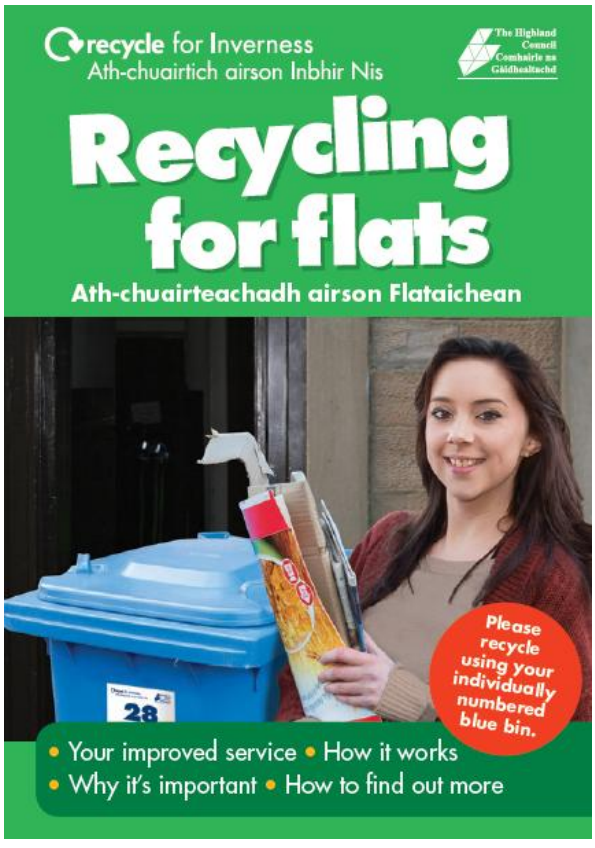
Report

Local Authority Tenemental Communications Support

Final Report



Zero Waste Scotland works with businesses, individuals, communities and local authorities to help them reduce waste, recycle more and use resources sustainably.

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Written by: Nicki Souter Associates

Executive Summary

NSA were contracted by Zero Waste Scotland in 2012 to provide communications project management support to four Scottish Local Authorities in order to improve the quality and increase the quantity of recyclable materials they collect from tenemental properties (e.g. without changing infrastructure or collection systems). This was to be achieved by:

- Reviewing existing tenemental recycling systems and related communications to establish a good practice communications strategy;

- Developing and implementing four pilot projects to test and evaluate the impact of a range of communication materials and methods in improving tenemental recycling performance from tenemental properties.

A scoping exercise was undertaken to evaluate the current communications and research work on engaging tenemental households in recycling, involving a desk-based literature review and depth interviews with staff in nine Scottish Local Authorities with a high proportion of tenemental households among their housing stock. The findings from this research were presented in a Scoping Report, outlining the key considerations for communication campaigns involving tenemental households. This informed the production of a Recommended Communication Strategy for Local Authorities (Appendix 1) implementing or improving a recycling service for tenemental properties. In addition, NSA developed a Brand Guidance document for multi-material recycling services to tenemental, flatted and high-rise properties, including template communication materials. This document is available from ZWS.

Zero Waste Scotland made funding available through the LAS004-300 Local Authority Tenements Communications Fund to support Local Authorities to communicate directly with residents in flats and tenements and test the effectiveness of a range of communication materials and methods in increasing the quality and quantity of recyclate collection from flats and tenements. Aberdeen City, Highland, Inverclyde and Renfrewshire Council confirmed their willingness to access the available funding and NSA developed pilot projects to test different types of approaches to communications for each Local Authority, thereby allowing a comparison of the effectiveness of each intervention method in encouraging tenemental households to participate in their recycling service.

The communication materials and methods piloted were effective in encouraging people living in flats to participate to a greater extent in the local recycling servicese. However, due to the short timescales for delivery, the intervention period for piloting communication materials and methods in each Local Authority area was restricted, thereby affecting the overall effectiveness of the pilots and the monitoring and evaluation data collected. A key recommendation would be to repeat the pilot projects on a larger scale and longer timeframe to evaluate their effectiveness incorporating a robust pre- and post-monitoring strategy.

Based on the data available and the anecdotal evidence from the Working Group members within each Local Authority, the following conclusions have been drawn:

- Early engagement of the community in the area, at local community centres or via existing organisations, can ensure buy-in before communication materials or activities begin. This can also inform the strategy used, ensuring it addresses the issues and needs, of the local population.

- A cross-section of staff from different departments should be involved in the project Working Group, including representatives of Housing Associations and Tenancy Groups to facilitate internal communication.

- Regular Working Group meetings are essential to ensure momentum is maintained, members are kept informed of developments and that the strategy remains focussed to achieve the aims and objectives of the individual project.

- Councils providing an 'amnesty' to removing heavily contaminated bins and clearing flytipping and excess waste in backcourt areas can increase confidence amongst the local community and encourage buy-in to a new initiative as it provides a visible improvement to the local environment.

- Individualising the recycling and residual bins, where possible, encourages ownership and responsibility for the bin and its contents resulting in increased participation and set out.

- Local Councillors can help promote the service and increase confidence amongst local residents that their views about the recycling service will be taken seriously and that action will be taken.

- Door knocking is an effective mechanism of direct engagement which provides an opportunity to reiterate key messages from the communication campaign and to discuss use of the services.

- Communication materials alone are unlikely to result in signficant increases in the quality or quantity of the recycling service, and should be accompanied by community engagement activities for local areas.

Monitoring and evaluation methodologies currently favour low and medium density housing with individual bins. High density monitoring and evaluation is frequently limited to contamination and fill level monitoring and we would therefore also suggest there is a need for greater understanding how tenemental households interact with their recycling service, particularly those who are provided with communal bins at back of court or on-street. This initially could take the form of observational analysis to understand:

- The frequency of use of the recycling service;

- The methods used to transport materials to bins;

- The different methods available to householders to transport materials to bins; and

- Household behaviour in relation to flat position within a block.

The following Intervention Strategy is recommended for Local Authorities aiming to increase the quality and quantity of recyclate collected from tenemental properties.

Pre-Intervention

- Produce an internal and external communication strategy and monitoring plan;
- Establish a Working Group which includes members of the Waste Team, Collection Crews, Contact Centre, Housing Department, Community Wardens / Neighbourhood Services, Corporate Communications, Housing Associations andTenancy Groups;
- Review the existing local environmental quality for potential minor improvements;
- Arrange a community engagement workshop in a local venue to gather opinions on the current recycling service;
- Repair or replace all damaged bins and clear the local area (flytipping, backcourts etc);
- Conduct pre-intervention monitoring and evaluation (observational analysis, waste composition analysis, set out, participation, fill level, contamination) over three consecutive collection cycles;
- Issue an introductory letter to residents explaining the upcoming initiative and what they can expect;
- Set community engagement meeting to discuss local improvements which could be made.

Intervention

- Working Group meeting;
- Where individual bins are provided as part of the recycling service, individualise bins using address labels;
- Sticker bins and containers with information decals highlighting the materials which can be accepted;
- Deliver an information leaflet to every household outlining the service, the materials which can be collected and the collection frequency of the containers;
- Place posters in local outlets (shops, community centres, libraries) and in building closes or on noticeboards;
- Issue press articles which include quotes from active Community Councillors for the area and images with local residents;
- Door knock every household in the area (expected return of 30-40% based on the WRAP guidance of 140 households per surveyor per day) to engage the householder and discuss the service;
- Conduct monitoring and evaluation over two consecutive cycles;
- Schedule a Working Group meeting to discuss the project to date and further actions required.

Post-Intervention

- Working Group meetting to review the success of the project;
- Arrange a community engagement workshop in a local venue to gather opinions on the current recycling service;
- Issue a Thank You letter to thank householders for their participation, inform them of the changes made, and describe the next steps;
- Conduct post-intervention monitoring and evaluation (observational analysis, waste composition analysis, set out, participation, fill level, contamination) over three consecutive collection cycles;

Contents

1 Introduction

The Scottish Government's Waste (Scotland) Regulations 2012 require Scottish Local Authorities to provide a recycling service to all households by the 1st January 2016. The provision of recycling services to low, medium and high density houses will contribute towards the Scottish Government recycling target of 70% of household waste by 2025 and ensure equitable waste provision across all housing types.

Recycling provision for tenemental and flatted properties presents greater barriers than typically seen for low and medium density housing and may therefore require additional communication materials and methods to ensure sufficient quality and quantity of materials are collected from these properties. Communication challenges faced may include:

- Lower individual or identifiable ownership of recycling containers;
- Reduced visibility of recycling services due to bin storage in back of court or dedicated bin storage areas;
- High turnover of residents (transience) who are unaware of the recycling services available;
- Clusters of certain resident types who have different communication requirements, such as those who do not speak English as a first language, students etc;
- Low priority given to refuse and recycling services by households due to social circumstances.

NSA were contracted by Zero Waste Scotland in 2012 to provide communications project management support to four Scottish Local Authorities in order to improve the quality and increase the quantity of recyclable materials they collect from tenemental properties (e.g. without changing infrastructure or collection systems). This was to be achieved by:

- Reviewing existing tenemental recycling systems and related communications to establish a good practice communications strategy;
- Developing and implementing four pilot projects to test and evaluate the impact of a range of communication materials and methods in improving tenemental recycling performance from tenemental properties.

2 Tenemental Research and Development

2.1 Scoping

NSA undertook a scoping exercise on current communications materials and methods used to engage tenemental households in recycling. This involved a desk-based literature review, qualitative research, in the form of depth interviews, with staff in Scottish Local Authorities with a high proportion of tenemental households among their housing stock and a review of potential monitoring activities to assess the recycling performance from tenemental properties.

2.1.1 Depth Interviews

Depth interviews were undertaken to:

- Explore the attitudes and perceptions of Council staff towards existing tenemental recycling services;
- Discuss the personal experiences of staff in implementing, collecting and/or supporting tenemental recycling services;
- Review existing communication activities used to encourage participation in tenemental recycling;
- Identify any operational and/or communication issues that could be improved to encourage further public participation in tenemental recycling; and
- Explore the opportunities for a tenemental communications pilot in the Council area to test the effectiveness of various communication materials and methods to encourage, engage and enable the public living in tenements to recycle.

Staff were interviewed from Aberdeen City Council, Dundee City Council, Glasgow City Council, Highland Council[1], Inverclyde Council, Renfrewshire Council and South Lanarkshire Council.

Each Local Authority was requested to arrange interviews with a cross-section of staff with knowledge or experience of tenemental households. Each person was interviewed by the NSA Project Manager and/or an NSA Consultant using a standardised set of interview questions. This format of interviewing allowed comparisons to be made across the interviews and for common opinions or themes to be recorded without being attributed to individuals. Interview responses were used to make recommendations on good practice for both internal and external communication strategy methods and materials.

2.1.2 Literature Review

The literature review involved:

- Sourcing, collating and reviewing published work relating to flats and tenements in Scotland and the UK. For example WRAP's 'Recycling Collections for Flats – Communicating with Residents in Flats[2]' and DEFRA's 'Recycling for Flats[3]' documents, WRAP case studies and the Scottish Executive Multi-Occupancy Recycling Feasibility Project report[4];

[1] Edinburgh City Council were originally stated as one of the nine Local Authorities to be interviewed, but were substituted for Highland Council by Zero Waste Scotland.
[2] http://www.wrap.org.uk/content/recycling-collections-flats-communicating-residents-flats
[3] http://www.wrap.org.uk/sites/files/wrap/Recycling%20for%20flats%20March%202006%20WW%20Defra.pdf
[4] http://www.scotland.gov.uk/Resource/Doc/138558/0034476.pdf

- Reviewing existing monitoring and evaluation research to appraise the public acceptability, attitudes and behaviours towards a range of tenemental recycling services and associated communication support functions across Scotland; and

- Reviewing the range of communication materials that have been used to engage with people living in tenements and other high density property types.

2.1.3 Monitoring Review

A review of existing monitoring and evaluation activities and guidance documents was undertaken to produce a Monitoring Review, outlining the considerations for assessing the impact of communication methods and materials on the recycling performance from tenemental properties.

2.2 Tenemental Scoping Report

The findings from the depth interviews, literature review and monitoring review are presented in a Scoping Report (available from ZWS). This summarises the communication materials currently or previously used by Local Authorities to communicate with tenemental households.

The results of the scoping study informed the production of a Recommended Communication Strategy (Appendix 1) for Local Authorities implementing or improving recycling services for tenemental properties. The communication strategy provides guidance on the materials and methods which can be used to engage, enable and encourage households to participate in recycling services. The monitoring plan presents a range of monitoring and evaluation methods which could be used to assess the level of participation amongst householders as well as information on the quantity and quality of recyclate collected.

In addition, NSA developed a Brand Guidance document, 'Dry Recyclate Collection Service for Flats: Communication Material Toolkit', for multi-material recycling services to tenemental, flatted and high-rise properties, including template communication materials. This document is available from ZWS.

3 Tenemental Pilot Projects Methodology

3.1 Development of Pilot Projects

In 2012, Zero Waste Scotland made funding available through the LAS004-300 Local Authority Tenements Communications Fund to support Local Authorities to communicate directly with residents in flats and tenements and test the effectiveness of a range of communication materials and methods in increasing the quality and quantity of recyclate collection from flats and tenements. Councils with a significant proportion of tenemental properties in their area were invited to apply for funds to produce and deliver communication materials and interventions, with project management support available from NSA as part of the ZWS Local Authority Tenemental Communications Support project.

Four Local Authorities confirmed their willingness to access the available funding: Aberdeen City Council, Highland Council, Inverclyde Council and Renfrewshire Council. NSA developed and designed a pilot project for each Local Authority to test a range of communication materials and methods identified in the Scoping Report as detailed in Table 1. The communication materials were based on templates developed via focus groups, which were then localised to reflect the local recycling service for each of the pilot projects.

Table 1: Summary of Internal and External Communication Activities Undertaken in Each Local Authority Pilot Project

	Aberdeen City Council	Inverclyde Council	Renfrewshire Council	Highland Council
Internal Communications				
Tenemental Working Group	✓	✓	✓	✓
Staff Briefing Sessions	✓	✓	✓	✓
Community Councillor Briefing			✓	✓
External Communications				
8pp A5 Recycling Leaflet	✓	✓	✓	✓
Recycling and Residual Bin Decals	✓		✓	✓
Recycling and Residual Address Decals			✓	✓
Contamination Decal			✓	✓
A4 Posters	✓	✓	✓	✓
Reminder Postcard				✓
Pull-Up Banners		✓		
Door Knocking	✓			✓
Community Engagement Group				✓
Active Councillor Support				✓

The pilot projects were designed to test a range of communication activities and to explore their effectivness in encouraging peple living in flats to recycle:

- Inverclyde Council's tenement recycling service comprised of individual 240 litre grey bins for residual waste and 240 litre blue bins for multi-material dry recyclates collected on alternate weeks. The recycling containers

accept food and drink cans, cardboard, paper, plastic bottles and containers, cardboard food and drinks cartons and textiles. Each household in the pilot area received a new leaflet, and additional communication activities were limited to the distribution of posters and pull-up banners in Council and Housing Association Offices.

- Aberdeen City Council's tenement recycling service comprised of on-street 1,280 litre containers for residual waste and blue-lidded 1,280 litre containers for paper and cardboard, emptied at least once weekly. Each household in the pilot area received a new leaflet and decals were placed on the on-street containers where a replacement was required. Additional communication activities consisted of a door knocking campaign to engage the households in recycling and A4 posters distributed at local outlets such as Council offices.

- Renfrewshire Council's tenement recycling service comprised of individual 240 litre blue recycling bins and 240 litre grey residual bins situated at the back of properties and presented kerbside on alternate weeks. The recycling service accepts food and drink cans, cardboard, paper, glass and mixed plastics. Each household in the pilot area received a new leaflet and decals were placed on the bins providing information on the materials which could be recycled and allocating the bin to an address in the block. Additional communication activities consisted of A4 posters distributed at local outlets and contamination decals were made available to collection crew.

- Highland Council's tenement recycling service comprised of individual 240 litre blue recycling bins and 240 litre grey residual bins presented kerbside on alternate weeks. The recycling service accepts food and drink cans, cardboard, paper and mixed plastics. Each household in the pilot area received a new leaflet and decals were placed on the bins providing information on the materials which could be recycled and allocating the bin to an address in the block. Additional communication activities consisted of A4 posters distributed at local outlets, contamination decals made available to collection crews, reminder postcards used to encourage households to remove their bins from the street after collection, a door knocking campaign to engage the households in recycling and discussion groups with members of the community to explore attitidues towards the local environment and recycling service.

3.1.1 Communications Project Management Support

Each Local Authority was provided with six days communications project management support from NSA to support the implementation of their tenemental pilot project. This support included:

- Production of a specific Communications Strategy outlining the communication materials and methods to be used, the timeframes for delivery and key staff involved;

- Production of a specific monitoring plan to gauge the effectiveness of each pilot on participation, set-out, contamination and fill-level of containers;

- Training sessions for Local Authority staff to ensure they were fully informed of the pilot project;

- Development of communication materials, excluding print and production.

The project management support provided to each Local Authority is detailed in Table 2. The level of support accessed varied with each Local Authority, based on staff capacity, service requirements and the scale of rollout.

Table 2: Project Management Support Provided

	Aberdeen City Council	Highland Council	Inverclyde Council	Renfrewshire Council
Development of tenemental communications pilot project and preparation of ZWS funding application	✓	✓	✓	✓
Assistance in establishing a Working Group for the project	✓	✓	✓	✓
Attendance at Working Group meetings	✓	✓	✓	✓
Development of communication materials	✓	✓	✓	✓
Assistance in the delivery of the communication strategy	✓	✓	✓	✓
Delivery of communication materials to households in the pilot area		✓	✓	✓
Delivery of a community discussion group to investigate current attitudes to recycling and the local environment and suggested improvements to the current waste service		✓	✓	✓
Delivery of briefing sessions for the Collection Crew and Contact Centre			✓	✓
Preparation of a briefing note and presentation for the Council Committee				✓
Delivery of a monitoring and evaluation training session for Waste Advisors				✓
Support for door knocking engagement activities	✓	✓		

3.2 Aberdeen City Council

3.2.1 Existing Tenemental Recycling Service

There are approximately 58,000 flatted properties in Aberdeen comprising of 4,455 Council properties in blocks of seven stories or more, 12,000 Victorian tenements and the remainder are a combination of different flatted property types (such as other tenement style blocks and private courtyard developments). The Victorian tenements and tenement-style flats are generally serviced by on street 1,280 litre residual containers emptied at least once weekly. Blue-lidded on-street 1,280 litre containers for paper and cardboard have been introduced in some areas of the city.

