Education and Behaviour Change Approaches – Better Practice for Waste Management Pilot Study

WALGA Waste Sorted

Prepared for WALGA

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Executive Summary

The Western Australian Local Government Association (WALGA), with funding from the Waste Authority, commissioned Talis Consultants (Talis) to undertake a Pilot Study (the Study) targeting Multiple Dwelling Developments (MDDs) that currently have a three bin food organics and garden organics (FOGO) waste management system operating, with the objective of trialling specific education approaches to assist in improving landfill diversion rates and reducing contamination in the recycling and FOGO bins at MDDs.

The study was undertaken to inform the WALGA *Better Practice Guideline Resource Recovery from Multiple Dwelling Developments*, 2022 (Better Practice Guidelines) and trial specific waste education approaches to improve landfill diversion rates and reduce contamination in MDD bins based on better practice methods. The approaches are focused on increasing resource recovery and reducing contamination in recycling and FOGO bins.

Five MDDs were targeted across Perth metropolitan Local Governments (LGs) and the general waste, recycling and FOGO bins of these properties audited. The audits were designed to collect data on the general waste, recycling and FOGO waste streams and to collect Baseline data that allows future comparison of these information and engagement approaches.

This study targeted a variety of information and engagement approaches based on the Better Practice Guidelines to determine the effectiveness of each approach which included:

- Information leaflets;
- Signage and stickers;
- Visual colour and bin arrangement;
- Engagement workshop; and
- Bin inspections and tagging.

The results indicate that for the approaches chosen there is some initial success, but that this declines over time. This suggests that repeated engagement, or a combination of repeated approaches would be required to achieve sustainable results for improving landfill diversion rates and contamination reduction. Results will also vary significantly depending on MDD risk ratings, number of dwellings/demographic factors and how the bin system is managed.

EducResults suggest that bin tagging was the most successful approach in reducing contamination rates at MDDs, followed by signage and stickers and then information leaflets.

The Study shows that:

- Following the processes in the Better Practice Guidelines will assist LGs, strata companies and real estate companies to successfully manage waste and increase resource recovery at MDDs;
- Completing a database for all MDDs in a LGA to gain baseline data on bin numbers, risk ratings and other demographics is essential information for LGs to have available. This will help determine the most appropriate approach(s) to be implemented;
- MDDs using a combination of engagement and information approaches, with periodic follow up to keep up the momentum, will have effective waste management practices;
- If staff resources are available, it is beneficial to undertake bin tagging/audits to assist in reducing contamination rates at MDDs; and

- There should be greater focus around ongoing information approaches to target problematic wastes, primarily in the recycling stream i.e. tied bagged recyclables, hazardous wastes (aerosols) and soft plastics.

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1 Introduction

The Western Australian Local Government Association (WALGA), with funding through the Waste Authority, commissioned Talis Consultants (Talis) to undertake a Pilot Study (Study) targeting Multiple Dwelling Developments (MDDs) that currently have a three bin food organics and garden organics (FOGO) waste management system operating, with the objective of trialling specific education approaches to improve landfill diversion rates and reduce contamination in MDDs, targeting FOGO.

The Study was undertaken to inform the WALGA *Better Practice Guideline Resource Recovery from Multiple Dwelling Developments* (Better Practice Guidelines), and trial specific education approaches based on better practice methods.

Five MDDs were targeted across Perth metropolitan Local Government (LGs) and the general waste, recycling and FOGO bins of each were audited.

It is widely understood that a 'one size fits all approach' is not suitable for all MDDs and LGs, therefore this study targeted a variety of information and engagement approaches based on the Better Practice Guidelines to determine the effectiveness of a range of engagement approaches. These included information leaflets, signage, stickers, visual colour and bin arrangement, engagement workshops, bin inspections and tagging.

1.1 Project Objectives

The Study was undertaken to achieve the following objectives:

- Trial some information and engagement options for improving diversion rates and reducing contamination in MDDs with a three-bin FOGO waste system;
- Collect data on the general waste, recycling and FOGO bins pre and post-trial;
- Understand the amount of waste diverted from landfill during the trial (based on visual observations and weighing the bins); and
- Identify contamination across the waste streams (based on visual audits only).

1.2 Background

MDDs present a number of challenges for LGs as they produce large amounts of waste in a small footprint, generating a range of waste materials including general waste, recycling, FOGO, household hazardous waste and bulky waste.

These types of developments are often associated with lower resource recovery and diversion rates when compared to single dwellings. Low recycling participation and high contamination levels from MDDs can significantly affect resource recovery performance for LGs. Contamination for this report generally refers to the items that are incorrectly placed into the general waste, recycling or FOGO bins, i.e. general waste in the recycling bin.

MDDs have a range of challenges, particularly:

- Lack of ownership – in MDDs bins are shared and not owned by residents, typically resulting in higher contamination levels due to misuse of bins by residents;

- Higher resident turnover which often results in increased loss of bin caddies, liners and educational materials when tenants leave;
- Absence of suitable space for bin infrastructure – typically there is lack of space for additional bins in old buildings and often there is inadequate planning for waste management during the development stage of new buildings, leading to not enough space for bins or the introduction of additional bins for new streams, i.e. FOGO bins;
- Inconvenience – distances for transferring waste from the apartments/units to the bin storage area, or use of small or badly designed bin stores, therefore potentially less motivation for residents to engage in the waste system, or segregate waste properly;
- Difficulty with engagement or education – in some communities older generations or culturally and linguistically diverse (CALD) residents may struggle to understand messaging; and
- Lack of understanding of waste management – insufficient ongoing management and education.

This Study provides information on education and behaviour change approaches involving better practice for waste management to inform the above factors.

Providing waste education is known to be a significant factor in the success of a waste management system and is important in maintaining existing and new waste management services such as FOGO. It is understood that the highest performing waste management systems are supported by strong waste education and engagement programs.

Waste education is vital to support a successful waste management system and predominantly focuses on most preferred actions of the Waste Management Hierarchy, which includes waste avoidance and recovery (refer Figure 1). Education also aids in informing the waste management services provided to dwellings in each LG.

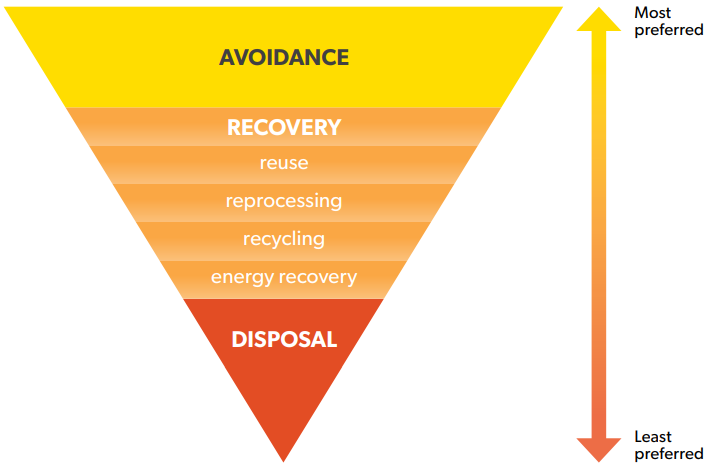

Figure 1: Waste Hierarchy (Waste Strategy 2030)

Therefore, the findings of this Study will be increasingly important as LGs implement FOGO across single dwellings and MDDs in line with the Western Australian Waste Avoidance and Resource Recovery Strategy 2030 (Waste Strategy 2030) with the target for all LGs in the Perth and Peel region to implement a consistent three bin kerbside FOGO system by 2025?.

2 Methodology

This section outlines the process that was undertaken to complete the Study.

2.1 Guidelines

The Study was founded on the Better Practice Guidelines.

2.2 Selection Criteria and Profiling

The following LGAs volunteered their time and resources for the Study:

- City of Fremantle;
- City of Vincent;
- Town of Bassendean; and
- City of Bayswater.

Each LG selected one MDD to participate in the study (with the exception of the City of Fremantle which selected two). The MDDS were classified from Minimal to High Risk, refer Table 2-1.

Table 2-1: Property Risk Ratings Consideration

Risk Rating	Considerations/Criteria
Minimal	MDDs with separate services
Low risk	Engaged contact person/property manager Minimal history (with 24 months) of recycling contamination/ bin presentation/ illegal dumping offences Sufficient room in the bin storage area and no anticipated service considerations
Medium risk	Contact person that is stable Minimal history (within 12 months) of recycling contamination/ bin presentation/ illegal dumping offences Challenging but manageable bin capacity/ servicing considerations
High risk	Contact person not regular/ easy to contact History of waste servicing issues Bin capacity/bin servicing challenges

During the MDD selection process, the LGs completed a MDD profile excel tool (database). The database was utilised to determine a baseline for the current service levels, collect key data for identifying demographics and waste services data. It also collected contact details for the strata company, and/or a contact person at the building to assist with education, engagement and monitoring of waste services at the MDD.

Profiling parameters for the database included:

- Number of units/apartments, how many bin stores there are and where they are located (public/secured);
- Contact organisation details (body corporate/strata manager/council of owners);

- Existing recycling education initiatives in the property – e.g., council/contractor provided signage, bin stickers/bin tagging;
- Turnover of renters/owners (i.e. % of new occupants every 12 months);
- Any CALD resident homes, where minimal English is spoken;
- Any historical waste or other significant issues related to the property; and
- Property risk ratings.

2.3 Determine Education Approach

Once the MDD was categorised low to high risk and profiled, the LG decided on a unique waste education approach to trial at the MDD.

The approach chosen was based on a range of options that could be considered for the determined risk level of the MDD. For example, if a MDD was a low risk then some additional signage would be used, or if the MDD was high risk then it was determined that face to face engagement with residents would be undertaken.

The options can be broadly categorised into either information or engagement-based approaches, with examples shown in Table 2-2. These approaches can also be suited to MDDs classified from Minimal to High Risk, refer Table 2-3.

