

Report prepared by Arup on behalf of:

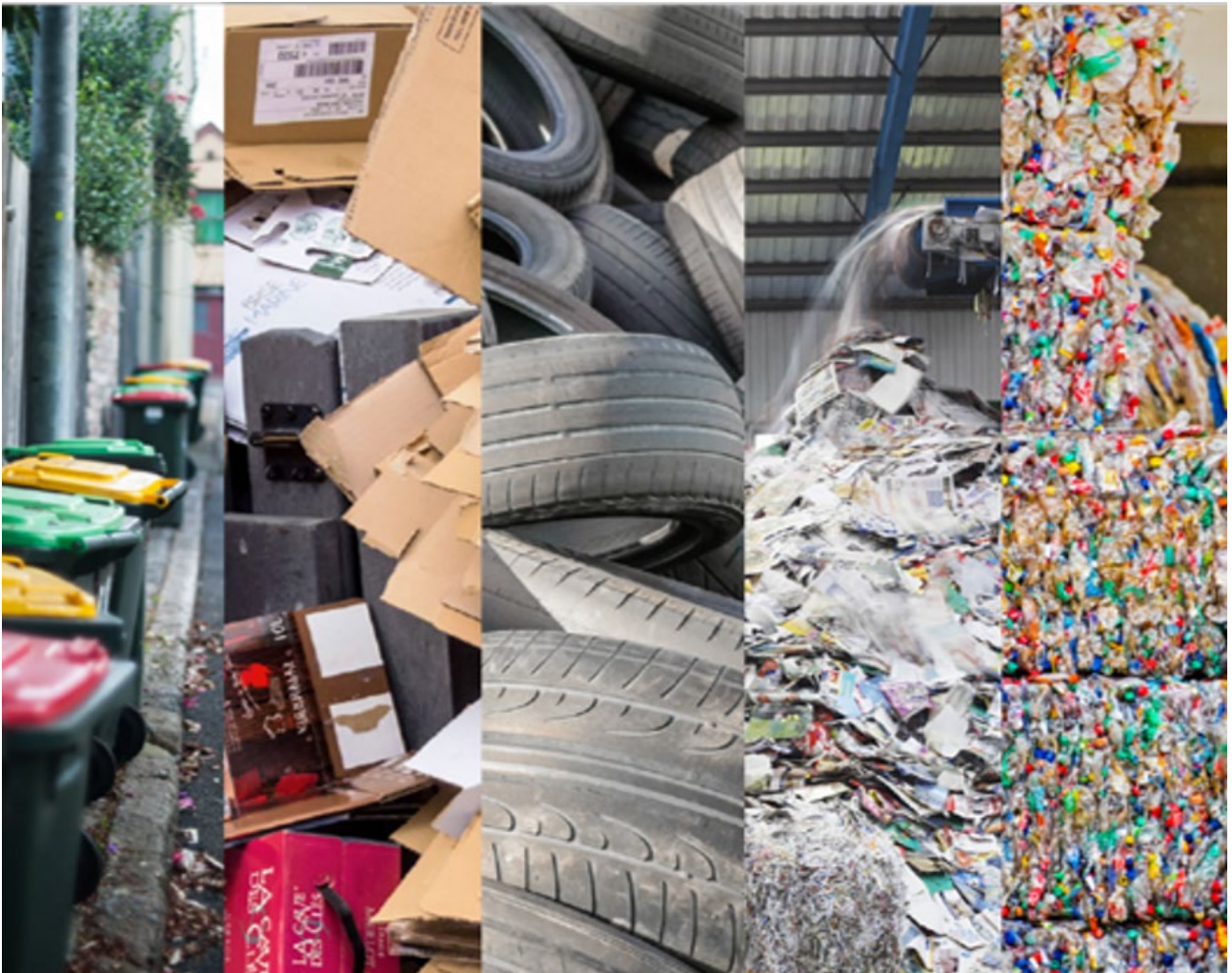


# Resource Recovery 2040 Program and Business Case

## Stage 1: Strategic Assessment Report

Reference: 288911-SAR-001

Final | 20 February 2023



# Executive summary

## Background

The viability of resource recovery in Cairns is constrained by the variable volume and quality of waste produced, costly and carbon-intensive transport logistics, poor customer behaviours, and inconsistent policy at a local, state and national level.

As a result, existing waste systems and assets face imminent redundancy. The redundancy of assets will lead to increased rates of waste disposal to landfill, adverse environmental impacts, increased costs to Cairns Regional Council (CRC), and a failure to meet Queensland's waste diversion and resource recovery targets.

To respond to these challenges, CRC is developing a detailed Resource Recovery Program to 2040 (the RR2040 Program), to document the long-term plans to optimise its resource recovery systems. The RR2040 Program seeks to position Cairns as leaders in resource recovery and by doing so, strengthen the economic resilience, environmental health, amenity and liveability of the region.

