



WASTE EDUCATION PROGRAM DEVELOPMENT

February 2017

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1 Executive Summary

Golden Plains Shire, City of Ballarat, Pyrenees Shire and Ararat Rural City commissioned Tandem Solutions Pty Ltd to conduct a project that primarily focusses on the conduct of a survey to gain an understanding of resident's behaviours in regards to depositing materials into the kerbside recycling stream to develop an education program that will reduce contamination (specifically plastic bags), of this stream.

In addition, information on existing Council led education programs for reducing contamination were reviewed to ascertain their success and applicability to this project.

Surveys were conducted in a broad range of locations. This survey was conducted via "face-to-face" interviews or via Survey monkey. The same questions were used for both techniques. The following summarises the results.

- 850 – surveys conducted¹
- 35 – locations where surveys were conducted
- Information in respect to recycling has been gathered in a broad range of ways
- Preferences for recycling information centre of the local paper, bin stickers and letter box drops
- There is some confusion as to what can and cannot be deposited into the kerbside recycling bins
- Education program for reducing contamination need to be simple, yet targeted to materials and explain "why"
- Education programs also need to be accompanied by other programs such as regular bin audits and associated feedback to residents

The results from this survey can be used to guide the development and delivery of education programs across the State to reduce contamination in the kerbside recycling stream. This is due to the high number of responses and spread of locations where respondents reside. The results also correlate to conclusions made in literature reviewed.

The over-riding conclusion from this project is that generic, non-targeted communication/education programs to encourage recycling behaviour are not working.

Key findings:

1. Targeted, long-term programs that explain the rationale for, as well as the how to recycle correctly (ie., avoid contamination) are required.
2. A variety (but limited), methods for communicating to residents as to correct recycling behaviour be utilised. These involve the use of bin stickers, articles in local newspapers and letter box drops.

¹ Not all questions were responded to.

3. Importantly, education messages must target the cessation of placing contaminants into the container used within the household to contain and transport recyclables to the kerbside bin. Once in this household container, residents tend to not sort so any contaminants remain.
4. Information as to “why” specific recycling actions should or should not occur need to be communicated to residents. This information should range from the recycling process to issues associated with specific contamination.
5. Information provided to residents as to where materials can also be recycled – this needs to be communicated in alternate methods than the Council based website.
6. Overall, the education program to reduce contamination should be viewed as long-term with a range of messages communicated that cover correct recycling behaviour as well as feedback on improvements made.

The concepts for the education program (ie., newspaper advertisements/information, bin stickers and brochure for letter box drops), are included in the final section of this report. Once accepted, then graphics will be finalised.

2 Introduction

2.1 Background & Project Objectives

Data from a series of audits of the recycling stream (conducted in May 2016), indicated that there was a high level of contamination and that there were various materials categorised as contamination. Of these, plastic bags (and other soft plastics), were identified as being problematic to the recycling system and needed to be diverted to the waste stream.

Following these audits, a Business Plan was developed to seek funding to develop targeted education programs so as to reduce the type and volume of contaminants in the kerbside recycling stream – with an emphasis on plastic bags. This was Phase 1 of the project – to develop a Business Case for further funding.

Funding for the development of the education program was provided by Local Government Victoria – the submission was to *“Develop and implement an education and behavioural change program to reduce kerbside waste and improve recycling rates”* to support Councils to reduce waste and dispose less waste to landfill.

The primary objectives of this project are:

- i. Provide residents with the tools and knowledge to improve sustainability outcomes
- ii. Improvement in recycling rates and diversion of waste to landfill
- iii. Changes in stakeholder knowledge and rationale for action
- iv. Assist LGAs to implement the most effective ongoing kerbside waste strategies
- v. Achieve ongoing education and behaviour change outcomes through the development of educational material and delivery modes to be used on an ongoing basis, by both participating councils and other councils wishing to replicate the outcomes
- vi. Allow Councils to utilise budget funds more effectively to maintain the “reduce waste and increase recycling” message as top of mind with residents

Secondary objectives being:

- i. Improvement in strategies to target waste management services by Councils
- ii. Reductions in Council operating costs by efficiencies in waste/recycling collection and fees/rebates applicable to waste management (eg., landfill disposal fees and penalties for contamination of recycling streams)
- iii. Standardised education strategies for Victoria in relation to kerbside waste management;
- iv. Enhanced community (residential, schools and business) engagement to reduce waste and increase landfill diversion activities
- v. Reinforce messages in regards to improved waste management to both residents and businesses as well as linking the potential outcomes of improved programs and behaviour to support from both sectors

- vi. Support State Government messages in relation to reducing environmental impacts of waste generation.
- vii. This then will, as an additional benefit, enable future actions to increase recycling and reduce contamination/leakage easier to communicate as the stakeholders will have an enhanced understanding of the potential impacts from incorrect material segregation.

2.2 Summary of Methodology

The following summarises the methodology for conducting the project.

- i. A project steering committee was convened and met to discuss project logistics and timeframes
- ii. Council representatives provided advice on locations for where the survey could/should be conducted as well as processes for promoting it within the Council areas and to stakeholders
- iii. A draft survey was developed and circulated to Council representatives for feedback
- iv. Following feedback, the survey was finalised
- v. The survey was placed on Survey Monkey and the link provided to Councils for distribution to stakeholders where feasible
- vi. Face-to-face surveys were undertaken at a range of locations within each Council area so as to gain a representation of vies of residents in terms of demographics, location and services available
- vii. Survey results were analysed and results included in this report
- viii. A literature review and analysis of Council led recycling education programs conducted and aspects related to this project determined

A copy of the survey is in Appendix A.

2.3 Confirmation of Benchmarking Data

Results from a number of waste/recycling audits conducted mid-2016, for the four participating Councils found the following:

The average level of contamination (by volume), observed in vehicle loads was:

- Bannockburn – 10%
- Ballarat – 13%
- Avoca – 7%
- Ararat – 12%

For samples that were physically sorted, the percentage contamination (by volume) was:

- Bannockburn – 24%
- Ballarat – 18%
- Avoca – 17%

- Ararat – 20%

For visual audits of the kerbside recycling bins for these four Councils, a range of 22% to 38% of audited kerbside general waste bins contained recyclable materials.

To confirm these contamination rates a review of available data from kerbside recycling systems that was available from Councils in Victoria was undertaken.

These audits showed that contamination rates range from approximately 5% to 13%. However, this is dependant on day of the week that the audits have been conducted as well as whether rural/regional or metropolitan. A study has indicated that an average contamination rate of 7-13% is an acceptable figure².

The types of contaminants that were deposited into the recycling bins for the four Councils audited was similar – that is there is commonality in regards to what residents place into the kerbside recycling bins.

² http://www.wmaa.asn.au/event-documents/2013skm/coffs/NTWMG-2010_Kerbside-Recycling-Contamination-in-Australia.pdf

3 Survey Results

3.1 Introduction

This section summarises the results from the surveys. The following section is the consolidated data – that is for the surveys as a whole with the following sections summarising the data for each of the Councils participating in this project.

In total, 850 surveys were completed. Where for individual questions, response numbers are less than that, it indicates that the respondent(s) did not provide an answer/response.

Some respondents did not complete all questions. The main questions not responded to were;

- Occupation
- Where else could materials be recycled
- Unsure as to placing certain materials into the recycling bin.

Some respondents that did not have a kerbside recycling collection also did not respond to when and who would manage the recycling bin (though some did respond as to what they would do if they had the kerbside collection).

3.2 Consolidated Data

The following summarises the consolidated data – that is for all surveys. This information is primarily to provide an overview of the respondents and to demonstrate that there was a spread of respondents – and that the spread does represent the population of the four Council Local Government Areas (LGA), targeted.

Appendix D provides the occupations of the respondents. Note that this is a consolidated list providing indicative occupations (and removing duplications of the same or similar occupation).

With the type of respondent (resident or tourist), the majority of respondents (92.4% were residents.

3.2.1 Demographic Information

The spread of ages and sex of the respondents is illustrated below. These age groups were selected as they are similar to that used by the Australian Bureau of Statistics (ABS). Comparisons with ABS data is also provided where the data is available.