3.2.2 Pilot Project Scope

Tenement households in the Urquhart Road area of Aberdeen were encouraged to recycle using their existing on-street recycling service. The pilot area consisted of approximately 800 households on one collection route in an area of low/medium recycling performance (compared with other areas with on-street recycling provision). The recycling service was promoted in a marketing campaign when it was introduced. While general information for the on-street recycling service is available on the Council website and provided at information stalls, there has been no dedicated promotion of the service since the original roll-out. The area covers a wide range of tenures, with a mix of owner/occupiers, private landlords and Council tenants. There is a large student population which can cause communications difficulties due to the high turnover of residences and ongoing problems with fly-tipping and side waste at the communal on-street bin locations. Current recycling tonnage was not available as the collection route incorporates areas outwith the pilot.

The pilot project aimed to engage households in the use of the 1,100 litre on-street paper and cardboard recycling bins using:

- 8pp A5 Recycling Leaflet outlining the service available, the containers used, acceptable materials and an explanation of the impact of contamination on the recycling process;
- Recycling bin decals reiterating the materials which could be placed in the paper and cardboard bins;
- A4 posters placed in local shops, community centres, libraries etc and in tenement closes to remind households of the recycling service;
- Door knocking by members of the Waste Team and NSA to discuss the recycling facilities with households, answer any questions and encourage them to use the service.

3.2.3 Communications Project Management Support Provided

Aberdeen City Council were provided with the following communications project management support to deliver the pilot tenemental project:

- The development of the tenemental communications pilot project and the preparation of the ZWS funding application;
- Assistance in establishing a Working Group for the project;
- Attendance at Working Group meetings;
- Development of communication materials;
- Assistance in the delivery of the communication strategy; and
- 5 days support to engage households through door knocking.

3.2.4 Monitoring and Evaluation

A monitoring plan was produced for Aberdeen City Council's pilot project, outlining the process to assess the fill level and contamination present in the 1,280 litre on-street containers (Appendix 2). As households were provided with a communal recycling container, it was not possible to collect participation and set-out data. Independent monitoring and evaluation of the impact of the communication materials and methods on recycling performance was undertaken by Exodus Market Research[5].

3.2.5 Communication Strategy

The following internal and external communication strategies were developed for Aberdeen City Council. The timeline for delivery is provided in Figure 1.

Aberdeen City Council Internal Communications Strategy for Tenements

The Internal Communications Strategy was developed to ensure there was effective communication across all Council staff involved in the tenemental pilot project. It identifies the key elements, methods and activities to ensure that staff are fully informed and engaged to deliver any new recycling service, and states what was required to continue to communicate effectively as the implementation programme proceeds. This strategy includes:

☐ **Internal Working Group**
A Working Group was formed of representatives from across the Waste Team; Operational Managers, Collection Crew Supervisors, Waste Aware Officers, Contact Centre staff, Environmental Health Authorised Officers, City Wardens and Housing Officers. The Working Group met at key stages during the pilot scheme. These meetings allowed close co-operation between staff and teams, while providing opportunities to share information, give operational updates, discuss the successes and barriers, allocate workloads for upcoming activities and ensure clear, consistent communication from all members of the Working Group to the wider staff and public.

☐ **Collection Crew Briefings**
Crews were made aware of the reasons for trialling the pilot scheme and the important role that they would play in helping to deliver this service. Briefings included:

- The reason for the pilot;
- The collection service;
- Areas covered;
- Timetable for pilot;
- Copies of communication materials used.

☐ **Briefings for Contact Centre and Corporate Communications**
The Contact Centre and Corporate Communications were briefed prior to the implementation of the service to give them a full understanding of the pilot, its objectives, policies and the Council position on anticipated key questions.

Aberdeen City Council External Communication Strategy for Tenements

[5] The monitoring report can be obtained from ZWS but was unavailable at the time of writing.

16 Local Authority Tenemental Communications Support Final Report

The External Communications Strategy was developed to deliver an effective integrated communication campaign which targeted all households with access to the tenemental recycling pilot project and aimed to Engage, Enable and Encourage the public to participate.

- **Communication Materials**
  - **Recycling Leaflet**
    An 8pp A5 instructional leaflet was provided to the householder at the start of the pilot. This leaflet provided the public with the information and helped motivate them to participate in their recycling service. It gave clear and explicit instructions on how to use the new service, information on the benefits of recycling and information on the waste journey.
  - **Bin Decal**
    New decals were placed on the 1280 litre containers in the pilot area highlighting the materials which should and should not be placed inside.
  - **Posters**
    Posters were put up in blocks and local outlets to reiterate key messages such as the location of the recycling facilities and materials which can or cannot be recycled.

- **Engagement Methods**
  - **Community Councillors**
    Community Councillors were briefed prior to the pilot starting to ensure they were aware of the campaign.
  - **Collaboration with Other Council Departments**
    The Waste Team collaborated with the Contact Centre, Housing, Environmental Health and Street Cleaning and during the pilot project.
  - **Direct Waste Team Intervention**
    The Waste Aware Team undertook door knocking in the pilot area to engage with householders, explain the recycling service and answer any questions.

	Week Commencing											
Aberdeen City Council Strategy and Timeplan (Provisional)	**21st Jan**	**28th Jan**	**4th Feb**	**11th Feb**	**18th Feb**	**25th Feb**	**4th Mar**	**11th Mar**	**18th Mar**	**25th Mar**	**1st Apr**	**8th Apr**
Pre-Intervention												
Inception Meeting	25th											
1st Working Group Meeting		1st Feb 10:00-12:00, Kittybrewster Training Room 1										
Briefings for Working Group, Contact Centre and Crews												
1st Audit of 1280s and Area Tidy												
Contamination and Fill-Level Monitoring												
Development of Communication Materials												
Intervention Phase												
2nd Working Group Meeting							6th March	11:30 Kittybrewster Training Room 2				
Delivery of Communication Materials to Local Authority												
Introductory Letters Issued to Landlords, Factors, Houing Associations												
Leaflets Delivered to Householders												
Decals Applied to 1280s												
Posters Placed in Trial Area and Closes												
Door Knocking Community Engagement						27th, 28th	9th	14th				
Articles in Our Green Times												
Website Copy and Social Media Live												
Ongoing Direct Engagement with Residents												
Post-Intervention												
3rd Working Group Meeting											28th 11:30	Kittybrewster Training Room 1
Second Bin Audit												

Figure 1: Aberdeen City Council Tenemental Pilot Project Timeline

3.2.6 Communication Materials

3.2.6.1 8pp A5 Leaflet

3.2.6.2 A4 Posters

All other communication materials produced for the Aberdeen City Council tenemental pilot project are in Appendix 3.

3.3 Highland Council

3.3.1 Existing Tenemental Recycling Service

There are approximately 2,000 flatted properties in Inverness with a combination of two storey, four storey and 6-plex property types. The majority of the public living in these flats have access to a kerbside recycling services comprising of two standard 240 litre bins per property: one for residual waste (green) and one for multi-material dry recyclates (blue). These bins are serviced as an alternative weekly collection. The recycling containers all accept food and drinks cans, cardboard, paper and plastic bottles.

3.3.2 Pilot Project Scope

Tenemental households in the Ballifeary area of Inverness were encouraged to recycle using the existing two bin system. The pilot area consisted of 250 flatted households (six in a block) on a single collection route. This is a Council Housing Estate with many of the properties now owner occupied and some private lets. There are no caretakers. Some of the flats may be occupied for short tenancy periods and there may also be non-English speaking members of the Polish community living in the flats. Back of court space is variable between blocks, therefore bins are stored at the back and sides of properties or along the entryway to the property; a large number are left on-street.

Presentation was low, estimated by Council staff to be between 30 and 40%, and there was an on-going problem with contamination specifically identified as:

- Black bag waste;
- Polythene, polystyrene and other forms of packaging;
- Glass; and
- Nappies.

The pilot project aimed to engage households in the use of their individual 240 litre recycling and residual bins for multi-material dry recyclate using:

- 8pp A5 Recycling Leaflet outlining the service available, the containers used, acceptable materials and an explanation of the impact of contamination on the recycling process;
- Recycling bin decals reiterating the materials which could be placed in the paper and cardboard bins;
- Individual address decals to encourage ownership and responsibility amongst households;
- A4 posters placed in local shops, community centres, libraries etc and in tenement closes to remind households of the recycling service;
- Reminder postcard requesting that households remove their bins from the street to their normal storage place and reminding them of the materials which can be recycled;
- A community engagement discussion group to explore the attitudes of local households towards recycling and hear opinions on improvements that could be made to the recycling service;
- Door knocking by members of the Waste Team and NSA to discuss the recycling facilities with households, answer any questions and encourage them to use the service.

3.3.3 Communications Project Management Support Provided

Highland Council were provided with the following communications project management support to deliver the pilot tenemental project:

- The development of the tenemental communications pilot project and the preparation of the ZWS funding application;
- Assistance in establishing a Working Group for the project;
- Attendance at Working Group meetings;
- Development of communication materials;

- Assistance in the delivery of the communication strategy;
- Delivery of communication materials to households in the pilot area;
- Delivery of two community discussion groups to investigate current attitudes to recycling and the local environment, potential improvements to the current waste service and to assess the effectiveness of the pilot in engaging local residents;
- 1 day of support to engage households through door knocking.

3.3.4 Monitoring and Evaluation

A monitoring plan was produced for Highland Council outlining the methodology to undertake participation and set out, and contamination and fill level monitoring pre- and post-intervention to assess the impact of the pilot project acitivites on the performance of the service (see Appendix 4). Independent monitoring and evaluation of the impact of the communication materials and methods on recycling performance was undertaken by Exodus Market Research[6].

3.3.5 Communication Strategy

The following internal and external communication strategies were produced for Highland Council. The timeline for delivery is shown in Figure 2.

Highland Council Internal Communications Strategy for Tenements

The Internal Communications Strategy was developed to ensure there was effective communication across all Council staff involved in the tenemental pilot project. It identifies the key elements, methods and activities to ensure that staff are fully informed and engaged to deliver any new recycling service, and states what was required to continue to communicate effectively as the implementation programme proceeds. This strategy includes:

☐ **Internal Working Group**
A Working Group was formed of representatives from across the Waste Team, including the Waste Management Operational Officer, a Community Development Officer, Housing Participation Officer, a Community Warden, an Environmental health Officer and a Planning Officer. The Working Group met at key stages during the pilot scheme. These meetings allowed close co-operation between staff and teams, while providing opportunities to share information, give operational updates, discuss the successes and barriers, allocate workloads for upcoming activities and ensure clear, consistent communication from all members of the Working Group to the wider staff and public.

☐ **Collection Crew Briefings**
Crews were made aware of the reasons for trialling the pilot scheme and the important role that they would play in helping to deliver this service. Briefings included:

- The reason for the pilot;
- The collection service;
- Areas covered;
- Timetable for pilot;
- Copies of communication materials used.

Highland Council External Communication Strategy for Tenements

[6] Results can be obtained from ZWS but were unavailable at the time of writing.

The External Communications Strategy was developed to deliver an effective integrated communication campaign which targeted all households with access to the tenemental recycling pilot project and aimed to Engage, Enable and Encourage the public to participate.

- **Communication Materials**
  - **Recycling Leaflet**
    An 8pp A5 instructional leaflet was provided to the householder at the start of the pilot. This leaflet provided the public with the information and motivation to fully participate in their recycling service. It gave clear and explicit instructions on how to use the new service, information on the benefits and information on the waste journey.
  - **A5 Information Decal**
    An A5 bin decal was applied to the household bins to inform and motivate the public to correctly participate in the recycling service by reiterating materials which can be recycled.
  - **A5 Address Decal Stickers**
    A numbered sticker was applied to each bin to identify ownership to a particular household, encouraging people to take responsibility of their bins and participate correctly in the service.
  - **Posters**
    Posters were put up in blocks and local outlets to reiterate key messages such as the location of the recycling facilities and materials which can or cannot be recycled.
  - **External Communications**
    Highland Council issued a press release to coincide with the start of the pilot scheme and invited local press to a photo opportunity in the pilot area with the local Councillor and residents.

- **Engagement Methods**
  - **Community Councillors**
    Community Councillors were briefed prior to the pilot starting to ensure they were aware of the campaign. One local Councillor was invited to become a member of the Working Group and to attend community discussions held in the community centre, The Bught.
  - **Collaboration with Other Council Departments**
    The Waste Team collaborated with the Contact Centre, Housing, Environmental Health and the City Wardens during the pilot project.
  - **Direct Waste Team Intervention**
    The Waste Aware Team undertook door knocking in the pilot area to engage with householders, explain the recycling service and answer any questions.
  - **Community Outreach Programme**
    As part of the pilot project, two community discussions were arranged at the community centre, The Bught, to obtain feedback from local residents on the recycling service and the local environment. Participants were asked their views on the pilot scheme and were encouraged to make suggestions for improvements which could be made in the local area.

	Pre-Intervention				Intervention				Post-Intervention			
Strategy and Timeplan (Provisional)	**21st Jan**	**28th Jan**	**4th Feb**	**11th Feb**	**18th Feb**	**25th Feb**	**4th Mar**	**11th Mar**	**18th Mar**	**25th Mar**	**1st Apr**	**8th Apr**
Pre-Intervention												
1st Working Group Meeting			5th, 11am at The Bught Stop									
Working Group Briefing Session			5th, 11am at The Bught Stop									
Discussion Group with Local Community			6th, 11am at The Bught Stop									
Community Councillor Briefing			5th, 11am at The Bught Stop									
Participation and Set Out Monitoring				15th		1st		15th		29th		
Contamination and Fill-Level Monitoring				15th		1st		15th		29th		
Bin Audit and Refresh, and Bin Area Tidy				12th								
Development of Communication Materials												
Intervention												
2nd Working Group Meeting							5th 11am at The Bught					
Press Release and Photo Opportunity												
Delivery of Materials to Households												
Personalised Bin Stickers												
Bin Decals Applied												
Leaflets Delivered												
Posters for Local Display												
Door Knocking / Engagement Exercise												
Post-Intervention												
Discussion Group with Local Community									19th, 18:00-19:30			
3rd Working Group Meeting										26th, 11am at The Bught		
Post-Trial Meeting with Councillor										26th, 11am at The Bught		
2nd Participation and Set Out Monitoring												
2nd Contamination and Fill-Level Monitoring												

Figure 2: Highland Council Tenemental Pilot Project Timeline

3.3.6 Communication Materials

3.3.6.1 8pp A5 Leaflet

3.3.6.2 Recycling Bin Decals

All other communication materials produced for the Highland Council tenemental pilot project are in Appendix 5.

3.4 Inverclyde Council

3.4.1 Existing Tenemental Recycling Service

There are 20,265 flatted properties in Inverclyde comprising of 1,249 high rise properties, 4,770 flats and 14,246 tenements. Best practice for tenemental properties, where possible, comprises of an individual 240 litre grey bin for residual waste and a 240 litre blue bin for multi-material dry recyclates either for individual properties or shared, provided a resident is nominated as having responsibility for the bin. Where storage space for bins is limited or unavailable, residents are issued with a 55 litre blue recycling sack. Bins and sacks are collected fortnightly and must be presented at kerbside. Approximately 7,000 tenemental properties have recycling facilities at present.

The recycling containers accept food tins and drinks cans, cardboard, paper, plastic bottles and containers, cardboard food and drinks cartons and textiles.

3.4.2 Pilot Project Scope

Tenemental households across the whole Inverclyde area were encouraged to recycle using their existing recycling service. The pilot area consisted of approximately 7,000 households on five collection routes. Inverclyde Council does not operate separate tenement collection routes, as such the tenemental properties included in the service are incorporated into existing routes. Approximately 3,000 properties receiving a separate high-rise and tenemental collection service operated by a third party (Greenlight Environmental) were excluded from this pilot. Current recycling participation is estimated by Council staff at 90% for tenemental blocks, but 50% for individual households within tenements. It was identified that there are opportunities to improve recycling capture and contamination of recyclable materials from tenements with non-recyclables.

The pilot project aimed to engage households in the use of their individual 240 litre recycling and residual bins for multi-material dry recyclate using:

- 8pp A5 Recycling Leaflet outlining the service available, the containers used, acceptable materials and an explanation of the impact of contamination on the recycling process;
- A4 posters placed in Council offices to remind households of the recycling service;
- Pull-up banners placed in Housing Association offices to advertise the service available to tenemental households.

3.4.3 Communications Project Management Support

Inverclyde Council were provided with the following communications project management support to deliver the pilot tenemental project:

- The development of the tenemental communications pilot project and preparation of ZWS funding application;
- Assistance in establishing a Working Group for the project;
- Attendance at Working Group meetings;
- Development of communication materials;
- Assistance in the delivery of the communication strategy;
- Liaison with Housing Associations to distribute posters and position pull-up banners;
- Contact Centre briefing sessions;

- Placement of posters in public areas and tenement closes.

3.4.4 Monitoring and Evaluation

No monitoring data was collected as part of the agreed tenemental pilot project due to staff resourcing and commitments in the Waste Team for the duration of the trial period. Therefore, no comment can be made on the performance of the pilot project or the effectiveness of the communication strategy or materials in increasing the quality or quantity of materials recycled[7]. However, Inverclyde Council were provided with a monitoring plan for future use if required (Appendix 6). Independent monitoring and evaluation of the impact of the communication materials and methods on recycling performance was undertaken by Exodus Market Research[8].

3.4.5 Communication Strategy

The following internal and external communication strategies were developed for Inverclyde Council. The timeline for delivery is shown in Figure 3.