Table 2-2: Education Approach Options

Approach – WALGA Guidelines	Description/Examples
Information Options/Approach	Posters/signage/stickers in bin area, on bins and caddies Visual Colour and Bin Arrangements: - Bin Arrangement: Group bins into designated areas for General Waste, Recycling and FOGO. - Colours on bin room walls (behind bins) Information leaflets: - Raise awareness of the problems around organic waste in landfills - Specific communications around FOGO (what, why, how, where)
Engagement Options/Approach	Bin inspections/tagging: - Letter in letterbox after inspection Tagging individual bins Door knocking Onsite workshops

Table 2-3: Engagement Approach Options based on Classifications

Approach – WALGA Guidelines	Approach Option	Low risk	Medium risk	High risk
Information Options/Approach	Posters/signage/stickers in bin area, on bins and caddies	✓	✓	✓
	Visual Colour and Bin Arrangements	✓	✓	
	Information leaflets		✓	✓
Engagement Options/Approach	Bin inspections/tagging	✓	✓	✓
	Door Knocking			✓
	Onsite Workshops			✓

2.4 Audit Timing

The audits were conducted over four months with physical auditing days in April and May chosen to maximise waste observations whilst minimising operational disruptions for the LG. To ensure that the gathered data was representative of normal circumstances, the audits were conducted to avoid public holidays, long weekends and major events. The overview of the audit schedule is shown in Table 2-4.

Table 2-4: Schedule

Month	Task/Milestone
January 2022	Pre-Planning LG confirmation MDD Selection
February 2022	Site Visits
March 2022	Baseline Audit Approach Implementation (ongoing)
April 2022	Post Implementation Audit 1
May 2022	Post Implementation Audit 2

2.5 Data Collection

The following sections describe the methodology used to collect the audit data.

2.5.1 Site Visit

The strata company/contact person for each MDD was identified by the LGs. The LGs and Talis contacted the strata representative and arranged to undertake a site visit to brief the representative in more detail about the Study and its objectives and seek feedback on any waste management issues the MDD may be having and to inspect bin store locations.

2.5.2 Audit Techniques

All bins presented at each MDD were audited as part of the Study. This included the general waste, recycling and FOGO waste streams. The waste audit team consisted of two Talis staff working in the roles of Lead Auditor and Audit Supervisor. Audit staff captured photos of the audit and instances of contamination throughout the audit.

An initial audit of the MDDs was completed to identify the baseline for the Study prior to the approaches being implemented (Baseline Audit). Following the approach implementation by each LG, the first Post Implementation Audit (Post Audit 1) was conducted four weeks later and the second Post Implementation Audit (Post Audit 2) conducted after a further four weeks.

To understand the amount of waste diverted from landfill, the volume and weight of each bin was captured, based on visual observations and weighing of the bins. Sample material was weighed using a calibrated digital platform weight scale with 0.05 kg precision up to 150 kg +/- 5% of true weight, with built-in spirit level to ensure the weighing bed is flat when recording weights. The weight scale was calibrated prior to the auditing. Tongs and a litter picker were used to sort through the waste for visual inspections.

The volume of the bins and the number of bins presented at each MDD were recorded on data collection spreadsheets during the audit to determine the overall volume of waste at each MDD.

Levels of contamination across all three waste streams were based on visual audits only. The Better Practice Guidelines were applied to quantify the level of contamination found within each waste stream, refer Table 2-5. This was used to determine the average level of contamination present across the bins. Tongs and a litter picker were used to ensure the bins were audited thoroughly.

For the purposes of the visual audits, contamination in the general waste stream refers to materials which could be placed into the recycling or FOGO bins.

Table 2-5: Contamination Classification

Number	Description
1	1 – 2 instances of contamination present
2	3 – 8 instances of contamination present
3	8+ instances of contamination present

2.5.3 Data Recording

During the audits, the bins were tagged/marked with a number and material stream so they could be easily identified with visual photo comparison, e.g., General Waste 1. All bins within the bin storage area or presented on the verge were audited.

All data collected during the audit was entered into data collection sheets. Following auditing data from the collection sheets were then entered into MS Excel for analysis. Data was independently checked to ensure the accuracy of the data entry process.

Once entered, the weight of the empty bin was deducted from the gross weight taken during the sorting process to obtain the net weight of the bin.

The assumptions and limitations of the audit are:

- The audit was captured over set audit days for each MDD based on the LG bin collection schedule and provides data based on a snapshot in time. Waste generation and contamination levels may vary from week to week and the data collected is not sufficient to enable measurement of variables such as seasonal variations or changes in behaviour of individuals, therefore care needs to be taken when interpreting the data.
- Levels of contamination were based on visual audits only. Tongs and a litter picker were used to ensure the bins were audited as thoroughly as possible. However, it's possible that some contents of the bins may not have been visible;
- The quantity and composition of general waste, recycling and FOGO in bins will vary seasonally, and will be impacted by activities such as public holidays and holiday seasons;
- Across the data collection period WA experienced peak COVID caseloads. This has the potential to impact residential waste generation.

2.6 Safety

In order to ensure the safety of Talis auditors, a project specific Occupational Health and Safety (OHS) Plan was prepared. The objective of the OHS Plan was to identify the potential OHS hazards and risks associated with the audit and provide management with measures to ensure that these were controlled to an acceptable level.

All staff were provided with the required personal protective equipment (PPE), and a first aid kit made available for each audit.

3 Case Studies

The following subsections detail the case study for each LG based on the findings from the Study.

The participating MDDs and approaches implemented are shown in Table 3-1.

Table 3-1: MDD and Approach Selection

LG	MDD Location (Suburb)	Number of Dwellings	Risk Rating	Contact Organisation	Education Approach
City of Fremantle	White Gum Valley	24	Low	Council of Owners	Information Leaflets
City of Fremantle	North Fremantle	24	Medium	Department of Communities	Signage and Stickers
City of Vincent	West Perth	80	High	Property Management Company	Visual Colour and Bin Arrangement
Town of Bassendean	Ashfield	12	High	Department of Communities/Housing Authority	Engagement Workshop
City of Bayswater	Morley	43	Medium	Strata Company	Bin Inspections/Tagging

3.1 City of Fremantle – Low Risk – Information Leaflets

3.1.1 Overview

This MDD was categorised as a low-risk property based on demographic and waste services data from the database and the initial site visit. This property has an engaged main contact resident and has minimal history of any contamination or illegal dumping offences and a secure, gated bin storage area. The MDD also achieves One Planet Living in the City of Fremantle through sustainable living technologies and is observed as a 'Smart Waste Zone' which aims to reduce, reuse and recycling wherever possible. The MDD also has an internal composting system and additional containers for the collection of Container Deposit Scheme (CDS) eligible containers and soft plastics.

The City of Fremantle chose an information-based approach by providing education leaflets to all residents at the MDD.

The benefit of this approach is that it can provide direct information about the waste management services and how to use these services.

Educational materials like leaflets can deliver clear instructions on what materials can go into each waste stream and also provide reasons as to why it is important to sort material at the source. This can assist with raising awareness and highlighting the importance of resource recovery and diverting waste from landfill.

The City distributed information leaflets over 4 weeks during the Study which each contained a different topic or information. Examples of these leaflets are shown in Figure 2.

Figure 2: Example of Distributed Information Leaflets

3.1.2 Results

Figure 3 shows the total weight of the general waste, recycling and FOGO bin contents for the City of Fremantle (Information Leaflets) MDD. Results have been separated based on the three audits conducted – Baseline (pre approach), first Post Implementation Audit (Post Audit 1) and the second Post Implementation Audit (Post Audit 2).

The total weight of the general waste bin contents was highest during the Baseline (96.85kg) and then decreased following the approach implementation (51.38kg at Post Audit 1).

Recycling bin weight was lowest during Baseline (77.99kg) and increased following approach implementation (84.02kg at Post Audit 1), however declined again at Post Audit 2 (70.89kg)

FOGO followed a similar trend to the recycling which was lowest at the Baseline (48.05kg) and increased following the approach implementation (84.02kg at Post Audit 1) and declined again at Post Audit 2 (57.83kg).

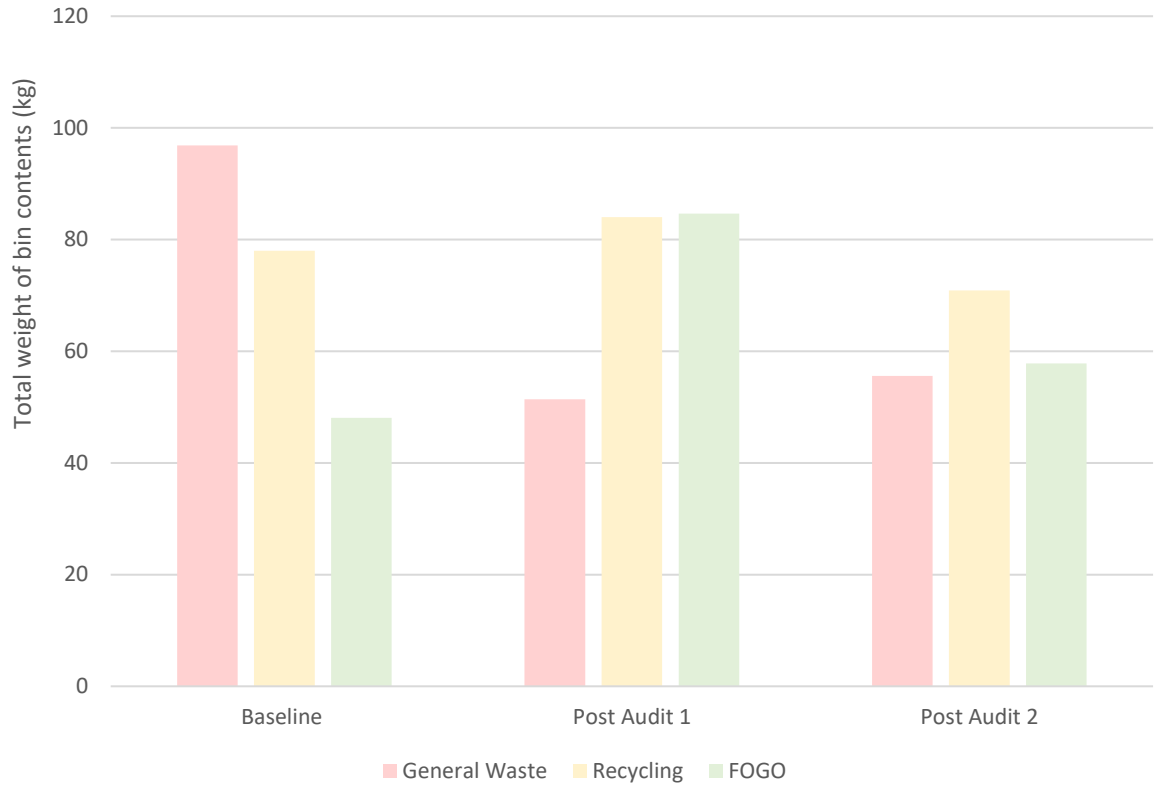

Figure 3: Total Weight of Bin Contents – Information Leaflets

Table 3-2 shows the average contamination classification across all three waste streams observed at the Baseline and Post Implementation Audits and the trend is shown in Figure 4.