Table 1: Age group of respondents (consolidated)

Age Groups	Response Percent	Response Count
<14	10.8%	92
15-24	10.6%	90
25-34	14.9%	127
35-44	19.1%	162
45-54	19.4%	165
55>	25.2%	214

Figure 1: Age group of respondents (consolidated)

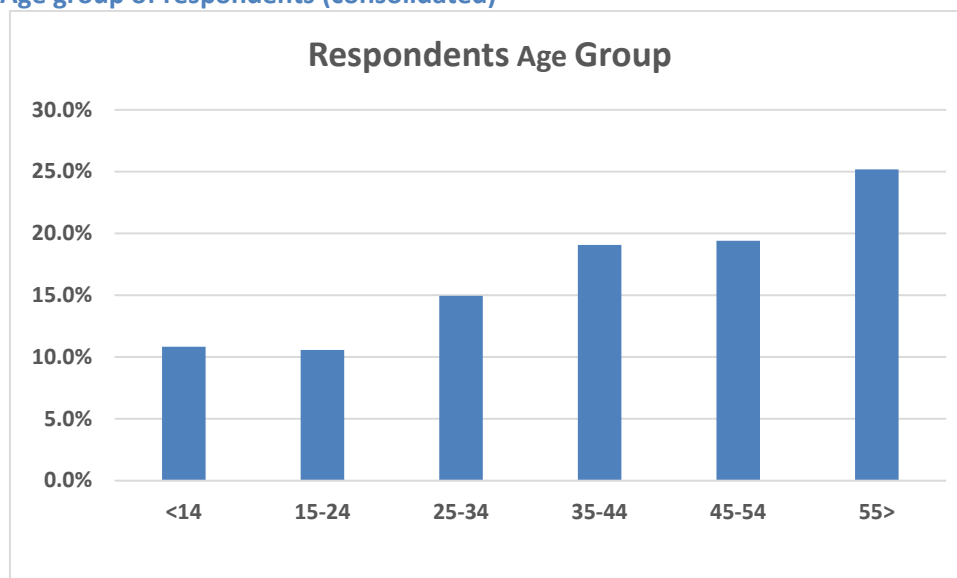


Table 2 illustrates the percentage of the population of each Council (LGA) as per ABS data³. This allows a comparison with the age groupings of the respondents. As illustrated, the age groups of the respondents is not exactly as the spread of the ABS data, but still can be considered representative. One issue identified, is that the older persons were more willing to answer the surveys than the younger members of the population.

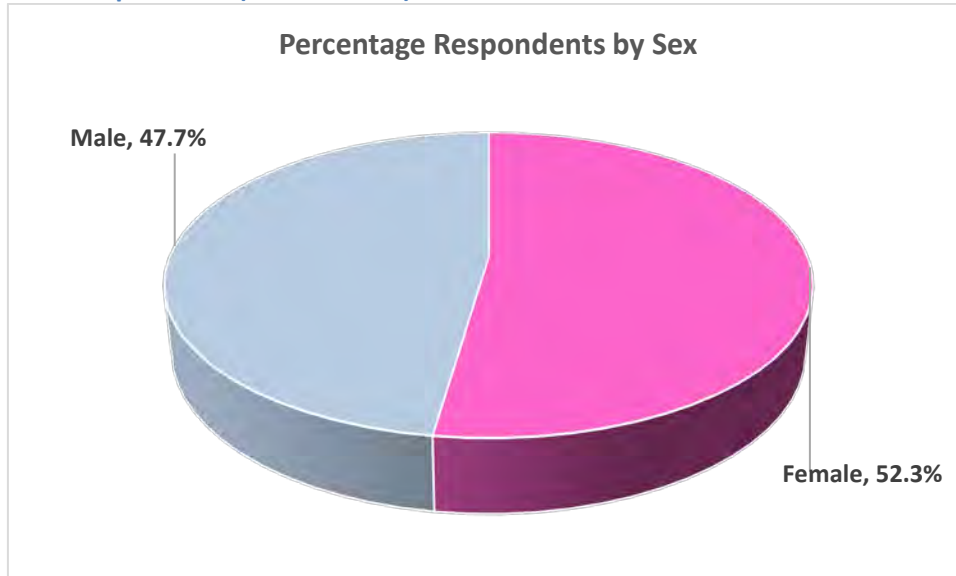
Table 2: ABS age groupings and percentage of population

Age Group	Golden Plains Shire	City of Ballarat	Pyrenees Shire	Ararat Rural City	Average
0-14 years (%)	22.8%	19.2%	15.8%	17.1%	18.7%
15-24 years (%)	11.4%	15.2%	9.2%	10.0%	11.5%
25-34 years (%)	10.3%	12.8%	7.3%	9.8%	10.1%
35-44 years (%)	14.5%	12.6%	11.2%	12.2%	12.6%
45-54 years (%)	15.6%	12.7%	14.1%	14.2%	14.2%
55-64 years (%)	13.3%	11.6%	17.2%	15.1%	14.3%
65-74 years (%)	8.2%	8.7%	15.5%	11.5%	11.0%
75-84 years (%)	2.9%	5.1%	6.8%	7.4%	5.6%
85 years and over (%)	1.1%	2.1%	3.0%	2.8%	2.3%
TOTALS	100.0%	100.0%	100.0%	100.0%	100.0%

The following figure illustrates the sex of the respondents. There were more females responding than males. No reason can be provided for this, except that females did agree to participate more readily than males. This response rate by the sexes also is in line with the average percentages of each for the Council LGA – again indicating that the survey responses were representative of the population of the Council areas.

³ <http://stat.abs.gov.au/itt/r.jsp?databyregion/> - this is 2014 data. This data is used for all comparisons in this report unless otherwise indicated.

Figure 2: Sex of respondents (consolidated)



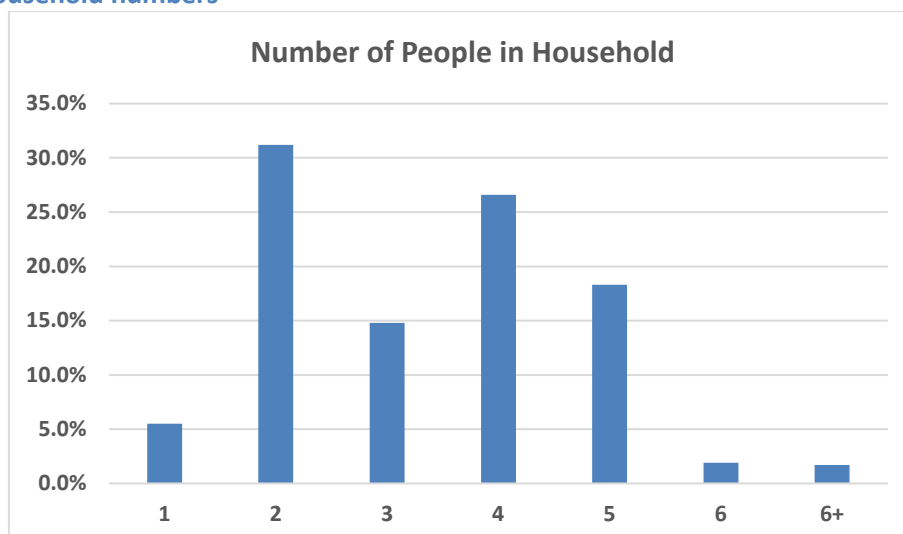
Comparing the percentage sex of the respondents with the ABS data as illustrated below, it shows that the higher rate of female respondents is in line with that for the population.

Table 3: ABS sex of population

Sex	Golden Plains Shire	City of Ballarat	Pyrenees Shire	Ararat Rural City	Average
Female	48.7%	51.3%	50.8%	48.4%	49.8%
Male	51.3%	48.7%	49.2%	51.6%	50.2%

The spread of numbers of people per household is illustrated below. While in terms of materials in the recycling stream, this does not impact on that issue, but provides some guidance in that educational material will need to be developed with a consideration that there is a spread of persons per household.

Figure 3: Household numbers



Tourists were asked to respond in relation to what they would do in the area they were surveyed. Results from tourist were analysed separately as responses may bias the overall conclusions – also the information gathered from them was used as a comparison for behaviours and approaches in other locations.

Figure 4: Percentage category of respondents



3.3 Survey Responses

3.3.1 Recycling Behaviour

The following are the main results from the survey – note that there were multiple responses (eg., many respondents indicating that they have learnt about recycling from a multiple of sources).

Most respondents indicated that they do place their recycling bin out for collection every fortnight. There were 13 respondents that did not answer this question – these were mainly tourists.

Table 4: Placement schedule for recycling bins

Answer Options	Response Percent	Response Count
Weekly	17.2%	130
Every fortnight	77.0%	582
Monthly	4.5%	34
Less	1.3%	10

The following two graphs indicate how full the general waste and recycling bins respectively are when placed out for collection. This data provides an indication (but not conclusively), that there is still capacity within the general waste bins to accommodate the materials currently being placed into the recycling bin – that is if the contaminants are removed then they can “fit” into the general waste stream.

