

6.2.4 Willingness to pay – The Tourism Master plan states the island hosted 290,000 visitors in 2023 and estimate 320,000 visitors by 2025 with projections of 400,000 by 2030.

TCC is unable to recover revenue from visitors for waste management. However, 69% indicated support for the introduction of an environmental levy added to the ferry ticket price to offset waste-related expenses. Forty-one per cent (41%) of visitors were willing to pay less than $2 extra per person per return trip, 33% were prepared to pay between $2 to $5, 17.5% between $5 to $10 and 2% would pay more than $10 per person per return trip.

If introduced at the lowest fee of $2 per person per return trip, the new income stream generated would be $600,000 to offset waste management on the island.

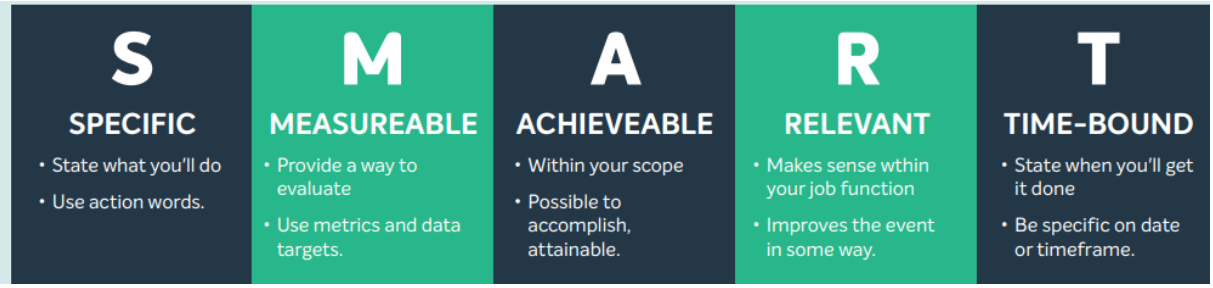
Figure 19 Visitor Survey Summary



7. KEY OPPORTUNITIES

The strategy will outline a vision, objectives, and priorities, each with measurable targets. The SMART goal target-setting approach (see Figure 20) will guide the document to ensure the strategy is relatable, inclusive, and transparent. It will contain specific, measurable, relevant, and achievable actions with an indicative timeline.

Figure 20 SMART goal target-setting approach



Source: *Attitude is everything if you want to succeed above and beyond*, Paul J. Meyer (2003) USA

This section discusses opportunities to improve resource-recovery outcomes and reduce waste to landfill as identified through the waste audit, community consultation, stakeholder engagement, and contemporary best practice. The options in this section form the blueprint for the waste strategy and require consideration by Council and the community, including:

Avoid

- Single use – single-use packaging and materials policy
- Zero waste events – wash and hydration station, reusables and detailed event guide

Reduce

- Bin sizes – variable
- Litter – stormwater outlet litter traps, fishing waste bins
- Packaging – refill and bulk food co-operative/outlet
- Share economy – Library of Stuff or specific tool and toy library

Reuse

- Garden waste – kerbside collection
- Garden and food waste – kerbside collection
- Food waste – collection
- Organics – on-island processing
- Glass – on-island processing
- Textiles – collection
- Disposable nappies – rebates
- Community garden – community hub

Recycle

- Households
- Commercial
- Container Refund Scheme
- Litter bins
- EPS
- Solar panels

Repair

- Repair café

Dispose

7.1 Avoidance

Avoidance options were discussed during the consultation process. Members of the community and tourists were open and receptive to measures that could be applied at the individual purchasing level. Many wanted more education to make informed decisions, for example, choosing the best packaging types, avoiding waste, and bulk buying to reduce packaging.

7.1.1 Phasing out single-use items

The Queensland Government has introduced a range of bans, including on the following:

1. plastic bags shopping bags
2. plastic straws
3. plastic stirrers, plates and bowls
4. cutlery
5. expanded polystyrene (EPS) takeaway food containers and cups
6. cotton buds (plastic stems)
7. EPS loose packaging,

Coffee cups and single-use cold drink cups are still being used extensively. The waste audit estimated, based on May 2024 visitor consumption, that 20,000 coffee cups are disposed at the ferry terminal bins annually. Also, 65% of used coffee cups were placed in the recycling stream, causing contamination.

Image 4 Single-use plastic and plastic- cups and reusable cutlery

Many organisations have campaigned to ban single-use cups, which have come to symbolise our throwaway society. *'A moment on your lips, forever in the tip*.'**.** Some cafes have cup and mug libraries where crockery is borrowed and returned for reuse. In the 1990s, Coles Bay in Tasmania banned plastic shopping bags, setting a precedent that was later formalised by the government. Similarly, the NSW coastal town of Bermagui was the first town in Australia to ban disposable coffee cups. The phase-out began on 1 December 2024, just before peak tourist season.

***Case study* – Bermagui's coffee cup ban**

All Bermagui's cafés joined Good Reusables, a closed-loop, return-and-reuse system where cups are rewashed and reused. Cafés pay a $3 deposit per cup that is passed onto customers. The deposit helps prevent cups from being discarded or littered. Customers can return the cup to any café or exchange it for a clean one the next time they buy a coffee. Visitors redeem the cup before departure for $3 refund or keep the cup. By all cafés joining, no café benefits by selling cheaper products outside the scheme.

In 2023, Byron Shire Council adopted a Single-use Packaging and Materials Policy[5], detailed below.

Case study – Byron Bay

This policy aims to help support reuse systems to reduce waste, plastic pollution, litter and emissions.[6] The Policy conditions apply to:

- **all Council business and operations (councillors, staff, committees, contractors, volunteers) where single-use, disposable materials may be used such as, but not limited to, purchases, packaging, merchandise, catering, workshops and events.**
- **all Council sponsored and funded activities and events**
- **all individuals, groups, or organisations planning to use, hire and/or lease Council-owned or managed sites (buildings, facilities and land) that require Council's approval, formal notification or a permit to conduct an activity. This includes, but not limited to, events, information sessions, workshops, meetings, parties, filming, markets, farmers' markets, festivals or club activities.**

Single-use packaging and materials **not permitted** to be procured, used, sold or distributed:

- **All plastic bags** – including thicker supermarket style bags.
- **Straws** – plastic, paper, 'biodegradable' or 'plant based'
- **Plates, bowls and platters** – plastic, bioplastic, paper, bamboo, compostable
- **Food containers (takeaway)** – plastic, bioplastic, paper, bamboo, compostable
- **Drink stirrer** – any material
- **Polystyrene** – tableware, drinkware and packaging
- **Cutlery** – plastic, bioplastic, bamboo, wood
- **Bottled water** – including within vending machines
- **Drinkware** – plastic, paper, 'compostable', 'biodegradable' and polystyrene cups
- **Coffee cups and lids** – 'compostable', 'recyclable' or 'biodegradable'
- **Accessory food ware items** – individually wrapped sugar, coffee, tea bags containing plastic, salt and pepper, soy sauce, condiments, individually portioned spreads or cup sleeves
- **Cling film/plastic wrap**
- **Promotional materials and merchandise** – plastic items not durable and/or reusable
- **Supply of individually wrapped confectionary** – e.g., chocolate bars, ice creams, lollies

As part of Council operations, workshops or events:

- **Masks** – no single-use disposable (does not include P2, P3)
- **Coffee pods** – **no** Nespresso-style pods but reusable/refillable accepted.
- **Balloons** – all types, including helium, 'biodegradable' and water balloons
- **Decorations** – glitter, confetti, tinsel, party poppers, streamers, glow sticks

Actions

- **Council adopt and implement a *Single Use Packaging and Materials Policy* to ban single use items.**
- **TCC/ MICDA/ZWMI promote, encourage / incentivise alternative branded reusable merchandise at key locations across the island (including the mainland ferry terminals) to support the community, businesses and visitors transition to reusables. Items could include reusable water bottles, coffee cups, food containers, cutlery and shopping bags.**

[5] Byron Shire's Move to Reuse - Byron Shire Council

7.1.2 Zero waste events

Some councils and communities have implemented policies permitting only 'zero waste' events. Councils, landowners, and event organisers want to reduce their environmental impact by minimising waste and litter. Poor waste management increases cost and diminishes the event experience. There are also opportunities to educate event attendees and influence their waste management attitudes and behaviour.

TCC has developed an *Environmental and Sustainable Packaging Guidelines for Council Events.* Byron Bay Shire Council[7] and Barwon Regional Council[8] have developed 'How to Guides' for event organisers and there are many other excellent resources available. There are many large-scale events held on Magnetic Island and some event organisers have no regard for creating a positive waste free experience. All events on Council land or requiring Council approval should be required to submit a waste management plan and bond to cover clean-up activities and removal of all waste.

Image 5 Single use plastic fee event in Townsville

Additionally, new service businesses have developed creating mobile wash and hydration stations and supplying commercial quantities of reusable plates, bowls, cups, glasses, and utensils. Events also require receptacles for the return of used items. Image 6 below shows an example of a return system by Eco Trilogy. The system costs approximately $40,000 for a wash station, reusable crockery and cutlery, posters and infrastructure, which can then remain on the island.

Image 6 Recycling station for containers, crockery/cutlery and general waste by Eco Trilogy

[7] Help with Managing Waste & Recycling at Your Event - Byron Shire Council

[8] https://www.environmentbellarine.org.au/resources/8da4df9b6c39b65_zerowasteguide.pdf

Actions

- **Adopt a *Zero Waste Events Policy* for all events held on Council land on Magnetic Island and require the submission of a Waste Management Plan and bond to cover clean-up activities.**
- **Promote the *Environmental and Packaging Guidelines for Public Events* to assist event organisers**
- **Purchase a mobile wash and hydration station and reusable food ware to be located on the island and available for hire at minimal cost to non-for- profit groups or engage a contracted service provider.**

7.2 Reduce

7.2.1 Litter – stormwater litter traps

Magnetic Island is located within the Great Barrier Reef Marine Park. Stormwater from the island flows into the bays and beaches around it. Marine litter is known to have significant harmful effects on reef and marine life. Much of the marine litter is lightweight plastic, easily dispersed by wind and water. Over time, plastic breaks down into microplastics, which fish and birds consume while feeding. A recent shocking news investigation on ABC News reported more than 770 individual pieces of plastics found in the stomachs of seabird chicks on Lord Howe Island. [9]

The installation of stormwater pollution traps is essential to reduce marine litter and supports the Reef 2050 Plan to reduce the impacts from land-based activities by reducing marine debris and rubbish pollution in particular plastic remnants (including lids, wrap and containers), rope, cigarette butts and rubber footwear[10]. Litter traps that collect sediment, litter and debris need to complement the existing infrastructure. Litter booms are most effective as they have reduced maintenance and minimise other impacts such as blocking with debris and causing flooding.