A large amount of contamination was present amongst all three waste streams at the time of the Baseline.

The most prominent contamination material types found in the general waste stream were hazardous wastes (aerosols), recycling and food organics.

The recycling stream contamination was less than the general waste but did still include contamination such as soft plastics and compostable items (tissues and cups).

The FOGO stream was the least contaminated with the main types comprising of soft plastic and clean cardboard items which could have been recycled.

Table 3-2: Average Contamination – Information Leaflets

Audit	Average Contamination Classification	Contamination Types	
General Waste*			
Baseline	3	Aerosol, cardboard, recycling	
Post Audit 1	2.5	Recycling, food organics	
Post Audit 2	1.5	Recycling, food organics	
Recycling			
Baseline	0.5	Soft plastics, compostable items (e.g. tissues)	
Post Audit 1	0.7	Soft plastics, compostable items (e.g. tissues)	
Post Audit 2	0	-	
FOGO			
Baseline	0.5	Cardboard	
Post Audit 1	0.2	Soft plastic	
Post Audit 2	0.25	Cardboard	

** For the purposes of the visual audits, contamination in the general waste stream refers to materials which could be placed into the recycling or FOGO bins*

General waste had the highest average contamination at the Baseline Audit and reduced following the approach implementation. A similar trend was observed for the recycling and FOGO streams, refer Figure 4.

The trend indicated that following the approach implementation, average contamination rates decreased. General waste contamination decreased from 3 to 1.5, recycling from 0.5 to 0 and FOGO from 0.5 to 0.25.

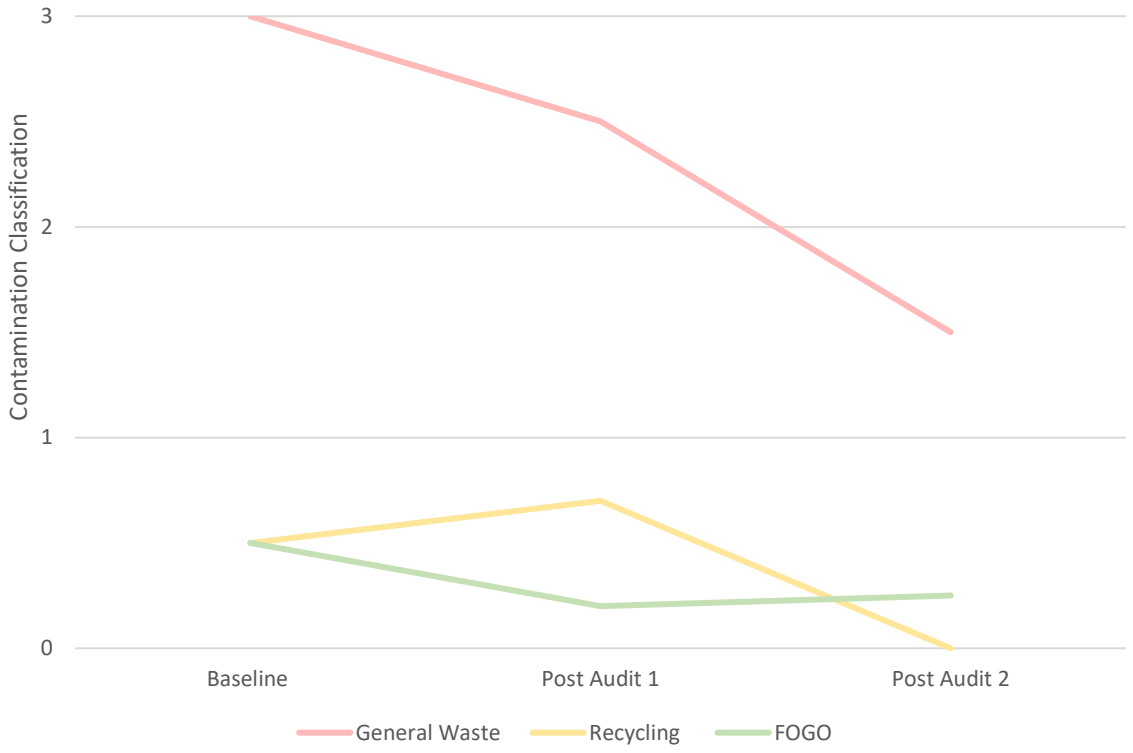

Figure 4: Average Contamination Trend – Information Leaflets

3.1.3 Evaluation

- Baseline and Post Implementation Audit data showed a decrease in the weight of general waste and an increase in the weight of recycling and FOGO.
- Waste diversion rates at the baseline were 57% and this increased at 70% at Post Audit 2. This indicates that following implementation, more general waste was diverted from landfill which could be attributed to residents source separating waste into the recycling and FOGO streams.
- Baseline and Post Implementation Audit data showed decreases in contamination across all three waste streams. The trend suggests that the provision of leaflets containing a variety of information was successful in reducing contamination in those streams.
- Audit data on the recycling stream showed that soft plastics were the main contributor to contamination, suggesting that information leaflets had lesser success on reducing this form of contamination in the recycling bins.
- Recycling bins in particular are often contaminated throughout many LGs, largely due to confusion around what can/cannot be recycled, as educational materials and accepted items vary between LGs. This outcome suggests that for a more difficult waste stream such as recycling, that information leaflets may not be sufficient to alleviate confusion or motivate correct source separation behaviours of residents. The impact of this approach may lessen over time and therefore if it was ongoing/regular the approach may have greater success. Alternatively, more engaging methods such as workshops or bin inspections may be more effective.
- This approach was effective on a low-risk property as observed at this MDD. However, it may not be as effective on a medium to higher risk property based on different demographics and waste services factors.

3.2 City of Fremantle – Medium Risk – Signage and Stickers

3.2.1 Overview

This MDD was categorised as a medium-risk property based on demographic and waste services data from the database and the initial site visit. The property has a main contact resident that is stable, minimal history of contamination or illegal dumping offences and a bin storage area which is hidden from public view but not secure or gated.

Therefore, the City of Fremantle introduced bin storage area signage and stickers on the bins to the second selected MDD in this Study, refer Figure 5. This included large signs above the bins displaying what can and cannot be placed into each waste stream (refer Figure 6) and stickers on the front of the individual bins (refer Figure 7). This is included as an information-based approach through review of the Better Practice Guidelines.

Consistent and clear signage is a vital part of helping to reduce contamination and informing correct source separation. It can assist residents of a MDD to demonstrate how to use the waste system correctly and inform what materials can and cannot go into each bin. Signage and colours should conform to the relevant Australian Standards and safety signs. Pictorial guides and community languages are typically encouraged.

Signage is typically a popular approach used in conjunction with other interventions as it has the value of being relatively inexpensive and easy to install and can be modified when required.

Figure 5: Bin Signage and Stickers Delivered

Figure 6: Example of Bin Area Signage

Figure 7: Example of Bin Stickers

3.2.2 Results

Figure 8 shows the total weight of the general waste, recycling and FOGO bin contents for the City of Fremantle (Signage & Stickers) MDD. Results have been separated based on the three audits conducted – Baseline (pre approach), first Post Implementation Audit (Post Audit 1) and the second Post Implementation Audit (Post Audit 2).

The total weight of the general waste bin contents was highest during the Baseline (149.04kg) which decreased to an average of 57kg following the Post Implementation Audits.

The recycling total weight at the Baseline was 38.93kg and this generally increased after the approach implementation and was highest at Post Audit 2 (69.33kg).

The FOGO stream was the lightest of the waste streams throughout the audit period and increased in total weight from the Baseline (9.47kg) to Post Audit 2 (20.15kg).

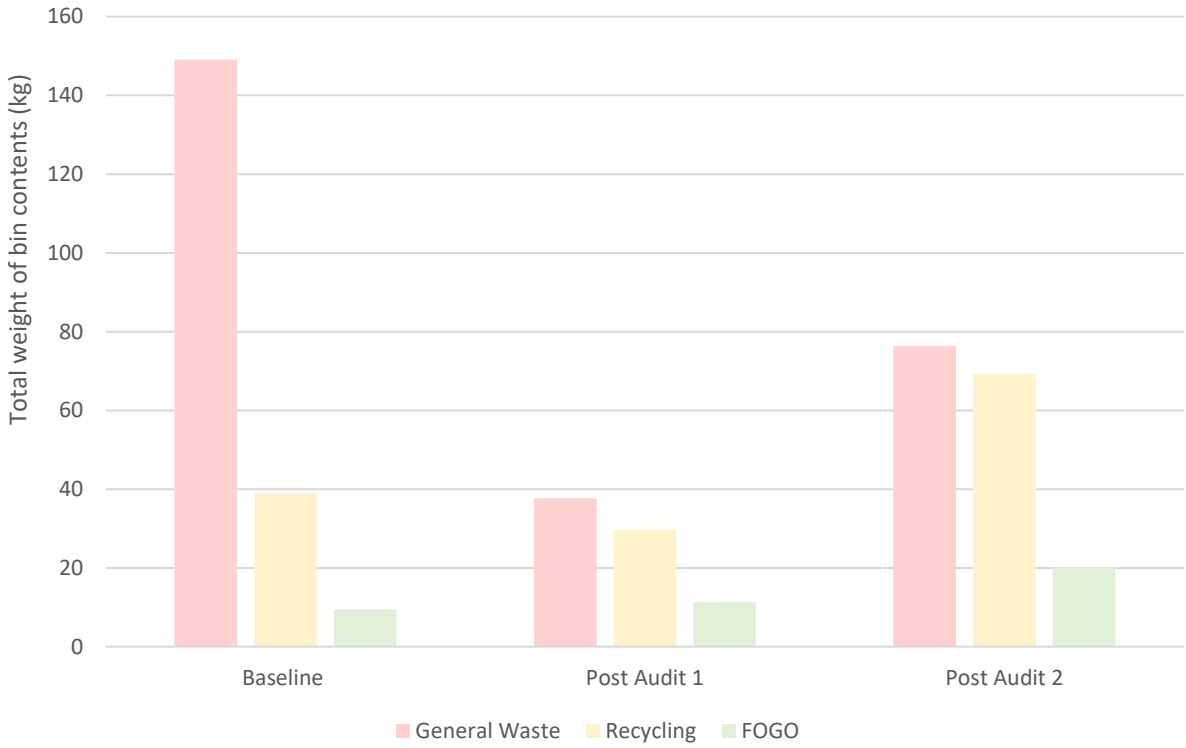

Figure 8: Total Weight of Bin Contents – Signage and Stickers

Table 3-3 shows the average contamination classification across all three waste streams observed at the Baseline and Post Implementation Audits and the trend is shown in Figure 9.