Inverclyde Council Internal Communications Strategy for Tenements

The Internal Communications Strategy was developed to ensure there was effective communication across all Council staff involved in the tenemental pilot project. It identifies the key elements, methods and activities to ensure that staff are fully informed and engaged to deliver any new recycling service, and states what was required to continue to communicate effectively as the implementation programme proceeds. This strategy includes:

☐ **Internal Working Group**
A Working Group was formed of representatives from across the Waste Management Operational Officer, a Community Development Officer, Housing Participation Officer, a Community Warden, an Environmental Health Officer and a Planning Officer. The Working Group met at key stages during the pilot scheme. These meetings allowed close co-operation between staff and teams, while providing opportunities to share information, give operational updates, discuss the successes and barriers, allocate workloads for upcoming activities and ensure clear, consistent communication from all members of the Working Group to the wider staff and public.

☐ **Collection Crew Briefings**
Crews were made aware of the reasons for trialling the pilot scheme and the important role that they would play in helping to deliver this service. Briefings included:

- The reason for the pilot;
- The collection service;
- Areas covered;
- Timetable for pilot;
- Copies of communication materials used.

☐ **Briefings for Contact Centre and Support Staff**
The Contact Centre were briefed prior to the implementation of the service to give them a full understanding of the service, its objectives, policies and the Council's position on anticipated key questions. The briefing included:

- Discussion of anticipated questions from members of the public;
- The reason for the pilot;
- The collection service;
- Areas covered;
- Timetable for pilot;

[7] Pre- and post-trial monitoring and evaluation data was collected by a third party sub-contractor and is available from ZWS.
[8] Results can be obtained from ZWS but were unavailable at the time of writing.

- Copies of communication materials used.

Inverclyde Council External Communications Strategy for Tenements

The External Communications Strategy was developed to deliver an effective integrated communication campaign which targeted all households with access to the tenemental recycling pilot project and aimed to Engage, Enable and Encourage the public to participate.

☐ **Communication Materials**

- ☐ **Recycling Leaflet**
  An 8pp A5 instructional leaflet was provided to the householder at the start of the pilot. This leaflet provided the public with the information and motivation to fully participate in their recycling service. It gave clear and explicit instructions on how to use the new service, information on the benefits and information on the waste journey.
- ☐ **Posters**
  Posters were put up in blocks and local outlets to reiterate key messages such as the location of the recycling facilities and materials which can or cannot be recycled.
- ☐ **External Communications**
  Highland Council issued a press release to coincide with the start of the pilot scheme and invited local press to a photo opportunity in the pilot area with the local Councillor and residents.
- ☐ **Pull-Up Banners**
  Pull-up banners will be used to support each phase of the campaign. These were placed in the Council and Housing Association offices to advertise the materials which can be recycled as part of the recycling service and were rotated between premises during the project.

☐ **Engagement Methods**

- ☐ **Community Councillors**
  Community Councillors were briefed prior to the pilot starting to ensure they were aware of the campaign.
- ☐ **Collaboration with Other Council Departments**
  The Waste Team collaborated with the Contact Centre and Housing during the pilot project.
- ☐ **Housing Associations**
  Effective relationships with local Housing Associations were utilised to place pull-up banners in local offices to advertise the recycling service to local households.

	Pre-Intervention				Intervention Phase 1				Intervention Phase 2				Post-Intervention	
Inverclyde Tenemental Pilot Strategy and Timeplan	**21st Jan**	**28th Jan**	**4th Feb**	**11th Feb**	**18th Feb**	**25th Feb**	**4th Mar**	**11th Mar**	**18th Mar**	**25th Mar**	**1st Apr**	**8th Apr**	**15th Apr**	**22nd April**
Pre-Intervention														
1st Working Group		31st - Pottery Street Recycling Centre; 14:00-15:30												
Briefing Sessions			8th - Contact Centre											
Contact with Housing Associations, Landlords and Factors														
Focus Group Testing		31st - Tontine Hotel, Greenock, 18:30-20:30												
Development and Production of Communication Materials														
Intervention														
2nd Working Group Meeting									18th - Pottery Street Recycling Centre 14:30-16:00					
Delivery of Communication Materials to Council					19th									
Delivery of Leaflets to Households								11th						
Posters Distributed														
Pull-up Banners Positioned														
Post-Intervention														
3rd Working Group meeting													18th - Pottery Street Recycling Centre; 14:	

Figure 3: Inverclyde Council Tenemental Pilot Project Timeline

3.4.6 Communication Materials

3.4.6.1 8pp A5 Leaflet

3.4.6.2 Pull-Up Banners

All other communication materials produced for the Inverclyde Council tenemental pilot project are in Appendix 7.

3.5 Renfrewshire Council

3.5.1 Existing Tenemental Recycling Service

There are 17,632 flatted properties in Renfrewshire comprising of 1,000 high rise properties and 16,632 tenements and flats. The majority of tenemental properties across Renfrewshire are provided with individual 240 litre blue recycling bins and 240 litre grey residual bins. These are situated at the back of properties and must be presented kerbside on alternate weeks. The recycling service accepts food tins and drinks cans, cardboard, paper, glass and mixed plastics.

3.5.2 Pilot Project Scope

Tenemental households in the Johnstone Castle area of Paisley were encouraged to recycle using their existing blue bin recycling service. The pilot area consisted of approximately 41 closes of modern style tenements, comprising of 247 individual flats, on one collection route in an area of medium recycling performance. The area has a mix of private and Council-owned property with a strong community focus. The primary issue with recycling performance in this area was identified by Council staff as contamination of blue bins with black bag waste, plastic bags, nappies and food waste.

The pilot project aimed to engage households in the use of their individual 240 litre recycling and residual bins for multi-material dry recyclate using:

- 8pp A5 Recycling Leaflet outlining the service available, the containers used, acceptable materials and an explanation of the impact of contamination on the recycling process;
- Recycling bin decals reiterating the materials which could be placed in the paper and cardboard bins;
- Address decals to encourage ownership and responsibility amongst households;
- A4 posters placed in local shops, community centres, libraries etc and in tenement closes to remind households of the recycling service; and
- Contamination decal reminding households of the correct materials to place in the bins.

3.5.3 Project Management Support Provided

Renfrewshire Council were provided with the following communications project management support to deliver the pilot tenemental project:

- The development of the tenemental communications pilot project and preparation of the ZWS funding application;
- Assistance in establishing a Working Group for the project;
- Attendance at Working Group meetings;
- Development of communication materials;
- Assistance in the delivery of the communication strategy;
- Delivery of communication materials to households in the pilot area;
- Delivery of a community discussion group to investigate current attitudes to recycling and the local environment and suggested improvements to the current waste service;
- Delivery of briefing sessions for the Collection Crew and Contact Centre;
- Preparation of a briefing note and presentation for the Council Committee; and

- Delivery of a monitoring and evaluation training session for Waste Advisors.

3.5.4 Monitoring and Evaluation

A monitoring plan was produced for renfrewshire Council outlining the methodology to undertake participation and set out, and contamination and fill level monitoring pre- and post-intervention to assess the impact of the pilot project acitivites on the performance of the service (see Appendix 8). Independent monitoring and evaluation of the impact of the communication materials and methods on recycling performance was undertaken by Exodus Market Research[9].

3.5.5 Communication Strategy

The following internal and external strategies were produced for Renfrewshire Council. The timeline for delivery is shown in Figure 4.

Renfrewshire Council Internal Communications Strategy for Tenements

The Internal Communications Strategy was developed to ensure there was effective communication across all Council staff involved in the tenemental pilot project. It identifies the key elements, methods and activities to ensure that staff are fully informed and engaged to deliver any new recycling service, and states what was required to continue to communicate effectively as the implementation programme proceeds. This strategy includes:

☐ **Internal Working Group**
A Working Group was formed of representatives from across the Waste Team, Housing Officers, Environmental Health and the Contact Centre. The Working Group met at key stages during the pilot scheme. These meetings allowed close co-operation between staff and teams, while providing opportunities to share information, give operational updates, discuss the successes and barriers, allocate workloads for upcoming activities and ensure clear, consistent communication from all members of the Working Group to the wider staff and public.

☐ **Collection Crew Briefings**
Crews were made aware of the reasons for trialling the pilot scheme and the important role that they would play in helping to deliver this service. Briefings included:

- The reason for the pilot;
- The collection service;
- Areas covered;
- Timetable for pilot;
- Copies of communication materials used.

☐ **Briefings for Contact Centre, Support Staff and Corporate Communications**
The Contact Centre were briefed prior to the implementation of the service to give them a full understanding of the pilot, its objectives, policies and the Council position on anticipated key questions. The briefing included:

- A discussion of anticipated questions from the public;
- Pilot schedule;
- The collection service;
- Areas covered;
- Copies of all communication materials.

Renfrewshire Council External Communication Strategy for Tenements

[9] Results can be obtained from ZWS but were unavailable at the time of writing.

The External Communications Strategy was developed to deliver an effective integrated communication campaign which targeted all households with access to the tenemental recycling pilot project and aimed to Engage, Enable and Encourage the public to participate.

- **Communication Materials**
  - **Recycling Leaflet**
    An 8pp A5 instructional leaflet was provided to the householder at the start of the pilot. This leaflet provided the public with the information and motivation to fully participate in their recycling service. It gave clear and explicit instructions on how to use the new service, information on the benefits and information on the waste journey.
  - **A5 Information Decal**
    An A5 bin decal was applied to the household bins to inform and motivate the public to correctly participate in the recycling service by reiterating materials which can be recycled.
  - **A5 Address Decal Stickers**
    A numbered sticker was applied to each bin to identify ownership to a particular household, encouraging people to take responsibility of their bins and participate correctly in the service.
  - **Posters**
    Posters were put up in blocks and local outlets to reiterate key messages such as the location of the recycling facilities and materials which can or cannot be recycled.
  - **External Communications**
    Highland Council issued a press release to coincide with the start of the pilot scheme and invited local press to a photo opportunity in the pilot area with the local Councillor and residents.

- **Engagement Methods**
  - **Community Councillors**
    Community Councillors were briefed prior to the pilot starting to ensure they were aware of the campaign.
  - **Collaboration with Other Council Departments**
    The Waste Team collaborated with the Contact Centre, Housing and Environmental Health during the pilot project.

	Pre-Intervention									Intervention				Post-Intervention	
Strategy and Timeplan	**21st Jan**	**28th Jan**	**4th Feb**	**11th Feb**	**18th Feb**	**25th Feb**	**4th Mar**	**11th Mar**	**18th Mar**	**25th Mar**	**1st Apr**	**8th Apr**	**15th Apr**	**22nd Apr**	**29th Apr**
Recycling Collection Dates		**3rd**		**17th**		**3rd**		**17th**		**31st**		**7th**		**28th**	
Pre-Intervention															
1st Working Group meeting	24th														
Staff Briefing Sessions															
Bin Audit, Refresh and Area Tidy	Audit								Refresh / Tidy						
Training Session for M&E		31st													
Contamination and Fill Level Monitoring										NSA					
Participation and Set Out										NSA					
Briefing Note for Councillors															
Development of Communication Materials															
Community Discussion Group			6th - Johnstone Castle Community Centre 6-8pm												
Intervention															
2nd Working Group Meeting										27th 13:00 Underwood Road					
Delivery of Communication Materials										25th					
Personalised Bin Decals Applied										during bin replacement					
Information Bin Decals Applied										during bin replacement					
Leaflets to every household										25th					
Posters Placed										25th					
Contamination Stickers Available															
Post-Intervention															
3rd Working Group Meeting														22nd 10:00 Underwood Road	

Figure 4: Renfrewshire Council Tenemental Pilot Project Timeline

3.5.6 Communication Materials

3.5.6.1 8pp A5 Leaflet

3.5.6.2 Recycling Bin Decals

The additional communication materials are presented in Appendix 9.

3.6 Pilot Project Performance

The recycling performance data provided by each Local Authority for the pilot areas was limited due to constraints on Council staff capacity and the given timescales to design, develop and deliver the pilot projects (Table 3). The Monitoring Plans produced for each pilot project (Appendices 3, 5, 7 and 9) recommend that the pre-trial monitoring is complete before any intervention begins and that the post-trial monitoring takes place at least one month after the intervention has been completed. Due to the restricted timescales for delivery, it was not possible to achieve this.

Table 3: Comparison of Monitoring and Evaluation Performance for Tenemental Pilot Projects

	Aberdeen City Council		Highland Council		Renfrewshire Council	
	Pre-Pilot	Post-Pilot	Pre-Pilot	Post-Pilot	Pre-Pilot	Post-Pilot
Participation Rate (%)	N/A	N/A		84%		58%
Set-Out Rate (%)	N/A	N/A	58%	66%	32%	43%
Contamination (% of bins)	33%	18%	0.75%	0.96%	Unavailable	Unavailable

3.6.1 Aberdeen City Council

As the recycling containers were on-street, it was not possible to ascertain the participation rate for the Aberdeen City Council pilot. However the data collected suggests that the communication strategy was effective in reducing the contamination found in each paper and cardboard bin reducing from 33% of bins showing contamination in a given week to 18% over the trial period. Weight data collected by the Council indicate an increase of 15kg of paper and cardboard per week over the course of the pilot.

3.6.2 Highland Council

It was not possible to establish a pre-trial participation rate in the Highland Council pilot as the bins had not been marked with individual addresses. The post-trial evaluation indicates a participation rate of 84%. An 8% increase in the set-out rate was observed between the pre- and post-trial surveys. Monitoring and evaluation activities were undertaken by Exodus Market Research and results are available from ZWS.

3.6.3 Inverclyde Council

No monitoring activities were undertaken as part of this project due to staff capacity issues within the Council. A third party contractor, Exodus Market Research, conducted monitoring and evaluation on behalf of ZWS. These results are available separately from ZWS.

3.6.4 Renfrewshire Council

It was not possible to establish a pre-trial participation rate in the Renfrewshire Council pilot as the bins had not been marked with individual addresses. The post-trial participation rate was observed to be 58%, considerably lower than the rate observed for the Highland Council pilot though the relative changes in rate are unknown. The set out rate increased by 11% during the trial period, but the methodology used for the fill level and contamination monitoring differed from pre- to post-trial surveys and were therefore not comparable. Monitoring and evaluation activities were undertaken by Exodus Market Research and results are available from ZWS.

3.7 Follow-Up Activities

Following the sucessful completion of the tenemental communications pilot projects, all Councils have stated their intention to continue using the communication materials produced when engaging tenemental households. All have been provided with the artwork files for ongoing print and distribution as required. In addition:

- The Tenemental Working Group for Renfrewshire Council have begun planning future initiatives and gaining support from associated departments, such as Housing, to ensure the residents in the pilot area continue to receive information on the recycling service and are encouraged to make best use of the service;

- Highland Council have installed a recycling node in the pilot area as a result of feedback obtained at a community discussion event. Residents reported greater satisfaction with the recycling service but requested that recycling nodes were also provided for materials which could not be collected as part of the kersbide service, primarily glass.

4 Conclusions and Recommendations

The data gathered during the four pilots provides an initial overview of the impact of the communication methods and materials used to encourage tenemental households to make better use of their recycling facilities. In order to more fully understand the impact of these tyes of intervention, a more robust monitoring and evaluation methodology would have to be incorporated into trials including waste compositional analysis, and participation, set out, contamination and fill level monitoring pre- and post-intervention and a longer trial period for the pre-, intervention, and post-phases.

Based on the data available and the anecdotal evidence from the Working Group members within each Local Authority, the following conclusions have been drawn from the pilot projects:

- Early engagement of the community in the area, at local community centres or via existing organisations, can ensure buy-in before communication materials or activities begin. This can also inform the strategy used, ensuring it addresses the issues and needs, of the local population.

- A cross-section of staff from different departments should be involved in the project Working Group, including representatives of Housing Associations and Tenancy Groups to facilitate internal communication.

- Regular Working Group meetings are essential to ensure momentum is maintained, members are kept informed of developments and that the strategy remains focussed to achieve the aims and objectives of the individual project.

- Councils providing an 'amnesty' to removing heavily contaminated bins and clearing flytipping and excess waste in backcourt areas can increase confidence amongst the local community and encourage buy-in to a new initiative as it provides a visible improvement to the local environment.

- Individualising the recycling and residual bins, where possible, encourages ownership and responsibility for the bin and its contents resulting in increased participation and set out.

- Local Councillors can help promote the service and increase confidence amongst local residents that their views about the recycling service will be taken seriously and that action will be taken.

- Door knocking is an effective mechanism of direct engagement which provides an opportunity to reiterate key messages from the communication campaign and to discuss use of the services.

- Communication materials alone are unlikely to result in signficant increases in the quality or quantity of the recycling service, and should be accompanied by community engagement activities for local areas.

4.1 Further Work

If further pilot projects were to be undertaken, we would recommend that a project is considered to specifically assess the impact that could be made on recycling performance through direct, focussed

engagement with Housing Associations, private landlords and tenancy groups. Effective working relationships were already in place in several of the pilot areas which could be further developed to assess this intervention method for tenemental properties.

Monitoring and evaluation methodologies currently favour low and medum density housing with individual bins. High density monitoring and evaluation is frequently limited to contamination and fill level monitoring and we would therefore also suggest there is a need for greater understanding of how tenemental households interact with their recycling service, particularly those who are provided with communal bins at back of court or on-street. This initially could take the form of observational analysis to understand:

- The frequency of use of the recycling service;
- The methods used to transport materials to bins;
- The different methods available to householders to transport materials to bins; and
- Household behaviour in relation to flat position within a block.

The following Intervention Strategy, outlined in Figure 5, is recommended for Local Authorities aiming to increase the quality and quantity of recyclate collected from tenemental properties.

Pre-Intervention

- Produce an internal and external communication strategy and monitoring plan;
- Establish a Working Group which includes members of the Waste Team, Collection Crews, Contact Centre, Housing Department, Community Wardens / Neighbourhood Services, Housing Associations andTenancy Groups;
- Review the existing local environmental quality for potential minor improvements;
- Arrange a community engagement workshop in a local venue to gather opinions on the current recycling service;
- Repair or replace all damaged bins and clear the loca area (flytipping, backcourts etc);
- Conduct pre-intervention monitoring and evaluation (observational analysis, waste composition analysis, set out, participation, fill level, contamination) over three consecutive collection cycles;
- Issue an introductory letter to residents explaining the upcoming initiative and what they can expect;
- Set community engagement meeting to discuss local improvements which could be made.