Figure 5: Percentage full of recycling bins

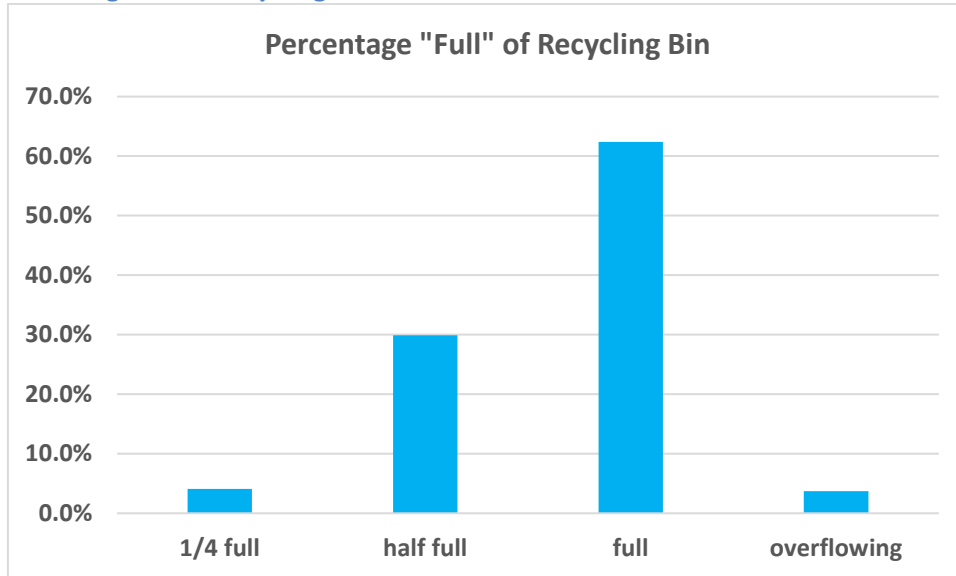
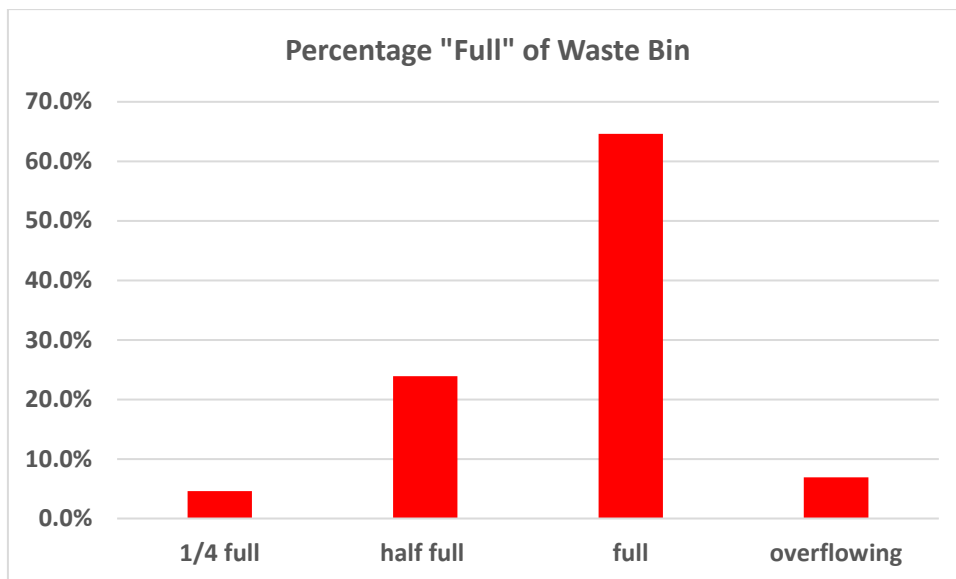


Figure 6: percentage full of waste bins



In terms of why recycle, the following summarises the responses – with the majority undertaking this for environmental reasons. However, the literature does indicate that this may not necessarily be the “real” reason as people tend to support environmental actions when questioned, but not in practice.

Table 5: Reasons for recycling

Answer Options	Response Percent	Response Count
Environmentally aware	61.6%	519
Not enough space in the waste wheelie bin	3.0%	25
Reuse of material items	27.8%	234
I am paying for the service	7.7%	65

There were seven “other” responses. These were:

- i. all of the above reasons
- ii. mum does it
- iii. dad taught us
- iv. mum says we have to
- v. mum and dad tell me to
- vi. don’t get a choice
- vii. Because it is what you do

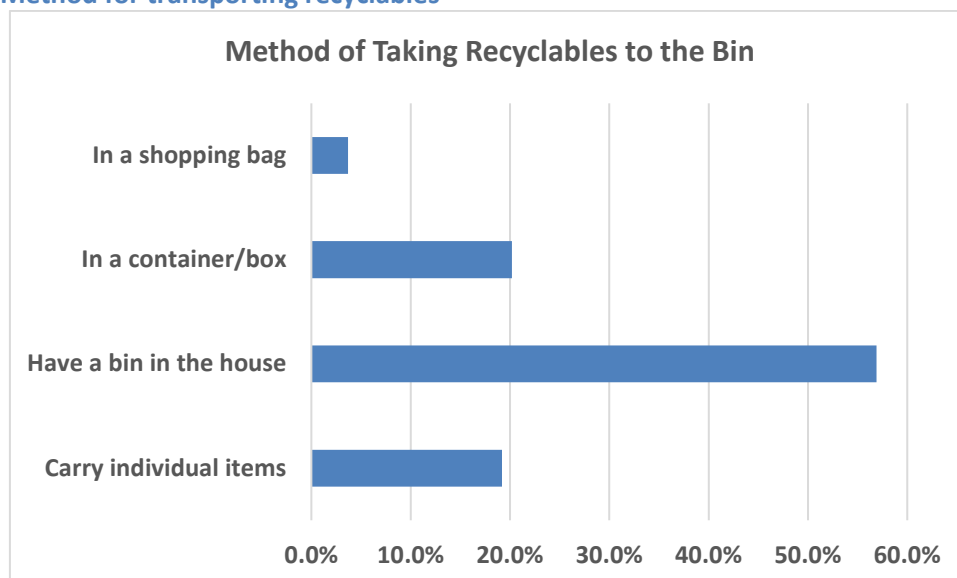
While the following graph shows those within the household who would normally take recyclables out to the kerbside bin, in most instances it was a combination of individuals (respondents were able to indicate more than one category of response). What this data shows is that it is a variety of person who takes out the recyclables to deposit into the kerbside bin and as such educational materials cannot simply target one “type” as the task changes within the households.

Table 6: Person who places recyclables into the bin

Answer Options	Response Percent	Response Count
Yourself	86.1%	732
Child	20.1%	171
Parent	20.6%	175
Partner	53.5%	455

There are a variety of methods of taking recyclables to the kerbside bin. These are illustrated in the figure below.

Figure 7: Method for transporting recyclables



By far the predominant method is by having a bin in the house and this is taken to the recycling bin and emptied. This shows that “reminders” could be placed onto these bins illustrating what can be deposited into the recycling bin. It also shows that the majority of households do have a container and that as such ones would not need to be provided by the Council(s).

3.3.2 Recycling Knowledge/Education

When asked as to how they learnt as to what materials can be recycled (ie., placed into the kerbside recycling bins), the following responses were received (note that respondents could give multiple responses):

Table 7: Source of information on recycling

Answer Options	Response Percent	Response Count
TV ads	14.2%	121
Radio	12.9%	110
Social Media	11.4%	97
School	43.3%	368
Local Newspaper	57.9%	492
Websites	14.6%	124
Sticker on wheelie bin	53.3%	453
Parents	24.9%	212
Letterbox	30.1%	256

There were 10 other responses – these were:

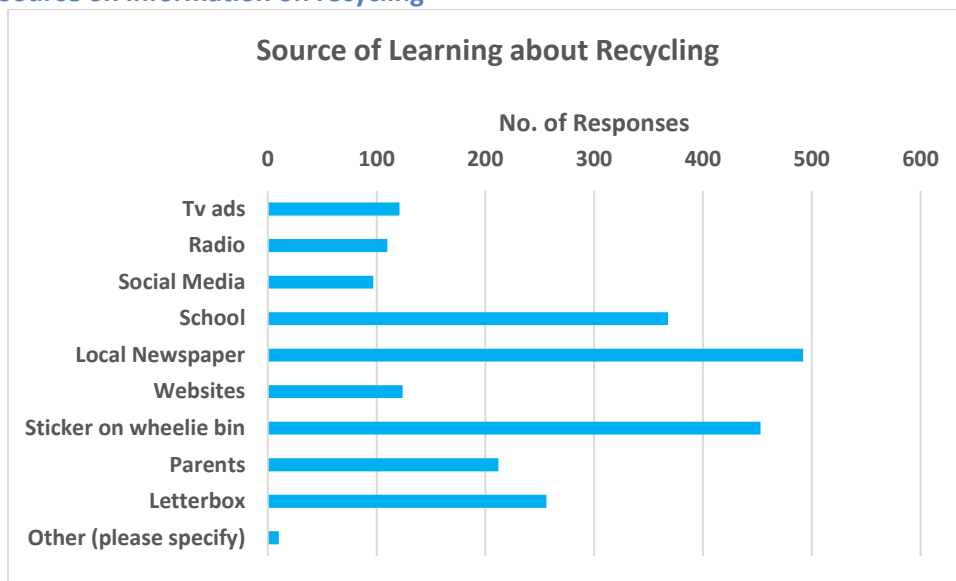
- i. Council newsletter
- ii. Previous employment
- iii. General conversation, info provided by council