Image 7 Example of litter boom

This action is also strongly supported by the MICDA Marine Working Group as stormwater flows to the sea through various types of stormwater infrastructure installed across the island.

[9] The birds on Lord Howe Island are now so full of plastic, they crunch - ABC News

[10] Plastics in our oceans and waterways - DCCEEW

Council engineers must evaluate each major stormwater outlet and develop an implementation program. Drains should be prioritised based on proximity to developments and housing where litter generation is more prevalent. This process is expected to take several years and will require both a capital budget and an operational budget, with ongoing maintenance of the litter traps being crucial. The budget for assessment, implementation, and maintenance will require input from Council engineering staff.

Actions

- **Council assess stormwater outlets around Magnetic Island and develop a implementation program to install and maintain litter traps to reduce litter and debris entering the Great Barrier Reef waterways.**

7.2.2 Waste bin sizes

During the waste audit, half of all houses audited had full to overflowing recycling bins. Council provides bin size options where households can upsize their recycling bin from the 240-litre to a 360-litre bin and downsize the general waste bin from 240-litre or 140-litre. The cost differential between 140-litre and 240-litre in general waste bins is only $15 per annum. The extra capacity of a 360L recycling bin is at no extra cost.

However, during the consultation, many residents were unaware that variable bin sizes were available, with 55% indicating they could downsize their general waste bin and 18% indicating they would upsize their recycling bin without any change to current services. Given that 37% of household garbage bins (by weight) contain garden waste-which is typically voluminous- the introduction of the new kerbside organics service supports downsizing the standard general waste to 140 litre if collected weekly. An option for a 240-litre general waste bin should remain available but with a great cost differential to encourage source separation.

Actions

- **That the cost differenial between bin sizes be increased to refect the difference in capacity and encourage waste minimisation**

7.2.3 Packaging – bulk food co-operative/outlet

A number of island communities have implemented bulk food co-operatives or have encouraged local stores to provide bulk food sections to avoid packaging. Customers weigh their empty containers then subtract that weight from the total weight of the contents. Lord Howe Island's waste committee received a Commonwealth Regional Initiatives Grant and started their co-op in April 2002. The co-op also provided a location where surplus homegrown vegetables and homemade goodies could be sold. The retail space was in the main village and provided at nominal rent by the Lord Howe Island Board.

Figure 21 Lord Howe Island Co-op logo

The co-op operated for nearly 20 years until the pandemic hit. It was also popular with tourists and strongly supported by a motivated and engaged community. Managed by a Board of Community representatives, the co-op employed a paid coordinator supported by community members volunteers.

Image 8 Lord Howe Island Community Food Co-op

An alternative to a physical store is an automated zero-waste mobile station that allows consumers to choose refill and reuse, avoiding waste of single-use plastics and packaging. Such a concept has been recently launched by Skipping Stones Refillery[11] at Cockburn in Perth[12] where consumers can refill reusable containers with a range of household liquids and pay by credit/debit card.

Each station dispenses eight different household cleaning, personal care, and food liquids. It encourages users to BYOC (bring your own container), borrow one for free from the 'Buy Nothing' box, or purchase a sustainable container to keep and refill every time. You only pay for the amount you need.

Figure 22 Skipping Stones Refill Automated Dispensary

Actions

- **ZWMI to investigate options to establish an automated refill station and bulk food outlet.**

[11] https://www.skippingstones.eco/refill-here

[12] Zero-waste container refill station opens at Cockburn ARC - City of Cockburn

7.3 Reuse

Organic materials disposed of in landfill decompose and produce methane, a common greenhouse gas. Outlined below are management options for these materials, with focus placed on common organic materials in landfills that break down and generate methane gas:

1. Garden waste – kerbside collection
2. Food and garden waste – kerbside collection
3. Organics – on-island processing
4. Textiles – non-saleable items
5. Disposable nappies – rebates for reusables
6. Paper and cardboard – recycling (refer section 7.4).

In addition, the following options are discussed:

7. Glass – on-island processing

7.3.1 Garden waste kerbside collection

Garden waste breaks down in landfill. The waste audit revealed that garden waste made up 37% of household general waste bins by weight. Garden waste was the largest single material found in household bins with 4 kilograms per week in houses and 1 kilogram per week in home units.

Generally, councils schedule garden organics collection every fortnight, alternating with the recycling bin collection week. Due to the large amount and bulky nature of palm fronds, the community identified that a 360L mobile garbage bin should be the standard size, with an option for a smaller 240L bin if required. At home units, general waste bins contain only a small amount of garden organics (3%), as there are fewer garden areas and maintenance contractors typically remove the waste from these sites. Council could provide garden waste bins for unit complexes on request. Garden organics would be sent to the transfer station's processing area, which will subsequently require more frequent processing.

Actions

Council introduces a kerbside garden organics service on a fortnightly basis with an option for residents to upsize to a 360L bin on request at no extra charge.

7.3.2 Food organics and garden organics (FOG0)

Food waste, like garden waste, decomposes in landfill and produces methane. The waste audit found households discard an average of 2 kilograms of food waste per week. Garden organics and food organics (FOGO) combined could target up to 56% of the general waste bin contents for single dwellings and 49% for home units. Households discard 19% of household general waste as loose and packaged food, while home units discard more than double this amount, at 46% (25% loose food and 21% packaged). This could be because holiday rentals discard all food waste at check-out.

A FOGO service significantly contributes to waste diversion and aligns with the Queensland Government's *Organics Strategy* and *Organics Action Plan 2022–2032*[13], aiming for 1.6 million households to have food and garden waste collections by 2030 to meet national and state targets.

[13] Queensland Organics Strategy 2022–2023 and Queensland Organics Action Plan 2022–2032

During the community consultation, residents expressed their views and willingness to pay for the introduction of a FOGO service, which would require additional resources and funds. The survey indicated that 74% of residents support the service, with 60% willing to pay extra. Of those, 29% would pay an additional $1 per week ($52 per year), 22% are willing to pay $2 per week ($104 per year) and 9% would pay $5 per week ($260 per year).

Residents who were not in favour of a FOGO service expressed concerns about odour, vermin and limited general waste bin capacity due to reduced service frequency. Some said they produced insufficient organic waste to regularly use a FOGO service because they managed their organic waste through composting.

The amount of food waste separation depends on resident engagement and interaction with the system. Research indicates that to maximise food waste separation, each household should receive an engagement pack consisting of a kitchen caddy with compostable bag liners and educational materials. A food only (FO) bin may be more appropriate at units with low garden waste.

Figure 23 Example of a council FOGO information flyer with how-to-use guide, caddy and poster

If Council is to introduce a combined FOGO or FO-only service, the provision of kitchen caddies, compostable bin liners and new GO, FO or FOGO bins will be needed. In addition, a new collection service for the additional bins will be required. Capital and operational costs are detailed below, noting this study was conducted in 2022. The GHD Feasibility Study explored four collection options (Figure 24). Option 2, which involves collecting FOGO or FO bins weekly and general waste fortnightly, was seen as best practice at that time.

Figure 24 Extract of business case of waste collection options and costs (GHD)

	Option 1: FO collection (Weekly) and GO collection (Quarterly).	Option 2: FOGO for SUDs and FO for commercial and MUDs (Weekly).	Option 3: FO (Weekly) and opt in GO (Fortnightly).	Option 4: Self-haul FO and GO
Estimated diversion	544	761	301	50
Reduced landfill diversion	533	301	292	50
CAPEX Incl. new bins, kitchen caddies and trucks). Depreciated over 10/20 years included below and % interest.	$110,000	$545,000	$565,000	$7,000
OPEX				
Collection cost Bins, equipment, accessories	$339,000 $32,000	$346,000 $33,000	$341,000 $31,000	$0 $4,000
Marketing, education, monitoring	$38,000	$38,000	$38,000	$38,000
Trucks & fuel	$34,000	$43,000	$47,000	$0
Revenue***	$37,000	$37,000	$50,000	$0
Landfill savings	Including in processing	Including in processing	Including in processing	Including in processing
Additional net cost per annum on top of BAU ($207,000)	$198,000	$217,000	$200,000	$42,000
Cost per hh	$99 per hh	109 per hh	$100 per hh	$23 per hh
Increased job opportunities	1-2 new jobs	1-2 new jobs	1-2 new jobs	1-2 new jobs

In NSW, however, there are strong calls by the processing sector to maintain weekly general waste collections to reduce contamination in the FOGO bin.

Figure 25 NSW organic processing industry best practice for FOGO collection

Actions

- **Council undertakes a cost-benefit analysis considering the most appropriate collection model for food organics (FO) or food and garden organics (FOGO) taking into consideration the collection frequency of the general waste bin.**
- **Council introduce and encourage utilisation of a dedicated food and garden organics (FOGO) or food organics (FO) only collection service for households.**

7.3.3 Food recovery at commercial hospitality premises

The 2024 waste audit of 12 local hospitality businesses found that general waste bins contained 42% to 60% food waste, equivalent to 125 kilograms of loose food and 40 kilograms of packaged food per day. Magnetic Island's hospitality venues and two backpackers' hostels generate an estimated 1.6 tonnes of food waste per week or 75 tonnes per year. The main food items found in the general waste bins were coffee grounds, food preparation scraps, and citrus peels.

Image 9 Largest component of commercial general waste bins is loose food waste

In 2022, with support from the Department of Environment and Science (DES), a three-month commercial food organics (COFO) trial was carried out involving 20 cafes. The trial provided valuable local insights into diversion potential and collection logistics. Participating businesses were provided with a 140L COFO wheelie bin affixed with an instructional lid sticker, a 15L and 20L bucket with instructional labels, certified compostable bucket liners, and a laminated factsheet. TCC collected the wheelie bins in the morning, three times per week (Monday, Wednesday, Friday). Food waste in the general waste bin decreased from 51% to 22%, with 65% of available food recovered. Contamination was 6%. After the trial, cafés indicated strong support for an ongoing service.

Image 10 Bins, buckets, bags and educational resources for trial

Space is at a premium in any commercial kitchen and therefore the system design should ensure the best bin configuration for user and collector. Installing dedicated bins in the kitchen at the points where food preparation and plate-scraping activities occur allows for effective food recovery. The size and shape of the food bins must align with the kitchen layout and the number of bins should be proportional to the amount of food waste generated.

Some kitchens are designed to accommodate wheelie bins under the work benches, which and can be pulled out for food waste disposal and then pushed back under the counter. Alternatively, kitchens can be retrofitted with holes in the benchtops, allowing food waste to be pushed directly into the bin. Due to the weight of food waste, smaller caddies or buckets can be used in the kitchen and emptied into larger bins outside.