A large amount of contamination was present amongst all three waste streams at the Baseline.

The main type of contamination found in the general waste stream was recycling and food organics, the recycling stream contamination included soft plastics, tied bagged waste and textiles (face masks) and the FOGO stream contamination included non-compostable (plastic) bags.

Table 3-3: Average Contamination – Signage and Stickers

Audit	Average Contamination Classification	Contamination Types	
General Waste*			
Baseline	2.1	food organics, garden organics, recycling	
Post Audit 1	1.8	cardboard, food organics, recycling	
Post Audit 2	0.8	food organics, recycling	
Recycling			
Baseline	1.2	soft plastics, textiles, tied bagged waste	
Post Audit 1	0.6	soft plastic, tied bagged waste	
Post Audit 2	0.8	soft plastic, tied bagged waste	
FOGO			
Baseline	1.5	plastic bags, textiles	
Post Audit 1	0	-	
Post Audit 2	0	-	

** For the purposes of the visual audits, contamination in the general waste stream refers to materials which could be placed into the recycling or FOGO bins*

General waste had the highest average contamination at the Baseline Audit and reduced following the approach implementation. A similar trend was observed for the recycling and FOGO streams.

The trend indicated that following the approach implementation, average contamination rates decreased. During the audits, general waste contamination decreased from 2.1 to 0.8, recycling from 1.2 to 0.8 and FOGO from 1.5 to 0.

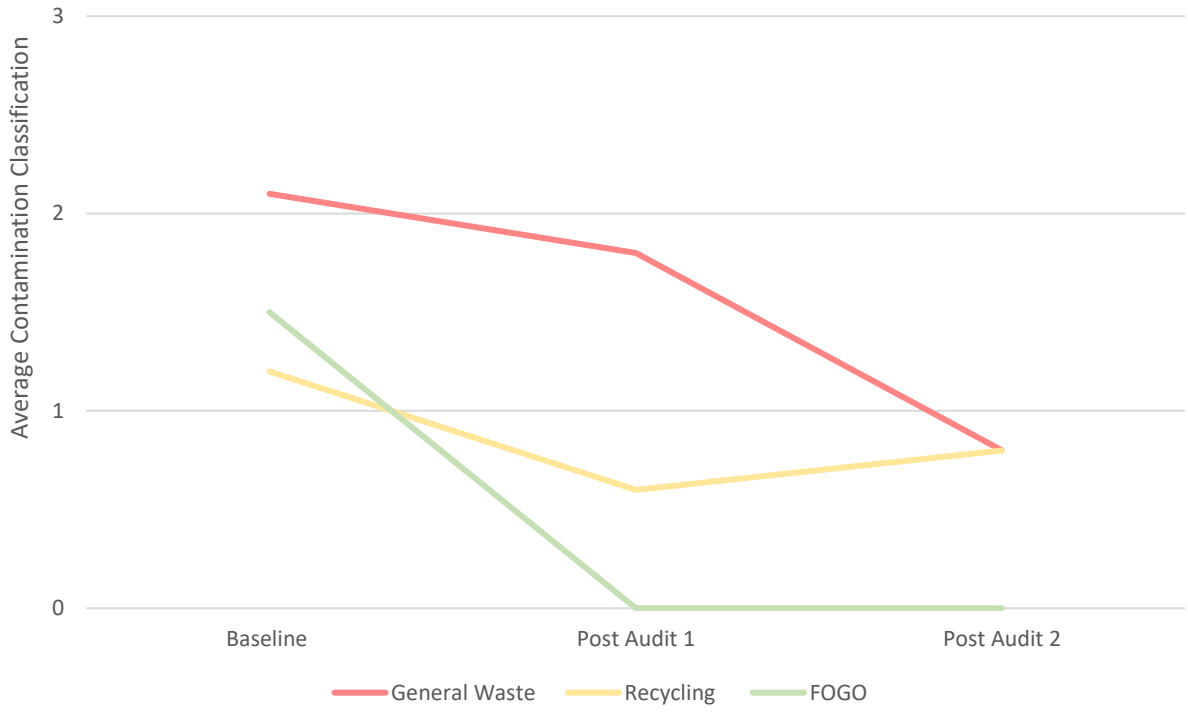

Figure 9: Average Contamination – Signage and Stickers

3.2.3 Evaluation

- Baseline and Post Implementation Audit data showed a considerable decrease in the weight of general waste and an increase in the weight of recycling and FOGO. Waste diversion rates at the Baseline were 25% and this increased to 54% at Post Audit 2. This indicates that following approach implementation, more general waste was diverted from landfill which could be attributed to residents source separating waste into the recycling and FOGO streams.
- Contamination of textiles were predominantly observed as discarded single use face masks which could be attributed to the peak COVID-19 caseloads being experienced in Perth throughout the study period.
- Baseline results revealed high levels of contamination across all waste streams, along with a high total weight of general waste, suggesting poor waste minimisation and source separation behaviours at the MDD prior to the education approach being implemented.
- Post Implantation Audit results suggest that use of signage and stickers was successful in reducing contamination in each bin and therefore improving resource recovery.
- It also suggests that the use of signage and stickers may also have some impact on raising awareness on what items can go into each bin, as general waste bin weights decreased.
- Signage and stickers may be effective as they can be customised to each LGs services and can be modified at any time. However, there is the potential for signage and stickers to go missing or fall off walls especially if the bin storage location is outside and open to weather (e.g. rain and high winds).
- Signage and stickers were effective on a medium-risk property as observed at this MDD, while being a relatively inexpensive and easy to install education approach. However high-risk properties with waste service issue history may need multiple more engaging methods to achieve improvements in source separation and diversion.

3.3 City of Vincent – High Risk – Visual Colour & Bin Arrangement

3.3.1 Overview

The City of Vincent (The City) MDD was categorised as a high-risk property based on demographics and waste services data from the database and the initial site visit. With the large number of apartments (80) and a student-based demographic, residential turnover is reported to be very high. The main contact/property management company is less regular (not based on site) and there is a history of waste servicing issues and bin capacity challenges. Illegal dumping of bulky waste and overflowing bins were noted as some of the main issues during the site visit. The bin storage area is open but secure from the public through property perimeter gates.

The City chose an information based approach and following the Baseline audit, the City of Vincent transformed the MDD bin storage area using bright colours on the walls (behind bins) and arranging the bins into designated areas based on the individual waste streams (refer Figure 10, Figure 11 and Figure 12). The floor underneath the bins were also painted/marked out so that residents know where to place the bins in the correct spot.

Bins were then repositioned to ensure the general waste stream bins were more accessible (closest to the residential accessways) to deter residents from contaminating the recycling & FOGO bins as they were less accessible.

Storing waste streams against colour coded walls can help re-enforce correct source separation and enable easy identification of what materials should and shouldn't be placed into each bin. Colour markings can also ensure bins are always returned to the same location to maintain consistency and bin storage area amenity.

Figure 10: MDD Bin Storage Area – Pre-Approach Implementation

Figure 11: MDD Bin Storage Area – Post-Approach Implementation

Figure 12: Visual Colour Approach Implementation

3.3.2 Results

Figure 13 shows the total weight of the general waste, recycling and FOGO bin contents for the City of Vincent (Visual Colour and Bin Arrangement) MDD. Results have been separated based on the three audits conducted – Baseline (pre approach), first Post Implementation Audit (Post Audit 1) and the second Post Implementation Audit (Post Audit 2).

The total weight of the bin contents varied across all three audits. Across all waste streams, the general waste weight was the heaviest (highest at 355.05kg at Post Audit 1).

The recycling and FOGO waste streams were significantly lighter compared to the general waste and remained fairly constant across all three audits.

The total weight of the general waste bin contents was lowest during the Baseline (224.87kg) which increased following the approach implementation (239.43kg at Post Audit 1).

The recycling total weight at the Baseline was 88.54kg and this generally decreased after the approach implementation (54.78kg at Post Audit 2).

The FOGO total weight at the Baseline was 95.62kg and this decreased slightly after the approach implementation (94.71kg at Post Audit 2).

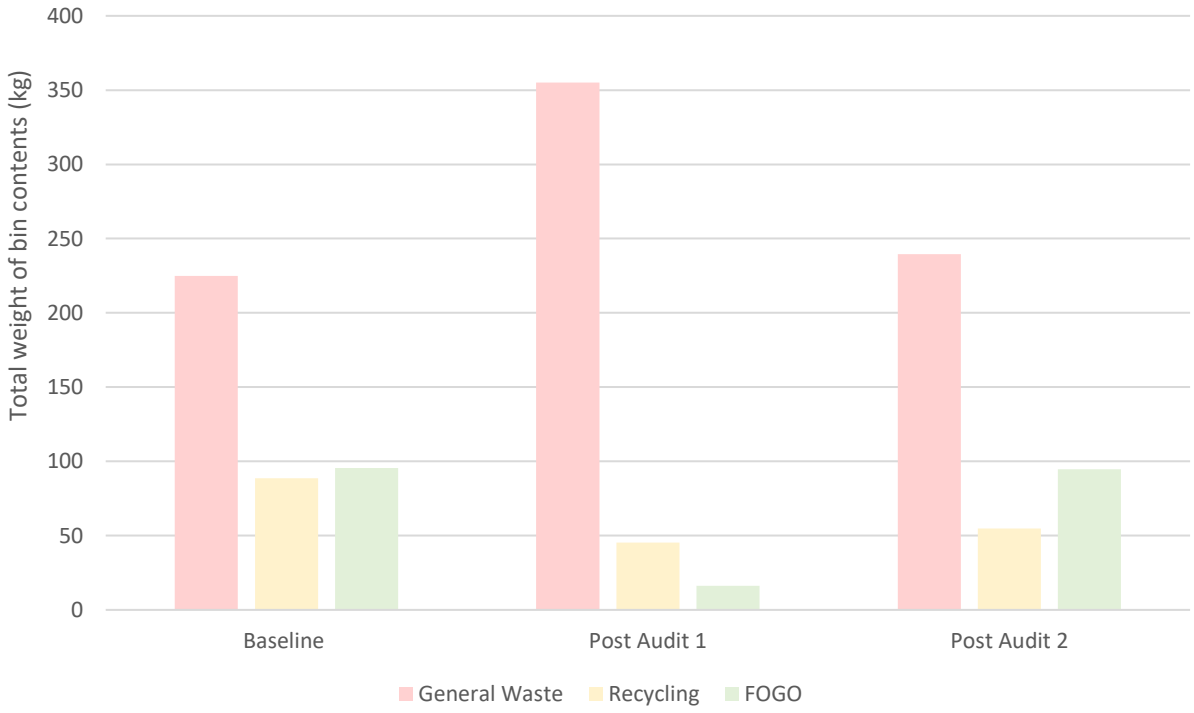

Figure 13: Total Weight of Bin Contents – Visual Colour and Bin Arrangement

Table 3-4 shows the average contamination classification across all three waste streams observed at the Baseline and Post Implementation Audits and the trend is shown in Figure 14.