## Purpose

This strategic assessment report has been prepared to define the service need for the RR2040 Program and develop a long-list of potential initiatives and program options. The program options define alternative pathways that could be adopted by CRC to meet its resource recovery aims over the long-term (to 2040).

Each option comprises a sequence of complementary initiatives, designed to respond to the problems, opportunities and service need that were defined through investment logic mapping (ILM) process, and include varying levels of intervention, investment and therefore achievement of the intended benefits.

## Problem definition

Delivery of the RR2040 Program is needed to address three key problems shown in Figure 2.

Problem 1	• Failure to take personal responsibility for resource recovery continues poor customer practices which <b>increases</b> contamination in recycling streams, the volume of waste disposed to landfill and adverse environmental impact.
Problem 2	• An increasingly complex and volatile global environment is driving reactive and inconsistent government policy, which impacts practices across the regions, and <b>causes</b> imminent redundancy of current waste systems and assets.
Problem 3	• The variable volume and quality of recoverable materials and costly and carbon intensive logistics <b>limits</b> the viability of resource recovery solutions and ability to generate viable markets and investment.

Figure 2 Problems to be addressed through the RR2040 Program

### Opportunity definition

Delivery of the RR2040 Program is needed to realise six opportunities shown in Figure 3.

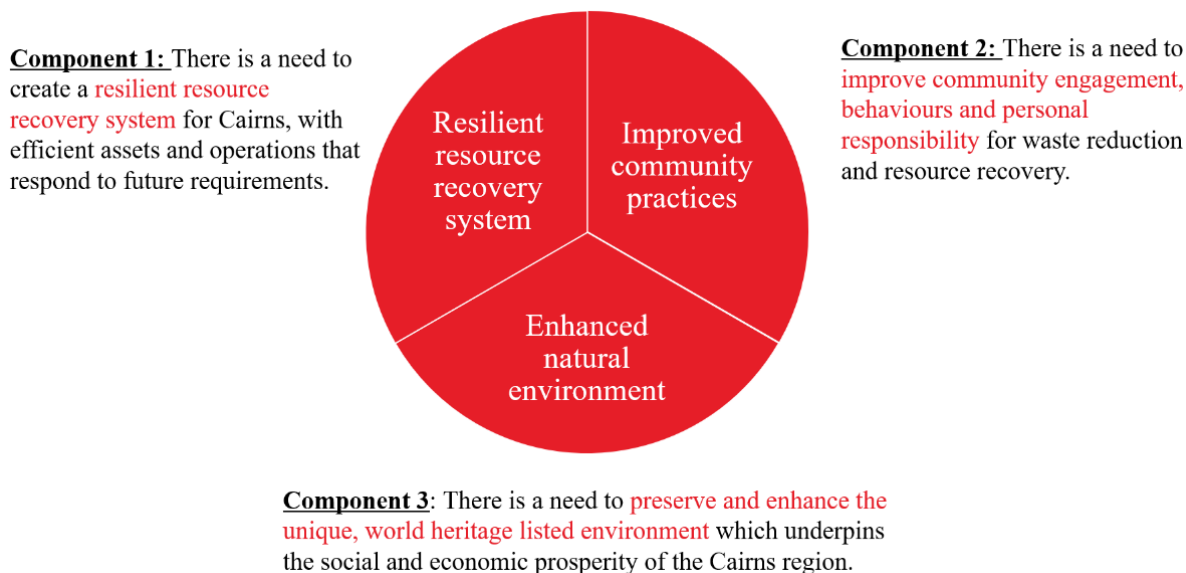
Opportunity 1	•Support economic resilience through improved resource recovery
Opportunity 2	•Drive viable market uptake of resource recovery solutions
Opportunity 3	•Partner with our communities to instigate innovative step changes and end-to-end solution design
Opportunity 4	•Minimise environmental impact whilst improving community liveability
Opportunity 5	•Enhance our regional heritage and ecological reputation
Opportunity 6	•Repurpose/reuse/optimize current built assets

**Figure 3 Opportunities to be realised by the RR2040 Program**

### Service need

There is a need to deliver the RR2040 Program to create a resilient resource recovery system, improve community practices and enhance the natural environment. Meeting this service need will support environmental health, improve liveability, and strengthen the strong destination reputation of the Cairns region, in particular the World Heritage Areas of the Great Barrier Reef Marine Park and Wet Tropics Rainforest. It will also support strengthening First Nations Peoples' connection to caring for Country through resource recovery initiatives.

The three components of the service need are illustrated in the figure below.



**Figure 4 Service need for the RR2040 Program**

### Targeted benefits

RR2040 targets three key benefit areas of unified communities, economic resilience and environmental health. A preliminary benefits assessment was completed to identify how benefits may be realised through delivering the service need, and to map the alignment of the initiatives and program options to the targeted benefits. Key performance indicators (KPIs) for the three benefits areas are shown in the figure below.