Actions

- **Undertake a cost-benefit analysis considering the most appropriate collection model for commercial premises as an extension to the household FO/GO/FOGO service or as a dedicated collection program.**
- **Introduce and encourage utilisation of a dedicated food organics collection service for hospitality and accommodation businesses.**

7.3.4 Organics processing options on Island

The waste audit estimated that the sampled hospitality venues and backpackers' accommodation produce at least 60 tonnes of food waste per year, or 1.1 tonnes per week.

If Council introduces a FO service for commercial premises, the Bio-Regen unit could be upgraded and two units installed at the waste transfer station, capable of processing up to 1,000 kilograms of food waste per week. A dedicated undercover area to store and process the food into IBC containers with power and water would be required to accommodate the two units. Consumables include Xlr8 inoculant, vented bottles for finished product, and staff wages are required. The process is a labour-intensive process so paid positions to run the process and operate the equipment.

When FOGO or household quantities of food organics (FO) are collected and mixed with garden organics, the combined material needs to be composted. Composting more than 200 tonnes of organic material per annum is classified as an Environmentally Relevant Activity (ERA) requiring an Environmental Authority (EA) ERA53(a) under the *Environmental Protection Act 1994*. [14]

From November 2024, under section 41AC of the Environmental Protection Regulation, if organic material processing is to be carried out within 4km of the boundary of a residential zone, then an enclosed system must be used for receiving, storing and initially mixing the odorous feedstock; and an enclosed and/or in-vessel system must be used for composting the feedstock. There is no land on the island that is more than 4km away from residents. Curing or maturing the compost can be done outside in the open.

Councils are increasingly engaging third-party contractors to process organics, as they can both manufacture and market outputs as the finished product must be of a high quality and meet Australian Standard AS 4454 Composts, Soil Conditioners and Mulches.

The Queensland Government has issued a Best Practice Guideline[15] that provides environmental management advice for operators designing and operating composting facilities. The guidelines provide information on how to manage the risk of environmental harm and to achieve environmental compliance. This is supported by guidelines on model operating conditions[16].

[14] Composting regulation in Queensland | Environment | Department of the Environment, Tourism, Science and Innovation, Queensland

[15] Best practice environmental management guideline ERA 53(a)

[16] ERA 53(a) – Organic material processing by composting

Revised permissible levels for PFAS, a forever chemical, has been released requiring just 2 micrograms per kilogram of compost or 0.000002 per kg – this is a minute amount. Monitoring and testing requirements are rigorous with sampling required every 90 days or for every 300 tonnes of finished compost being produced. [17]

These conditions increase costs for site set-up and processing. Any system needs to be reliable, well-managed, and efficient. Composting relies on a carbon-and-nitrogen ratio. Cardboard can be incorporated into the composting process after shredding.

In 2022, TCC engaged consultants to undertake a business case for an organic processing facility on Magnetic Island. Six processing options were assessed (Figure 26). After Council considered the Feasibility Report and decided on the preferred collection and processing options, a cost–benefit analysis was recommended. To our knowledge, the cost–benefit study was not undertaken.

Figure 26 Collection and processing options assessed for Magnetic Island (2022)

Collection options	**2. FOGO collection**				**1. FO / GO collection 3. FO and opt in GO 4. Self-haul FO/GO**	
Processing options	1. Small-scale AD (Wet and dry)	2. In-vessel aerobic composting	3. Covered Aerated Static Pile (CASP)	4. Covered Inoculative Static Pile (CISP)	5. Dehydration	6. Black larvae
FO	Yes	Yes	Yes	Some	Yes	Yes
GO	Yes - dry	Yes	Yes	Yes	No	No
FOGO	Yes - dry	Yes	Yes	Yes	No	No
Biosolids	Yes	Yes	Yes	Yes	Some	No
End markets	Biogas Digestate	Mulch Compost	Mulch Compost	Mulch Compost	Soil amendment	Food for fish farms and poultry

Source: GHD

Actions

- **Council undertakes a cost-benefit analysis of preferred processing technology for FO and FOGO informed by the 2024 waste audit data or go to market and assess tendered responses for processing.**
- **Review the Bio-Regen facility once a full-scale commercial composting facility is commissioned but continue to fund and support in the interim.**

7.3.5 Glass crushing

Return-It runs the Containers for Change program on the island, offering a 10-cent refund for eligible containers. A hired truck visits and provides two mobile collection points for bag drop-offs and services bins at the kindergarten and the school pod. After five years of operation, the container refund scheme was expanded in November 2023 to include wines and spirits, which are mostly packaged in glass. Truck weights are exceeding allowable barge limits, as glass is much heavier than plastic bottles and

[17] https://www.detsi.qld.gov.au/policies?a=272936:policy_registry/pr-op-pfas-limits-in-compost-era53.pdf

aluminium cans. The collection team is rejecting bag deliveries and bins, and the school pod is not being cleared regularly. This is resulting in overflowing bags and community frustration**.**

Return-It accepts an estimated 25,000 containers per week, or 1.3 million containers per year. It is anticipated that up to 4 million containers may be consumed annually on the island. Assuming 30% of the current containers are glass, and the average weight of a beer bottle is 200 grams, approximately 30 tonnes (equating to 500,000 glass containers) are currently being transported back to the mainland. Section 7.4 discusses methods to increase container recovery which if successful, could increase glass recovery.

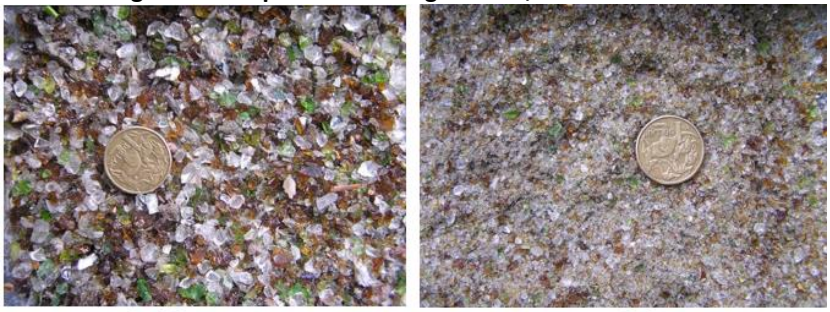
The idea of processing clean glass on Magnetic Island has been considered for some time. Undertaking a Glass Recycling Feasibility Study to boost glass recycling and reuse on MI was a key recommendation in the Decarbonisation of Great Barrier Reef Islands – Whole of Community Pilot Project of 2020. However, no formal study has been carried out.

Magnetic Island imports aggregates from the mainland and sends glass back for processing, incurring high freight costs. Crushed glass is utilised by various outlets, including the concrete batching plant (which imports aggregates) and Council, for a range of civil works. Local engineer and entrepreneur Sara Cole is researching and developing prototype construction materials incorporating glass.

Crushed glass can be used as a substitute for imported aggregate in a number of current applications. The Recycled Glass Sand (RGS) specifications in Australia are defined by Austroads Technical Specification ATS 3050. This specification outlines minimum requirements for the production and supply of RGS, including particle size distribution, shape, and material properties. RGS is suitable for various applications, including granular materials in infrastructure, road construction, and concrete.[18] A significant obstacle to the use of glass sand is the perception glass sand is an inferior product, a view often held by procurement staff and engineers. Glass is crushed into gravel or sand-size pieces with no sharp edges using pulverisers and mills. The material can then be used in construction projects.

The Andela Glass Pulveriser produces an aggregate, with the consistency of fine sand from all types of post-consumer glass and can also remove steel caps, straws and labels. Glass is fed from the top above a central rotor, which propels the glass against aprons using a continuous breaker bar. The unit is lined with replaceable liners, and the product is discharged directly out the end. After processing, the material is passed through a trommel for size separation. Typically, the trommel screen sizes are 0–3 millimetres or 3–10 millimetres, with waste discharged at the end.

Image 11 Example of crushed glass size, Lord Howe Island



3–10 mm *0–3 mm*

[18] ATS-3050 | Austroads

All processed glass must meet the End of Waste (EOW) Code for Glass Fines[19]. Under Section 155 of the *Waste Reduction and Recycling (WRR) Act 2011,* waste becomes a resource when it meets the requirements and conditions of an EOW code. Five composite samples of glass fines must be collected every three months and sent to a NATA-accredited laboratory for analysis when less than 4,000 tonnes per annum is processed. The samples must meet the criteria specified in the Code referenced in Figure 27 below. The CRS glass is processed to be clean, in contrast to glass processed from commingled kerbside bins. Community education on removing caps, corks and collars from glass containers may be beneficial.

Figure 27 Extract from End of Waste Code for glass fines quality standards for reuse

The **registered resource producer** must not use, sell or give away the **resource** under this EOW code unless the resource complies with all of the following criteria and quality characteristics:

a) is generated by the **mechanical processing** of waste glass;

b) contains no more than 2% **foreign materials**, where no more than 0.5% is labelling and residues; and

c) does not exceed the quality criteria stated in *Table 1: Resource quality criteria*.

Table 1: Resource quality criteria

Quality characteristic	Total maximum concentration (mg/kg 'dry weight' unless otherwise specified)
Arsenic	20
Cadmium	1.5
Chromium (total)	40
Copper	120
Lead	100
Mercury	1
Molybdenum	10
Nickel	20
Zinc	300
Electrical Conductivity	2.0dS/m
Total Organic Carbon	2.0%

A second-hand, 10-year-old rebuilt Andela glass pulveriser is available in Coffs Harbour, NSW for $60,000. Installation must comply with AS4024 regarding equipment guarding. A space approximately 20 metres by 10 metres is recommended to allow the holding of input and output material. A bin lifter feeds a conveyor belt, dropping glass over the pulveriser in a continuous stream. To optimise the wear pattern of the machine's components, a high and steady feed rate is recommended, as wear occurs on an hourly basis rather than per tonne of material. Based on the expected tonnage, maintenance of the hammer and liners may cost approximately $2,000 per annum. Oversized material can be rerun to eliminate waste. The discharge can be placed in bulka bags for ease of transport.

Actions

Undertake a glass processing feasibility study to investigate options to process and reuse glass on the island.

[19] End of waste code for glass fines (EOWC010001051)

7.3.6 Disposable nappies – reusables rebate

The waste audit of 2024 found that used nappies represent 2.3% of the single-dwelling general waste bins and 5% of home-unit bins. Combined households generate approximately 18 tonnes of used nappies per year which breakdown in landfill.
TCC offers a Reusables Rebate to residents, providing a 50% refund on eligible products-such as reusable cloth nappies, reusable inner liners and reusable wipes-up to a ma $200. Due to the popularity of the scheme, however, we understand the annual allocation is quickly exhausted.

Actions

Increase the Reusables Rebate budget allocation given the program's popularity to encourage the use of reuseable products such as cloth nappies.

7.3.7 Community Garden

Community gardens enable residents to come together to grow fresh food and take part in various environmental activities, including workshops and training in sustainable practices. They may also provide opportunities for networking and extending social circles.