A large amount of contamination was present amongst all three waste streams throughout the audit period. The highest contamination was found at the Baseline.

The main type of contamination found in the general waste stream was recycling, food organics, e-wastes and clean cardboard.

Contamination in the recycling stream included tied bagged waste, soft plastics and textiles (face masks).

The FOGO stream contamination included recyclable materials, non-compostable bags (plastic) and clean cardboard.

Table 3-4: Average Contamination – Visual Colour and Bin Arrangement

Audit	Average Contamination Classification	Contamination Types	
General Waste*			
Baseline	2.3	recycling, food organics	
Post Audit 1	2	recycling, cardboard, e-waste	
Post Audit 2	1.5	recycling, cardboard, CDS items	
Recycling			
Baseline	2	Bagged waste, soft plastic, e-waste	
Post Audit 1	2.2	bagged waste, soft plastic, organic waste	
Post Audit 2	1.3	plastic bags, tied bags, textiles	
FOGO			
Baseline	2.2	plastic bags, cardboard	
Post Audit 1	1.8	plastic bags, recycling	
Post Audit 2	2.2	plastic bags, cardboard	

** For the purposes of the visual audits, contamination in the general waste stream refers to materials which could be placed into the recycling or FOGO bins*

All three waste streams experienced high average contamination classifications throughout the audit period with all streams receiving a contamination classification above 1 (indicating on average more than 1 – 2 instances of contamination present). The highest contamination classification was found in the general waste stream (2.3 at the Baseline) and the lowest contamination was found in the recycling stream (1.3 at Post Audit 2).

The trend for both general waste and recycling indicated that following the approach implementation, average contamination rates decreased. During the audits, general waste contamination decreased from 2.3 to 1.5, and recycling from 2 to 1.3.

The FOGO waste stream showed a decrease in contamination Post Audit 1 (1.8), although subsequently increased to the original Baseline contamination level (2.2).

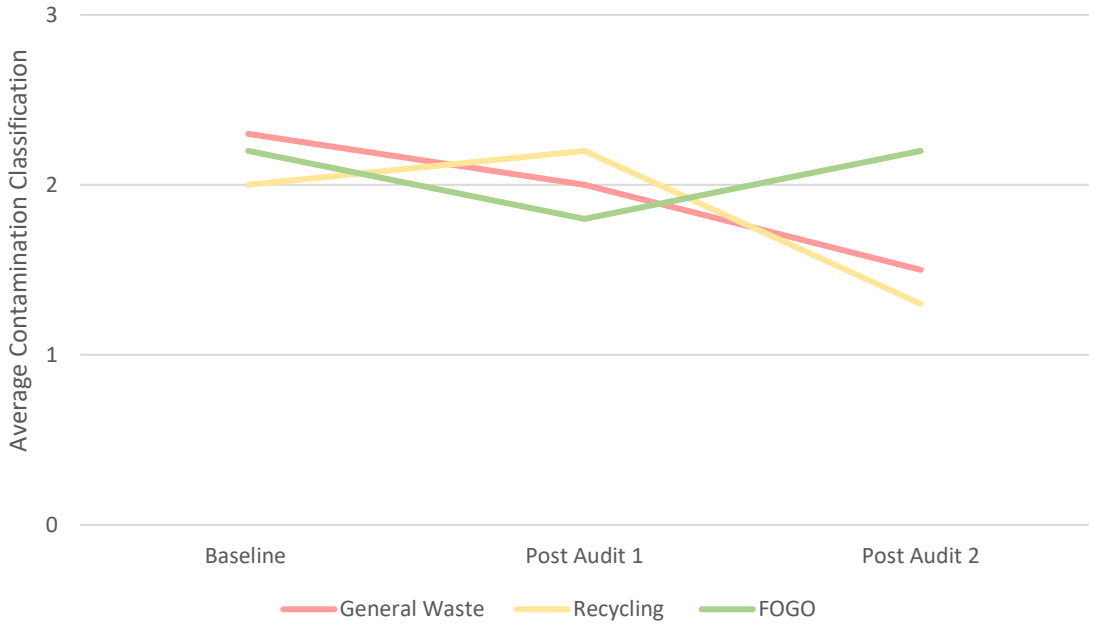

Figure 14: Average Contamination – Visual Colour and Bin Arrangement

3.3.3 Evaluation

- Baseline and Post Implementation Audit data did not show any clear trend between of the weight of the bin contents following approach implementation. This indicates that once this approach was implemented, there was little to no impact on the diversion of waste from landfill.
- Post Implementation Audit results suggest that the use of visual colour and bin arrangement successfully reduced contamination in the general waste and recycling streams. However, this was not observed in the FOGO stream which showed an increase in contamination. This could be attributed to resident confusion about what can go into the FOGO bin as this service was recently introduced to the MDD. Residents may not be utilising this service properly or have a poor understanding of what can and cannot go into this bin.
- Textile contamination was predominantly single use face masks which could be attributed to peak COVID-19 caseloads in Perth throughout the Study period.
- This approach has the potential to be effective in enforcing source separation behaviours, however, has its limitations as a standalone approach as it does not provide information on waste minimisation or what can/cannot be placed in each bin. The bin arrangement is also easily affected by residents/caretakers returning bins to the wrong area, despite clear colour coding.
- Limitation of the approach is highlighted by the fact that contamination was still reasonably high by the end of the audit period and contamination was never recorded at nil instances.
- There are benefits of this approach being relatively inexpensive, easy to install and modify, and visually appealing in what are typically displeasing bin storage areas.
- This could be a good approach for LGs or property management to use in conjunction with other educational approaches (e.g. signage/stickers or information leaflets) that provide

information on reducing waste and using bins correctly. It also has the potential to be successful at low and medium risk MDDs.

- The audit results revealed high levels of contamination across all waste streams, along with high total weights of general waste, suggesting poor waste minimisation and source separation behaviours at the MDD prior to the education approach being implemented.
- The visual audits revealed success in the re positioning of bins to reduce contamination by ensuring the general waste stream is more accessible (closest to the residential accessway) to deter residents from contaminating the recycling & FOGO bins. This could be observed through the greater volumes of waste in the general waste bins which were positioned close to the residential accessway as part of the approach, and lower volumes in the recycling bins placed further away, refer Figure 15.

Figure 15: Full general waste bins located near the residential accessways

3.4 Town of Bassendean – High Risk – Engagement Workshop

3.4.1 Overview

The Town of Bassendean (the Town) categorised this MDD as a high-risk property based on demographic and waste services data from the database and the initial site visit. The main contact organisation for this MDD is the Department of Communities/Housing Authority as there is a known history of waste servicing issues and illegal dumping of bulky waste at the property. The MDD has received engagement from the LG (including verbal information and pamphlets) in the early stages and residents also received additional educational material once the FOGO system was introduced in 2020. There is no main bin storage area and bins are instead scattered around the property located behind the property perimeter gates.

Therefore, the Town conducted an engagement workshop with residents from their selected MDD. This is an engagement-based approach through review of the Better Practice Guidelines.

A letter was delivered a few weeks earlier to residents informing of the workshop and to determine a suitable timeslot to ensure maximum turnout. On the day of the workshop, residents from seven units attended (6.8% turnout rate). The workshop material/information was available only during this time and was not available online post workshop.

Waste education in the form of face-to-face workshops is seen as an important approach to ensure residents have the resources to understand all aspects of waste services provided by the LG. Generally, this approach is completed in MDDs in the early stages after the first residents have settled in and the LG/property management will issue information and educational materials including resident handbooks, welcome packs, flyers, leaflets and stickers. If FOGO has recently been introduced into a MDD, the LG in conjunction with property management may also take the opportunity to revisit engagement workshops to help residents understand how to use the new FOGO system correctly and be provided with kitchen caddies, compostable liners and other printed materials.

Two staff members from the Town provided a one-hour engagement session with the willing residents of the MDD. A summary of the materials and resources provided at the workshop and resident feedback received is shown in Table 3-5. As part of the engagement, dedicated bins for Container Deposit Scheme (CDS) eligible items were provided to residents, refer Figure 16.

Table 3-5: Engagement Workshop Summary

Workshop Summary
Materials and Resources Provided
Fridge magnets
Waste & Recycling Calendar
FOGO information booklet
Household Hazardous Waste booklet
Caddies and compostable liners
Information regarding Bayswater waste information, mattress pickup, tip passes, waste facility tours
Dedicated bins for Container Deposit Scheme (CDS) eligible items
Resident Responses and Feedback
Wanted additional FOGO caddy compostable liners
Asked for additional signage on bins to help with correct material separation
Noted some units have little interest in waste sorting or using bins correctly - very unlikely to engage and would not be interested in waste education
Bulk waste items scattered around the complex

Figure 16: Bins Distributed for CDS Eligible Materials

3.4.2 Results

Figure 17 shows the total weight of the general waste, recycling and FOGO bin contents for the Town (Engagement Workshop) MDD. Results have been separated based on the three audits conducted – Baseline (pre approach), first Post Implementation Audit (Post Audit 1) and the second Post Implementation Audit (Post Audit 2).

The total weight of the bin contents varied across all three audits with the general waste and recycling weights fluctuating the most.

The general waste stream was lightest at the Baseline (26.14kg) and increased following approach implementation (37.31kg at Post Audit 2).