- iv. Council information
- v. Council
- vi. Really common sense.
- vii. Common sense
- viii. Council advice and fridge magnet.
- ix. Council mail outs letters
- x. Common knowledge

The responses are also illustrated in the following figure. This shows that the three main sources of knowledge about recycling (kerbside), were in order:

1. The local newspaper
2. Stickers on bins
3. School

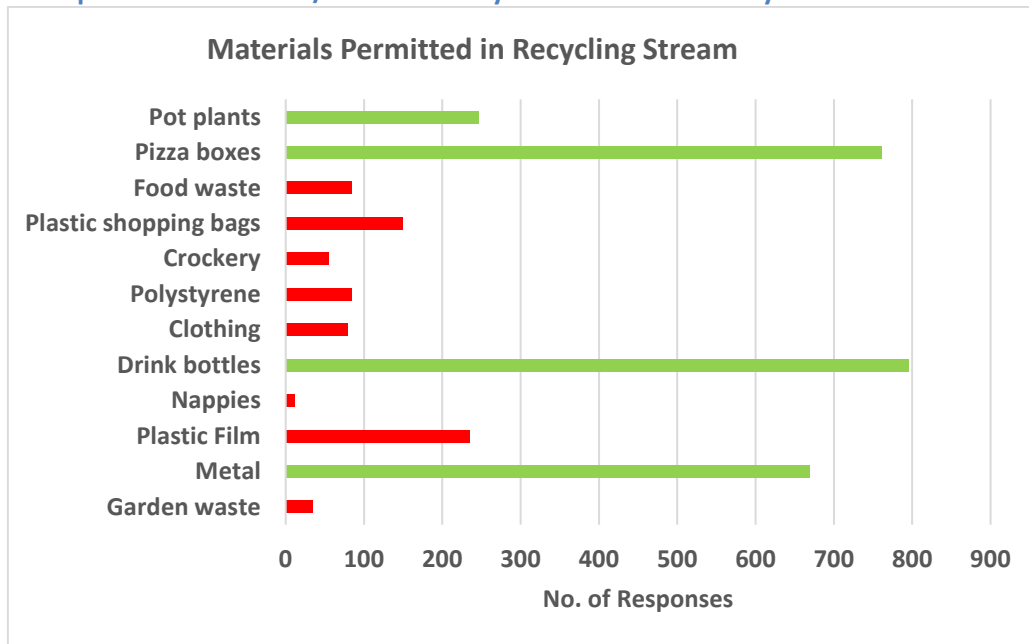
Figure 8: Source on information on recycling



Of interest though, when discussing responses with some respondents that had indicated the TV or radio as sources of information, none could actually nominate a specific program or when they had heard about the messages via these media.

When asked as to what items can be deposited into the kerbside recycling bin, respondents were provided with a list (of correct and incorrect items). The following is the analysis of the responses:

Figure 9: Responses to what can/cannot be recycled in the kerbside system



Green responses indicate those materials that are allowed, with the red indicating materials that are not permitted – that is they would be considered contaminants.

Respondents were asked to indicate what could be deposited into the recycling stream. So it is of interest that not all respondents were able to indicate those items that are allowed. However, apart from metals and pizza boxes, there was a high percentage of respondents that were correct. For the correct responses, the percentage correct was:

Table 8: Percentage correct responses

Materials	Percentage Responses
Metal	78.7%
Drink bottles	93.5%
Pizza boxes	89.5%
Pot plants	29.1%

It may have been that is the respondent did not generate the materials (eg., pot plants), then they may not have known that they can be recycled.

However, as indicated in the table below, there is a significant number of residents who incorrectly indicated the wrong materials are permitted into the kerbside recycling stream. In respect to this project’s objectives, the highest percentages were for plastic film and plastic shopping bags.

Table 9: Percentage incorrect responses

Materials	Percentage Responses
Garden waste	4.0%
Plastic Film	27.6%
Nappies	1.3%
Clothing	9.3%
Polystyrene	9.9%
Crockery	6.5%
Plastic shopping bags	17.5%
Food waste	9.9%

Not all respondents were able to correctly identify the materials that are allowed to be deposited into the kerbside recycling system. As noted below, at some point respondents indicated that all of the options could be recycled – however, most were able to correctly identify what could be recycled.

Appendix C contains a list of those items that respondents were unsure about. Of interest was that some of the materials nominated were allowed to be deposited into the existing kerbside recycling stream.

The common items that were mentioned in terms of uncertainty as to whether they are allowed in the kerbside recycling stream were:

- Plastics (a variety of types/descriptions)
- Metal items
- Glass items

There were some responses over what the recycling logo meant.

Again, this information is valuable in terms of communicating to residents what can or cannot be deposited into the kerbside recycling stream. Importantly, the messages should indicate how residents can determine this so that they can be empowered to make the decision themselves.

The following table shows what materials/items that respondents would like information on as to whether they can be recycled and placed into the kerbside bin for that purpose. This list is not in any order of importance or numbers of respondents indicating the same material(s).

What it does show is that respondents still are confused about what can or cannot be deposited into the kerbside recycling bin and that an ongoing education program should also include information about correct disposal of these materials.

Table 10: Material recyclability information requests

Material/Item	
Polystyrene	Wax cardboard
E-waste	Chicken Wire
Different types of plastics	Food waste
Batteries	Plastic yogurt containers
Some types of packaging	Meat trays
Clothes	Pot plants
Light globes	Aerosol cans
Meat trays	Small gas cylinders
Crockery	Cellophane
Plastics with different numbers - no idea what numbers mean	Things with number higher than 3
Hard plastics	Foil
Items with the recycling symbol	Envelopes with windows
Gladwrap	Meat trays from supermarket
Old farming equipment	Coat hangers
Plastic bags	PVC products
Kids toys such as plastic toys, teddy bears etc that aren't in good enough condition to be taken to the op shop	Plastic that looks like polystyrene but is not
Bike wheels	Contaminated recyclables
Tuna Cans	Medication bottles
Plastic wrappers	Drink bottle lids
Broken glass	Glass types ie pyrex
Saucepans or metal pans	Tin

When asked as to where else could you recycle materials from your household? (e.g. batteries, electronic items), there were 257 responses. These are listed in Appendix B (note that duplicated responses have been removed). While there are some duplications in the responses, it does illustrate two main points:

- a) Residents do have a level of knowledge of alternate means of recycling materials; and
- b) There still needs to be further education as to these options for all residents (as well as other options that were not mentioned).

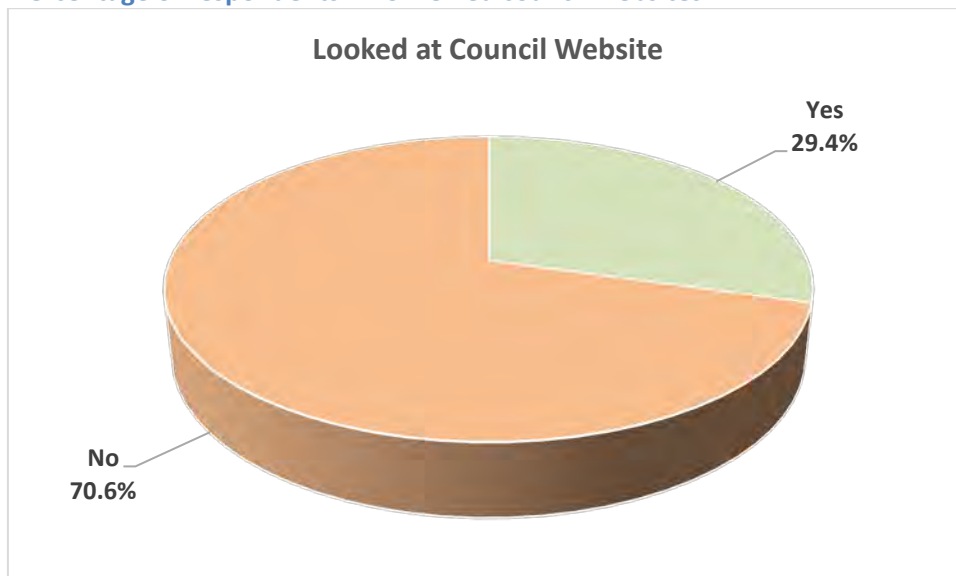
The most common responses in terms of alternate locations, or materials that could be recycled at other sites were:

- Batteries
- Local/Council Tip or Transfer Station
- Supermarket for plastic bags
- Composting
- “Op” shop for clothes

In terms of accessing Council websites for information on recycling, the majority (approximately 71%), of respondents had not. In terms of communicating information, linking the responses to this

question to that as to how respondents would like to receive information, use of the Council website does not appear to be an effective process.