Intervention

- Working Group meeting;
- Where individual bins are provided as part of the recycling service, individualise bins using address labels;
- Sticker bins and containers with information decals highlighting the materials which can be accepted;
- Deliver an information leaflet to every household outlining the service, the materials which can be collected and the collection frequency of the containers;
- Place posters in local outlets (shops, community centres, libraries) and in building closes or on noticeboards;
- Issue press articles which include quotes from active Community Councillors for the area and images with local residents;
- Door knock every household in the area (expected return of 30-40% based on the WRAP guidance of 140 households per surveyor per day) to engage the householder and discuss the service;
- Conduct monitoring and evaluation over two consecutive cycles;
- Schedule a Working Group meeting to discuss the project to date and further actions required.

Post-Intervention

- Working Group meetting to review the success of the project;
- Arrange a community engagement workshop in a local venue to gather opinions on the current recycling service;
- Issue a Thank You letter to thank householders for their participation, inform them of the changes made, and describe the next steps;
- Conduct post-intervention monitoring and evaluation (observational analysis, waste composition analysis, set out, participation, fill level, contamination) over three consecutive collection cycles.

Figure 5: Recommended Intervention Strategy for Future Tenemental Communications Projects

4.2 Local Authority Feedback

Aberdeen City Council

"The communications project management support provided by ZWS has brought about a greater understanding of the methods and materials Aberdeen City Council could adopt in the future to engage with people living in tenements. The project will influence the way we continue to communicate with these residents about their recycling services. We will also be using the materials produced to run a similar project in another area of the city later in the year."

Highland Council

"The communications project management support provided by ZWS has brought about a greater understanding of the methods and materials Highland Council could adopt in the future to engage with tenemental households. The project has influenced the way we communicate with these properties and we hope to replicate the project when resources and time allow. Following up on comments made by the residents requesting glass recycling facilities in the area, The Council has now installed a new recycling node. "

Inverclyde Council

"Inverclyde Council recognise tenements are an area where improvements could be made to increase participation in recycling. We were happy to be part of the communications project management support provided by ZWS and look forward to reviewing the results of the recent project with the potential to implement recommendations into our ongoing work."

Renfrewshire Council

"The project will influence the way in which we communicate with householders in these properties by ensuring that we engage with a wider range of stakeholders from the local area. In particular the visual illustrations within the literature combined with the clear marking of bins had an immediate and positive impact encouraging greater participation within the selected area. This more targeted approach provided a model which could be replicated in other areas of Renfrewshire in future."

5 Appendices

5.1 Appendix 1 - Recommended Tenemental Communications Strategy

Internal Communications Strategy Guidance for Tenements

The Internal Communications Strategy should be developed to ensure there is effective communication across all Council staff involved in the service implementation. It should identify the key elements, methods and activities to ensure that staff are fully informed and engaged to deliver the recycling service, and state what is required to continue to communicate effectively as the implementation programme proceeds. It should include a detailed time-plan for implementation and clarify the roles and responsibilities for key staff. This strategy could include:

- ☐ **Internal Working Group**
  A Working Group should be formed of representatives from across the Waste Team; Operational Managers, Collection Crew Supervisors, Waste Officers and Contact Centre staff. It is also recommended that a Working Group addressing tenemental recycling communications should include representatives from other departments who may have knowledge of tenemental properties and experience with tenemental households, such as Housing Officers, Community Wardens, Neighbourhood Wardens and Environmental Health. The Working Group should meet frequently during the Pre-Implementation and Implementation phases of the recycling service and quarterly thereafter. Regular meetings will allow close co-operation between staff and teams, while providing opportunities to share information, give operational updates, discuss the effectiveness of previous activities, allocate workloads for upcoming activities and ensure clear, consistent communication from all members of the Working Group to the wider staff and public.

  The Working Group could also ensure wider staff within the Council have an overview of the operational changes and the communication campaign that will be undertaken to roll out the recycling service. The group should also explore any opportunities for enhanced communication, awareness and partnership working Tenancy Groups, Landlords Associations and Housing Associations as appropriate for the intervention area. It is important that the Working Group understand the roles and responsibilities of each team member involved in the service rollout.

- ☐ **Review of Implementation Plan**
  The Implementation Plan should be reviewed at each Working Group meeting to ensure that the internal and external communication strategies continue to complement any operational changes. It is recommended that you link the Communication Strategy with your live Operational Implementation Plan.

- ☐ **Regular Meetings and Updates for Wider Staff**
  Short, regular meetings and updates provide opportunities to inform staff of the latest activities and initiatives taking place as part of the service roll out and to reinforce key communication messages. This may be particularly important for staff in departments such as Housing, Neighbourhood Services and Community Wardens who may be in contact with tenemental properties regularly to ensure they are informed about the service available. Updates could be provided on participation rates, tonnages collected, new FAQs, feedback on contamination levels or operational issues resolved, which could be fed back through team or departmental meetings and briefing sessions already taking place.

- ☐ **Staff Training**
  Prior to the start of the implementation of any recycling service or communication campaign, a staff training programme should be delivered to all staff in the Waste Team, Waste Supervisors, Collection Crews, Contact Centre and staff from identified departments who will promote the

service such as Housing Officers, Community Wardens, Environmental Health Technicians etc. The aim of this training is to ensure the service is effectively implemented and all staff are fully appraised and are given the opportunity to ask questions relevant to their role in the rollout. Training would aim to provide staff with:

- A basic knowledge of the relevant legislation and policies relating to the new recycling service and why this is important for the Council;
- An overview of the operational changes which will be implemented as part of the service;
- Explanation and demonstration of the communication campaign to be carried out as part of the Council's recycling service;
- The timetable for each element of the service to be implemented;
- The Council position on anticipated issues; and
- Time for discussion of likely questions from members of the public.

For training available to Local Authority staff see http://www.wrap.org.uk/events?sector=264 or email mailto:training@wrap.org.uk.

☐ **Collection Crew Briefings**

It is important that operational and communication issues which directly impact on the Collection Crews are made clear, as soon as possible, to ensure buy-in from staff which will lead to an efficient rollout and effective collection service. It is recommended to consult with Collection Crew members prior to the implementation of a new tenemental recycling service to gauge potential operational issues and understand the key barriers they perceive to participation.

Crews should be aware of the reasons for implementing a new service, its strategic importance to the Council, and the important role that they play in the delivery. They should also be briefed on how to answer queries from the public, be asked for feedback and encouraged to ask questions. Briefings could take the form of short (maximum 30 minutes) Toolbox Talks at a time convenient for the crews. It is recommended these are delivered by Crew Supervisors or members of the Implementation Team. Feedback sessions should be incorporated into the schedule to allow the Crew to make suggestions as the rollout progresses and to provide positive reinforcement of their roles and responsibilities. Feedback from crews should be communicated to the Working Group representative and the crew informed of any actions taken as a result.

In addition to the topics outlined for 'Staff Training' briefing sessions for the Collection Crew could include information on:

- Service schedule;
- Health & Safety procedures;
- Contamination issues;
- Operational policy changes;
- Relevant legislation.

☐ **Briefings for Contact Centre, Support Staff and Corporate Communications**

The Contact Centre, Support Staff and Corporate Communications (if not leading) should be briefed and consulted prior to the Implementation of the collection service to give them a full understanding of the service, its objectives, policies and the Council position on anticipated key questions. They should also be consulted on the key questions and call types received from tenemental households, to effectively inform the communication strategy and the communication materials produced. The Contact Centre staff should receive the same information as the Collection Crews, in addition to the topics outlined in 'Staff Training' and materials should be provided for reference. These might include:

- Contact Centre-specific briefing notes or sessions;
- Frequently Asked Questions;
- Rollout schedule;
- Copies of all communication materials;
- Briefing on opt-in procedure and eligibility criteria (if applicable).

☐ **Staff Handbooks**

Laminated Staff Handbooks could be produced for members of the service delivery team, and other staff where appropriate, to provide consistent guidance for public enquiries and to act as a reference for the service offered to tenemental properties. These could be produced to coincide with the delivery of Staff Training and would provide staff with detailed information on:

- Why the Council is recycling;
- Relevant Occupational Health considerations;
- Relevant Health and Safety information;
- The collection service and reprocessing information;
- The long term financial benefits of recycling and how this fits with the Council's long term strategy;
- Copies of communication materials used.

In addition to the generic information, the Staff Handbook could also contain specific information that is relevant to each of the Council Teams involved in the service implementation, such as:

- Waste Services Team;
- Collection Supervisors and Crews;
- Contact Centre Staff;
- Corporate Communications Team;
- Housing Department;
- Environmental Health;
- Community Wardens.

☐ **Implementation Progress Reports**

These could be produced quarterly or at the end of each phase in the service rollout or communication campaign to summarise the communications and operation activities undertaken to date, and highlight any issues or recommendations to maintain a progressive and effective Implementation Programme. These reports should be reviewed and approved by the Working Group prior to dissemination across the wider Council teams involved.

☐ **Dissemination**

In addition to the identified internal communication channels, consideration could also be given to providing brief service updates to staff using the following methods:

- Use of electronic monitors in the Council buildings;
- Bulletin Board Updates;
- Staff e-mail updates;
- Intranet;
- Face to face with key personnel or at scheduled team meetings.

☐ **Establishing the Relationships with Reprocessors**

Establishing a good working relationship with your contracted reprocessor will ensure a clear understanding of their requirements and potential contamination issues as well as providing key service considerations to ensure maximum return on collected materials. In addition, information can be provided by the reprocessor for use in any communication materials which focus on the recycling process. This will ensure that the information provided to both internal staff and the public is accurate and current. Regular two-way update reports could be established between the Council Waste Services Team and the reprocessor.

External Communication Strategy Guidance for Tenements

The External Communications Strategy should be developed to deliver an effective integrated communication campaign which targets all households with access to the tenemental recycling service and aims to Engage, Enable and Encourage the public to participate.

☐ **Phases of the Campaign**

The three phases of the External Communications Strategy have been colour coded for ease of identification as:

Engage

The Engage phase is used to inform the tenemental households of the collection service by providing a summary of the service, start dates and what the public are expected to do, thereby motivating participation in the service. Communication materials, complemented by engagement methods such as door knocking, attendance at events, presentation opportunities, work with Community Councillors, vehicle livery and other outdoor advertising opportunities (budget permitting) can be used to deliver this phase and should last 4-6 weeks for each rollout area.

Enable

The Enable phase is aimed at providing the public with information which allows them to fully understand how to use the recycling service and optimise their participation. Information should be provided at the same time as the delivery of any new containers. An A5 leaflet, bin decals and collection calendars, complemented by engagement methods such as door knocking, attendance at events, presentation opportunities, work with Community Councillors, vehicle livery and other outdoor advertising opportunities (budget permitting) can be used to deliver this phase which should last 8-12 weeks for each area.

Encourage

The Encourage phase is aimed at facilitating continued public participation in the recycling service and to ensure optimum collection of recyclates. This phase is likely to take in excess of 12 weeks and could be achieved using:

- Ongoing information provision;
- Ongoing intervention activities;
- Monitoring and evaluation;
- Public feedback.

☐ **Communication Materials**

☐ **Introductory Letter**

An adaptable introductory letter from the Council can be used to announce the service or communication campaign, provide area-specific information such as start dates, and motivate the public to participate. This should state the location of communal bins, where appropriate, and remind the public of the materials which can be recycled.

☐ **Teaser Leaflet**

A 4pp A5 leaflet could be sent to all households highlighting the tenemental recycling service and the benefits it provides. The teaser leaflet should aim to engage the householder in the new recycling service that will be offered by broadly stating the aims, objectives and next steps.

☐ **Recycling Leaflet**

An A5 instructional leaflet should be provided to the householder with the collection containers at the start of the Enable phase. This leaflet should provide the public with the information and motivation to fully participate in the service by showing the collection containers to allow easy recognition by the public, the location of the recycling facilities, clear and explicit instructions on how to use the service, information on the benefits, collection dates or calendars (where individual bins are provided) and information on the waste journey.

☐ **A5 Information Bin Decal**

An A5 bin decal can be applied to all container types used in tenemental services which provide individual, communal and on-street bins to inform and motivate the public to

correctly participate in the recycling service by reiterating materials which can be recycled. Where households are provided with individual bins, these should be applied prior to delivery by Council staff.

- ☐ **A5 Address Bin Decal**
  For use where households are provided with individual recycling and residual waste bins. An A5 bin decal identifying the address of the household can be applied to the recycling and residual bins. This promotes ownership of the bins by households, potentially reducing contamination, encourages correct use of the recycling service and allows the Waste Team to target interventions to specific households rather than an entire block. These should be applied prior to delivery by Council staff.
- ☐ **Hot Foil Stamping on the Collection Containers**
  Permanent signage on the container enables and motivates the public to use the service correctly by reiterating key messages, such as stating the materials which can be recycled, contact information for the Council etc.
- ☐ **Collection Calendar**
  Where households are required to present individual bins at kerbside, the collection calendar enables the public to participate by reminding them of key collection dates. The collection schedule could feature in the A5 Recycling leaflet, be provided as a standalone material or be incorporated into a bin decal. Collection calendars may need to be replaced annually. It is recommended that collection calendars are made of robust, durable materials.
- ☐ **Contamination Tags and Stickers**
  Highlighting contamination issues, for example packaging, can be used to encourage households to use the recycling service correctly and effectively, and can also be used to emphasise which materials are accepted. Contamination messages can also be incorporated into the introductory letter, teaser leaflet and recycling leaflet with an explanation contamination has on the recycling process.
- ☐ **Posters and Signage**
  Posters and signage within blocks can be used to reiterate key messages such as the location of the recycling facilities, materials which can or cannot be recycled and collection days. These should be displayed in common areas, noticeboards or on doors with the consent and support of the Caretaker, factor or tenants association. The placement of posters should adhere to relevant fire safety regulations.
- ☐ **Council Publications**
  Publications and magazines which are already in use and circulated to all households or particular demographics, such as Council house tenants, can raise awareness of the recycling service and give key messages to the public at all phases of the service rollout.
- ☐ **Website Copy**
  Specific service information for tenemental or flatted properties should be provided on the website ensuring that households can access clear information on how to recycle in their area, the collection service offered, what can be recycled and why it is important to recycle. This could be accompanied by a list of frequently asked questions to reduce uncertainty and calls to the Contact Centre.
- ☐ **Vehicle Signage**
  Vehicle graphics provide a highly visible method of highlighting key service messages at all phases of the campaign. The Communication Templates have been designed to allow key sections to be used as effective vehicle signage as part of the overall external communications strategy.
- ☐ **Local Newspapers and Newsletters**
  Local press and newsletters by community groups, Housing Associations or Council departments can reach a broad audience at all stages of the service rollout and cover a wider range of messages, such as the schedule for activities, what the householder can expect from the Council, what materials can be recycled and the potential benefits. Follow-up articles can be used to provide feedback on the engagement in the service and on the tonnage collected, address contamination issues and help to overcome barriers identified by staff or the public whilst building relationships with local organisations.

- ☐ **Resident's Packs**
  Working in partnership with the Council Housing Department, local Housing Associations, factors or landlords could allow new residents to be provided with an information pack containing copies of current leaflets and communication materials for tenemental households, highlight the location of recycling facilities, the materials which can be accepted and any other instructions for effectively using the service.
- ☐ **Advertising Mediums**
  Other advertising options can be utilised for each phase of the campaign, such as Outdoor Media (for example, bus sides and backs or ticketing opportunities with local buses), 48 and 6 sheets, press adverts, electronic screens in Council buildings and radio advertising.
- ☐ **Event Displays**
  Various displays can be considered to support each phase of the campaign, such as pop-up display systems, pull-up banners, wind dancers and windchasers as part of community engagement events or for placement in Council offices, Housing Association premises or housing complexes.

☐ **Engagement Methods**

- ☐ **Councils Corporate Communications Team**
  Early collaboration and notification of the service to the Council's Corporate Communications Team is recommended. This will allow the identification of the range of internal and external PR opportunities that exist that could be used to support the service introduction and to help to ensure effective communication to local Councillors, other Council departments and to the general public.
- ☐ **Community Councillors and Councillors' Surgeries**
  Early briefings should be provided for Councillors and they should continue to be updated as the service introduction progresses. Well informed Councillors can help to support local community involvement and provide factual advice to the public. Councillors could be provided with copies of Frequently Asked Questions and the communication materials before the service is promoted to the public which will allow them to prepare for any potential questions. Press releases and photo opportunities could also be used to gain Councillor support, and attendance at community events presents an opportunity to engage with local households.
- ☐ **Community Outreach Programme**
  An effective outreach programme can ensure that all parts of your community are aware of the service and are motivated to participate. The activities undertaken as part of the outreach programme should be tailored to your target audience, but might include:
    - Leafleting and postering relevant outlets within the community to increase visibility or engage particular demographics, for example local shops, schools via Eco-School Committees, community centres, building closes and in the bin storage areas;
    - Waste Services Communication Officers' attendance at community events and presentations to community organisations such as resident groups, tenancy groups and Housing Associations;
    - Working with the Zero Waste Volunteers to deliver roadshow events or participate in community initiatives;
    - Working in partnership with other relevant local organisations interested in waste or environmental work;
    - Engaging with community groups who share a similar interest, goals or objectives e.g. Climate Challenge Fund groups.
- ☐ **Collaboration with other Council Departments**
  Collaboration between Council departments will allow consistent messaging and increased awareness of the recycling service. This could be achieved through the Working Group established for the internal communications strategy, to ensure opportunities for partnership working and collaboration are developed, or through 'awareness days' within Local Authorities which may be organised by Councils or ZWS.
- ☐ **Direct Waste Team Intervention**

Activities such as door knocking and Recycling Advisor support can be carried out pre-implementation to engage households and explain the coming service, or post-implementation to encourage participation, answer questions and gauge the effectiveness of the rollout.

☐ **Citizens Panels or Forums**

These allow widespread dissemination of service information to a large number of people from a broad range of demographics. Panels or Forums could be used to gauge the effectiveness of planned communication methods and to assess the acceptability of the proposed service. For Councils with access to Panels and Forums throughout the year, communication can be scheduled during the pre-implementation and implementation phases.