The recycling weight was typically the heaviest (highest at 65.82kg at Post Audit 1) and the weight generally increased following the Baseline audit.

The FOGO stream was highest during the Baseline audit (49.31kg) and decreased following approach implementation (14.06kg at Post Audit 2).

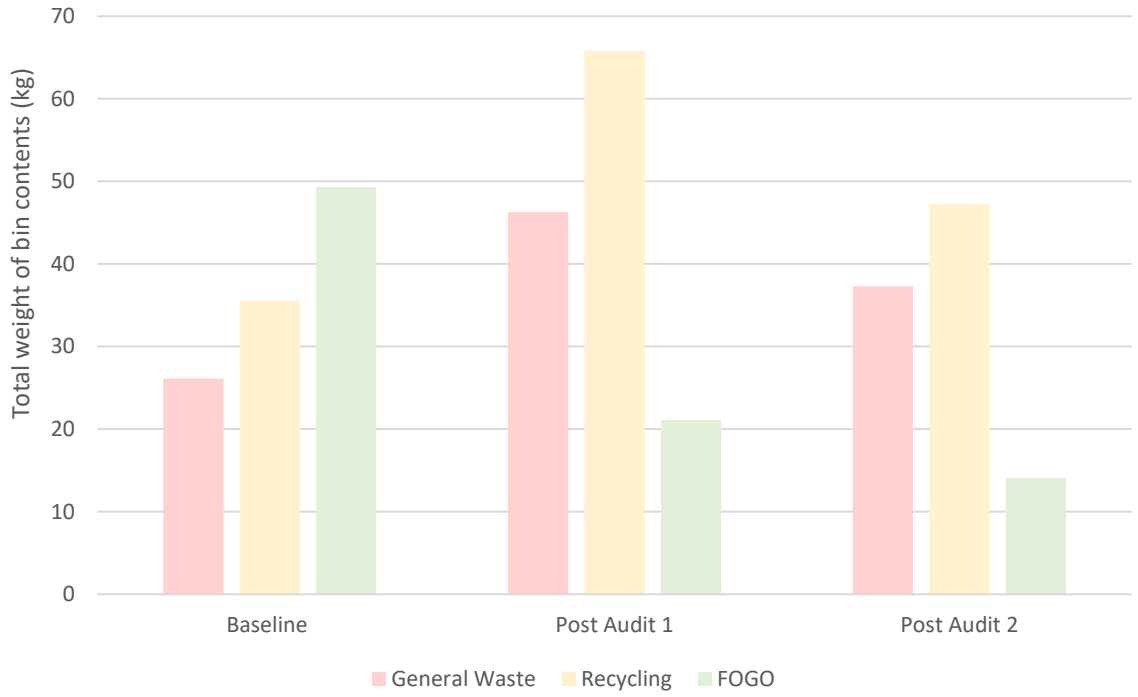

Figure 17: Total Weight of Bin Contents – Engagement Workshop

Table 3-6 shows the average contamination classification across all three waste streams observed at the Baseline and Post Implementation Audits and the trend is shown in Figure 18.

The majority of contamination was observed during the Baseline audit for recycling and FOGO waste streams and general waste contamination was highest at Post Audit 1.

The most prominent contamination found in the general waste stream were recyclable items and clean paper/cardboard.

The recycling stream contamination included hazardous wastes (aerosols) and soft plastics.

The FOGO stream contamination included recyclable items (including CDS materials) and hazardous wastes (aerosols).

Table 3-6: Average Contamination – Engagement Workshop

Audit	Average Contamination Classification	Contamination Types	
General Waste*			
Baseline	1.3	recycling, cardboard, paper	
Post Audit 1	2.2	cardboard, recycling, food and garden waste	
Post Audit 2	1.2	Paper/cardboard, recycling	
Recycling			
Baseline	1.3	Plastic bags, aerosols, soft plastic	
Post Audit 1	0.5	soft plastic	
Post Audit 2	0.2	soft plastic	
FOGO			
Baseline	2	recycling, CDS eligible containers	
Post Audit 1	0.7	Recycling	
Post Audit 2	1	Recycling, aerosol	

** For the purposes of the visual audits, contamination in the general waste stream refers to materials which could be placed into the recycling or FOGO bins*

The highest contamination classification was found in the general waste stream (2.2 at Post Audit 1) and the lowest contamination was found in the recycling stream (0.2 at Post Audit 2).

The trend indicated that following the approach implementation, average contamination rates for recycling and FOGO decreased. During the audits, recycling contamination decreased from 1.3 to 0.2 and FOGO from 2 to 1.

The general waste stream showed an increase in contamination at Post Audit 1 (2.2), but subsequently decreased to the initial Baseline contamination level (1.2).

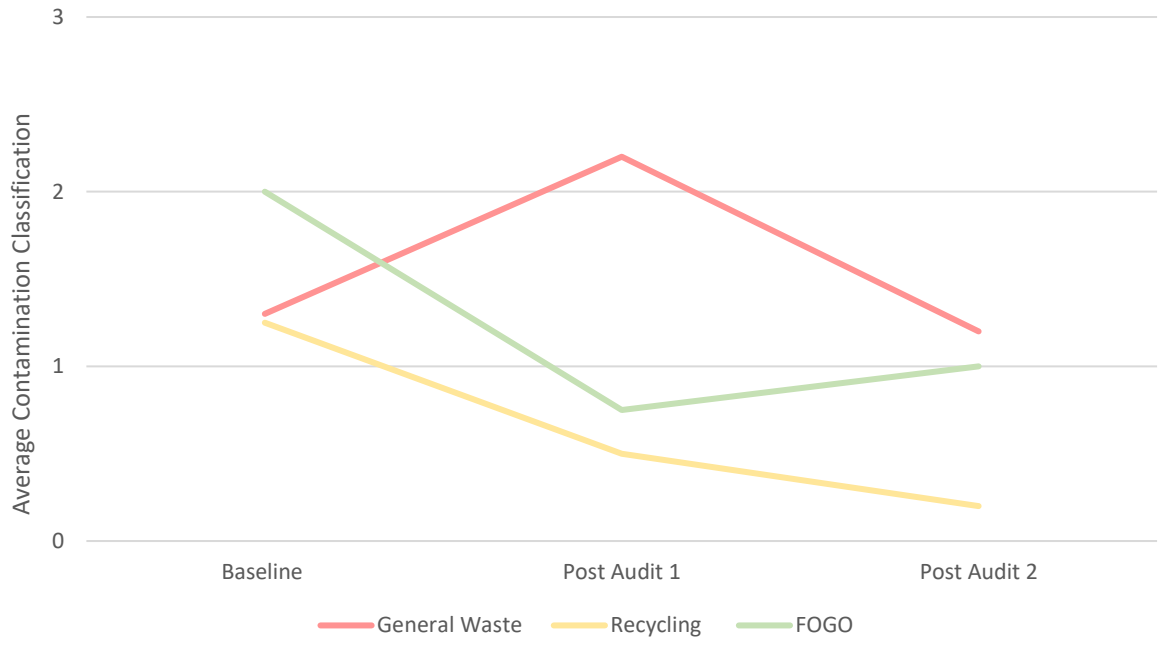

Figure 18: Average Contamination – Engagement Workshop

3.4.3 Evaluation

- Baseline Audit results revealed medium/high levels of contamination across all waste streams, suggesting poor source separation behaviours at the MDD prior to the education approach being implemented.
- Post Implementation Audit results suggest that the engagement workshop was successful in reducing contamination in the recycling and FOGO waste streams and therefore improving resource recovery.
- Due to the transient nature of residents in MDDs, this approach may have its limitations if provided one time only. Continuing to provide this type of engagement will assist the LG/property management to monitor resident behaviours, determine any waste management issues and identify needs for further education approaches such as signage, stickers or information leaflets.
- The high FOGO bin weight at the Baseline Audit can be contributed to residents using the dedicated FOGO bins as receptacles to store CDS eligible materials. Following approach implementation, the LG delivered dedicated bins for residents to store CDS items which subsequently saw a reduction in volume and weight in the following Post Implementation Audits.

- MDDs with an engaging contact person/property manager are crucial in effective ongoing waste management and are recommended for MDDs with scattered bin areas.
- MDDs can capture large volumes of CDS eligible beverage containers including those made from glass, aluminium, PET, HDPE and LPB/aseptic materials. There are opportunities to separate out these containers and implement initiatives for collection by residents in association with community groups.
- A common contaminant found in the recycling bins following approach implementation were a variety of soft plastics which were seen in each of the other Case Studies. This suggests there needs to be a greater emphasis around education approaches targeted towards the management and disposal of soft plastics.
- Resident feedback proved useful to the LG as it highlighted which units may not be using the bin system correctly and causing more contamination in the communal bins. This gives the LG the opportunity to monitor this and include in any contamination processes.
- Residents feedback provided an insight into other approaches that may be required to help the MDD separate waste correctly. At this engagement workshop the residents highlighted that they would like to see signage introduced to help other residents with choosing the correct bin, highlighting that a combination of approaches may have a better effect on reducing contamination and increasing resource recovery.

3.5 City of Bayswater – Medium Risk – Bin Inspections/Tagging

3.5.1 Overview

The City of Bayswater (the City) categorised their MDD of 43 dwellings as a medium-risk property based on demographic and waste services data. The MDD has a mix of renters and owner occupiers, and the property has minimal history of contamination or illegal dumping offences. Bins are allocated to each dwelling and have their own recycling and general waste bin, with some dwellings having a FOGO bin (note not all units have a FOGO bin). Bins are stored outside each unit within the property boundaries.

Therefore, the City chose an engagement based approach to conduct individual bin inspections and tagging at the selected MDD, refer Figure 19.

The Bin Tagging Program was rolled out in Western Australia in 2016 with assistance from WALGA and funding from the Waste Authority through the Waste Avoidance and Resource Recovery Account. Bin tagging is completed by a large number of LGs as a method of providing direct feedback on the contents of general waste, recycling and FOGO bins along with some general guidance and educational tips/graphics. Typically, this approach is provided to single unit dwellings (households) which have their own individual bins. These types of approaches have been successful in providing clarity to residents into what materials can and cannot go into each bin, helping to prevent contamination, improve source separation of waste streams and assist with the transition of a new three bin FOGO system.