Figure 10: Percentage of respondents who viewed council websites

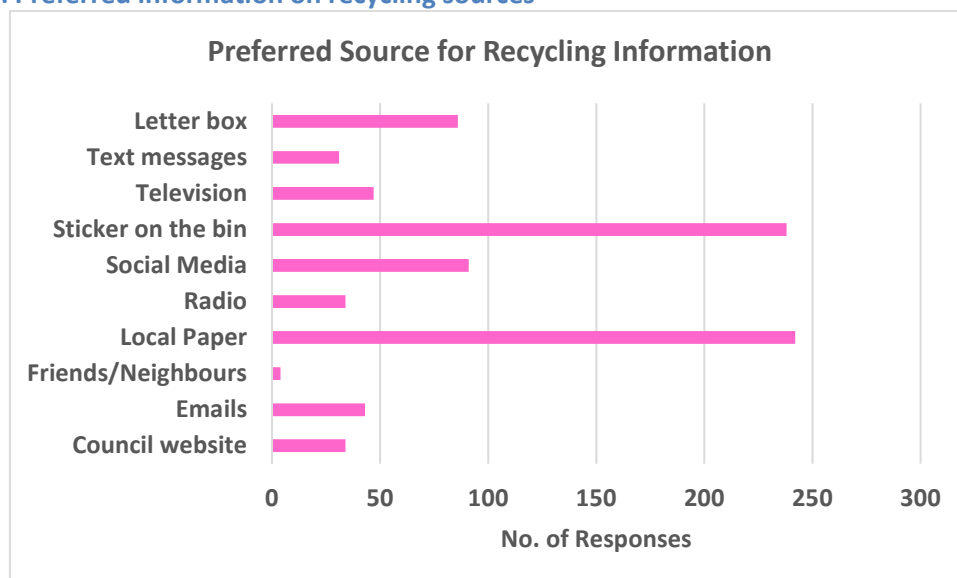


As illustrated in the following table and graph, there are a variety of methods that respondents have identified as their preferred way of receiving messages about recycling.

Table 11: Preferred recycling information sources

Response	No. of Responses	Percentage
Council website	34	4.0%
Emails	43	5.1%
Friends/Neighbours	4	0.5%
Local Paper	242	28.5%
Radio	34	4.0%
Social Media	91	10.7%
Sticker on the bin	238	28.0%
Television	47	5.5%
Text messages	31	3.6%
Letter box	86	10.1%
TOTAL	850	100.0%

Figure 11: Preferred information on recycling sources



The main options identified by the respondents are:

1. Local paper – 28.2%
2. Stickers on the bins – 27.8%
3. Social media – 10.9%
4. Letterbox drops – 10.2%

While it would be useful to be able to link the age of the respondents to the preferred method for obtaining information on recycling, it is clear that these broad based approaches (ie., local paper and stickers on bins), would meet the majority of residents, with social media approaches targeting the younger age groups.

3.4 Ararat Rural City

The following Postcodes and survey responses for each, were identified by respondents for this municipality:

3351	48
3374	3
3377	107
3379	27
Total	185

3.5 City of Ballarat

The following Postcodes and survey responses for each, were identified by respondents for this municipality:

3360	42
3351	30
3352	45
3355	31
3356	27
3357	21
3358	14
3363	2
Total	212

3.6 Golden Plains Shire

The following Postcodes and survey responses for each, were identified by respondents for this municipality:

3213	23
3218	2
3328	18
3321	22
3329	2
3330	2
3331	85
3332	27
3333	18
3334	11
3342	8
Total	218

3.7 Pyrenees Shire

The following Postcodes and survey responses for each, were identified by respondents for this municipality:

3352	26
3360	18
3361	2
3373	32
3375	16
3384	18
3465	11
3467	31
3468	1
3469	20
3477	2
3478	20
Total	197

4 Education Programs

This Section of the report discusses programs that have been implemented by Councils and their applicability to the objectives of this specific project. There is also a discussion on aspects of education for improving recycling and their relationship to the results of the resident's surveys.

4.1 Introduction

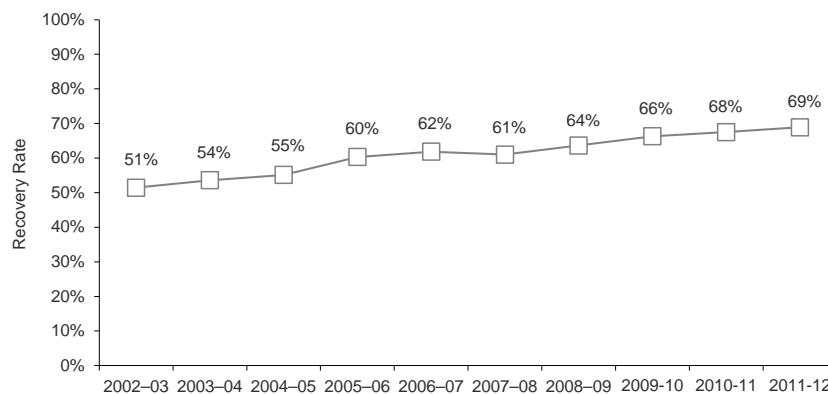
A number of options are available to councils for lowering the contamination entering the recycling stream. Careful waste management planning and educational initiatives are the areas than need to be addressed first. The body of research dealing with these issues is considerable.

Rewards and enforcement should only be employed when a council is satisfied with the effectiveness of its waste collection system and their educational initiatives. Enforcement ranges from letters and stickers on bins to financial penalties.⁴

Evidence suggests that to maintain the benefits of an education program consistent and regular education messages need to be maintained on a periodic basis.

Clarity of message is important. For example, a common contaminant in recycling streams is plastic shopping bags. Supermarkets have systems in place that encourage the deposition of these materials into recycling bins that are located at the stores. Potentially shoppers see a message indicating that is acceptable (and in fact correct behaviour) to recycle these materials and when they empty their bags at home, deposit them into the kerbside recycling stream which then results in contamination.

According to Sustainability Victoria, the following graph illustrates the recovery rate of materials in Victoria. Note that this rate is plateauing and significant effort must be applied to increase this rate.



Case studies have demonstrated that improvements in resource recovery have achieved greater success if the program involves a targeted mix of education and provision of infrastructure and services. Infrastructure can be relatively as simple as appropriate bins and signage,

⁴ http://www.wmaa.asn.au/event-documents/2013skm/coffs/NTWMG-2010_Kerbside-Recycling-Contamination-in-Australia.pdf

Key messages from recent studies are:

- One-on-one engagement
- Target specific materials (eg., cardboard or organics)

The issue is that most case-studies that have increased participation in recycling have been targeted towards small-to-medium businesses and generally involve one-on-one education – where the business is visited and options explained. One good example is the NSW EPA's "Bin Trim" program. Often these programs involve the provision of necessary infrastructure such as signage, bins and other supporting materials.

Education of the broader community is not as easy. Mostly education is generic and involves web-based information, information on rates notices, billboards and occasionally brochures or information in local newspapers.

Programs implemented by the participating four Councils include:

- National recycling week included a number of publications in local papers.
- *Love Food Hate Waste* brochures developed which were distributed to customer service centres and other Council facilities.
- Brochures on how to worm farm and compost for paper distribution and web site.
- Installation of signage at problem areas that attract illegal dumping.
- A rethink work shop, cooking demonstration on recycled foods and two compost workshops with a facilitator.
- Free green waste disposal for a week in November each year.
- Free green and hard waste disposal/voucher for the months November-January each year
- "It's not that hard" – Public place recycling campaign. TV, back of bus, social media and radio ads. Key message to remind residents and visitors that putting waste and recycling in the bin is not that hard.
- Accepting e-waste for free at the transfer station.
- Promotion of paper and cardboard recycling.

In addition to the above, recycling information has been made available via a range of brochures/notices as well as on Council websites.

Targeting is generally non-existent and thus, those who either do the right thing or don't generate that specific material can dismiss the actual message which, also means the principle of improved behaviour is missed.

The Waste and Resource Recovery Groups have been involved in a suite of waste management education programs over a long time period. However, discussions with current and former staff from these Groups has indicated that the waste management education programs have predominantly been focussed on school education with programs for other stakeholders often targeted at specific materials or sectors.

Importantly, the discussions indicated that there has been minimal evaluation of the success of these programs.

Most actions or messages that have focussed on improving recycling in the community (household, business and public place) have focused on advising stakeholders as to “what to do”. Few, if any messages, have explained “why to do it.”

Together the State Waste and Resource Recovery Infrastructure Plan (SWRRIP) and Draft Victorian Community and Business Waste Education Strategy 2015-2020 (VCBWES) establish the strategic direction for waste management infrastructure and education in the state under a thirty-year vision, a ten-year plan with five-year actions. As such they demand serious consideration in any review of waste education programs or facilities.

The Victorian Community and Business Waste Education Strategy, is for a “statewide” coordinated approach to state government programs and activities that involves close and meaningful engagement with delivery partners so they can capitalise on state government priorities, programs and activities that align with their own.’