☐ **Tenancy Group Meetings**

Partnership working with Tenancy Groups and attending meetings, where possible, is recommended as this can help to deliver effective communication to residents, and could help to develop a Caretaker Model. Caretakers are commonly responsible for the recycling areas and placement of containers for uplift, as well as maintaining notice boards, and may have existing communication methods with tenants which could be incorporated into a new recycling service communication strategy. Tenancy Group Meetings can also allow the siting of bins to be discussed, preventing future disagreements or complaints.

☐ **Private Landlords**

Private landlords can be identified by working in partnership with the Council Housing Department or potentially by liaising with local universities, colleges and Housing Associations. Materials such as Resident's Packs could be provided to encourage all new tenants to use the recycling services correctly from the point of moving in.

☐ **Factors**

Factors can also be identified by working in partnership with the Council Housing Department. Factors could be encouraged to enforce correct use of the recycling services and notify residents where issues arise. They can also overcome access issues to tenemental properties caused by security entries or limited service access.

☐ **'Under-Served' Groups**

'Under-served' demographics can have particular barriers to engagement with recycling services which may need to be addressed to maximise uptake and inclusion for a new recycling service. Groups who might be affected within your Council area may include people with learning disabilities, sensory impairment, literacy needs and where English is not their first language. Research on recycling communication methods for under-served groups suggests that the following should be considered:

- Clear pictorial messaging;
- Simple, clear and active language;
- Providing materials partially or entirely in different languages;
- Recognisable items and locations;
- Telephone and email contact details.

It may also be necessary to provide additional training to staff in the Contact Centre and Collection Crews to better understand the communication barriers that might be experienced by householders prior to the service implementation. People with communication support needs may have their preferred communication method already registered with your Council, and could therefore be contacted using existing contact lists. This will help to ensure you effectively engage the whole community.

☐ **Engage the Student Population**

Student populations may be hard-to-engage due to the transient nature of tenancy and therefore potentially require re-messaging each term or year to ensure effective participation. Students can be engaged through their representative bodies such as Student Unions, Student Representative Councils or relevant Societies, and it is recommended to work in partnership with these organisations to achieve the greatest engagement during events such as Fresher's Fairs. Students could also be engaged on-campus by student societies and clubs such as the Zero Waste Scotland Student Volunteers and student Climate Challenge Fund

groups. Landlords, letting agents and factors can be approached to incorporate messaging and materials in Student Tenant Welcome Packs.

- ☐ **Recycling Champions**
  Residents can be recruited to act as Recycling Champions within their block, who can promote the recycling services, answer questions and ensure communication materials are delivered to households.
- ☐ **Zero Waste Scotland Volunteers and Network**
  Local Authorities could work with ZWS Regional Partnership Managers to identify opportunities to engage the appropriate ZWS volunteer networks to support the uptake of their new service. As volunteers have a limited amount of time they can commit on a monthly basis, it is suggested that care is taken to identify the most relevant opportunities for volunteer support. This might include distribution of posters or take part in local awareness raising events.
- ☐ **Links to ZWS and Scottish Government National Recycling Initiatives**
  Events such as Greener Scotland national campaigns, National Recycling Week, the European Week for Waste Reduction and linking to the current Love Food Hate Waste campaigning programme can provide opportunities to highlight local activities whilst taking advantage of wider press attention on waste.

☐ **PR Strategy**
Both the internal and external communication strategies should be supported with an effective PR strategy, managed by the in-house Communications Team, to maximise and support promotional opportunities to engage, enable and encourage the public in the use of the recycling service.

5.2 Appendix 2 – Aberdeen City Council Tenemental Monitoring Plan

Aberdeen City Council Tenemental Pilot Project Monitoring Plan

January 2013

Written by: Tim Reid (informed in part by WRAP Monitoring and Evaluation guidance[10], especially Chapters 5 & 8 and WRAP's Recycling Collections for Flats[11])

[10] http://www.wrap.org.uk/content/monitoring-and-evaluation-guidance
[11] http://www.wrap.org.uk/content/recycling-collections-flats-monitoring-evaluation

1 Monitoring options

1.1 Background

Zero Waste Scotland has identified an opportunity for individual Scottish Local Authorities to better understand their waste collections from tenements by refreshing and updating the methods and materials used to communicate with householders in flats and tenements. A number of pilot projects have been approved to compare and contrast the effect of communication materials and messaging on the participation rate of households in these services and on the quantity and quality of recyclates from tenements and flats.

Aberdeen City Council's pilot project will focus on the following communication activities and monitor the capture and quality of materials pre- and post-intervention:

- Internal Communications: How to improve internal communications between Waste Services Strategy and Operations, and between the Waste Services Team and other relevant Council departments; and wider external agencies to deliver improved recycling performance in tenement properties;

- External communications: Explore the impact of the following communication activities: explanation letters; leaflets; personalised bin stickers; and a multi department approach to direct public communication.

This document outlines the methods which will be used to monitor the impact of communication materials against the stated outcomes.

Table 1 shows the range of options for monitoring recycling performance in flatted properties.

Table 1 – WRAP's Key Performance Indicators for monitoring recycling and food waste collection schemes from flats[12]

Type of monitoring	Definition	Frequency	Door to door	Bring Banks	Chutes	Collection points on each floor
Percentage of eligible households served	The percentage of eligible households that have received / have access to a recycling service (allows the progress of the roll out of a service to be monitored)	Monthly (during the roll out of a service)	Yes	Yes	Yes	Yes
Set out rates	The proportion of households that put out recycling or food waste on one collection opportunity	6 monthly - annually	Yes	No	No	No
Participation rates monitored through containers set out at least one in a defined period	Participation rate is the proportion of households that take part at least once in the defined period. Participation rate is calculated over three collection opportunities because many households don't put out their container each time, normally because it isn't full or they forget.	6 monthly - annually	Yes	No	No	No
Claimed participation rates recorded through resident surveys	The number of households claiming to use a recycling system	6 monthly - annually	Yes	Yes	Yes	Yes

[12] http://www.wrap.org.uk/sites/files/wrap/13a%20Performance%20Indicators.pdf

Type of monitoring	Definition	Frequency	Door to door	Bring Banks	Chutes	Collection points on each floor
Reuse, recycling and composting rate (NI 192)	The percentage of waste produced that is reused, recycled or composted	Monthly and annually	Yes	Yes	Yes	Yes
Kilograms per household per week and per year	The amount of material recycled or disposed per household per year	Monthly and annually	Yes	Yes	Yes	Yes
Annual cost per household	The costs of delivering a scheme each year	Every 12 months (or more frequently if costs change regularly e.g. due to overtime payments)	Yes	Yes	Yes	Yes
Cost per tonne	The cost per tonne of material collected	Every 12 months (or more frequently if costs change regularly e.g. due to overtime payments)	Yes	Yes	Yes	Yes
Capture rates	The proportion of a targeted material that has been collected (by the scheme) rather than disposed of. This requires waste audit data	Annually	Yes	Yes	Yes	Yes
Contamination rates	The percentage of material in the recycling / composting stream that is not targeted for collection and therefore is not recycled.	Dependent on collection type (separated/comingled/door to door etc). See M&E guidance for further information	Yes	Yes	Yes	Yes
Number of containers rejected due to contamination	Number of containers that contain unacceptable amounts of contamination	Monthly	Yes	Yes	Yes	Yes
Resident satisfaction with services (measured through resident surveys).	The percentage of residents reporting they are satisfied with a service as a percentage of the total surveyed	Annually – check internally as your Council may already conduct resident surveys.	Yes	Yes	Yes	Yes
Complaints / positive feedback	Complaints and positive feedback from different sources e.g. caretakers, residents, call centres	Monthly	Yes	Yes	Yes	Yes
Issues and incidents e.g. missed collections, arson, vandalism of containers	The number of reported incidents associated with a recycling system	Weekly	Yes	Yes	Yes	Yes

1.2 Fill level monitoring

For fill level monitoring in general, surveyors accompany the normal collection crew on the normal collection day. For each block or site:

1. Note the number and size of each container for each material
2. Take a note of the fill level of each container (e.g. ¼, ½, ¾ or full)
3. Collect any additional information required e.g. contamination, instances of graffiti, missing signage, broken infrastructure, access issues, capacity issues etc.
4. Convert the fill level(s) of each material to a volume in m^3
5. Convert the volume of the material to a weight using, for example, WRAP's Material Bulk Densities Report[13]

[13] http://www.wrap.org.uk/sites/files/wrap/Bulk%20Density%20Summary%20Report%20-%20Jan2010.pdf

An aggregated tonnage can then be derived for all addresses monitored.

It is understood that all bins are the same size in the pilot areas (1280l). It may therefore not be necessary to note the size of the bins.

By conducting fill level monitoring on residual waste bins and converting volume to weight using WRAP conversion factors it would also be possible to derive an approximate recycling rate for the pilot area.

1.3 Contamination monitoring

For accurate contamination monitoring in co-mingled schemes it is useful to conduct a waste compositional analysis, as this will provide a percentage figure (by weight) of the different types of contamination. As the materials for the pilot scheme will be collected alongside materials from other areas this will not be possible.

A more practical option would be to conduct a visual contamination check during the fill level monitoring exercise. As a basic measure, waste aware officers can take a note of a) whether or not contaminating materials are visible on the surface and b) the types of contaminating materials. Any materials known to be common contaminants can each be given a dedicated column on the data collection sheets. In this way it would be possible to state e.g.:

- The percentage of households where contamination was observed
- The percentage of households where no contamination was observed
- The percentage of households where food was a contaminant
- The percentage of households where black bag waste was a contaminant

The level of contamination may vary from bin to bin. In order to monitor improvement it may be necessary to use a more descriptive method, whereby a code is recorded to describe the level of contamination (see Table 22 for details)

Table 2 – Potential contamination codes to use

Classification	Quantity	Description
X	None	Only target materials observed.
S	Single	Only one article of contaminated material.
F	Few	More than one article but evidence of separation.
M	Many	No apparent attempt at material separation i.e. looks like residual waste.

It may also be possible to record an estimated percentage of contamination from a visual inspection. If estimated correctly this information can be used to roughly estimate the volume of contamination (in litres) and this can be useful when assessing the improvement in performance. Surveyors may therefore wish to collect this information **in addition to** the contamination code recommended by WRAP.

2 Monitoring actions

2.1 Proposed monitoring regime

Table 3 shows the suggested monitoring actions and performance indicators that could be used for the pilot.

Table 3 – Proposed monitoring regime

Type of monitoring	Pre intervention	Post intervention	Unit of measurement
Average volume yield per household	Yes	Yes	Litres/household/week, litres/setting out household/week, litres/participating household/week
Average weight yield per household[14]	Yes	Yes	kg/household/week, kg/setting out household/week, kg/participating household/week
Contamination monitoring	Yes	Yes	% of presented bins: a) contaminant free b) contaminated with one item c) contaminated with a few items d) contaminated with many items % contamination (optional)
Recycling Rate (based on conducting additional fill level monitoring of residual bins)	If possible	If possible	% recycled

2.2 Number of households to survey

All households and recycling bins in the pilot study area should be included in the monitoring and evaluation.

2.3 Timeline and frequency of collection

It is understood that intervention is due to start on Monday 18th February. There is therefore limited time for pre-intervention monitoring. The project plan stated the pre-intervention monitoring will take place over three weeks and, where possible, it is recommended that this is carried out.

The 1280l bins are scheduled to be uplifted every Tuesday morning – this is essential to the monitoring regime as it will provide a regular and consistent collection timetable throughout the trial. This will therefore allow for consistent comparable monitoring events, especially if ACC wish to continue monitoring throughout the trial.

The first pre-intervention monitoring event should take place exactly one week after the previous collection day, followed by a monitoring event on each of the next two collection days.

[14] It is understood that the pilot area will not be served by a dedicated collection vehicle. Any weight measurement can only be derived using volume to weight conversion factors and this process is open to more error due to different co-mingled compositions and levels of contamination.

Ideally, post intervention monitoring should commence one month after the end of the campaign and should be carried out over three consecutive weeks, however, this will not be possible for a project end date of 31st March.

Table 4 below outlines a possible monitoring timeline. Where possible, both the recycling and residual bins should be monitored each week starting from week commencing 4th February (if this has not already commenced). By monitoring every week it is hoped that an improvement in service use will be seen in week-on-week improvements in set-out rate and recycling rate.

If resources are available, Aberdeen City Council may wish to conduct further monitoring following the project end date. In order to best evaluate the improvement in performance, this supplementary post-intervention monitoring should start in week commencing 15th April and take place over at least three consecutive collection cycles (i.e. Week 11 to Cycle 13 in Table 44 below).

Table 4 – Proposed monitoring timeline for both recycling and residual bins

Week	Week commencing
1	04/02/2013
2	11/02/2013
3 (intervention starts in this week)	18/02/2013
4	25/02/2013
5	04/03/2013
6	11/03/2013
7	18/03/2013
8	25/03/2013
9 (optional)	01/04/2013
10 (optional)	08/04/2013
11 (optional)	15/04/2013
12 (optional)	22/04/2013
13 (optional)	29/04/2013

(**NB** It is recommended that monitoring takes place each time the bin is serviced and that servicing continues on a weekly basis and on the same day each week. It should be noted that any monitoring taking place during public or school holidays may produce unrepresentative results.)

2.4 Data to be collected

Table 55 summarises the suggested data to be collected. Where possible, the residual bins should also be monitored in order to estimate recycling rates. Exact data collection requirements are discussed later in the document.

Table 5 – Information to be collected

Information to record	Blue	Residual
Location of bin	Yes	Yes
Fill level	Yes	Yes
Contamination level (coded)	Yes	No
Estimated % contamination	Yes	No

Contaminating materials present	Yes	No
Additional comments	Yes	Yes

2.5 Surveyor roles

2.5.1 Monitoring bins

The waste aware officers will accompany the collection crew on their round to record the required data – surveyors should not attempt to monitor recycling bins at the same time as residual bins. It is recommended that two officers share the monitoring duties as this allows for more information to be gathered in a short space of time. Monitors should be aware of any gaps between bin locations so that the collection vehicle does not have a chance to overtake. It may be more practical for surveyors to accompany collection crews in the collection vehicle.

2.5.2 Consistency

It is advised that the same waste aware officers conduct the monitoring and evaluation throughout the trial – this will ensure consistent fill level and contamination assessments.

2.6 Preparing paperwork

The location or address of each bin should be recorded on the data collection sheets before starting the survey. This can either be a GPS location, grid reference (by Easting and Northing) or the address of the nearest flat; however, it should be comprehensible to all members of the team, both surveyors and collection crews. It may also be useful to assign a number to each bin for reference purposes.

When preparing the data collection sheets it is good practice to list the addresses in the same order as the collection crews normally travel and to leave enough spaces at the top of each page and at the back of the booklet to include bins or streets not on the list.

It is also useful to visit the area in advance to check your address/bin list for errors and note any potential difficulties.

2.7 Instructions for surveyors

2.7.1 Suggested fill level monitoring method

Table 6 – Data collection sheet example

			Contamination										
Street	**No.**	**Fill**	**Code**	% contamination	Cans / pl. bottles	Glass	Plastic bag	Other plastic	Food	Other black bag waste	Building materials	Other	**Comments**
Urquhart Road	81	1	X	0									
Urquhart Road	57	3	M	70	1			1		1	1	1	Wood, child's toy
Urquhart Road	31	4	F	10	1								

Urquhart Road	15	5	S	1	1		1	1					

- Each row in the data collection sheet will correspond to an individual bin
- Under '*Fill*', enter the fill level of the contents of the bin as described in Table 6.
- For any bins not surveyed enter an 'E' in the 'Fill' column.

Table 7 – Fill level codes to use

Classification	Description
0	empty (or practically empty)
1	approximately a quarter full
2	approximately half full
3	approximately three-quarters full
4	approximately full
5	overflowing or side waste

In the subsequent volume calculations, recording '5' will suggest that the overflowing or side waste represents approximately a quarter of the volume of the bin – '5' should therefore not be entered if the lid is only slightly raised.

2.7.2 Alternative fill level monitoring method

For a more accurate measurement, monitors could measure the fill level below the lip of the bin and convert to litres. Any fill levels above the lip could be recorded as 'Full' = 1280 litres. This methodology may be too complicated to conduct in the time afforded and would require a different analysis method to the one described in section 3.3.2.

2.7.3 Contamination

For all presented bins, under '*Contamination*':

- Enter the level of contamination described in Table under 'Code'
- For any contaminating materials visible on the surface enter a '1' in the relevant column
    - Give any details of 'Other' contaminants in the 'Comments' column.

It is important that the contents of the bin are not moved to ensure a consistent approach - if one monitor looks deeper into than another the comparison will be unreliable. **Never touch the contents of the bin** – this is also a health and safety issue.

Table 8 – Contamination codes to use

Classification	Quantity	Description
X	None	Only target materials observed.
S	Single	Only one article of contaminated material.
F	Few	More than one article but evidence of separation.
M	Many	No apparent attempt at material separation i.e. looks like residual waste.

If surveyors wish to collect information on the estimated % contamination this should be done **in addition** to recording the contamination code recommended by WRAP – this additional information can be recorded either in the Comments column or in a newly created column, say "% contamination".

Surveyors may also wish to record any instances of target recycling materials visible in the residual bins – this can be noted in the Comments column.

3 Use of data

3.1 Quality control

It is very important to check the quality of the data after the first round of data collection and after the second round if problems are found. It is therefore easier to create separate data collection sheets for each collection day.

If more than one person is collecting data throughout the pilot it is good practice to check each other's work for quality and consistency.

3.2 Data entry

After the three collection cycles, enter the data into Excel (or another spreadsheet package) or a database.

Enter the fill level and contamination code data as recorded on your paper data collection sheet.

For individual material contamination enter a '1' if the contaminating material was present and '0' for bins that did not have any contaminants present.

WRAP recommends undertaking a 10% check of the monitoring sheets against what has been entered in the spreadsheet. This should not be done by the same person who entered the data. If data input errors are found, then all the data must be checked.