The City has dedicated Community Waste Education Officers who complete the visual assessments, record data and attach a tag to the bin, providing individualised feedback on the bin contents. This is conducted at the kerbside prior to collection with the intention of encouraging residents to source separate materials into the correct bins. The City utilises the WALGA Guidelines to implement Bin Tagging Programs which provide a step by step account of the planning, preparation, implementation and evaluation phases involved in the program.

The tags include a 'happy' or 'sad' face to indicate whether the bins have the correct materials inside or whether there are some incorrect items (contamination), refer Figure 20. There is also the opportunity to provide specific written feedback on the tags to help make certain issues clearer.

The City completed five weeks of bin tagging at the MDD which reflects a standard round of their household bin tagging program.

Figure 19: Bayswater Bin Tagging Approach Implementation

Figure 20: Example Bin Tags (FOGO Waste Stream)

3.5.2 Results

Figure 21 shows the total weight of the general waste, recycling and FOGO bin contents for the City of Bayswater (Bin Inspections/Tagging) MDD. Results have been separated based on the three audits conducted – Baseline (pre approach), first Post Implementation Audit (Post Audit 1) and the second Post Implementation Audit (Post Audit 2).

The total weight of the general waste bin contents was the heaviest of the weight streams and remained relatively constant throughout the audits, increasing slightly from 371.09kg at the Baseline to 445.29kg at Post Audit 2.

The FOGO waste stream followed a similar trend to the general waste and was lowest at the Baseline (153.73kg) and increased following the approach implantation (250.07kg at Post Audit 2).

Recycling weight was highest during Baseline (219.43kg) and decreased following approach implementation (128.38kg at Post Audit 2).

Figure 21: Total Weight of Bin Contents – Bin Inspections/Tagging

Table 3-7 shows the average contamination classification across all three waste streams observed at the Baseline and Post Implementation Audits and the trend is shown in Figure 22.

A large amount of contamination was present amongst all three waste streams at the Baseline.

The most prominent contamination found in the general waste stream were recyclable materials, clean cardboard and food organics.

The recycling stream contamination overall was less than the general waste but did include soft plastics, tied bagged waste and textiles (face masks).

The FOGO stream was the least contaminated with the main types comprising of general wastes, non-compostable (plastic) bags and clean cardboard.

Table 3-7: Average Contamination – Bin Inspections/Tagging

Audit	Average Contamination Classification	Contamination Types	
General Waste*			
Baseline	2.6	recycling, food organics, cardboard	
Post Audit 1	2	recycling, food organics, cardboard	
Post Audit 2	0.8	recycling, cardboard	
Recycling			
Baseline	1.5	soft plastic, organic materials, aerosols	
Post Audit 1	1	soft plastic, textiles, bagged waste	
Post Audit 2	0.5	soft plastic, textiles, tissues	
FOGO			
Baseline	1	Plastic bags, cardboard	
Post Audit 1	0.5	recycling, general waste	
Post Audit 2	0.5	General waste, plastic bags, cardboard	

** For the purposes of the visual audits, contamination in the general waste stream refers to materials which could be placed into the recycling or FOGO bins*

General waste had the highest average contamination at the Baseline audit and reduced following the approach implementation. A similar trend was observed for the recycling and FOGO streams.

The trend indicated that following the approach implementation, average contamination rates decreased. General waste contamination decreased from 2.6 to 0.8, recycling from 1.5 to 0.5 and FOGO from 1 to 0.5.

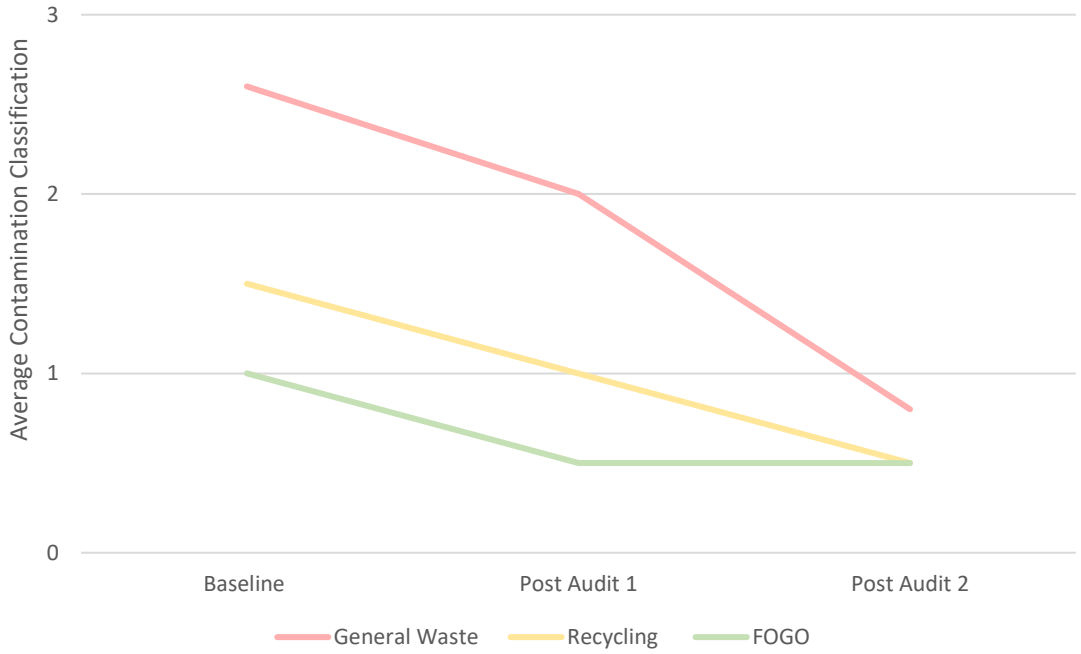

Figure 22: Average Contamination – Bin Inspections/Tagging

3.5.3 Evaluation

- The audit results revealed high levels of contamination across all waste streams, along with high total weights of general waste, suggesting poor waste minimisation and source separation behaviours at the MDD prior to the education approach being implemented.
- Baseline and Post Implementation Audit data showed decreases in contamination across all three waste streams. This suggests that bin inspections/tagging was successful in reducing contamination in those streams and that having officers on site assessing the bins overall improves behaviour. The approach improved household recycling and waste management performance.
- Bin tagging was an effective approach on a medium risk MDD, where residents have ownership of their own sets of bins. It is believed that the higher the initial contamination classification, the greater the improvement that would be expected over the course of the program. This may not be as an effective approach on a low risk MDD experiencing lower levels of contamination as only small improvements are noted and the approach overall is fairly resource intensive.
- Bin inspections may be limited by its high resource requirements and it is unclear how long the good performance will last once the inspections finish after a program (programs are typically 5 weeks only).
- Recycling bins in particular are often contaminated throughout many LGs, largely due to confusion around what can/cannot be recycled, as educational materials and accepted items vary between LGs. This outcome suggests that for a more difficult waste stream like recycling, bin inspections are successful in alleviating confusion and encourage correct source

separation behaviours. This is enhanced by the direct nature of the feedback through the tags and the opportunity to provide specific written feedback.

- This approach is particularly beneficial as it provides individual onsite engagement through the presence of Waste Education Officers as well as information leaflets in the form of bin tags.
- Textile contamination was predominantly single use face masks which could be attributed to peak COVID-19 caseloads in Perth throughout the Study period.

4 SWOT Analysis

A Strengths Weakness Opportunities Threats (SWOT) Analysis was carried out for each of the approaches, refer Table 4-1 to Table 4-5.

Table 4-1: SWOT Analysis – Information Leaflets

SWOT Analysis			
Strengths	**Weaknesses**	**Opportunities**	**Threats**
- Customisable for different LGs and waste services - Inexpensive	- Unused leaflets contribute to waste - Impact may lessen over time and needs to be repeated to keep interest ongoing and for new residents	- Collaborating with resources available to LG, such as Waste Authority and WALGA	- Emerging online technologies: leaflets may be made redundant as residents move to paperless options or use LG websites/apps more regularly for their waste information - Resident turnover - Uninterested residents

Table 4-2: SWOT Analysis – Signage and Stickers

SWOT Analysis			
Strengths	**Weaknesses**	**Opportunities**	**Threats**
- Present regardless of resident turnover - Inexpensive - Easy to install - Easy to change	- Not actively engaging with residents - Can easily be worn by weather or deliberately removed	- Clear waste-related information from the LG	- Uninterested residents - Tend to be ignored by residents over time - Maintenance

Table 4-3: SWOT Analysis – Visual Colour and Bin Arrangement

SWOT Analysis			
Strengths	**Weaknesses**	**Opportunities**	**Threats**
- Present regardless of resident turnover - Relatively inexpensive - Reduces contamination from residents not willing to use bins properly or segregate wastes	- Bin arrangement is easily altered by residents - Difficult to change - No clarification of what items go in each bin	- Less confusion from residents	- Uninterested residents - Residents altering arrangements

Table 4-4: SWOT Analysis – Engagement Workshop

SWOT Analysis			
Strengths	**Weaknesses**	**Opportunities**	**Threats**
- High level of engagement - Contributes to establishing valuable relationships within the community	- Labour intensive with high resource requirements - Requirement to repeat workshops for new residents - Difficult to achieve full community engagement - Impact may lessen over time and needs to be repeated to keep interest ongoing and for new residents	- Workshops could be carried out online	- LG Resourcing (staff and/or budget) challenges - Resident turnover - Difficulty attending workshops - Uninterested residents

Table 4-5: SWOT Analysis – Bin Inspections/Tagging

SWOT Analysis			
Strengths	**Weaknesses**	**Opportunities**	**Threats**
- High level of engagement	- Labour intensive with high resource requirements - Tags may be lost due to weather and contribute to litter - Requires thorough pre-planning and follow-up - Not suitable for MDDs with shared bins	- Less contamination within the individual waste streams - Potential to reduce the amount of money LGs spend on waste management	- Lack of staff to carry out auditing - Lack of budget - COVID risks - Uninterested residents

5 Summary

The study was undertaken to inform the Better Practice Guidelines and trial specific waste education approaches to improve landfill diversion rates and reduce contamination at MDDs. The approaches are focused on increasing resource recovery and reducing contamination in the general waste, recycling and FOGO bins.

It is widely understood that a one size fits all approach is not suitable for all MDDs and LGs. Therefore, this study targeted a variety of information and engagement approaches based on the Better Practice Guidelines to determine the effectiveness of each approach. These included:

- Information leaflets;
- Signage and stickers;
- Visual colour and bin arrangement;
- Engagement workshop; and
- Bin inspections and tagging.