The following are some of the strategic statements contained in the VCBWES:

- Waste education is about increasing community and business awareness of the environmental and economic impacts of waste.
- There is a need for a coordinated approach to waste education as outlined in the SWRRIP
- A coordinated best-practice approach will ensure that the Victorian community understands the importance of effective waste management and resource recovery
- The waste education strategy aims to guide and support the design and delivery of efficient and effective waste education programs.
- Waste education is part of a broader behavioural change process that should be understood and considered before developing activities or interventions.
- An appropriately resourced Local Government is an essential component of effective waste education. It is important to note that in the context of this project, Local Government also refers to the Waste and Resource Recovery Groups.
- Ultimately, the waste education strategy proposes a coordinated approach to state government programs and activities that involves close and meaningful engagement with delivery partners so they can capitalise on state government priorities, programs and activities that align with their own.

In relation to waste education and specifically this project, the VCBWES recognises the role that Local Government and the Waste and Resource Recovery Groups have played in regards to educating their stakeholders. However, the publication also indicates that the overall successes of the education programs provided has been variable due to a number of factors. Specifically, the VCBWES states:

An uncoordinated and inconsistent approach to education across the state reduces its effectiveness, often sending mixed messages to communities.

This is the point of difference from previously implemented recycling education programs. By understanding the impacts inappropriate recycling behaviours have on the environment, recycling facility processes and the cost of waste management by understanding why materials are not allowed (eg., plastic film contaminating paper recycling streams), it provides enhanced encouragement to improve behaviour.

Put simply, stakeholders do not understand the consequences and by providing the “why,” change should eventuate.

Some of the findings according to the Sustainability Victoria report “*Drivers and Barriers Affecting Kerbside Recycling Behaviour in Victorian Households in 2014,*”

- The main motivation is doing the right thing by the environment and clear identification on packaging. The main barrier is being unsure of what can and cannot be recycled.
- Most Victorians have a good idea of what can and cannot be recycled, there are a number of specific household items that can often be overlooked and placed in the garbage bin rather than being recycled. A number of key recommendations have been identified around the five desired recycling behaviours:

This suggests that a program related to awareness along with monitoring behaviour change is essential. This is a point that has been identified in a number of publications⁵ and in some projects.

A review of Council websites indicated that there is a range of information advising as to what can and cannot be placed into the recycling streams (as well as green waste systems).

Other forms of education include:

- Information in Council newsletters (often mailed out with rates notices)
- Information in collection calendars (those that advise as to dates for collection of the streams as well as having vouchers if applicable for disposal of waste at landfill/transfer stations)
- Stickers on bins
- Bill boards
- Posters on public transport

There are also education messages such as video clips on social media that have been produced by waste management agencies or Regional Waste Management Groups.

The issue is that there is no real research to measure the success of all of these education messages.

4.2 Evaluation of Programs

This section evaluates a number of programs that were relatively recently implemented to reduce contamination in the kerbside recycling stream.

Overall, while there have been a variety of programs implemented, one of the main issues is that there is a lack of data indicating specific on contamination prior to the commencement of the program, and also in many instances no clear methodology as to how levels of contamination were measured on completion of the program. In addition, while it is acknowledged that types and volumes of contaminants differ during the various seasons, many programs were rolled out in one season and then success measured in another season.

⁵ Planet Ark, All sorted: Answering the big recycling questions. Planet Ark, So you think you can recycle

The recommendations from the program conducted in Robe⁶, South Australia summarised the approach that could (should) be adopted by the four Councils involved in this project. These recommendations are:

1. Introduce a program of ongoing education using Zero Waste SA branded resources including fact sheets, the A-2 Disposal Guide and presentations to community and school groups.
2. Include incentives as a part of future bin tagging programs to provide greater promotion of the bin tagging program, and encourage wider community improvement in recycling.
3. Increase local media activity through media releases and advertising
4. Recruit households who are recycling right to be ambassadors for the program and to provide other households with tips on how they recycle at home
5. Review of kerbside recycling bin collection strategy.

These conclusions and others made in this report are supported by a number of other studies⁷. Specifically that there is:

- Still highly reliant on brochures in letterboxes, recycling calendars, and schools programs to promote attitudinal and behavioural change.
- Lack of a research base and sharing ‘the best we know.’
- Lack strategy, guidance, training and support for quality education

What does appear to be clear from the studies conducted is that, what is referred to as “bin tagging” – providing feedback via stickers placed onto recycling bins following visual inspections does reduce contamination.

This supports the recommendation that any education program must be accompanied by feedback on performance and some form of sanction for non-compliance.

This type of approach has been used by where there program involved:

1. Each kerbside recycling bin under the assessment may be checked up to three consecutive times.
2. A pass, improvement required or fail sticker will be left on each bin after each inspection.
3. A form outlining the reason for the decision will be left in the resident’s mailbox.

A brochure specific for reducing plastic bag contamination was produced and distributed by the Northern Tasmanian Waste Management Group (NTWVG)⁸. This is illustrated below. This indicates what good recycling behaviour is and importantly why. It is the why that is often lacking and therefore residents may not associate poor behaviour with the consequences. The Councils also produced a two page brochure. While it did contain the “usual” recycling messages, it did also contain a message on why – as illustrated below.

⁶ Zero Waste SA Recycle Right, Bin Tagging Trial, District Council of Robe 2015.

⁷ Educating the NSW Community about waste - what is the evidence of success?

⁸ <http://rethinkwaste.com.au/kerbside-recycling-assessments/>

DON'T PUT RECYCLING IN PLASTIC BAGS

Did you know that the recyclables in your yellow-lidded recycling wheeler bin are sorted by hand?

Or that the facility that sorts your recyclables sorts through literally tonnes of recyclables and rubbish every hour?

If you want to recycle properly and do the right thing to save the planet then check with your local council.

Rethink Waste TASHAMIA

Find out more at www.rethinkwaste.com.au

We don't want your efforts to be wasted.

Due to the sheer volume of material rolling through the materials recovery facility (MRF), the sorters just can't have the time to open plastic bags.

If workers open plastic bags they are out at risk of needle stick injuries and exposure to potentially dangerous substances.

The risk far outweighs the reward. As a result of this, plastic bags full of recyclables are going straight to landfill.

So please, leave the bags out of it!

The Cradle Coast Authority and Northern Tasmanian Waste Management Group (NTWMG) are conducting kerbside recycling assessments to determine how much general waste is being incorrectly placed into yellow-lidded recycling bins in north and north-west Tasmania.

The assessment will be coupled with an education program to show residents what can and what cannot be placed in their recycling bins.

Each recycling bin will be checked three times to assess the level of contamination. A pass or fail sticker will be placed on each bin depending on the amount of contamination found.

Rethink Waste TASHAMIA

CRADLE COAST AUTHORITY **NORTHERN TASMANIAN Waste Management**

For more information on what can and cannot be recycled, visit www.rethinkwaste.com.au

The importance of keeping recycling bins free from contamination

The contamination rate refers to the quantity of items in a recycling bin that are not actually recyclable. Less contamination means materials are easier to sort and more items can be recycled.

A high contamination rate can result in an entire truckload of recyclables being rejected and sent to landfill.

As well as being harmful to the environment, continued contamination increases the cost of recycling to the community.

Did you know used clothing in good condition cannot be recycled in the kerbside recycling bin? However, if donated, local charities can reuse the clothing.

Rethink Waste TASHAMIA

For more information about the kerbside recycling assessment, visit www.rethinkwaste.com.au

About the kerbside recycling assessment

The Cradle Coast Waste Management Group (CCWMSG) and the Northern Tasmanian Waste Management Group (NTWMG) are conducting kerbside recycling assessments to determine how much general waste is being incorrectly placed into yellow-lidded recycling bins in north and north-west Tasmania.

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Rethink Waste TASHAMIA

For more information about the kerbside recycling assessment, visit www.rethinkwaste.com.au

All you need to know about YOUR KERBSIDE RECYCLING

Rethink Waste TASHAMIA

Do the right thing, only put suitable items in your recycling bin.

Don't lose your bin by doing the wrong thing.

CRADLE COAST AUTHORITY **NORTHERN TASMANIAN Waste Management**

Find out more at www.rethinkwaste.com.au

A more recent program conducted in Hamilton, Victoria in April-June 2016 trialed the use of bin stickers on kerbside general waste and recycling bins. The audit conducted after the stickers were introduced showed a reduction of:

- 1.1% by volume of contamination of the recycling stream
- 1.4% reduction of leakage of recyclables into the general waste stream

While a small percentage for both outcomes, the program was only measured over a 5 week period.

4.3 Literature Review

A review of articles published on recycling and contamination was conducted. The primary purpose was to see if any studies/research had been published with conclusions and recommendations relevant to the development of the education program for this project.

As to be expected, there is minimal studies/research published. What is relevant in regards to aspects of recycling have been included in this section of the report in terms of a statement or conclusion.