Community members have worked for years to establish a community garden on the island. Despite discussing various locations, a suitable site has not been found, mostly due to ownership and water supply access.

Actions

- **Establish a community garden as a demonstration site and hub for community training and outreach activities.**
- **Establish a range of training forums and programs-such as composting workshops, permaculture courses, and repurposing activities-to empower and engage the community.**

7.3.8 Textiles

The household waste audit found that 0.2 kilograms per household per week of used textiles are discarded in general waste bins, equating to approximately 18 tonnes per year. Although donations of good-quality clothing and manchester should be encouraged to local op shops for resale, end-of-life management of poor-quality textiles remains a challenge. State and federal governments are now supporting initiatives and new enterprises to deal with the problem.

Case studies

BlockTexx - Located in southern Queensland. It uses a patented chemical process at a commercial scale to recycle textiles by breaking down and repurposing cotton and polyester materials, which makes up around 80% of textile use. The company partners with councils and has developed various programs, including one aimed at recovering old linen.

Shoalhaven City Council (SCC) provides drop-off bins at its waste facilities for textile recycling, including clothing, bedding, towels, curtains, soft furnishings, shoes, belts, and bags not suitable for op shop resale. There are three pathways:

- Reuse: saleable via charity networks or SCC's buy-back shops
- Repurpose: mechanically deconstructed to manufacture blankets, camping mats, rugs, etc.
- Recovery: textiles, mattresses, lounges, plastics, timber and foam made into process engineered fuel (PEF) and sold to cement kilns as a fuel source.

Figure 28 BlockTexx Give a Sheet flyer

Actions

- **Participate in Council annual Give a Sheet Day promotion for old linen recycling.**
- **Investigate options for poor-quality, unsaleable textiles to be reused / recycled.**

7.3.9 Solar panels

One goal of *Towards Net Zero Magnetic Island (Yunbenun) Climate Action Project* is to transition the community to solar energy. The establishment of a micro-grid would provide climate change resilience and reduce greenhouse gas impacts from coal-fired power sources. Over time, more solar roof-top panels will be installed. In Australia, solar panels typically have a lifespan of 25 to 30 years and will require replacement. Early adopters are already replacing panels, raising concerns about recycling costs and sustainable recovery.

Actions

That TCC provide a testing service to encourage panel reuse and resale at tip shop.

7.3.10 Share economy

Overconsumption and the purchase of cheap, disposable products contribute to waste generation. Alternatives to buying new products include sharing, borrowing, swapping, and purchasing second-hand items. The share economy has manifested in various forms, including shared music platforms such as Spotify, shared transport, such as GoGet, and local shared models for household items, books, toys, and tools.

BehaviourWorks Australia, part of the Monash Sustainable Development Institute, conducted research to understand 'circular consumption' and its impacts on the transition to a circular economy. The report outlines eight core behaviours, as shown in Figure 25 below.

Figure 29 Actions to reduce consumption behaviour

Source: BehaviourWorks Australia

Three actions are shown to have the greatest impact:

- Borrow/rent
- Source second-hand
- Buy built-to-last

Case studies

The Library of STUFF (LoS) Co-op, Mullumbimby NSW

This initiative began in April 2017 as a project of Mullum Cares Incorporated, a non-profit organisation established in 2016 to inspire and enable resource conservation in the Northern Rivers district of NSW. Between April 2017 and June 2024, the Library of Stuff grew to be the busiest share library in Australia with more than 5,000 loans per year. Funding to pay for a co-ordinator from flood recovery funds ran out in June 2023 and the organisation transitioned to a co-operative model. Members (individuals or households) pay $1 per week and donate one hour a week of their time. LoS proactively supports individuals, schools, community groups and event organisers to reduce their ecological footprint and save money by borrowing. The Mullumbimby and District Neighbourhood Centre donates the space.

Merribek Council, Melbourne [20]

Promotes a range of reuse, borrow and swap services including:

- **Toy library** – large range of individual toys for children of all ages and party packs of toys for birthdays and other occasions. Requires an annual membership.
- **Maker community** – not-for-profit giving members access to space and equipment, including woodworking space, 3D printers, soldering stations and electronics. DIY workshops for adults and kids.
- **Food swaps** – swapping of excess homegrown fresh produce such as fruit, vegetables, eggs, seeds and seedlings on a fair exchange. No currency is used.

Action

The community investigate funding options to establish a share library for tools, equipment, toys to be operated by a non-profit or social enterprise to promote reuse

[20] Home - Zero Carbon Merri-bek

7.4 Recycle

7.4.1 Households

The waste audit identified that 19% of home units and 14% of household general waste bins, by weight, contain recyclables that should be in the recycling bin. The recycling performance varied significantly by housing stock, with single houses averaging 64% recovery of all recyclable materials compared with 28% at home units. Houses are poor recyclers of plastics and steel, while units perform poorly in recycling glass, aluminium, paper, and plastics. Refer to Table 2 below.

Table 2 Amount recycled by material type and housing stock

Houses	Home units
• 60–70% of glass, aluminium and paper • 30–40% of plastics and steel	• 100% of steel recycled • 40% of glass and aluminium • 20% paper • 9% plastics

A considerable number of residential properties are listed for holiday accommodation with agents, privately and on short-term rental platforms. During their stay, guests are indistinguishable from permanent or part-time residents in terms of their waste generation and behaviour. Tourists depend on information provided at the time of booking or check-in as typically there is no-one on site to address any queries they may have.

Poor recycling performance may stem from apathy, arrogance, or ignorance. The waste audit revealed 10% contamination in household recycling bins and 17% in home-unit bins.

Top five recycling contaminants

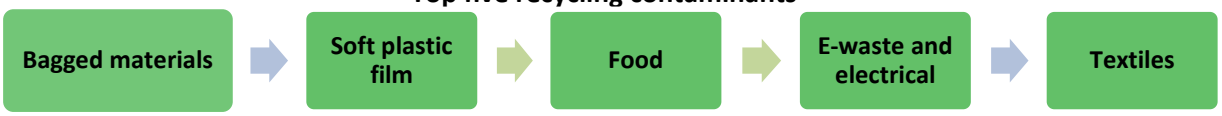


Image 12 Bagged material should NOT be in the recycling bins

Developing a campaign or aspirational slogan around improving poor recycling behaviour may help lift performance, for example, 'We can do better together'. Western Australia's Rottnest Island used 'Sort it out … Recycle, it's Vital!

Figure 30 Rottnest slogan Island's Waste

Image 13 Inconsistent bin colours

Confusion also arises due to inconsistency in bin lid colour, with some general waste bins having red or green lids. In most council areas, green bins and lids indicate garden waste and red lids are or general waste. A bin audit by collection drivers could identify any inconsistencies. Residents would be notified and their bins replaced or updated.

Action

- **Council undertakes a bin audit should identify waste receptacles not complying with the standard bin colours and these bins should be replaced.**
- **Issue new household resident waste management information packs**
- **Develop a specific island-wide behaviour change program targeting residents and visitors to drive waste minimisation and improve resource management or align with actions within the mainland behaviour change program.**
- **Design educational resources, including bin specifically for the tourist sector, using graphics to reduce language barriers for fridge magnets, wall posters and bin stickers.**
- **Ensure consistent messaging harmonising with TCC and state government Let's Get It Sorted campaign focusing on the key items contaminating recycling bins - bagged materials, soft plastics, food, electronic and textiles.**

7.4.2 Commercial accommodation

The community consultation surveys offered insights into overnight visitor experience, including:

- 14% of properties had a recycling bin inside the home
- 13% had no recycling bins at the accommodation premises
- 52% had no information about what could be recycled.

The lack of infrastructure and educational materials may explain poor recycling results, particularly in units where bins are not directly outside. The following actions should occur:

- Reviewing the infrastructure at large complexes on the island is necessary.
- Developing standard signage that clearly shows items for separation and the appropriate bin is crucial.
- All accommodation should have identical signage for compostables, recyclables, and general waste.

Visitors told us the best communication methods were at the time of booking, at accommodation premises, on ferries, at ferry terminals, and via social media and websites.

Action

- **Distribute resources and bin stickers to commercial accommodation premises annually.**
- **Consult with commercial accommodation premises to determine the preferred waste bin types for tourism rental properties for a consistent approach across the island and seek funding to subsidise new recycling bins, crates, or twin bins for all accommodation venues to promote recycling.**
- **Encourage all venues to include waste management as part of visitor inductions.**
- **Ensure educational resources use graphics to reduce language barrier.**
- **Request ferry operators to include waste minimisation messages on community screenings for tourists and locals.**

7.4.3 Commercial hospitality venues

The waste audit revealed 12% of the general waste bin contained material that should be diverted to recycling, including recyclable paper and cardboard, used containers such as steel, aluminium, and plastic, and CRS containers with a 10-cent redemption value. Contamination in these samples was 20%, of which 15% was loose food. Large amounts of bagged material and film plastic were also found.

Top three commingled recycling contaminants

The hospitality sector experiences high staff turnover, requiring constant engagement with staff and acknowledgment that all venues operate differently. At Rottnest Island, which has similar characteristics and challenges as MI, a wall poster and bins stickers were designed to educate staff on the waste separation process.

Figure 31 Rottnest Island commercial premises wall poster for staff education

Action

- **Seek support from the waste collection drivers to identify sites with contaminated recycling bins.**
- **Develop a Contamination Management Action Plan to reduce bin contamination.**
- **Consult with hospitality businesses to standardise resources for staff engagement to improve recycling and minimise contamination.**
- **Design and distribute resources including bin stickers to the sector for a consistent approach.**

7.4.4 Container refund scheme (CRS)

More than 25,000 containers per week, or 1.3 million containers per year, are redeemed for a deposit of 10 cents on Magnetic Island. However, the Containers for Change co-ordinator, COEX, uses a formula to estimate beverage consumption, concluding that up to 4 million containers are consumed on the island annually from:

- Residents consume 1.2 containers per day x 2,475 MI population – 1.1 million
- Tourists consume 3 containers per day x 880,000 bed nights – 2.7 million.

Many used beverage containers were found in general waste bins during the audit including:

- Single houses – generate 9 containers per week and 36% in the general waste stream
- Units – generate 3 containers per week and 73% in the general waste stream.

Based on the audit of the commercial sector, we estimate the following number of containers are being disposed of in the general waste bins and therefore not recovered for recycling or for their redemption value:

- 12 hospitality venues sampled generated - 19,000 per annum
- Backpackers – 32,000 per annum.