**Table 1 Targeted benefits for the RRBC**

Benefit 1: Unified communities	Benefit 2: Economic resilience	Benefit 3: Environmental health
KPI 1: ↑ Community connection with waste recovery programs KPI 2: Support community and environmental health through waste education programs KPI 3: ↓ Incidents of adverse environmental and heritage impact KPI 4: Strengthen First Nations Peoples connection to caring for Country through resource recovery programs	KPI 1: New local industries identified and developed KPI 2: ↑ Productivity and efficiency of infrastructure KPI 3: ↑ Resilience to future changes in resource recovery policy and markets KPI 4: ↑ Investment by third parties KPI 5: ↑ Tourist visitations, lengths of stay and spend	KPI 1: ↑ Amenity for our communities, visitors and workers KPI 2: ↓ Waste to landfill KPI 3: ↑ Resource recovery rate KPI 4: ↑ Reputation of our World Heritage Reefs and Rainforests

### Program Options

A longlist of 40 initiatives were identified and six program options have been developed, each of which represent a plausible resource recovery future for Cairns. The options are differentiated by key factors on a high-level comparative basis including:

- level of capital investment
- anticipated performance against resource recovery and landfill diversion targets
- approach to community engagement
- approach to specific components of the waste system, including kerbside collection, organics recovery, dry recyclables recovery, waste transfer stations and residual waste disposal
- level of regional/industry collaboration.

Each option groups related changes to engagement, technologies and processes within the waste system to create coherent waste and resource recovery arrangements.

An overview of each option is provided in Table 2. These options will be further defined in Stage 2 in order to identify the preferred program option.

**Table 2 Overview of program options**

Element	Option 1 – Do minimum (base case)	Option 2 – Enhance existing	Option 3 –Organics focus	Option 4 – Regional opportunities	Option 5 – Recovery precinct	Option 6 – Energy from Waste focus
<i>Performance against targets</i>	Resource recovery: <b>Low</b> Landfill diversion: <b>Low</b>	Resource recovery: <b>Low</b> Landfill diversion: <b>Low</b>	Resource recovery: Medium Landfill diversion: Medium	Resource recovery: Medium Landfill diversion: Medium	Resource recovery: <b>High</b> Landfill diversion: <b>High</b>	Resource recovery: <b>Low</b> Landfill diversion: <b>High</b>
<b>Community engagement</b>	BAU	Significant program	Significant program	Significant program	Significant program	Significant program
<b>Kerbside collection</b>	2 Bin (BAU): Waste + Recycling	3 Bin: Waste + Recycling + Garden Organics	3 Bin: Waste + Recycling + Food Organics & /or Garden Organics	3 Bin: Waste + Recycling + Food Organics & /or Garden Organics	3 Bin: Waste + Recycling + Food Organics & /or Garden Organics	2 Bin (BAU): Waste + Recycling
<b>Organics processing</b>	BAU (mulching of self-hauled green waste only)	Mulching	Organics processing technology	Organics processing technology	Organics processing technology	BAU (mulching of self-hauled green waste only)
<b>Dry recyclables recovery</b>	BAU (existing MRF)	Minor enhancement to MRF	Increase MRF capability	Increase MRF capability	Major enhancement to MRF	Major enhancement to MRF
<b>Waste transfer stations</b>	BAU (existing transfer station network)	Minor enhancement	Minor enhancement	Minor enhancement + new facilities	Major enhancement + new facilities	Minor enhancement
<b>Residual waste disposal</b>	Do Minimum (Landfill)	Landfill	Landfill (+ potential future Energy from Waste outside of Cairns)	Landfill (+ potential future Energy from Waste outside of Cairns)	Landfill (+ potential future Energy from Waste outside of Cairns)	Energy from Waste
<b>Regional and industry collaboration</b>	n/a	n/a	n/a	Regional hub and spoke model	Centralised precinct model	Attract regional MSW & C&I

### Limitations of the analysis

This strategic assessment for the RR2040 Program has been prepared based on a qualitative analysis, drawing upon the source information referenced in this document. Waste flow modelling has not been undertaken, nor has any financial or economic assessment in the identification of the initiatives and options. These analyses will be undertaken in later stages as required to firstly identify a preferred program and then to analyse the first investment under the program in accordance with the BCDF.

### Next Steps

This strategic assessment has identified a clear service need for the development and implementation of the RR2040 Program to optimise Cairns' resource recovery systems and infrastructure over the short, medium and long-term. Based on the outcomes of the strategic assessment, the following next steps are recommended:

- CRC progress a data analysis and prioritisation process to identify a preferred RR2040 Program (Stage 2A).
- CRC engages with industry, government and community stakeholders to develop a robust RR2040 Program, ensuring it reflects the needs and ambitions of the diverse community, will be widely supported, and will therefore have the greatest chance of achieving the defined aims.
- CRC progresses a business case for the first investment under the program (Stage 2B).
- CRC prepares a detailed business case to evaluate the technical and economic viability of the Proposal (Stage 3).