Copies of the articles referred to are available.

- The statement below supports the findings of the literature review, that most of the work undertaken in regards to improving recycling has been written by consultants and therefore not subject to peer review and/or readily available.

Because municipal recycling program design decisions likely are based on unpublished data and gray literature—much in the form of municipal-level reports written by consultants.⁹

- In support of some of the recommendations, improvement in regards to contamination of the recycling streams involves simple measures, of which one is auditing by the collectors as bins get emptied and/or visual audits undertaken as a separate exercise prior to the bins being emptied. These are approaches in use by Councils across Australia.

Behaviour change is most effectively brought about using simple, low-cost methods to engage with residents at the point of service delivery, i.e. by the collection crews whilst emptying bins. The challenge now is to integrate this into service delivery as standard.¹⁰

- Again as recommended, this study concluded that simple consistent actions can achieve recycling behaviour change.

Expensive, complicated options are not always necessary; behaviour change can be achieved by implementation of low-cost, low-tech methods.¹¹

⁹ Gordon W.S. Lane, Travis P. Wagner, Examining recycling container attributes and household recycling practices, Resources, Conservation and Recycling 75 (2013) 32–40

¹⁰ R.E. Timlett, I.D. Williams, Public participation and recycling performance in England: A comparison of tools for behaviour change, Resources, Conservation and Recycling 52 (2008) 622–634

¹¹ Susan Byrne, Bernadette O'Regan, Attitudes and actions towards recycling behaviours in the Limerick, Ireland region, Resources, Conservation and Recycling 87 (2014) 89–96

- This article commented that traditional approaches for recycling behaviour change have not always been successful, whereby doorstepping (knocking on doors), has been shown to be very effective.

For recycling to become successfully established it is necessary to have processing facilities, demand for products, commercial possibilities, collection infrastructure and appropriate legislation and enforcement. However, even the sum of those will not be sufficient if residents do not cooperate and separate their waste. Doorstepping is already considered an effective method for changing recycling behaviour.¹²

- The above point is supported by the following. While the study that this refers to was about resident's obtaining larger bins, the conclusions about the value of door-to-door delivery of education has merits.

It also shows that a simple door-to-door delivery of literature could be done at low cost and should be effective for communicating improvements to curbside recycling programs and other community initiatives where resident action is desired.¹³

- And further supported.

This study showed quantitatively that a traditional information strategy was not effective in causing behaviour change for the target behaviour ... This study also showed that an alternative strategy, describing itself as one of 'more personal interaction', produced outstanding results in similar communities.¹⁴

- The study referred top below supports the notion that not only is the infrastructure and other components necessary for improved recycling, but information on the actual process is also vital.

In conclusion our study found that providing public with MSW infrastructures and improving citizens' awareness about SW source separation and recycling to promote SW recycling programs hold great promise for developing effective public campaigns and behaviour-changing interventions.¹⁵

- Many respondents indicated that they gained recycling knowledge from bins stickers and many commented that they would like to receive messages about recycling via the same media. The following is the conclusion made from a food waste trail, but results are applicable to reducing recycling contamination.

¹² Y.C. Dai, M.P.R. Gordon, J.Y. Ye, D.Y. Xu, Z.Y. Lin, N.K.L. Robinson, R. Woodard, M.K. Harder, Why doorstepping can increase household waste recycling, *Resources, Conservation and Recycling* 102 (2015) 9–19

¹³ Kenneth W. Willman, Information sharing and curbside recycling: A pilot study to evaluate the value of door-to-door distribution of informational literature, *Resources, Conservation and Recycling* 104 (2015) 162–171

¹⁴ Y.C. Dai, Z.Y. Lin, C.J. Li, D.Y. Xu, W.F. Huang, M.K. Harder, Information strategy failure: personal interaction success, in urban residential food waste segregation, *Journal of Cleaner Production* 134 (2016) 298e309

¹⁵ Ali Akbar Babaei, Nadali Alavi, Gholamreza Goudarzi, Pari Teymouri, Kambiz Ahmadie, Mohammad Rafiee, Household recycling knowledge, attitudes and practices towards solid waste management, *Resources, Conservation and Recycling* 102 (2015) 94–100

A sticker prompt was then affixed to the lids of refuse bins in the treatment group area only. Weights for both groups were subsequently measured across a 16-week experimental period. Results showed that, in the control group, there was no change in the average weight of food waste captured for recycling between the baseline and experimental period. However, there was a significant increase (20.74%) in the treatment group, and this change in behaviour persisted in the longer term. Sticker prompts therefore appear to have a significant and sustained impact on food waste recycling rates, while being simple, practically feasible and inexpensive (£0.35 per household) for local authorities to implement at scale.¹⁶

Similarly, while visual prompts may not be as effective as other types of behaviour change intervention (Steg and Vlek, 2009), they are one of the simplest and most cost-efficient to introduce and could represent a 'quick win' for local authority waste managers looking to achieve change with limited budgets. Visual prompts will not change the minds and behaviour of all individuals, and the individual impact of each per-son's behavioural change may be small. However, the aggregate impact of this intervention, if introduced at scale, could be large.

¹⁶ Linzi Shearer, Birgitta Gatersleben, Stephen Morse, Matthew Smyth, Sally Hunt, A problem unstuck? Evaluating the effectiveness of sticker prompts for encouraging household food waste recycling behaviour, Waste Management (2016)

5 Conclusions & Recommendations

5.1 Conclusions

The following summarises the conclusions resulting from the survey and review of programs and literature.

- Residents are participating in the kerbside recycling systems where it is provided.
- Not one “type” of person in a household is responsible for depositing recyclables into the kerbside bin.
- There appears to be room in both the waste and recycling bins for materials that should be deposited into the other one – that is removing contaminants from the recycling bin and *vice versa*.
- Most households have a bin that is used for the temporary storage of recyclables then it is used to transport the recyclables to the kerbside bin. However, there are methods used and therefore education program materials need to be cognisant of these variations.
- Residents obtain their advice/education about correct recycling behaviour from a number of sources. However, there is no evaluation as to the validity/correctness of these messages as well as allowing for changes that have subsequently been made in what can/cannot be recycled.
- Messages as to “why” certain items cannot be deposited into the kerbside recycling stream are not being provided.
- Reliance on Council websites for distributing/advising as to recycling behaviour are not being accessed by residents.
- There is still a high level of confusion as to what can or cannot be deposited into the kerbside recycling stream.
- Self-reporting indicates that residents are keen to recycle for environmental reasons.
- Messages need to be simple, based on symbols and visual items and a variety of approaches utilised.
- Residents do not appear to be understanding how recycling works and why contamination is an issue.
- Council run recycling education programs tend to rely on web based and printed publications and there is minimal evaluation of the success of these approaches.
- Successes to reduce recycling contamination generally involve multi approaches and include programs that provide direct feedback to residents.

5.2 Recommendations

The following are a summary of the recommendations that have resulted from the activities conducted for this project.

- Residents need to take ownership of the kerbside recycling system and not simply view it as a Council service.
- Recycling education programs need to be long-term and also include information on how the systems work and why specific items cannot be recycled (at least in the kerbside system – and why they can in other systems).
- Advice on other opportunities/facilities for recycling need to be communicated on a regular basis.
- Continual positive feedback needs to be communicated to residents on their achievements as well as what actions are necessary to further reduce contamination.
- A series of articles be commissioned in local newspapers advising as to correct recycling actions and why. These should also be followed up by continual reminders.
- A bin monitoring program be introduced. This inspects recycling bins for contamination and if identified, a card is left at the premises and/or sticker placed onto the bins.
- Bin stickers be developed and circulated to all residents indicating what cannot be placed into the recycling bin – these stickers be provided for internal and external (Council provided) bins.
- Councils consider the use of social media to promote improved recycling behaviour.
- Participation of schools in promoting good recycling behaviour and specifically reducing contamination be encouraged and supported with information/resources.

6 Education Program Outline

6.1 Introduction

This Section outlines the education program in terms of materials designed to change resident's behaviour in regards to placement of contaminants into the kerbside recycling stream – with an emphasis on plastic bags.

As indicated above, the results of the survey and other information indicated that an approach that utilises a number of methods of communicating information are required. These are use of newspaper advertisements/articles, bin sticker and brochure left in letter boxes.

The slogan that will be used is:

This is not the bin for your plastic bag

It is simple, not confronting and clear as to the message. In addition, the slogan can be changed when focussing on other materials (eg., replace bag for polystyrene, or clothing etc). It can also be used to encourage materials to be placed into specific bins such as “this is the bin for garden waste or for general waste – this is the bin for plastic bags”.

Various research into environmental education programs for issues such as reducing litter, coastal management and stormwater management have clearly stated that educational messages should target the different attitudes – therefore to change the attitudes (and reduce contamination), some residents need to know how and why, others only how as they know why. Unfortunately, in regards to this program, individual messages cannot be targeted to each household.