At present, the island is recovering less than one-third of all eligible containers, which have an estimated value of approximately $300,000. To improve container recovery, the community indicated support for the following measures: a permanent location on the island where all containers can be processed (see current issues discussed in section 4.5), and a permanent site for Horseshoe Bay residents

TCC, COEX and Return-It are discussing ways to enhance community service and boost redemptions, given the operational constraints of sea tides and barge weights. Key ideas include:

1. Providing a permanent on-island solution (depot) for the scheme operator to enable sorting and counting of all containers on island with the transport fees off island paid by COEX
2. By having a permanent depot, a full-service solution can be offered where households and commercial operators can request a mobile collection service to the premises termed Container Home or for commercial premises Partner Program.
3. Install wire container cages to all litter bins throughout the island, allowing members of the public or charitable organisations to remove containers for recovery.

Image 14 Wire container cages attached to litter stations for container recovery

Wire container cages will need to be monitored in high-use areas and near waterways to ensure containers are not carried by the wind into the marine environment if the cage is overfull.

Actions

- **Provide a permanent on-island solution (depot) for the scheme operator to provide a full-service solution for households and commercial operators including collecting containers from source i.e. Container Home / Partner Program.**
- **Install wire container cages to all high-profile litter bins across the island.**
- **Monitor wire cages to ensure do not overflow and adversely impact the environment.**

7.4.5 Litter and recycling bins

Residents are concerned about the absence of litter bins at bus stops, leading to the accumulation of litter. There are no recycling bins at the ferry terminal, the island's first access point. Community reports insufficient or inadequate litter bins at major tourist stops along the bus route, including The Fort and the rock wallabies' viewing area. Additional bins are requested at Geoffrey Bay, Nelly Bay, and Picnic Bay near the Surf Life Saving Club. Providing wire cages to every litter bin may address the need for dedicated recycling bins to ensure containers do not get blown away by wind.

Actions

- **Ensure litter bins are installed at all litter hotspots, including high-usage bus stops, jetties, and boat ramps.**
- **Review placement of litter bins at Geoffrey Bay, Nelly Bay and Picnic Bay near the Surf Life Saving Club and provide additional bins if needed.**

7.4.6 Household batteries

Batteries are part of everyday life, from TV remotes to embedded batteries in phones and tooth-brushes. Used household batteries are causing frequent fires in waste collection vehicles, waste and recycling facilities, and landfills nationwide. In May 2025, Gold Coast City Council reported seven truck fires during May 2025, and both Canberra and Cairns recycling plants have suffered catastrophic fires recently. While most fires are associated with lithium-ion batteries the Queensland Fire Department has stated that even spent AA and AAA batteries were capable of starting fires if they are compacted or crushed in waste collection vehicles.

A battery recycling bin was conveniently located at the MI Foodworks, however, due to lack of service of the full bin by the provider the bin was removed by the store manager. The problem remains. TCC has provided a bin at the transfer station however this is not convenient to many in the community, and it is imperative to educate the community to store and return batteries, but convenience is key. Point of sales is the obvious solution and works well on the mainland. It is critical to consider the risks associated with used batteries and the options for safe disposal. The Queensland Government has announced $2 million in funding for a comprehensive and easily accessible network of 'safe disposal' collection points for end-of-life loose and embedded batteries.

Actions

- **Provide household battery recycling collection points at locations where batteries are sold or at community hubs to facilitate easy return.**

7.4.7 Recycling from commercial waste generators

TCC charges fees for commercial recycling deliveries. At present, recyclables are $168 per tonne, cardboard $114 per tonne and mixed waste is $217 per tonne. The difference between the commercial recycling rate, which is exempt from the landfill levy, and the general waste fee with levy, is $49. The levy for this year is $115. It would be expected that there would be a significant price difference between general waste and recycling, with recycling being less expensive.

Actions

- **Council reviews its pricing policy for commercial operators delivering recyclables**

7.4.8 Expanded polystyrene

Council has contacted IS Recycling, specialists in polystyrene (EPS) recycling, about the purchase of a thermal compaction recycling machine (model SH-40M), which reduces the volume of EPS by 90% through the application of heat. The indicative capital cost for the unit is $36,000. The company supports a buy-back of the consolidated EPS. Feedback from users is that the machine is labour-intensive and requires a well-ventilated area.

During the waste audit, we monitored waste deliveries to the transfer station over a weekend and a weekday. During this time only 1% of the deliveries were EPS by volume. Additionally, a local company delivering appliances to the island indicated they return transport packaging, including EPS, to the retailers or wholesalers in Townsville for recycling. Before Council invests, a trial to separate all EPS from deliveries is needed to determine the long-term quantity delivered.

Image 15 EPS recycling

We understand that TCC has a melter at the Hervey Range Facility. EPS from the island could be delivered for recycling rather than replicating infrastructure.

Actions

- **Commence a six-month trial to determine the amount by volume and weight of EPS delivered to the transfer station.**
- **Undertake a business case using trial data to determine if EPS melter is warranted at the island transfer station.**

7.5 Repair

7.5.1 Repair café

There are 127 repair cafes in Australia and more than 3,000 globally. They offer a selection of tools for DIY projects and expert volunteers to help residents repair household items. Towards Better is a social enterprise and recipient of a government grant to establish a repair café on Townsville's north shore. Initially, the focus will be on textiles, toys, and basic furniture, moving onto bikes and battery-powered tools. The donation model is the most typical approach, but it relies on volunteers.

Ricky Esterquest, the organiser, is keen to explore a different funding model, including 'Repair and Resell', and is seeking to empower people with new skills. Ideally, the enterprise will run within an existing organisation such as the Men's or Women's Shed network. Ricky suggested 'Circular Magnetic' as a potential brand name.

Actions

The community investigate options and models to inform funding to establish a repair café on the island.

7.6 Disposal

7.6.1 Horseshoe Bay waste infrastructure for yachts

During the consultation we were advised that several visitors stay or live on yachts moored in Horseshoe Bay area, some for extended periods. Unlike those at the marina, these visitors lack dedicated waste infrastructure, instead relying on public bins along the foreshore. The litter and recycling bins in this area are serviced daily during the high season as Horseshoe Bay is a popular destination with locals and visitors. Council should consider providing a dedicated waste bin system for yachts at the public toilets with access by code issued with information about moorings by the Marine Park.

Actions

That a dedicated waste system be provided to Horseshoe Bay yacht moorings to avoid overuse of the public litter bin stations along Horseshoe Bay foreshore

7.6.2 Marine litter

The Magnetic Island community organises regular beach clean-ups, and dedicated residents and visitors pick up marine litter washed up on beaches every day. The MICDA Marine Working Group have identified the need for more beach clean-ups on remote bays of the island and installing Rig Recycle bins at jetties and boat ramps. This new initiative was launched in 2019 to encourage responsible disposal of fishing lines and tackle. These bins provide fishers with the opportunity to put their discarded tackle, fishing line, hooks, lures, sinkers, and washed-out bait-bags into a purpose-built bin with information signage to reduce impact on our waterways and marine life. This is a priority for Magnetic Island given the abundant marine life and adverse human impacts on the marine eco-system.

Figure 32 Rig Recycle for recreational fishers

Action

- **Install where possible Rig Recycle or similar boxes at or near jetties and boat ramps with information signage to encourage responsible disposal of fishing lines and tackle**
- **Undertake beach clean-ups on remote bays of the island where marine debris wash up**

8 Challenges and constraints

Island communities, such as Magnetic Island, face unique challenges, beyond those of their mainland counterparts, including but not limited to:

- Transport logistics and limitations
- High freight costs
- Increased distance to processing facilities
- Poor economies of scale
- Heavy reliance on external grants
- Highly transient community members and staff
- Competing funding priorities
- Small rate bases
- Reliance on volunteers.

8.1 Financial management

A major barrier to implementing waste strategies in island communities is gaining community support and fiscal management, particularly with a small rate base for infrastructure, maintenance and service delivery.

Unlike many other offshore islands, Magnetic Island gains support from a large and growing regional centre and a progressive council. Despite limited resources and completing priorities, waste management is essential for every household. Residents rely on weekly waste bin collections and visits to the waste transfer station for recycling or disposal. However, all waste and recycling except garden waste must be transported to mainland for disposal to landfill of general waste and processing of recyclables at a Material Recovery Facility (MRF). A gate fee per tonne delivered is charged at the landfill or recycling plant.

In addition is the freight cost to transport the waste and recycling from the island to the mainland. A special barge is chartered approximately 3 times per fortnight, subject to island activity and seasonality. The barge has a load capacity of 28 tonnes per trip and a cost of $7,000 per trip. In addition, some waste is transported on the passenger barge. The barge cost alone is around $550,000 per annum plus transport costs to and from the barge at both ends of the static compactors on a hook lift vehicle. or $250 per tonne, excluding wages and transport to the barge. The barge cost alone equates to around $337 per annum per rateable island property.

Excluding collection and transfer station operation we estimate the following fees for barge transport and disposal fees based on current tonnages for both waste and recycling.
The general waste component in 2026 is estimated to cost $981,000 or $584 / tonne rising to 1,115,000 or $665 / tonne in 2030 if waste remains static and assuming an annual 3.5% CPI index. Whereas recycling currently costs $280,400 or $320 / tonne and this will also increase to $319,200 or $364 / tonne by 2030 assuming tonnages remain static. Clearly, recycling is almost half the cost of general waste disposal.

If the savings in landfilling are realised from this strategy and more on-island processing of food, garden and glass are achieved these actions have the potential to reduce barge costs, disposal or processing fees. Our estimates are 17 less barge movements per annum providing a direct financial saving of

$119,000 per annum plus disposal fees and landfill levy payments providing a combined saving of $300,000.

During the community consultation we surveyed residents and tourists about their willingness to pay for services. While residents want to avoid paying extra for services, the Magnetic Island community showed 60% support for a FOGO service, with 32% against and 8% undecided. Of those willing to pay, 29% would pay an extra $1 per week or $52 a year, 22% would pay $2 per week or $104 a year and 9% would pay $5 per week or $260 a year.

Magnetic Island attracts more than 300,000 visitors annually, with projections indicating an increase to 400,000 by 2030. Tourism is a key component of the island's economy, however visitors use council facilities and assets, and generate waste, while not contributing directly to council revenue through rates. TCC faces challenges in identifying suitable opportunities to obtain financial contributions from these visitors. The Tourism Masterplan highlights the absence of offsets for tourism purposes from private short-term holiday rentals, such as a bed tax or differential rates.

A visitor survey found that 69% of tourists support an environmental levy on ferry ticket prices to offset waste-related expenses. Of those willing to pay, 41% preferred less than $2 extra per person per return trip, 33% preferred between $2 to $5, 17.5% between $5 to $10 and 2% preferred more than $10 per person per return trip. A $2 levy per person per return trip would generate $600,000 for waste management each year. To achieve this level of income from island residents, fees would need to increase by $337 per annum per island ratable property or $8 across the entire 75,000 rateable properties in TCC.