Any bins that have not been monitored on all three collection days should be excluded from the spreadsheet[15] and **no cells should be left blank**.

As this is a pre/post evaluation of intervention, bins that are not being monitored at both phases should be removed from the file – if not, there is a danger that they will be included in the analysis.

3.3 Spreadsheet calculations

3.3.1 Contamination

For data entered as in Figure 3, under the contamination code column you will need to calculate the percentage of each contamination level using the formulas below (assuming there are no blank cells in the data):

- % of bins with no contamination =COUNTIF(D3:D6,"X")/ROWS(D3:D6)*100
- % of bins with a single contaminant =COUNTIF(D3:D6,"S")/ROWS(D3:D6)*100
- % of bins with a few contaminants =COUNTIF(D3:D6,"F")/ROWS(D3:D6)*100
- % of bins with a many contaminants =COUNTIF(D3:D6,"M")/ROWS(D3:D6)*100

For data entered as in Figure 3, under each individual contaminant column you will need to calculate the percentage of bins contaminated with each material using the formulas below (assuming there are no blank cells in the data):

- % of bins contaminated with cans or plastic bottles =SUM(E3:E6)/COUNT(E3:E6)*100

[15] This is to ensure a like for like comparison of the volume across the three weeks, however, proficient users of Excel may wish to attribute catchment areas (containing household numbers) to each bin and then create an average volume per household for each week.

- % of bins contaminated with glass =SUM(F3:F6)/COUNT(F3:F6)*100
- Etc.

Figure 3 – Example data entered in a spreadsheet

	A	B	C	D	E	F	G	H	I	J	K	L	M
1				Contamination									
2	**Street**	**No.**	**Fill**	**Code**	Cans / pl. bottles	Glass	Plastic bag	Other plastic	Food	Other black bag waste	Building materials	Other	**Comments**
3	Urquhart Road	81	1	X	0	0	0	0	0	0	0	0	
4	Urquhart Road	57	3	M	1	0	0	1	0	1	1	1	Wood, child's toy
5	Urquhart Road	31	4	F	1	0	0	0	0	0	0	0	
6	Urquhart Road	15	5	S	1	0	1	1	0	0	0	0	
7													
8													

3.3.2 Fill level, volume and weight

To calculate the volume and weight presented you will need to create a new column (say column N) and use the formulas below (assuming the fill level coding in section 2.7.1 is used and there are no blank cells in the data):

- **Volume of recyclate[16] (litres)** = SUM(N3:N6),
    - where N3 =IF(C3>0,1280*C3/4,0), N4 =IF(C4>0,1280*C4/4,0) etc.
- **Weight of recyclate (kg)** = (Volume of recyclate in litres x 112) ÷ 1000
    - where '112' is the kg/m^3 volume to weight conversion factor of mixed paper and card in a 140l bin from WRAP's Bulk Density Report[17] [**NB** No conversion factor is given for a 1280l bin in the report – the density for a 1280l bin may, in reality, be higher. It should also be noted that the 95% confidence interval for the given figure covers a large range of values (+/- 17.76 kg/m$^{3)}$ as a result of different amounts of cardboard in bins.]

[16] This formula does not take into account any information collected on % contamination but can be amended to do so.

[17] http://www.wrap.org.uk/sites/files/wrap/Bulk%20Density%20Summary%20Report%20-%20Jan2010.pdf

5.3 Appendix 3 – Aberdeen City Council Additional Communication Materials

A4 Recycling Bin Decal

A5 Recycling Bin Decal

Residual Bin Decal

5.4 Appendix 4 – Highland Council Tenemental Monitoring Plan

Highland Council Tenemental Monitoring Plan

Monitoring & Evaluation Plan

Highland Council

January 2013

Written by: Tim Reid (informed in part by WRAP Monitoring and Evaluation guidance[18], especially Chapters 5 & 8 and WRAP's Recycling Collections for Flats[19])

[18] http://www.wrap.org.uk/content/monitoring-and-evaluation-guidance
[19] http://www.wrap.org.uk/content/recycling-collections-flats-monitoring-evaluation

1 Monitoring options

1.1 Background

Zero Waste Scotland has identified an opportunity for individual Scottish Local Authorities to better understand their waste collections from tenements by refreshing and updating the methods and materials used to communicate with householders in flats and tenements. A number of pilot projects have been approved to compare and contrast the effect of communication materials and messaging on the participation rate of households in these services and on the quantity and quality of recyclates from tenements and flats.

Highland Council's pilot project will focus on the following communication activities and monitor the capture and quality of materials pre- and post-intervention:

- Internal Communications: How to improve internal communications between Waste Services Strategy and Operations, and between the Waste Services Team and other relevant Council departments; and wider external agencies to deliver improved recycling performance in tenement properties;

- External communications: Explore the impact of the following communication activities: explanation letters; leaflets; personalised bin stickers; and a multi department approach to direct public communication.

This document outlines the methods which will be used to monitor the impact of communication materials against the stated outcomes.

In flatted properties performance monitoring is complicated by the difficulty of identifying households that participate in schemes where recyclate is bulk collected. It is usually only in door-to-door recycling schemes that is it possible to monitor direct participation, as recyclate is presented outside each individual address.

Table 1 shows the various monitoring methods available for recycling schemes in flatted properties. The most appropriate method will largely depend on the exact scheme type, existing data and available resources. In some cases it may be most beneficial to gauge performance using a number of indicators.

Table 1 – WRAP's Key Performance Indicators for monitoring recycling and food waste collection schemes from flats[20]

Type of monitoring	Definition	Frequency	Door to door	Bring Banks	Chutes	Collection points on each floor
Percentage of eligible households served	The percentage of eligible households that have received / have access to a recycling service (allows the progress of the roll out of a service to be monitored)	Monthly (during the roll out of a service)	Yes	Yes	Yes	Yes
Set out rates	The proportion of households that put out recycling or food waste on one collection opportunity	6 monthly - annually	Yes	No	No	No
Participation rates monitored through containers set out at least one in a	Participation rate is the proportion of households that take part at least once in the defined period. Participation rate is calculated over three collection opportunities because many households don't put out their container each time, normally because it isn't full or they	6 monthly - annually	Yes	No	No	No

[20] http://www.wrap.org.uk/sites/files/wrap/13a%20Performance%20Indicators.pdf

Type of monitoring	Definition	Frequency	Door to door	Bring Banks	Chutes	Collection points on each floor
defined period	forget.					
Claimed participation rates recorded through resident surveys	The number of households claiming to use a recycling system	6 monthly - annually	Yes	Yes	Yes	Yes
Reuse, recycling and composting rate (NI 192)	The percentage of waste produced that is reused, recycled or composted	Monthly and annually	Yes	Yes	Yes	Yes
Kilograms per household per week and per year	The amount of material recycled or disposed per household per year	Monthly and annually	Yes	Yes	Yes	Yes
Annual cost per household	The costs of delivering a scheme each year	Every 12 months (or more frequently if costs change regularly e.g. due to overtime payments)	Yes	Yes	Yes	Yes
Cost per tonne	The cost per tonne of material collected	Every 12 months (or more frequently if costs change regularly e.g. due to overtime payments)	Yes	Yes	Yes	Yes
Capture rates	The proportion of a targeted material that has been collected (by the scheme) rather than disposed of. This requires waste audit data	Annually	Yes	Yes	Yes	Yes
Contamination rates	The percentage of material in the recycling / composting stream that is not targeted for collection and therefore is not recycled.	Dependent on collection type (separated/comingled/door to door etc). See M&E guidance for further information	Yes	Yes	Yes	Yes
Number of containers rejected due to contamination	Number of containers that contain unacceptable amounts of contamination	Monthly	Yes	Yes	Yes	Yes
Resident satisfaction with services (measured through resident surveys).	The percentage of residents reporting they are satisfied with a service as a percentage of the total surveyed	Annually – check internally as your Council may already conduct resident surveys.	Yes	Yes	Yes	Yes
Complaints / positive feedback	Complaints and positive feedback from different sources e.g. caretakers, residents, call centres	Monthly	Yes	Yes	Yes	Yes
Issues and incidents e.g. missed collections, arson, vandalism of containers	The number of reported incidents associated with a recycling system	Weekly	Yes	Yes	Yes	Yes

1.2 Set-out and participation

For the Highland Council tenemental pilot each household will receive its own green residual bin and blue recycling bin marked with individual flat numbers/letters. This will therefore allow for the monitoring to include participation monitoring at some stage in the process.

For a household to be defined as a participant it must present its recycling at least once in a defined period – this is usually three consecutive collection days. The 'set out rate' is defined as the percentage of households that present the relevant container/materials for collection on any one collection day.

It should be noted that participation is not the same as set out. As a result, participation rates are not the same as set out rates.

Set-out rate = ("Number of households recorded as setting out on any day" ÷ "Number of households monitored on that day") x 100(%)

Set-out rate is normally calculated on each of the three collection days which are monitored to derive the participation rate.

An average set-out can be calculated by adding together the three set-out rates for each collection day and dividing the sum by three. Average set out rate can be used to calculate kg produced per household (kg/hh) using tonnage data.

'Participation rate' is defined as the percentage of households that present materials at least once across the three consecutive collection days – three collection cycles is the most appropriate period to monitor as many households don't put out their container each time or are away. 'Participation rate' is calculated according to the following formula:

Participation rate = ("Number of households recorded as setting out at least once in a defined period[21]" ÷ "Number of households monitored in that period") x 100(%)

Figure 1 - Graphical example of set out and participation rate calculations[22]

Heath Terrace	No. 1	No. 3	No. 5	No. 7	No. 9	Set out
Collection 1	✓	✓	×	✓		3/5 = 60%
Collection 2	✓	×	×	✓	✓	3/5 = 60%
Collection 3	×	✓	×	×	×	1/5 = 20%
Participation	✓	✓	×	✓	✓	4/5 = 80%

Average set out 7/15 = 47%

When monitoring communication campaigns, the monitoring (i.e. three consecutive collections) should be completed just before the campaign starts, and should not be carried out again until one month after the campaign has finished. This allows for the campaign impact to be felt. Figure 2 gives some examples. Due to time constraints this monitoring regime will not be possible – see section 2.3 for the proposed timeline.

[21] Usually three consecutive collection days

[22] http://www.wrap.org.uk/sites/files/wrap/WRAP%20ME%20Guidance%20-%20CHP%205.pdf

Figure 2 - Timetable examples for monitoring communications campaigns

Weekly collections

Week	-3	-2	-1	Campaign	+1	+2	+3	+4	+5	+6	+7
Monitor?	✓	✓	✓						✓	✓	✓

Fortnightly collections

Week	-5	-3	-1	Campaign	+1	+2	+3	+4	+5	+7	+9
Monitor?	✓	✓	✓						✓	✓	✓

Monthly/four-weekly collections

Week	-12	-8	-4	Campaign	+4	+8	+12	+16
Monitor?	If possible	✓	✓			✓	✓	If possible

1.3 Fill level monitoring

For fill level monitoring, surveyors should accompany the normal collection crew on the normal collection day. For each block or site:

6. Note the number and size of each container for each material
7. Take a note of the fill level of each container (e.g. ¼, ½, ¾ or full)
8. Collect any additional information required e.g. contamination, instances of graffiti, missing signage, broken infrastructure, access issues, capacity issues etc.
9. Convert the fill level(s) of each material to a volume in m^3
10. Convert the volume of each material to a weight using, for example, WRAP's Material Bulk Densities Report[23]

An aggregated tonnage can then be derived for all addresses monitored.

It is assumed that all bins are 240 litres for all households in the Highland Council pilot.

By conducting fill level monitoring on residual waste bins and converting volume to weight using WRAP conversion factors it would also be possible to derive an approximate recycling rate for the pilot area. It should be noted that estimating fill level for residual bins is less straightforward as waste is usually deposited in black bags and often comes in different shapes.

1.4 Contamination monitoring

Contamination can be monitored by conducting a visual check during the set-out and fill level monitoring exercise. Waste Aware Officers should take a note of a) whether or not contaminating materials are visible on the surface and b) the types of contaminating materials. Any materials known to be common contaminants can each be given a dedicated column on the data collection sheets. In this way it would be possible to state e.g.:

- The percentage of households where contamination was observed
- The percentage of households where no contamination was observed
- The percentage of households where food was a contaminant
- The percentage of households where black bag waste was a contaminant

The level of contamination may vary from household to household. In order to monitor improvement it may be necessary to use a more descriptive method whereby a code is recorded to describe the level of contamination (see Table 22 for details)

[23] http://www.wrap.org.uk/sites/files/wrap/Bulk%20Density%20Summary%20Report%20-%20Jan2010.pdf

Table 4 – Potential contamination codes to use

Classification	Quantity	Description
X	None	Only target materials observed.
S	Single	Only one article of contaminated material.
F	Few	More than one article but evidence of separation.
M	Many	No apparent attempt at material separation i.e. looks like residual waste.

2 Monitoring actions

2.1 Proposed monitoring regime

The suggestions in this document have been written in the assumption that each household will have its own bin but the bins will not have been allocated to individual households until after the pre-intervention monitoring.

Table 3 shows the suggested monitoring actions and performance indicators that could be used for the pilot.

Table 3 – Proposed monitoring regime

Type of monitoring	Pre intervention	Post intervention	Unit of measurement
Set-out rate (including set out rate per block)	Yes	Yes	% of households presenting a bin (In the pre survey a more accurate description would be '% of bins presented')
Participation Rate	No	Yes	% of households presenting a bin at least once in a given period
Average volume yield per household	Yes	Yes	Litres/household/week, litres/setting out household/week, litres/participating household/week
Average weight yield per household[24]	Yes	Yes	kg/household/week, kg/setting out household/week, kg/participating household/week
Contamination monitoring	Yes	Yes	% of presented bins: a) contaminant free b) contaminated with one item c) contaminated with a few items d) contaminated with many items
Recycling Rate (based on conducting additional fill level monitoring of residual bins)	Yes	Yes	% recycled

2.2 Number of households to survey

According to WRAP guidelines, a sample of at least 1,100 households is required for a standard participation survey in own-door properties. For any areas with fewer households all households should be included in the participation survey. **All households in the pilot study should therefore be included in the monitoring and evaluation.**

[24] It is understood that the pilot area will not be served by a dedicated collection vehicle. Any weight measurement can only be derived using volume to weight conversion factors and this process is open to more error due to different co-mingled compositions and levels of contamination

2.3 Timeline

It is understood that intervention is due to start in week commencing on 18th February. There is therefore limited time for pre-intervention monitoring – there will most likely be only one or two opportunities to measure set-out. It will therefore not be possible to conduct monitoring on three consecutive collection days prior to intervention. (The calculation of a participation rate is also not possible in the pre-intervention survey as bins cannot be attributed to individual households.)

Ideally, post intervention monitoring should commence one month after the end of the campaign and should continue for three consecutive collection days, however, this will not be possible for a project end date of 31st March.

Table 45 below outlines the recommended monitoring timeline. Both the recycling and residual bins should be monitored each week starting from Friday 1st February. Following the installation of the new bins and the application of individual house numbers it should be possible to derive a participation rate on data collected from Cycle 3 to Cycle 5, however, any positive effect of the intervention is unlikely to have taken place by this point. It is, however, hoped that an improvement in service use will be seen in week-on-week improvements in set-out rate and recycling rate. (**NB** Three weeks of residual waste collection monitoring will not be possible before 31st March.)

If resources are available, Highland Council may wish to conduct further monitoring following the project end date. In order to best evaluate the improvement in performance, this supplementary post-intervention monitoring should start on 12th April and take place over three consecutive collection cycles (i.e. Cycle 6 to Cycle 8 in Table 4 below).

Table 45 – Proposed monitoring timeline

Cycle	Blue	Green
Cycle 1	01/02/2013	08/02/2013
Cycle 2 (bins to be replaced during this cycle)	15/02/2013	22/02/2013
Cycle 3 (intervention ends at the end this cycle)	01/03/2013	08/03/2013
Cycle 4	15/03/2013	22/03/2013
Cycle 5	29/03/2013	05/04/2013
Cycle 6 (optional)	12/04/2013	19/04/2013
Cycle 7 (optional)	26/04/2013	03/05/2013
Cycle 8 (optional)	10/05/2013	17/05/2013

2.4 Integration of new bins

Following the back court audit and replenishment of bins (to one bin per household) pre-intervention **monitoring should ideally not be carried out until households have been in possession of the new bins for at least one whole collection cycle**. If pre-intervention monitoring is conducted less than two weeks after the installation of new bins the set-out and materials presented may not be representative of a full collection cycle and will not be directly comparable with any data collected post-intervention. This is also relevant to any residual waste bins being monitored.

2.5 Data to be collected

Table 55 summarises the suggested data to be collected. It is also recommended to monitor the set-out and fill level of the residual bins in order to estimate recycling rates. Exact data collection requirements are discussed later in the document.

Table 56 – Information to be collected

Information to record	Blue	Residual
Flat number on any bins already marked by residents	Pre-intervention	Pre-intervention
Bins set-out	Yes	Yes
Fill level	Yes	Yes
Contamination level (coded)	Yes	No
Contaminating materials present	Yes	No
Additional comments	Yes	Yes

2.6 General roles and responsibilities

2.6.1 Presented bins

The waste aware officers will record the required data during the collection round. It is recommended that two officers share the monitoring duties as this allows for more information to be gathered in a short space of time. The monitors should walk just ahead of the collection crews in order to capture any bins set-out at the last minute, however, they should give themselves enough time to collect all the required information. Monitors should be aware of any gaps between addresses so that the collection vehicle doesn't have a chance to overtake.

2.6.2 Bins not presented

It is also recommended that a third waste aware officer conducts a similar survey of the bins in the back courts which were not presented for uplift. Alternatively this can be conducted by the two waste aware officers following the monitoring of set-out bins. This will give supplementary information about set-out and usage.

2.6.3 Bins not replaced

It is understood that, in some cases, bins are not returned to their normal back court position after they have been emptied. If this is a concern for the Council, it is recommended that surveyors return a few days after each collection day to conduct a follow up survey of bins still present at the kerbside. A blank survey sheet would be appropriate for this task. Alternatively, if the Council wishes to monitor the residual bin set-out, an extra column could be added to the data collection sheets to collect information regarding blue bins presented on green bin week, and vice versa.