Five MDDs were targeted across Perth metropolitan LGs and the general waste, recycling and FOGO bins of these properties audited. The audits were designed to collect data on the general waste, recycling and FOGO waste streams and to collect Baseline data that allows future comparison of these information and engagement approaches.

The results indicate that for the approaches chosen there is some initial success, but that this declines over time. This suggests that repeated engagement, or a combination of repeated approaches would be required to achieve sustainable results for improving landfill diversion rates and contamination reduction. Results will also vary significantly depending on MDD risk ratings, number of dwellings/demographic factors and how the bin system is managed.

Results suggest that bin tagging was the most successful approach in reducing contamination rates at MDDs, followed by signage and stickers and information leaflets.

For the general waste stream, overall, diversion from landfill increased for all approaches following implementation with the exception of the engagement workshop, which initially increased at Post Audit 1 and then decreased to initial Baseline levels, refer Figure 23.

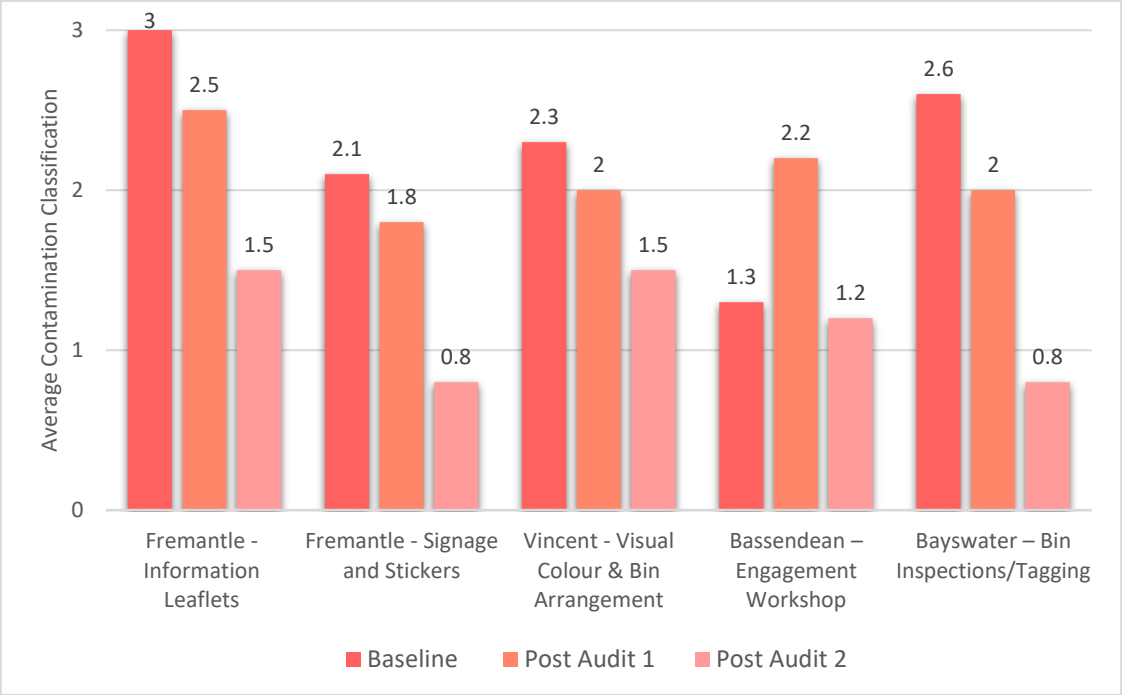

Figure 23: General Waste Average Contamination per Approach

For the recycling stream, contamination decreased for all approaches from initial Baseline results. Information leaflets and visual colour and bin arrangement approaches observed a slight increase in contamination at Post Audit 1, but then decreased at Post Audit 2, refer Figure 24. It is observed that the information leaflets, engagement workshop and bin inspection approaches were most effective on the recycling stream contamination.

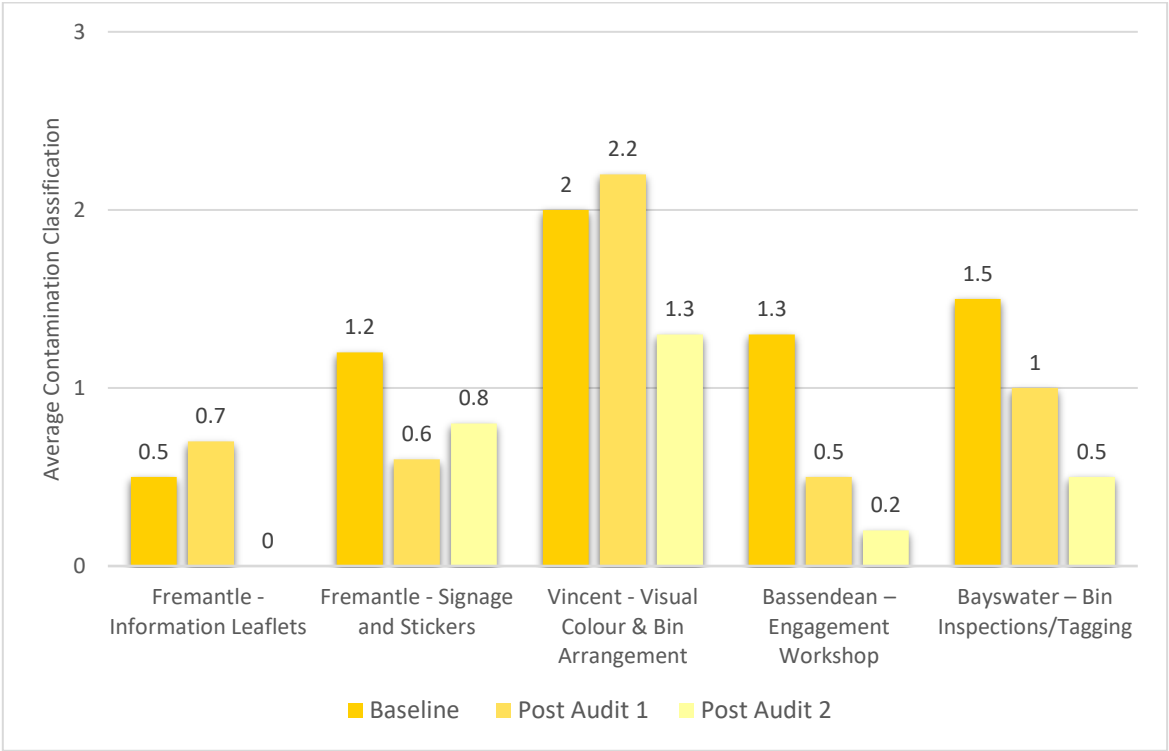

Figure 24: Recycling Average Contamination per Approach

For the FOGO stream, contamination decreased for all approaches from initial Baseline results, with the exception of the visual colour and bin arrangement approach which increased to initial Baseline results, refer Figure 25. It is observed that the signage and stickers approach was most effective on the FOGO waste stream contamination.

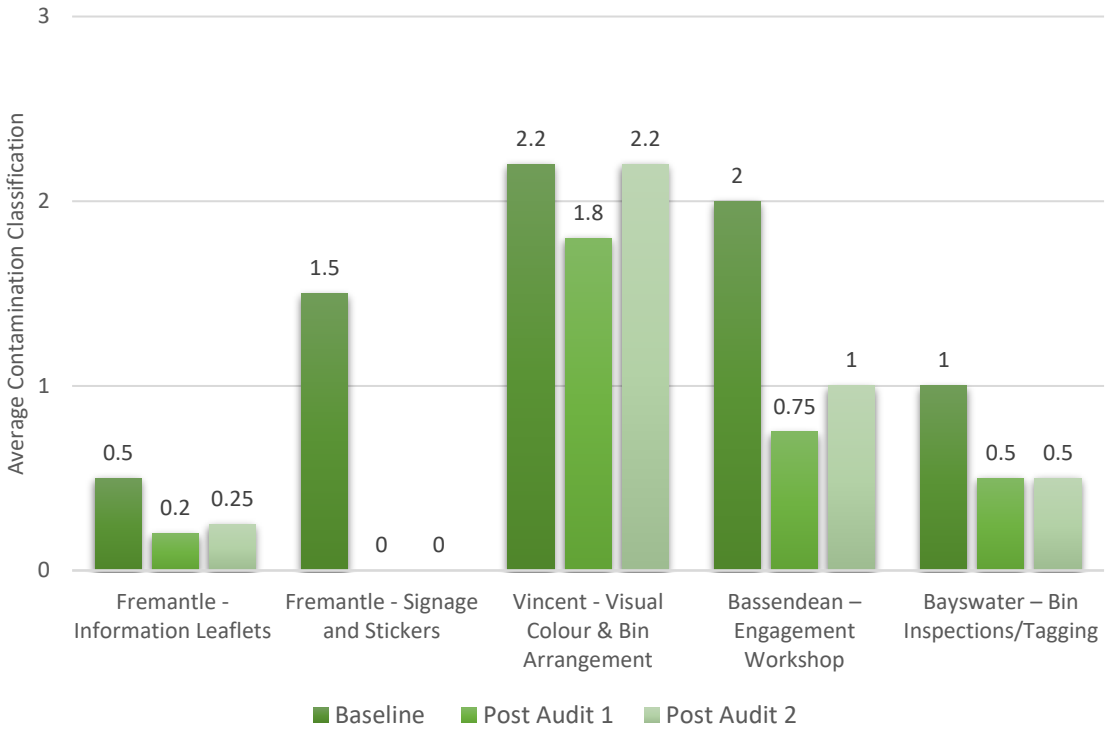

Figure 25: FOGO Average Contamination per Approach

6 Conclusion

The Study shows that:

- Following the processes in the Better Practice Guideline will assist LG, strata companies and real estate companies to successfully manage waste and increase resource recovery at MDDs;
- Completing the database for all MDDs in a LG to gain baseline data on bin numbers, risk ratings and other demographics is necessary information for LG. This will help determine the most appropriate approach(es) to be implemented;
- MDDs using a combination of approaches (information and engagement), with periodic follow up to keep up the momentum, will have effective waste management practices;
- If staff resources are available, it is beneficial to undertake bin tagging/audits to assist in reducing contamination rates at MDDs; and
- There should be greater focus around ongoing information approaches to target problematic wastes, primarily in the recycling stream i.e., tied bagged recyclables, hazardous wastes (aerosols) and soft plastics.

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