Environmental levies or environmental management charges (EMC) within the Great Barrier Reef (GBR) are not new and SeaLink collects EMC from passengers participating in commercial activities within the GBR Marine Park. Rates are $8.00 per person for a full-day visit and $4.00 per person for a part-day visit. These fees support research and conservation conducted by the Great Barrier Reef Marine Park Authority (GBRMPA). In addition, ferry tickets to Rottnest Island in Western Australia include a levy as does airline tickets to the World Heritage Lord Howe Island and have done for thirty years.

The introduction of a levy on Magnetic Island ferry tickets could be negotiated as there are only two ferry operators. An administration fee should be provided to the barge operators for collecting and passing on the fees.

Action

Introduce an environmental levy on all tourists whose residential address is outside of the TCC council boundary, develop annual budgets for the quarantine funds and report outcomes annually.

8.2 Implementation

Given the community's motivation, it is crucial to maintain the momentum from this project and ensure the community sees positive improvements and changes occurring. There is no reason to postpone implementing other actions that are not related to the introduction of an organics service and processing facility. Ongoing monitoring, evaluation, and reporting on progress is essential to maintain motivation in the community. No strategy remains effective indefinitely. Waste profiles, circumstances, community profiles, expectations, and opinions evolve over time as new issues arise. Further, no strategy is implemented unless it has a driver committed to the vision who has the respect and credibility of the community and committee they serve.

Action

- **That Council and MICDA representatives oversee strategy implementation.**
- **Employ an island based Towards Zero Waste Co-ordinator to drive the implementation of this waste strategy with budget for resources, events, social media and printing.**
- **Council to provide bi-annual reporting to the community of the islands waste performance for transparency and monitoring over time.**
- **Install a digital "Sustainability Notice Board" in a high-profile position at the gateway to the island with information about strategy goals, updates about what/where to recycle, current initiatives, and programs.**
- **Conduct a waste audit 6 – 12 months after the introduction of GO/ FO / FOGO to measure and quantify household and commercial bin use.**

8.3 Communication

The island faces a gap in community information dissemination, as there is no island newspaper or radio station, and many don't use the internet or are not familiar with social media. TCC this year initiated a quarterly island newsletter which is letter box dropped to all the island around infrastructure issues. This newsletter is a valuable TCC resource and should also be used to provide up to date and regular information around waste management and resource recovery.

Action

- **Utilise the council quarterly letter box dropped island newsletter to provide regular information around resource recovery activities and actions for the island.**

9. GREENHOUSE GAS SAVINGS

Based on the 2023-34 data provided by Townsville City Council Magnetic Island generated approximately 5,750 tonnes of waste per annum of which 1,677 tonnes of mixed waste was landfilled. One tonne of waste equates to generating between 1.4 - 2.1 tonnes of CO_2e- subject to composition of the waste and landfill practices. The 1,677 tonnes are estimated to generate 2,683 t CO_2e.

The *Towards Zero Waste Strategy 2030* for Magnetic Island in line with the Draft Queensland Waste Strategy 2025–2030 sets an 80% diversion target by 2030. To achieve this target requires an additional 527 tonnes of waste per annum to be diverted from landfill with no net increase in waste generation. Several key actions have been identified in the *Towards Zero Waste Strategy 2030* Action Plan which will directly contribute to reduced GHG. This would reduce the annual waste to landfill from 1,677 tonnes to 1,150 tonnes with the potential to provide reductions in GHG production.

9.1 Organic waste

When organic waste - food, garden waste, timber, textiles, nappies, paper and cardboard break down in landfill they create methane, which over a 100-year period is 28 times more powerful than carbon dioxide. The waste audit undertaken to support the strategy clearly identified the amounts of organics in the general waste stream. Most of all waste generated was garden and food waste in the waste streams of the households, accommodation and hospitality sector audited. The composition of each stream is detailed below with households ranging from 49%- 56% and commercial accommodation 42% and hospitality 60%.

Table 3 Organics composition by stream

Single dwellings	Home units	Commercial hospitality	Commercial accommodation
Garden waste - 37% Food waste -19% Combined - 56%	Food waste - 46% Garden waste – 3% Combined – 49%	Food waste - 60%	Food waste - 42%

As we know the composition of waste from the waste audit, we can refine the estimated GHG savings for three key materials – food, garden and paper/ cardboard. Of the 569 tonnes of food and garden waste generated based on achieving various recovery rates based on source we estimate that 454 tonnes are recoverable.

Table 4 Available tonnes of food and garden waste by sector with expected recovery

Material	Available tonnes	Recovery target by material	Extra tonnes per annum	Total tonnes per annum
		Households		
Garden waste	391	90% garden waste	**350**	**405**
Food waste	110	50% food waste	**55**	
	501			
		Hospitality venues		
Food Waste	45	65% of food waste	**30**	**30**
	45		**30**	
		Accommodation		
Garden waste	9	90% garden waste	**8**	**19**
Food waste	14	65% food waste	**9**	
	23			
Total	**569**			**454**

In addition, household place 0.5 kgs / household / fortnight of paper and cardboard in general waste or 27 tonnes per annum which the strategy aims to divert to the recycling stream.

One tonne of municipal waste equates to generating between 1.4 - 2.1 tonnes of CO_2e- subject to composition of the waste and landfill practices. As we know the composition of waste and the amount, we are aiming to divert from landfill we can calculate avoided emissions using the National Greenhouse and Energy Reporting Determination (2008) Scope 3 emissions factor based on one tonne of waste by type over a 100-year period in landfill.

Figure 33 GHG emissions factors by waste type

Landfilled material	Tonnes of greenhouse gas (CO_2e) produced per tonne of that material landfilled (tCO_2e/t)
Municipal solid waste (overall)	1.6
Food	2.1
Paper and cardboard	3.3
Garden and green	1.6
Wood	0.7
Textiles	2.0
Nappies	2.0
Rubber and leather	3.3
Inert waste, including concrete, plastic, metal and glass	0.0

- Food - 2.1t CO_2e x 94 tonnes (from table 2) = 197 t CO_2e
- Garden waste - 1.6 t CO_2e x 358 tonnes (from table 2) = 573 t CO_2e
- Paper and cardboard - 3.3 t CO_2e x 27 tonnes = 89 t CO_2e
- **Total 859 t CO_2e**

The general mixed waste calculation showed a reduction of 843 CO_2e whereas this specific analysis using waste audit data increases the savings to 859 CO_2e. To validate the above we cross checked with the Australian Carbon Neutral calculator[21] which calculates emissions estimates slightly differently with the outcome within 12 tonnes at 872 t CO_2e of the above.

Figure 34 Carbon Neutral calculator outputs

Type	Weight (T)	CO2 emissions (T)
Food	100	210
Paper	27	89
Garden	358	573
Total	**485**	**872**

However, by composting avoids methane emissions that result from anaerobic decomposition plus has the benefit that the compost can sequester carbon, providing a direct benefit for climate change mitigation but the composting process does still generated emissions estimated to be 50 per cent or half than landfilling.

- Food - 2.1t CO_2e x 94 tonnes (from table 2) = 197 t CO_2e
- Garden waste – 0.8 t CO_2e x 358 tonnes (from table 2) = 286 t CO_2e
- Paper and cardboard - 3.3 t CO_2e x 27 tonnes = 89 t CO_2e

Total GHG savings - 572 t CO_2e

[21] https://carbonneutral.com.au/carbon-calculator/

Processing food waste does create some GHG from electricity and fuel used to power dehydrators or compost aerators. However, at the time of writing the technology selection for the food waste processing is unknown and has not been factored in.

9.2 Collection vehicle electrification

The current waste collection vehicle travels an estimated 460kms per week or 24,000 kms per annum with a fuel economy of approximately 1.4km/l this equates to 17,000 litres of diesel per year at an average price of $2.50 / litre or $43,000 per annum. In total the waste collection vehicle generates around 5 tonnes of CO_2-e per annum.

- Scope 1 emissions 4.6 tonnes of GHG emissions based on 2.7 tonnes of CO_2-e per kilolitre
- Scope 3 emissions from diesel production and transportation an additional 0.340 tonnes of CO_2-e per kilolitre based on 0.2 t CO_2-e/kL)
- **Total GHG savings - 5 tonnes of CO_2-e**

9.3 Installation of solar panels at transfer station

The 2020 ARUP Decarbonisation Report identified that the for a small investment of around $5,000 (without battery), the installation of a 3kW solar panel system at the transfer station could reduce consumption annually by 3,900kWH saving is assuming 70% of the power consumption occurred in the day between 7 am and 4 pm which are the opening hours equating to $1,000 per annum and an estimated 3.2 CO_2-e per annum.

A larger PV installation and / or battery would provide more savings in both power bills and emissions reduction. The report also states larger systems and batteries need feed-in tariffs to offset and these are now drastically reduced.

At the time the report was written it identified four potential funding opportunities that may have been suitable to offset all, or part of the project costs as shown in Figure 7.

- **Total GHG savings - 3.2 tonnes CO_2-e**

9.4 Barge operation

On-island processing of more garden and food has the potential to reduce barge costs, landfill disposal and greenhouse gas generation from these activities. Currently a special barge is chartered about 3 times per fortnight, subject to island activity and seasonality to transport the 1,677 tonnes of general waste and the 875 tonnes of recycling. The barge has a load capacity of 28 tonnes per trip at a cost of approximately $7,000 per trip. If the savings in landfilling are realised this equates to 18 less barge movements per annum and a financial saving of $126,000 offset by the need for one additional barge to transport the additional recycling tonnage. The financial savings are estimated at $119,000 for the 17 less barge movements.

The GHG calculation for the barge operation can be calculated by two methods

1. Fuel-based method -involves determining the amount of fuel consumed (i.e., scope 1 and scope 2 emissions of transport providers) and applying the appropriate emission factor for that fuel
2. Distance-based method - involves determining the mass, distance, and mode of shipment, multiplied by mass-distance emission factor for the vehicle used

Using option 2 emissions from sea transport:[22]

- 28 (tonnes) x 8 (kms) distance travelled in transport leg x 2 (return leg) x 0.05 (kg CO2 e/tonne-km) x 17 barge movements = saving of 380 t CO_2 e
- **Total GHG savings – 380 t CO_2 e**

9.5 Summary

The *Towards Zero Waste Strategy 2030* for Magnetic Island is seeking to reduce waste to landfill by 80% or which can also achieve GHG emission reductions of 580 CO_2-e tonnes with 572 CO_2-e from waste reduction and composting and 8.2 CO_2-e from energy savings from waste related activities. In addition, the anticipated reduced 17 barge movements will achieve a further savings of 380 t CO_2e.