2.6.4 Consistency

It is advised that the same waste aware officers conduct the monitoring and evaluation throughout the whole trial – this will ensure consistent fill level and contamination assessments.

WRAP's guidelines on monitoring suggest that a protocol is developed for recording the data in order to avoid subjective judgements. The guidelines[25] recommend considering the following points:

- If a container is rejected because of contamination, is this counted as set out?

[25] http://www.wrap.org.uk/sites/files/wrap/WRAP%20ME%20Guidance%20-%20CHP%205.pdf

- If monitoring 'fullness', be clear on the interpretation of what this means.
- If there is more than one container per household, are these to be counted and noted?
- If a number of containers are grouped together there are ways in which to allocate them to households. Examples include:
    - look for markers on the containers that identify them with a property;
    - if the containers are for a house in multiple occupation, use a similar system, starting at the bottom of the building and working up;
    - if a container is across two property boundaries, allocate it to the property that it is predominantly in; and
    - if there are many containers at a 'bulking point', first look for identifying markers and assign those to the indicated properties. Then assign the remaining containers to the houses nearest the bulking point.

2.7 Preparing paperwork

When preparing the data collection sheets it is good practice to list the addresses in the same order as the collection crews normally travel and to leave enough spaces at the top of each page and at the back of the booklet to include addresses or streets not on the list.

It is also useful to visit the area in advance to check your address list and note any potential difficulties.

2.8 Instructions for surveyors

2.8.1 Pre-intervention set-out (if house number decals have not yet been applied)

For participation monitoring prior to intervention individual bins may not be identifiable as being from individual households. In this case the following process should be observed (see also Table 6).

Table 6 – Set-out monitoring process for unmarked bins (prior to intervention)

- For each address/block rows will be provided in the data collection sheets which correspond to the number of bins - each row should correspond to an individual bin. This will be informed by the audit and replenish exercise.
- For each presented blue bin identified with a flat letter/number, enter the flat letter/number in one of the empty rows provided in the column 'Flat' and enter a '1' in the column marked 'Set-out'.
- For each presented blue bin that cannot be attributed to an individual flat, enter a '?' in one of the empty rows in the 'Flat' column and enter a '1' in the column marked 'Set-out'.
- For each address/block fill in the remaining empty rows in the 'Flat' column with '?' and enter a '0' in the column marked 'Set-out' to signify that these bins have not been presented.[26]
    - For any addresses where no bins have been presented it is essential to enter '0' in the data collection sheets (rather than leave blank). This allows the data

[26] Some addresses may have less (and some more) than 6 bins each before the bin audit. The data recorded for bins not set out should therefore be checked on an address by address basis with regards to this information and amended where necessary.

analyst to know that the address has not been missed in the monitoring process.

- Please note in the '*Comments*' column if any bin receives an assisted lift. If the bin receives an assisted lift but has not been used please enter a '*0*' in the '*Set out*' column
- For any addresses/blocks not surveyed enter an 'E' in the 'Set-out' column in each individual flat row.
- If required, enter a '1' in the 'Wrong bin' column for each bin that has not been replaced from the previous week.
- If there are more than six bins presented at any address please use the empty space in the data sheets to record this information – remember to enter the address too.

Table 77 – Collection sheet example for unmarked bins

No.	Flat	Correct bin			Wrong bin	Contamination						Comments
		Set out	Size	Fill		Code	Black bag waste	P, P & P[27]	Glass	Nappies	Other	
1	B	1	1	1		X						
	D	1	1	3		M	1	1			1	Wood, child's toy
	?	1	2	4		F	1	1				
	?	1	1	5		S	1					
	?	0										
	?	0										
2	?	1	1	3		X						
	?	1	1	3		X						
	?	0										
	?	0										
	?	0										
	?	0										

2.8.2 Post-intervention set-out (and also pre-intervention if house number decals have already been applied)

Following the planned intervention each bin should be marked with an individual flat letter. In this case the following process should be observed (see also Table 8).

Table 88 – Set-out monitoring process for marked bins (post intervention)

- Each row in the data collection sheet will correspond to an individual bin/household
- For presented bins a '1' should be entered in the corresponding row. A '0' should be entered for any bins that have not been presented.
    - For any households where no bins have been presented it is essential to enter '0'

[27] Polythene, polystyrene and other packaging

in the data collection sheets (rather than leave blank). This allows the data analyst to know that the address has not been missed in the monitoring process.

- Please note in the '*Comments*' column if any bin receives an assisted lift. If the bin receives an assisted lift but has not been used please enter a '*0*' in the '*Set out*' column
- For any households not surveyed enter an 'E' in the 'Set-out' column.
- If required, enter a '1' in the 'Wrong bin' column for each bin that has not been replaced from the previous week.
- If there are more than six bins presented at any address please use the empty space in the data sheets to record this information – remember to enter address too.

Table 89 – Collection sheet example for bins marked with decals

No.	Flat	Correct bin			Wrong bin	Contamination						Comments
		Set out	Size	Fill		Code	Black bag waste	P, P & P[28]	Glass	Nappies	Other	
1	A	1	1	3		M	1	1			1	Wood, child's toy
	B	0										
	C	1	2	4		F	1	1				
	D	0										
	E	1	1	5		S	1					
	F	1	1	1		X						
2	A	0										
	B	0										
	C	1	1	3		X						
	D	0										
	E	1	1	3		X						
	F	0										

2.8.3 Size and fill level

For all presented bins, under 'Size', enter the size of bin based on its size relative to a normal 240 litre bin. See Table for details.

Table 9 – Data entry for bin sizes

Classification	Description
0.5	120 litres
0.6	140 litres
1	240 litres
1.5	360 litres

For all presented bins, under '*Fill*', enter the fill level of the contents of the bin as described in Table . In the subsequent volume calculations, recording '5' will suggest that the overflowing or side waste represents approximately a quarter of the volume of the bin – '5' should therefore not be entered if the lid is only slightly raised.

[28] Polythene, polystyrene and other packaging

(**NB** If surveyors are able to access back courts and monitor bins that have not been presented at the kerbside a fill level for each of the non-presented bins can also be recorded for supplementary information, however, this should be clearly marked so as not to be included in the set-out volume calculations.)

Table 10 – Fill level codes to use

Classification	Description
0	empty (or practically empty)
1	up to and including a quarter full
2	approximately half full
3	approximately three-quarters full
4	approximately full
5	overflowing, lid up or side waste

2.8.4 Contamination

For all presented bins, under '*Contamination*':

- Enter the level of contamination described in Table 8;
- For any contaminating materials visible on the surface enter a '1' in the relevant column;
    - Give any details of 'Other' contaminants in the 'Comments' column.

For all bins with visible contaminants, enter a '1' under each relevant contaminating material. Give any details of 'Other' contaminants in the 'Comments' column.

It is important that the contents of the bin are not moved to ensure a consistent approach - if one monitor looks deeper into than another the comparison will be unreliable. **Never touch the contents of the bin** – this is also a health and safety issue.

(**NB** If surveyors are able to access back courts and monitor bins that have not been presented at the kerbside the contamination details of the non-presented bins can also be recorded for supplementary information, however, this should be clearly marked so as not to be included in the set-out contamination calculations.)

Table 11 – Contamination codes to use

Classification	Quantity	Description
X	None	Only target materials observed.
S	Single	Only one article of contaminated material.
F	Few	More than one article but evidence of separation.
M	Many	No apparent attempt at material separation i.e. looks like residual waste.

It may be possible to record an estimated percentage of contamination. If estimated correctly this information can be used to roughly estimate the volume of contamination (in litres) and this can be useful when assessing the improvement in performance. Surveyors may therefore wish to collect this additional information **in addition to** the contamination code recommended by WRAP – this can be recorded either in the Comments column or in a newly created column, say "% contamination".

3 Use of data

3.1 Quality control

It is very important to check the quality of the data after the first round of data collection and after the second round if problems are found. It is therefore easier to create separate data collection sheets for each collection day.

If more than one person is collecting data throughout the pilot it is good practice to check each other's work for quality and consistency.

3.2 Data entry

(After the three collection cycles), enter the data into Excel (or another spreadsheet package) or a database.

'Set out' should be entered as '1' and 'not set out' as '0'. Properties marked 'E' for any or all of the collections should be deleted from the dataset.

Enter the bin size, fill level and contamination code data as recorded on your paper data collection sheet.

For individual material contamination enter a '1' if the contaminating material was present and '0' for bins that were presented and did not have any contaminants present. Leave the cell blank if the bin was not set out.

WRAP recommends undertaking a 10% check of the monitoring sheets against what has been entered in the spreadsheet. This should not be done by the same person who entered the data. If data input errors are found, then all the data must be checked.

For participation monitoring, any households that have not been monitored on all three collection days should be excluded from the spreadsheet and no cells should be left blank.

For a pre/post evaluation of intervention, households that are not being monitored at both phases should be removed from the file – if not, there is a danger that they will be included in the analysis.

3.3 Spreadsheet calculations

3.3.1 Set-out and participation

Use the formulas in Figure 3 as guidelines to derive the set-out and participation rates.

Figure 3 – Spreadsheet calculations for set-out and participation[29]

	A	B	C	D	E
1	Property	Collection 1	Collection 2	Collection 3	Participant?
2	1 Heath Terrace	1	1	0	=IF(B2+C2+D2=0,0,1)
3	3 Heath Terrace	0	0	0	=IF(B3+C3+D3=0,0,1)
4	5 Heath Terrace	1	1	1	=IF(B4+C4+D4=0,0,1)
5	2 Heath Terrace	1	0	1	=IF(B5+C5+D5=0,0,1)
6	4 Heath Terrace	0	1	0	=IF(B6+C6+D6=0,0,1)
7					
8		Set out rates			Participation rate
9	Set out rate	=SUM(B2:B6) /COUNT(B2:B 6)*100	=SUM(C2:C6) /COUNT(C2:C 6)*100	=SUM(D2:D6)/ COUNT(D2:D6) *100	=SUM(E2:E6)/ COUNT(E2:E6)*100
10	Average set out rate	=SUM(B2:D6) /COUNT(B2:D 6)*100			

3.3.2 Contamination

A similar approach to the set-out calculation can be used for the individual contaminating materials (i.e. =SUM(xx:xx)/COUNT(xx:xx)*100), however, contaminated containers should be expressed as a percentage of those set out, rather than as a percentage of all the households in the pilot. By leaving the contaminating materials cells blank for those bins not set-out you will derive the correct rate e.g. '% of bins set out that contained nappies'.

Under the contamination code column you will need to calculate the percentage of each contamination level using the formulas (assuming the contamination code data is in column F in rows 2 to 52 and the set-out data is in column B in rows 2 to 52):

- % of set-out bins with no contamination =(COUNTIF(F2:F52,"X")/SUM(B2:B52))*100
- % of set-out bins with a single contaminant =(COUNTIF(F2:F52,"S") / SUM(B2:B52))*100
- % of set-out bins with a few contaminants =(COUNTIF(F2:F52,"F") / SUM(B2:B52))*100
- % of set-out bins with a many contaminants =(COUNTIF(F2:F52,"M") / SUM(B2:B52))*100

3.3.3 Fill level , volume and weight

To calculate the volume and weight presented you will need to create a new column (say column I) and use the formulas (assuming the bin size data is in column G and fill level data is in column H, for rows 2 to 52):

- **Volume of recyclate (litres)** = SUM(I2:I52),
    - where I2 =IF(G2>0,240*G2*H2/4,0), I3 =IF(G3>0,240*G3*H3/4,0) etc.
- **Weight of recyclate (kg)** = (Volume of recyclate in litres x 53) ÷ 1000 [where '53' is the kg/m^3 volume to weight conversion factor of a co-mingled stream containing paper, card, cans and plastic bottles in a 240l bin from WRAP's Bulk Density Report – see the relevant excerpt in Table 12 below.]

[29] http://www.wrap.org.uk/sites/files/wrap/WRAP%20ME%20Guidance%20-%20CHP%205.pdf

Table 12 – Bulk density of the co-mingled material[30]

Plastic bottles, news & pams, cardboard and mixed cans			
Vehicle/container	**Rear end loader**	**240 litre wheeled bin (no compaction)**	**140 litre wheeled bin (no compaction)**
Data type	**Field work data: Material bulk density**	**Field work data: Material bulk density**	**Field work data: Material bulk density**
Mean, kg/m3	310	53	70
No. samples	21	191	57
Standard Deviation	53.9	27.2	32.5
Coefficient of Variance	0.2	0.5	0.5
95% Confidence Interval +/- kg/m3	23.1	3.9	8.4
Lowest value	186	14	17
Highest value	407	207	158

[30] http://www.wrap.org.uk/sites/files/wrap/Bulk%20Density%20Summary%20Report%20-%20Jan2010.pdf

5.5 Appendix 5 – Highland Council Additional Tenemental Communication Materials

Residual Bin Decals

Contamination Decal

A4 Posters

Reminder Postcard

5.6 Appendix 6 - Inverclyde Council Tenemental Monitoring Plan

Tenemental Communications Support

Monitoring & Evaluation Plan

Inverclyde Council

January 2013

Written by: Tim Reid (informed in part by WRAP Monitoring and Evaluation guidance[31], especially Chapters 5 & 8 and WRAP's Recycling Collections for Flats[32])

[31] http://www.wrap.org.uk/content/monitoring-and-evaluation-guidance
[32] http://www.wrap.org.uk/content/recycling-collections-flats-monitoring-evaluation

1 Monitoring options

1.1 Background

Zero Waste Scotland has identified an opportunity for individual Scottish Local Authorities to better understand their waste collections from tenements by refreshing and updating the methods and materials used to communicate with householders in flats and tenements. A number of pilot projects have been approved to compare and contrast the effect of communication materials and messaging on the participation rate of households in these services and on the quantity and quality of recyclates from tenements and flats.

Inverclyde Council's pilot project will focus on the following communication activities and monitor the capture and quality of materials pre- and post-intervention:

- Internal Communications: How to improve internal communications between Waste Services Strategy and Operations, and between the Waste Services Team and other relevant Council departments; and wider external agencies to deliver improved recycling performance in tenement properties;

- External communications: Explore the impact of the following communication activities: leaflets, pull-up banners placed in Housing Association offices and a multi department approach to direct public communication.

This document outlines the recommended methods to monitor the impact of communication materials against the stated outcomes.

In flatted properties performance monitoring is complicated by the difficulty of identifying households that participate in schemes where recyclate is bulk collected. It is usually only in door-to-door recycling schemes that is it possible to monitor direct participation, as recyclate is presented outside each individual address.

Table 1 shows the various monitoring methods available for recycling schemes in flatted properties. The most appropriate method will largely depend on the exact scheme type, existing data and available resources. In some cases it may be most beneficial to gauge performance using a number of indicators.

Table 1 – WRAP's Key Performance Indicators for monitoring recycling and food waste collection schemes from flats[33]

Type of monitoring	Definition	Frequency	Door to door	Bring Banks	Chutes	Collection points on each floor
Percentage of eligible households served	The percentage of eligible households that have received / have access to a recycling service (allows the progress of the roll out of a service to be monitored)	Monthly (during the roll out of a service)	Yes	Yes	Yes	Yes
Set out rates	The proportion of households that put out recycling or food waste on one collection opportunity	6 monthly - annually	Yes	No	No	No
Participation rates monitored through containers set out at least one in a	Participation rate is the proportion of households that take part at least once in the defined period. Participation rate is calculated over three collection opportunities because many households don't put out their container each time, normally because it isn't full or they	6 monthly - annually	Yes	No	No	No

[33] http://www.wrap.org.uk/sites/files/wrap/13a%20Performance%20Indicators.pdf

Type of monitoring	Definition	Frequency	Door to door	Bring Banks	Chutes	Collection points on each floor
defined period	forget.					
Claimed participation rates recorded through resident surveys	The number of households claiming to use a recycling system	6 monthly - annually	Yes	Yes	Yes	Yes
Reuse, recycling and composting rate (NI 192)	The percentage of waste produced that is reused, recycled or composted	Monthly and annually	Yes	Yes	Yes	Yes
Kilograms per household per week and per year	The amount of material recycled or disposed per household per year	Monthly and annually	Yes	Yes	Yes	Yes
Annual cost per household	The costs of delivering a scheme each year	Every 12 months (or more frequently if costs change regularly e.g. due to overtime payments)	Yes	Yes	Yes	Yes
Cost per tone	The cost per tonne of material collected	Every 12 months (or more frequently if costs change regularly e.g. due to overtime payments)	Yes	Yes	Yes	Yes
Capture rates	The proportion of a targeted material that has been collected (by the scheme) rather than disposed of. This requires waste audit data	Annually	Yes	Yes	Yes	Yes
Contamination rates	The percentage of material in the recycling / composting stream that is not targeted for collection and therefore is not recycled.	Dependent on collection type (separated/comingled/door to door etc). See M&E guidance for further information	Yes	Yes	Yes	Yes
Number of containers rejected due to contamination	Number of containers that contain unacceptable amounts of contamination	Monthly	Yes	Yes	Yes	Yes
Resident satisfaction with services (measured through resident surveys).	The percentage of residents reporting they are satisfied with a service as a percentage of the total surveyed	Annually – check internally as your Council may already conduct resident surveys.	Yes	Yes	Yes	Yes
Complaints / positive Feedback	Complaints and positive feedback from different sources e.g. caretakers, residents, call centres	Monthly	Yes	Yes	Yes	Yes
Issues and incidents e.g. missed collections, arson, vandalism of containers	The number of reported incidents associated with a recycling system	Weekly	Yes	Yes	Yes	Yes

1.2 Set-Out

For the Inverclyde Council tenemental pilot each household will receive a recycling leaflet explaining how to use the recycling service. Set-out monitoring can be conducted as the standard service provides each households with individual 240 litre recycling and residual bins. Participation monitoring cannot be conducted as the bins will not be marked to allow identification of householders. Please note it is

understood that some households share recycling bins; some areas are provided with blue sack collections.

The 'set out rate' is defined as the percentage of households that present the relevant container/materials for collection on any one collection day.

It should be noted that participation is not the same as set out. As a result, participation rates are not the same as set out rates.