The education campaign needs to address all – therefore needs to be conducted over a period of time with the different messages – perhaps starting with those who are not interested or participating. However, based on the survey results, approximately 90% of respondents are recycling for environmental benefits. This means that this aspect of the education program does not have to be a core component.

It is vital that with the communication/education program a single approach will not work. Hence the approach that has been advocated. It is also important to provide feedback on performance and this is addressed in one of the newspaper advertisements that can be placed into the paper following bin audits – this is an essential element of the education program.

The proposed methodology for this education program will be:

1. Have the advertisements placed into the local newspapers over a 2-3 month period
2. Bin stickers will be placed on all kerbside recycling bins during the bin audit program
3. Following bin audits, the brochure will be left in the letterbox
4. After points 1 and 2, advertisements advising as to the contamination level for plastic bags placed into the newspaper

This program will be conducted on a rolling basis over a minimum 12 month period, with a review at the 6 and 12 month periods to determine if the program continues on with the focus of plastic bags and/or other materials.

6.2 Bin Sticker, Brochure and Newspaper Advertisements

The intent of this aspect of the education program is to run the developed graphics in local newspapers over a continual period

In addition to the graphics, Councils should look for “good news” stories that articles can be written about so as to continue the message that (a) recycling is good, (b) reducing contamination results in these positive actions and (c) not reducing contamination has negative environmental and economic effects.

A bin sticker and flyer for distribution via letter box drops has also been developed.

Appendix E contains the images for all education programs.

Appendix A - Survey



Recycling Knowledge and Behaviour Survey

Age: <0-14 15-24 25-34- 35-44 45-54 55<

Gender Female Male

Postcode: _____

Occupation: _____

Are you a resident or tourist of the area? Resident Tourist Day trip Overnight

How many people in your household: _____

How often would you usually place your household recycling wheelie bin out for collection?

Weekly Every fortnight Monthly Less

Who would normally place recyclables into the Council wheelie bin (you can tick more than one)?

Yourself Child Partner Parent

Where have you learnt about recycling and waste (can tick more than one)?

TV ads School Sticker on the wheelie bin
 Radio Local newspaper Parents
 Social media Websites Letter box

What is your preferred method of receiving messages from council regarding waste and recycling?

Council website Local paper Radio
 Friends/Neighbours Social media Sticker on the bin
 Television Text messages Emails

Which of the following be placed into your household recycling wheelie bin (tick those that can)?

Garden waste Drink bottles Plastic shopping bags
 Metal Clothing Food waste
 Plastic film Polystyrene Pizza boxes
 Nappies Crockery Pot plants

How would recyclables usually be taken out to the recycling wheelie bin?

- | | |
|--|---|
| <input type="checkbox"/> Carry individual items | <input type="checkbox"/> In a container/box |
| <input type="checkbox"/> Have a bin in the house | <input type="checkbox"/> In a shopping bag |

Other _____

How full would the following waste and recycling wheelie bins usually be when you place them out for collection?

Waste Bin

Recycling Bin

- | | |
|--------------------------------------|--------------------------------------|
| <input type="checkbox"/> ¼ full | <input type="checkbox"/> ¼ full |
| <input type="checkbox"/> Half full | <input type="checkbox"/> Half full |
| <input type="checkbox"/> Full | <input type="checkbox"/> Full |
| <input type="checkbox"/> Overflowing | <input type="checkbox"/> Overflowing |

Which of the following best describes your reason for recycling?

- | | |
|--|--|
| <input type="checkbox"/> Environmentally aware | <input type="checkbox"/> Reuse of material items |
| <input type="checkbox"/> Not enough space in the waste wheelie bin | <input type="checkbox"/> I am paying for the service |

Other _____

Apart from your household recycling bin, where else could you recycle materials from your household (eg., batteries, electronic items)?

Are there items which you are unsure about placing into your recycling wheelie bin? If yes, please name the items:

Have you ever looked up or downloaded the information on your council's website regarding waste and recycling? Yes No

Appendix B – Alternate Recycling Systems

Batteries
Council tip
Council transfer station
Op shop, supermarket
Metal at recycler, Tip
Op shop, Supermarket, Council
Sometimes at school
Op shop, Council tip
Batteries at shop, Transfer station
Supermarket for plastic bags
Council depot, Supermarket for plastic bags
Transfer station, batteries at Aldi
Aldi, Alcoa for cans, Supermarket for plastic bags, Sims for metal
Recycling centre
Geelong
Aldi - batteries, Coles - plastic bags, Recycling centre
Op shop, Telstra for e-waste
Resource recovery centre
Post office for phone books
Clothing collection bag
Tip, various stores such as Officeworks, Op shop
Hard rubbish
Sometimes at school
Work
Bins at service station
Newsagency
Steel yard
Tip, Rotary car battery recycling
Aldi - batteries, Metal recycler, Garages - batteries
Garden
Batteries at library, plastic bag at Coles
Electronic items
Scrap dealer, YMCA
Transfer station
Green waste at transfer station, scrap timber for firewood, scrap metal at dealer
Ararat
Transfer station, footy club (batteries and metal), kindergarten for craft items
Clothing bins
Clothing at Op Shop and Aluminium Cans to School
Aldi for batteries, Coles for soft plastic, local recycler for greenwaste
Batteries to Ballarat Recycle Depot - all green and carbon waste trenched on property - Commercial
Metals to Ace recycling - All scrunchable plastics to Coles or Woolworths - All mobiles and tech
waste to Officeworks - All our business waste stream
Nowhere in golden plains. Scrap metal /batteries /chemical drum to Geelong. Green waste to rot in
garden or buried or burnt. Grass clippings used to be put in waste bin as only option when living in
car recyclers, car tyre replacement and mobile phone recycle

Appendix C – Items that there is Uncertainty Over

Clothes, some plastic items
Clothes
Some food plastics
Electronic items
Light bulbs, batteries, clothes
Polystyrene
Clothes, food
Plastic packaging
Polystyrene
Batteries and e-waste
Plastic bags
Meat trays and batteries
Crocery
Plastics with different numbers - no idea what numbers mean
Hard plastics
Items with the recycling symbol
Meat trays without symbols, polystyrene
Gladwrap
Old farming equipment
Kid's toys such as plastic toys, teddy bears etc that aren't in good enough condition to be taken to
Bike wheels
Crocery
Tuna Cans
Plastic wrappers
Polystyrene, wax cardboard, batteries
Chicken Wire.
Plastic yogurt containers
Pot plants
Aerosol cans
Small gas cylinders
Cellophane
Cling film, some food packaging, plastic wrappers
Things with number higher than 3
Cling wrap, envelopes with windows
Meat trays from supermarket
Coat hangers, PVC products, electronic items
Plastic that looks like polystyrene but is not
Glass, some plastics
Metal/electronic hardware
Ice cream containers, margarine containers
Contaminated recyclables
Aerosol cans, medication bottles, fly spray
Drink bottle lids
Broken glass
Medicine bottles, plastic items, rubber
Pizza boxes
Which number plastics
Plastic packaging and containers - would look for the recycling logo

Placing dirty items in recycling bin

Food scraps

Food left in containers

I know Polystyrene and scrunchable plastics cannot be recycled in our shire at present, but it would be wonderful if we could look to add that in GP - the machine to melt it into blocks is operating in Geelong, and there are small models available that local communities could operate.

Saucepans or metal pans

None but we need a green waste bin to go with recycle bin if council are serious about reducing waste

Glass types ie pyrex

Some items which do not have a triangular logo but probably ought to - like some plastic items (yoghurt pots for instance). Also glad wrap, aluminium foil products.

Appendix D – Respondent Occupations

Manager	Cafe worker	Gardener
Home duties	Cleaner	Dental nurse
Retired	Sales	Retail
Student	Courier	Hairdresser
Mechanic	Painter	Office worker
Technician	Waitress	Builder
Public servant	Driver	Electrician
Nurseryman	Chemist	Secretary
Pharmacy assistant	Volunteer	Cleaner
Shop keeper	Farmer	Labourer
Apprentice	Secretary	Kindergarten teacher
Council officer	Teacher	Chef
Butcher	Engineer	Nurse
Cafe owner	Butcher	Administrator
Shop assistant	Legal secretary	Plumber
Artist	Office manager	Unemployed
Mechanic	Pharmacy assistant	Gardener
Doctor	Farm worker	Accountant
Painter	Psychologist	Executive Officer
Petrol station attendant	Wine maker	Hotel manager
Dog trainer	Receptionist	Postman
Lawyer	Real estate agent	Pastor
School support officer	Potter	Paramedic
Journalist	Legal secretary	Safety advisor
Police officer	Financial planner	Nanny
Bank manager	Road maintenance	Environmental educator
Forklift driver	Theatre Manager	Lab Tech
Librarian	Vineyard manager	Fleet manager

7 Appendix E – Education Program Graphics