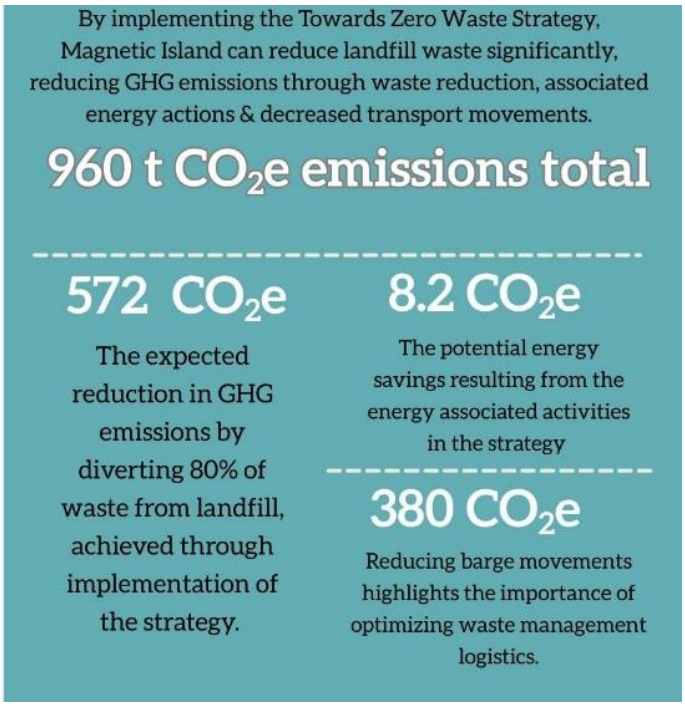
These combined actions should achieve a reduction of 960 t CO_2e per annum when the strategy is fully implemented.

The balance of the carbon emissions from the remaining waste that continues to be landfilled will need to be offset to achieve carbon neutrality. This can be achieved by buying carbon offsets, investing in projects that reduce or remove greenhouse gases from the atmosphere including renewable energy projects and planting trees.

Action

- **Investigate purchase of an electric garbage truck to service Magnetic Island**
- **Investigate installing solar panels on the roof of the TS with optional battery storage to charge the electric collection vehicle.**

Figure 35 GHG Savings from strategy implementation



[22] https://ghgprotocol.org/sites/default/files/2022-12/Chapter4.pdf

10. Towards Zero Waste Strategy

The 80% diversion from landfill target by 2030 set by state government is achievable for the Magnetic Island community. Based on current generation we must recover an additional 500 tonnes of waste. The table below shows the amount of recoverable material (available tonnes) currently placed in the general waste bins and the amount that is realistically achievable to be diverted from landfill as not every household or business will recycle every item or recover all garden waste or food waste. Drawing on our experience and national data, we have applied realistic recovery rates where a kerbside service is provided. These calculations indicate that it is feasible to achieve the state government's target of 80% landfill diversion by 2030 assuming waste generation remains static.

Table 5 Available tonnes by sector and expected recovery

Material	Available tonnes	Recovery target by material	Extra tonnes per annum	Total tonnes per annum
		Households		
Garden waste	391	90% garden waste	**350**	**442**
Food waste	110	50% food waste	**55**	
Recyclables	75	50% recyclables	**37.5**	
		Hospitality venues		
Food Waste	45	65% of food waste	**30**	**37**
Recyclables	12	60% recyclables	**7**	
		Accommodation		
Garden waste	9	90% garden waste	**8**	**24**
Food waste	14	65% food waste	**9**	
Recyclables	12	60% recyclables	**7**	
Total			**503**	**503**

10.1 Greenhouse Gas savings

The current 1,677 tonnes of mixed waste landfilled from Magnetic Island generates approximately 2,683 tonnes of greenhouse gas (GHG) measured as CO_2e.

The *Towards Zero Waste Strategy 2030* is seeking to reduce waste to landfill by 80% or 527 tonnes to 1,150 tonnes to be landfilled which can also achieve GHG emission reductions of 580 CO_2-e tonnes. Of this amount 572 CO_2-e is from landfill avoidance and composting and 8.2 CO_2-e from energy savings from waste related activities. In addition, the anticipated reduction of 17 barge movements per annum will achieve a further savings of 380 t CO_2e.

This strategy, when fully implemented, should achieve a reduction of 960 t CO_2e from 2,683 t CO_2e to 1,723 t CO_2e per annum or a reduction of 35%.

These reductions address climate action actions under the Reef 2050 plan and helps Australia meet its targets to keep the Great Barrier Reef (GBR) world heritage listing by UNESCO. It also provides a blueprint for other island & remote communities in the GBR catchment.

The balance of the carbon emissions from the remaining waste that continues to be landfilled will need to be offset to achieve carbon neutrality. This can be achieved by buying carbon offsets, investing in projects that reduce or remove greenhouse gases from the atmosphere including renewable energy projects and planting trees.

10.2 Landfill diversion opportunities

The graphics below illustrate the maximum potential new opportunities listed by waste source, bin type, and material if everyone separate recyclables, food and garden waste.

10.2.1 Households

A waste audit of 200 homes showed us what is in our bins

Figure 36 Composition of household general waste and recycling bins

Based on what we are throwing in our general waste bin, households could reduce the general waste bin by 68% by weight if all recyclables, food, and garden waste was diverted to other bins.

Houses = 68% reduction

13%	should be in the recycling	plastics, paper/cardboard and glass containers
55%	could be diverted to FOGO bin	loose, packaged food and garden organics

Home units = 69% reduction

20%	should be in the recycling	plastics, paper/cardboard and glass containers
49%	could be diverted to FOGO bin	loose, packaged food and garden organics

10.2.2 Commercial

TCC advises there are 63 rateable commercial premises on Magnetic Island. This analysis relates to the commercial hospitality and accommodation premises sampled for the audit.

Hospitality venues

A waste audit of 12 hospitality venues showed us what is in our bins

Figure 37 Composition of commercial hospitality general waste and recycling bins

There are 63 commercial premises on the Island. The amount and type of waste they generate differ. This analysis presents results for commercial hospitality and accommodation premises only, showing that if all recycling and food were properly separated, it could reduce their general waste bin weights by 68 – 72%.

Commercial Hospitality venues - could reduce waste to landfill by 72% if a food waste service was introduced.

Commercial hospitality = 72% reduction

12%	should be in the recycling	plastics, paper/cardboard and glass containers
60%	could be diverted to FO bin	loose and packaged food

Commercial accommodation - Based on the samples taken from backpackers accommodations, waste to landfill could be reduced by 68%.

Commercial accommodation = 68% reduction

24%	should be in the recycling	plastics, paper/cardboard and glass containers
42%	could be diverted to FO bin	loose and packaged food

10.3 Framework

We need to take more responsibility for the waste we produce, and take more control of how that waste is managed. By having a co-ordinated plan we can reduce our over consumption, refuse single use items, reuse, recycle, repair and return more. This vision has been set by the community.

Vision

Magnetic island to *become a global leader in sustainability and a Zero Waste community – protecting our precious Great Barrier Reef and natural environment for generations to come.*

Mission

Towards Zero Waste

Goals

1. Reduce waste to landfill
2. Improve organics recovery
3. Implement new waste management practices
4. Promote circular economy
5. Drive community and visitor behaviour change

2030 Targets

- Divert 80% of all waste from landfill
- Recycle 65% of bins contents
- Recover 80% of all Containers for Change containers
- Reduce greenhouse gas generation by 35%
- Reduce household waste by 15%

By introducing a four-stream waste system shown below, together we can achieve the targets:

1. Compostables – food and garden waste.
2. Recyclables – glass, aluminium, steel, plastic bottles and containers, cardboard and paper.
3. CRS material – used eligible beverage containers for 10 cent refund.
4. Residual waste – anything else.

The key steps required to meet the targets are:

1. Recycle Right

- Separate all our paper, cardboard, and containers to our recycling bins.
- Stop putting rubbish in our recycling bins.

2. Separate our food and garden waste

- We need a kerbside organics service to collect and process our organic waste on the island.
- Household bins - 37% garden organics + 19% food waste = 46%
- Hospitality bins - 45% loose food waste + 15% packaged food = 60%
- Accommodation bins - 25% loose food waste + 17% packaged food waste = 42%

3. Return our 10 cent containers

Each year of the estimated 4 million containers sold, 2.5 million containers are not redeemed for the 10-cent refund, resulting in $250,000 lost revenue

Table 6 Key action areas

Action area	Key actions	What it will do
Collections	Introduce a new kerbside collection service for garden organics to all households then extend the service to include food waste from households and the commercial sector.	This is the single biggest impact action as it has the potential to divert 452 tonnes from landfill.
Engagement	Research, develop, and implement behaviour change campaigns that effectively engage both the local community and tourists. Employ an island based Towards Zero Waste Coordinator to drive the Strategy.	Ensure that the community and visitors are engaged and motivated to align behaviours with the waste hierarchy.
Regulation	Introduce a by-law to regulate the use of single-use items and support zero-waste events.	This supports waste minimisation and reduces waste generation of single use items.
Data	Council to report bi-annually to the community on the island's waste performance to ensure transparency, accountability, and ongoing monitoring.	Consistent, reportable data helps the community track progress and to inform future activities, actions, and plans.
Leadership	Form a Waste Working Group with the non-for-profit island community groups and Council to oversee and implement this strategy. Advocate for change on issues of state and national significance.	Open, honest communication is essential between council and the community.
Financial	Implementation of the strategy can be offset by saving in 17 barge movements per annum at 2025 costs around $120,000 per annum plus operational costs associated with the barge loading/unloading.	Financial savings from reduced barges offset implementation costs.

10.4 Action Plan

The Action Plan aims to set out clear, practical initiatives for collective action to reduce waste arisings and address the issues and opportunities identified in this strategy. There are 61 key actions that will lead us on our *Towards Zero Waste* journey. This table links actions to the Waste Hierarchy, identifies who will lead each action, and the anticipated timeline for each action. Many of the actions can only be taken if programs are funded including the employment of a Zero Waste Co-ordinator to oversee and drive implementation of these recommendations. Zero Waste Magnetic Island (ZWMI) and Marine Action Magnetic Island (MAMI) are working groups of MICDA.

Legend: Magnetic Island Community Development Association (MICDA), Townsville City Council (TCC), Zero Waste Magnetic Island (ZWMI), Marine Action Magnetic Island, (MAMI), Containers for Change (COEX) , Townsville Enterprise Limited (TEL)

Table 7 Action plan

WASTE HIERARCHY	ACTION	BY WHO	BY WHEN (FINANCIAL YEAR)				
			2025-26	2026-27	2027-28	2028-29	2029-30
Avoid	**Single use items** 1. Adopt and implement by-law and *Single Use Packaging and Materials Policy* to ban single use items. 2. Encourage / incentivise single use alternative reusable merchandise - water bottles, keep cups, cutlery, food containers.	TCC MICDA/ ZWMI	✓ ✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓
	Zero waste events 3. Adopt and implement a *Zero Waste Events Policy* for all events held on Council land on Magnetic Island. 4. Promote the *Environmental and Packaging Guidelines for Public Events* to assist event organisers. 5. Investigate grants to purchase a mobile wash and hydration station with reusable food ware to be located on the island and available for hire at minimal cost to non-for- profit groups or engage a contracted service provider.	TCC TCC/ ZWMI MICDA	✓ ✓✓	✓ ✓✓ ✓	✓ ✓✓	✓ ✓✓	✓ ✓✓
Reduce	**Plastic shopping bags** 6. That advocacy efforts be directed to local, regional and state offices of IGA and Foodworks to remove all plastic shopping bags from island stores and replace with paper or reusable options to reduce the risks of marine litter.	MICDA/ ZWMI	✓	✓			
	Greenhouse gas 7. Investigate purchase of an electric garbage truck to service Magnetic Island	TCC TCC		✓			

WASTE HIERARCHY	ACTION	BY WHO	BY WHEN (FINANCIAL YEAR)				
			2025-26	2026-27	2027-28	2028-29	2029-30
Reduce	8. Investigate installing solar panels on the roof of the TS with optional battery storage to charge the electric collection vehicle			✓			
	Packaging 9. Investigate options to establish an automated refill station and bulk food outlet.	**MICDA/ ZWMI**	✓	✓	✓	✓	✓
	Stormwater 10. Install and maintain litter booms or traps to reduce litter and debris entering the Great Barrier Reef and Horseshoe Bay Lagoon waterways.	**TCC**		✓	✓	✓	✓
	Litter 11. Ensure litter bins are installed at all litter hotspots, including high-usage bus stops, jetties, and boat ramps.	**TCC/MICDA /ZWMI**	✓✓				
	12. Review current placement of litter bins at Geoffry Bay, Nelly Bay and Picnic Bay near the Surf Life Saving Club and provide additional if need identified.	**TCC/MICDA /ZWMI**	✓✓				
	13. Undertake beach clean-ups on remote bays of the island were marine debris wash up	**MICDA/**	✓	✓	✓	✓	✓
	14. Install tackle boxes at jetties and boat ramps with information signage to encourage responsible disposal of fishing lines and tackle.	**ZWMI/ MAMI**	✓	✓	✓	✓	✓
Reuse	**Garden waste service** 15. Council introduces a kerbside garden organics service on a fortnightly basis with an option for residents to upsize to a 360L bin on request at no extra charge.	**TCC**		✓	✓		
	16. Develop a garden planting guide to assist residents identify preferred plantings to reduce garden waste generation.	**TCC/ MICDA**		✓✓			
	Household food and garden organics, commercial food only collection and organics processing 17. Undertake a cost-benefit analysis for both households and commercial premises considering the most appropriate collection model and preferred processing technology or go to market and assess tendered responses for processing.	**TCC**		✓			
	18. Introduce and encourage utilisation of a dedicated food organics collection service for hospitality and accommodation businesses.	**TCC**			✓	✓	✓
	19. Introduce and encourage utilisation of a dedicated food and garden organics (FOGO) or food organics (FO) only collection service for households.	**TCC**			✓	✓	✓

WASTE HIERARCHY	ACTION	BY WHO	BY WHEN (FINANCIAL YEAR)				
			2025-26	2026-27	2027-28	2028-29	2029-30
Reuse	20. Continue the Bio-Regen project and reassess after FOGO service and commercial scale composting facility is commissioned food waste and reassess with TCC support.	TCC/MICDA	✓	✓	✓	✓	✓
	Community garden 21. Establish community gardens as demonstration sites and hubs for community training and outreach activities with TCC support.	TCC/MICDA		✓	✓	✓	✓
	Glass 22. Undertake a Glass Recycling Feasibility Study to investigate options to process and reuse glass on the island.	TCC	✓				
	Textiles 23. Participate in annual "Give a Sheet Day" promotion for old linen recycling 24. Investigate options for poor-quality, unsaleable textiles to be reused / recycled.	TCC/MICDA ZWMI TCC	✓✓	✓✓ ✓	✓✓ ✓	✓✓ ✓	✓✓ ✓
	Reusables rebate 25. Maintain the budget allocation to encourage the use of reusable products such as cloth nappies and divert from landfill	TCC	✓	✓	✓	✓	✓
	Share Library 26. Investigate funding options to establish a share library for tools, equipment, and toys to be operated by a non-profit or social enterprise to promote reuse.	MICDA		✓	✓		
	Solar panels 27. That TCC provide a testing service to encourage panel reuse and resale at tip shop.	TCC	✓				
	Tip shop 28. Provide an awning to the tip shop hard stand area for weatherproofing of items stored outside.	TCC		✓			
	Households 29. Ensure standard bin colours are used throughout the island and replace as necessary	TCC	✓				

WASTE HIERARCHY	ACTION	BY WHO	BY WHEN (FINANCIAL YEAR)				
			2025-26	2026-27	2027-28	2028-29	2029-30
Recycle	**Commercial accommodation** 30. With the support of Tourism Magnetic Island consult with commercial accommodation premises to determine the preferred waste bin types for a consistent approach and seek funding to subsidise bins for all accommodation venues. 31. With the support of Tourism Magnetic Island encourage premises to include waste management as part of all visitor inductions.	MICDA/ ZWMI MICDA/ ZWMI	✓ ✓	✓ ✓	 ✓	 ✓	 ✓
	Commercial hospitality 32. Seek support from waste collection drivers to identify contaminated recycling bins. 33. Develop a Contamination Management Action Plan to reduce bin contamination.	TCC TCC	✓ ✓	✓	✓	✓	✓
	Container Refund Scheme (CRS) 34. Provide a permanent on-island solution (depot) for the scheme operator to provide a full-service solution for households and commercial operators including collecting containers from source i.e. Container Home / Partner Program. 35. Install wire cages to high-profile litter bins across the island for container donations. 36. Monitor wire cages to ensure they do not overflow, preventing adverse impacts on the environment.	COEX /TCC COEX / TCC TCC	✓✓ ✓✓ ✓				
	Batteries – household 37. Provide household battery recycling collection points at locations where batteries are sold or at community hubs to facilitate easy return.	MICDA/ ZWMI	✓				
	Expanded polystyrene (EPS) 38. Conduct a 6-month EPS separation pilot to determine quantity over 6 months. 39. Develop a business case with trial data to determine if EPS machine is warranted	TCC TCC	✓ ✓				
Repair	**Repair cafe** 40. Investigate options /models to establish Repair Cafe by nonprofit or social enterprise.	MICDA/ ZWMI		✓	✓		
Dispose	**Hazardous and chemical waste** 41. That Council investigate the provision of a properly designed and constructed storage unit to be located at the Transfer Station for the storage of out of data and unwanted chemicals deliveries by the public.	TCC	✓				

WASTE HIERARCHY	ACTION	BY WHO	BY WHEN (FINANCIAL YEAR)				
			2025-26	2026-27	2027-28	2028-29	2029-30
Dispose	42. That the community be encouraged to safely dispose of chemicals at the transfer station to avoid them going into general waste with the potential contamination issues that arise at landfill.	TCC		✓			
	Horseshoe Bay Yacht moorings 43. That a dedicated waste system be provided to Horseshoe Bay yacht moorings to avoid overuse of the public litter bin stations along Horseshoe Bay foreshore	TCC		✓			
Finance	**Environmental levy for tourists** 44. Introduce an environmental levy on all tourists whose residential address is outside of the TCC council boundary. 45. TCC and community non-for-profits groups develop annual budgets for the quarantined funds to be used exclusively for island sustainability initiatives and report outcomes annually. 46. Employ an Island based Towards Zero Waste Co-ordinator to drive implementation of this waste strategy for a period of 3-5 years supported by a budget for resource, events, social media and printing.	TCC/ TEL / MICDA TCC/ TEL / MICDA TCC/MICDA	✓✓	✓✓ ✓✓ ✓✓	✓✓ ✓✓ ✓✓	✓✓ ✓✓ ✓✓	✓✓ ✓✓ ✓✓
	Commercial deliveries of recyclables 47. That TCC review its pricing policy for commercial operators delivering recyclables.	TCC	✓				
	Differential Bin Charges 48. That the cost differential between general waste bin sizes be increased to reflect the difference in capacity and encourage waste minimisation.	TCC	✓				
Education	**Behaviour Change** 49. Utilise the council quarterly letter boxed island newsletter to provide regular information around waste and resource recovery activities on the island. 50. Develop a specific island-wide behaviour change program targeting residents and visitors to drive waste minimisation and improve resource management or align with actions within the mainland behaviour change program. 51. Design educational resources specifically for the tourist sector, using graphics to reduce language barriers for fridge magnets, wall posters and bin stickers	TCC MICDA/ ZWMI TCC/MICDA /ZWMI	✓ ✓ ✓✓	✓ ✓	✓ ✓	✓ ✓	✓ ✓

WASTE HIERARCHY	ACTION	BY WHO	BY WHEN (FINANCIAL YEAR)				
			2025-26	2026-27	2027-28	2028-29	2029-30
Education	52. Establish a range of training forums/ programs such as composting workshops, permaculture courses, repurposing activities to empower and engage the community.	MICDA/ ZWMI	✓	✓	✓	✓	✓
	53. Distribute resources and bin stickers to commercial accommodation premises annually.	TCC/MICDA /ZWMI	✓	✓	✓	✓	✓
	54. Request ferry operators to include recycling messages on community screenings.	TCC/MICDA /ZWMI	✓✓	✓✓	✓✓	✓✓	✓✓
	55. Consult with hospitality businesses to standardise resources for staff engagement aimed at improving recycling and minimise contamination.	MICDA/ ZWMI	✓	✓	✓	✓	✓
	56. Ensure consistent messaging harmonising with TCC and state government Let's Get It Sorted campaign focusing on the key items contaminating recycling bins - bagged materials, soft plastics, food, electronic and textiles	MICDA/ ZWMI	✓				
	57. Issue new household resident waste management information packs annually.	TCC	✓	✓	✓	✓	✓
	58. Install a digital "Sustainability Notice Board" in a high-profile position at the gateway to the island with information about strategy goals, updates about what/where to recycle, current initiatives and programs.	TCC/MICDA /ZWMI		✓✓			
Implement	**Communication, measure, and monitor**						
	59. That Council representatives, Island community non-for-profits like MICDA and Zero Waste Magnetic Island oversee strategy implementation.	TCC/ZWMI MICDA	✓✓	✓✓	✓✓	✓✓	✓✓
	60. Council to provide a bi-annual reporting to the community of the islands waste performance for transparency and monitoring over time.	TCC		✓	✓	✓	✓
	61. Conduct a waste audit 6 – 12 months after the introduction of GO/FO/FOGO to measure and quantify household and commercial bin use.	TCC					✓