Set-out rate = ("Number of households recorded as setting out on any day" ÷ "Number of households monitored on that day") x 100(%)

Set-out rate is normally calculated on each of the three collection days which then inform the participation rate.

An average set-out can be calculated by adding together the three set-out rates for each collection day and dividing the sum by three. Average set out rate can be used to calculate kg produced per household (kg/hh) using tonnage data.

'Participation rate' is defined as the percentage of households that present materials at least once across the three consecutive collection days – three collection cycles is the most appropriate period to monitor as many households don't put out their container each time or are away. 'Participation rate' is calculated according to the following formula:

Participation rate = ("Number of households recorded as setting out at least once in a defined period[34]" ÷ "Number of households monitored in that period") x 100(%)

Figure 1 - Graphical example of set out and participation rate calculations[35]

Heath Terrace	No. 1	No. 3	No. 5	No. 7	No. 9	Set out
Collection 1	✓	✓	✗	✓		3/5 = 60%
Collection 2	✓	✗	✗	✓	✓	3/5 = 60%
Collection 3	✗	✓	✗	✗	✗	1/5 = 20%
Participation	✓	✓	✗	✓	✓	4/5 = 80%

Average set out 7/15 = 47%

When monitoring communication campaigns, the monitoring (i.e. three consecutive collections) should be completed just before the campaign starts, and should not be carried out again until one month after the campaign has finished. This allows for the campaign impact to be felt. Figure 2 gives some examples. Due to time constraints this monitoring regime will not be possible – see section 2.3 for the proposed timeline.

[34] Usually three consecutive collection days

[35] http://www.wrap.org.uk/sites/files/wrap/WRAP%20ME%20Guidance%20-%20CHP%205.pdf

Figure 2 - Timetable examples for monitoring communications campaigns

Weekly collections

Week	-3	-2	-1	Campaign	+1	+2	+3	+4	+5	+6	+7
Monitor?	✓	✓	✓						✓	✓	✓

Fortnightly collections

Week	-5	-3	-1	Campaign	+1	+2	+3	+4	+5	+7	+9
Monitor?	✓	✓	✓						✓	✓	✓

Monthly/four-weekly collections

Week	-12	-8	-4	Campaign	+4	+8	+12	+16
Monitor?	If possible	✓	✓			✓	✓	If possible

1.3 Fill level monitoring

For fill level monitoring, surveyors should accompany the normal collection crew on the normal collection day. For each block or site:

1. Note the number and size of each container for each material
2. Take a note of the fill level of each container (e.g. ¼, ½, ¾ or full)
3. Collect any additional information required e.g. contamination, instances of graffiti, missing signage, broken infrastructure, access issues, capacity issues etc.
4. Convert the fill level(s) of each material to a volume in m^3
5. Convert the volume of each material to a weight using, for example, WRAP's Material Bulk Densities Report[36]

An aggregated tonnage can then be derived for all addresses monitored.

It is assumed that all bins are 240 litres for all households in the Inverclyde Council pilot.

By conducting fill level monitoring on residual waste bins and converting volume to weight using WRAP conversion factors it would also be possible to derive an approximate recycling rate for the pilot area. It should be noted that estimating fill level for residual bins is less straightforward as waste is usually deposited in black bags and often comes in different shapes.

1.4 Contamination monitoring

Contamination can be monitored by conducting a visual check during the set-out and fill level monitoring exercise. Waste Aware Officers should take a note of a) whether or not contaminating materials are visible on the surface and b) the types of contaminating materials. Any materials known to be common contaminants can each be given a dedicated column on the data collection sheets. In this way it would be possible to state e.g.:

- The percentage of households where contamination was observed
- The percentage of households where no contamination was observed
- The percentage of households where food was a contaminant
- The percentage of households where black bag waste was a contaminant

The level of contamination may vary from household to household. In order to monitor improvement it may be necessary to use a more descriptive method whereby a code is recorded to describe the level of contamination (see Table 22 for details).

[36] http://www.wrap.org.uk/sites/files/wrap/Bulk%20Density%20Summary%20Report%20-%20Jan2010.pdf

Table 2 – Potential contamination codes to use

Classification	Quantity	Description
X	None	Only target materials observed.
S	Single	Only one article of contaminated material.
F	Few	More than one article but evidence of separation.
M	Many	No apparent attempt at material separation i.e. looks like residual waste.

2 Monitoring actions

2.1 Proposed monitoring regime

The suggestions in this document have been written in the assumption that each household will have its own bin but the bins will not have been allocated to individual households.

Table 3 shows the suggested monitoring actions and performance indicators that could be used for the pilot.

Table 3 – Proposed monitoring regime

Type of monitoring	Pre intervention	Post intervention	Unit of measurement
Set-out rate (including set out rate per block)	Yes	Yes	% of bins presented
Average volume yield per bin	Yes	Yes	Litres/bin/week, litres/setting out household/week
Average weight yield per household[37]	Yes	Yes	kg/bin/week, kg/setting out household/week
Contamination monitoring	Yes	Yes	% of presented bins: a) contaminant free b) contaminated with one item c) contaminated with a few items d) contaminated with many items
Recycling Rate (based on conducting additional fill level monitoring of residual bins)	Yes	Yes	% recycled

2.2 Number of households to survey

According to WRAP guidelines, a sample of at least 1,100 households is required for a standard participation survey in own-door properties. For any areas with fewer households all households should be included in the participation survey.

2.3 Timeline

It is understood that intervention is due to start in week commencing on 18th February. There is therefore limited time for pre-intervention monitoring – there will most likely be only one or two opportunities to measure set-out. It will therefore not be possible to conduct monitoring on three consecutive collection days prior to intervention. The calculation of a participation rate is also not possible as bins cannot be attributed to individual households.

Ideally, post intervention monitoring should commence one month after the end of the campaign and should continue for three consecutive collection days, however, this will not be possible for a project end date of 31st March.

[37] It is understood that the pilot area will not be served by a dedicated collection vehicle. Any weight measurement can only be derived using volume to weight conversion factors and this process is open to more error due to different co-mingled compositions and levels of contamination

Table 454 below outlines the recommended monitoring timeline. Both the recycling and residual bins should be monitored each week starting from Friday 1st February. If resources are available, Inverclyde Council may wish to conduct further monitoring following the project end date. In order to best evaluate the improvement in performance, this supplementary post-intervention monitoring should start on 12th April and take place over three consecutive collection cycles (i.e. Cycle 6 to Cycle 8 in Table 454 below).

Table 4 – Proposed monitoring timeline

Cycle	Recycling	Residual
Cycle 1	w/c 28/01/2013	w/c 21/01/2013
Cycle 2 (bins to be replaced during this cycle)	w/c 11/02/2013	w/c 04/02/2013
Cycle 3 (intervention ends at the end this cycle)	w/c 25/03/2013	w/c 18/03/2013
Cycle 4	w/c 11/03/2013	w/c 04/03/2013
Cycle 5	w/c 25/03/2013	w/c 18/04/2013
Cycle 6 (optional)	w/c 08/04/2013	w/c 01/04/2013
Cycle 7 (optional)	w/c 22/04/2013	w/c 15/04/2013
Cycle 8 (optional)	w/c 06/05/2013	w/c 29/05/2013

2.4 Data to be collected

Table 5 summarises the suggested data to be collected. It is also recommended to monitor the set-out and fill level of the residual bins in order to estimate recycling rates. Exact data collection requirements are discussed later in the document.

Table 5 – Information to be collected

Information to record	Blue	Residual
Flat number on any bins already marked by residents	Pre-intervention	Pre-intervention
Bins set-out	Yes	Yes
Fill level	Yes	Yes
Contamination level (coded)	Yes	No
Contaminating materials present	Yes	No
Additional comments	Yes	Yes

2.5 General roles and responsibilities

2.5.1 Presented bins

The Council Officers will record the required data during the collection round. It is recommended that two Officers share the monitoring duties as this allows for more information to be gathered in a short space of time. The monitors should walk just ahead of the collection crews in order to capture any bins set-out at the last minute, however, they should give themselves enough time to collect all the required information. Monitors should be aware of any gaps between addresses so that the collection vehicle doesn't have a chance to overtake.

2.5.2 Bins not presented

It is also recommended that a third Officer conducts a similar survey of the bins in the back courts which were not presented for uplift. Alternatively this can be conducted by the two Officers following the monitoring of set-out bins. This will give supplementary information about set-out and usage.

2.5.3 Bins not replaced

It is understood that, in some cases, bins are not returned to their normal back court position after they have been emptied. If this is a concern for the Council, it is recommended that surveyors return a few days after each collection day to conduct a follow up survey of bins still present at the kerbside. A blank survey sheet would be appropriate for this task. Alternatively, if the Council wishes to monitor the residual bin set-out, an extra column could be added to the data collection sheets to collect information regarding recycling bins presented on residual bin week, and vice versa.

2.5.4 Consistency

It is advised that the same Officers conduct the monitoring and evaluation throughout the whole trial – this will ensure consistent fill level and contamination assessments.

WRAP's guidelines on monitoring suggest that a protocol is developed for recording the data in order to avoid subjective judgements. The guidelines[38] recommend considering the following points:

- If a container is rejected because of contamination, is this counted as set out?
- If monitoring 'fullness', be clear on the interpretation of what this means.

[38] http://www.wrap.org.uk/sites/files/wrap/WRAP%20ME%20Guidance%20-%20CHP%205.pdf

- If there is more than one container per household, are these to be counted and noted?
- If a number of containers are grouped together there are ways in which to allocate them to households. Examples include:
    - Look for markers on the containers that identify them with a property;
    - If the containers are for a house in multiple occupation, use a similar system, starting at the bottom of the building and working up;
    - If a container is across two property boundaries, allocate it to the property that it is predominantly in; and
    - If there are many containers at a 'bulking point', first look for identifying markers and assign those to the indicated properties. Then assign the remaining containers to the houses nearest the bulking point.

2.6 Preparing Paperwork

When preparing the data collection sheets it is good practice to list the addresses in the same order as the collection crews normally travel and to leave enough spaces at the top of each page and at the back of the booklet to include addresses or streets not on the list.

It is also useful to visit the area in advance to check your address list and note any potential difficulties.

2.7 Instructions for Surveyors

2.7.1 Pre-Intervention Set-Out

Participation monitoring will not be possible as bins are unlikely to be identifiable as being from individual households. In this case the process outlined in Table 6 should be observed:

Table 613 – Set-out monitoring process for unmarked bins

- For each address/block rows will be provided in the data collection sheets which correspond to the number of bins - each row should correspond to an individual bin.
- For each presented recycling bin identified with a flat letter/number, enter the flat letter/number in one of the empty rows provided in the column 'Flat' and enter a '1' in the column marked 'Set-out'.
- For each presented blue bin that cannot be attributed to an individual flat, enter a '?' in one of the empty rows in the 'Flat' column and enter a '1' in the column marked 'Set-out'.
- For each address/block fill in the remaining empty rows in the 'Flat' column with '?' and enter a '0' in the column marked 'Set-out' to signify that these bins have not been presented.[39]
    - For any addresses where no bins have been presented it is essential to enter '0' in the data collection sheets (rather than leave blank). This allows the data analyst to know that the address has not been missed in the monitoring process.

[39] Some addresses may have less (and some more) than 6 bins each. The data recorded for bins not set out should therefore be checked on an address by address basis with regards to this information and amended where necessary.

- Please note in the '*Comments*' column if any bin receives an assisted lift. If the bin receives an assisted lift but has not been used please enter a '*0*' in the '*Set out*' column
- For any addresses/blocks not surveyed enter an 'E' in the 'Set-out' column in each individual flat row.
- If required, enter a '1' in the 'Wrong bin' column for each bin that has not been replaced from the previous week.
- If there are more than six bins presented at any address please use the empty space in the data sheets to record this information – remember to enter the address too.

Table 7 – Collection sheet example for unmarked bins

No.	Flat	Correct bin			Wrong bin	Contamination						Comments
		Set out	Size	Fill		Code	Black bag waste	P, P & P[40]	Glass	Nappies	Other	
1	B	1	1	1		X						
	D	1	1	3		M	1	1			1	Wood, child's toy
	?	1	2	4		F	1	1				
	?	1	1	5		S	1					
	?	0										
	?	0										
2	?	1	1	3		X						
	?	1	1	3		X						
	?	0										
	?	0										
	?	0										
	?	0										

2.7.2 Size and Fill Level

For all presented bins, under 'Size', enter the size of bin based on its size relative to a normal 240 litre bin. See Table 8 for details.

Table 8 – Data entry for bin sizes

Classification	Description
0.5	120 litres
0.6	140 litres
1	240 litres
1.5	360 litres

For all presented bins, under '*Fill*', enter the fill level of the contents of the bin as described in Table 9. In the subsequent volume calculations, recording '5' will suggest that the overflowing or side waste represents approximately a quarter of the volume of the bin – '5' should therefore not be entered if the lid is only slightly raised.

[40] Polythene, polystyrene and other packaging

(**NB** If surveyors are able to access back courts and monitor bins that have not been presented at the kerbside a fill level for each of the non-presented bins can also be recorded for supplementary information, however, this should be clearly marked so as not to be included in the set-out volume calculations.)

Table 9 – Fill level codes to use

Classification	Description
0	empty (or practically empty)
1	up to and including a quarter full
2	approximately half full
3	approximately three-quarters full
4	approximately full
5	overflowing, lid up or side waste

2.7.3 Contamination

For all presented bins, under '*Contamination*':

- Enter the level of contamination;
- For any contaminating materials visible on the surface enter a '1' in the relevant column;
    - Give any details of 'Other' contaminants in the 'Comments' column.

For all bins with visible contaminants, enter a '1' under each relevant contaminating material. Give any details of 'Other' contaminants in the 'Comments' column.

It is important that the contents of the bin are not moved to ensure a consistent approach - if one monitor looks deeper into than another the comparison will be unreliable. **Never touch the contents of the bin** – this is also a health and safety issue.

(**NB** If surveyors are able to access back courts and monitor bins that have not been presented at the kerbside the contamination details of the non-presented bins can also be recorded for supplementary information, however, this should be clearly marked so as not to be included in the set-out contamination calculations.)

Table 10 – Contamination codes to use

Classification	Quantity	Description
X	None	Only target materials observed.
S	Single	Only one article of contaminated material.
F	Few	More than one article but evidence of separation.
M	Many	No apparent attempt at material separation i.e. looks like residual waste.

It may be possible to record an estimated percentage of contamination. If estimated correctly this information can be used to roughly estimate the volume of contamination (in litres) and this can be useful when assessing the improvement in performance. Surveyors may therefore wish to collect this information **in addition to** the contamination code recommended by WRAP – this can be recorded either in the Comments column or in a newly created column.

3 Use of data

3.1 Quality control

It is very important to check the quality of the data after the first round of data collection and after the second round if problems are found. It is therefore easier to create separate data collection sheets for each collection day.

If more than one person is collecting data throughout the pilot it is good practice to check each other's work for quality and consistency.

3.2 Data entry

After the three collection cycles, enter the data into a spreadsheet or database.

'Set out' should be entered as '1' and 'not set out' as '0'. Properties marked 'E' for any or all of the collections should be deleted from the dataset.

Enter the bin size, fill level and contamination code data as recorded on your paper data collection sheet.

For individual material contamination enter a '1' if the contaminating material was present and '0' for bins that were presented and did not have any contaminants present. Leave the cell blank if the bin was not set out.

WRAP recommends undertaking a 10% check of the monitoring sheets against what has been entered in the spreadsheet. This should not be done by the same person who entered the data. If data input errors are found, then all the data must be checked.

For a pre/post evaluation of intervention, households that are not being monitored at both phases should be removed from the file – if not, there is a danger that they will be included in the analysis.

3.3 Spreadsheet calculations

3.3.1 Set-Out

Use the formulas in Figure 3 as guidelines to derive the set-out and participation rates.

Figure 3 – Spreadsheet calculations for set-out and participation[41]

	A	B	C	D	E
1	Property	Collection 1	Collection 2	Collection 3	Participant?
2	1 Heath Terrace	1	1	0	=IF(B2+C2+D2=0,0,1)
3	3 Heath Terrace	0	0	0	=IF(B3+C3+D3=0,0,1)
4	5 Heath Terrace	1	1	1	=IF(B4+C4+D4=0,0,1)
5	2 Heath Terrace	1	0	1	=IF(B5+C5+D5=0,0,1)
6	4 Heath Terrace	0	1	0	=IF(B6+C6+D6=0,0,1)
7					
8		Set out rates			Participation rate
9	Set out rate	=SUM(B2:B6) /COUNT(B2:B 6)*100	=SUM(C2:C6) /COUNT(C2:C 6)*100	=SUM(D2:D6)/ COUNT(D2:D6) *100	=SUM(E2:E6)/ COUNT(E2:E6)*100
10	Average set out rate	=SUM(B2:D6) /COUNT(B2:D 6)*100			

3.3.2 Contamination

A similar approach to the set-out calculation can be used for the individual contaminating materials (i.e. =SUM(xx:xx)/COUNT(xx:xx)*100), however, contaminated containers should be expressed as a percentage of those set out, rather than as a percentage of all the households in the pilot. By leaving the contaminating materials cells blank for those bins not set-out you will derive the correct rate e.g. '% of bins set out that contained nappies'.

Under the contamination code column you will need to calculate the percentage of each contamination level using the formulas (assuming the contamination code data is in column F in rows 2 to 52 and the set-out data is in column B in rows 2 to 52):

- % of set-out bins with no contamination =(COUNTIF(F2:F52,"X")/SUM(B2:B52))*100;
- % of set-out bins with a single contaminant =(COUNTIF(F2:F52,"S") / SUM(B2:B52))*100;
- % of set-out bins with a few contaminants =(COUNTIF(F2:F52,"F") / SUM(B2:B52))*100;
- % of set-out bins with a many contaminants =(COUNTIF(F2:F52,"M") / SUM(B2:B52))*100.

3.3.3 Fill Level , Volume and Weight

To calculate the volume and weight presented you will need to create a new column (say column I) and use the formulas (assuming the bin size data is in column G and fill level data is in column H, for rows 2 to 52):

- **Volume of recyclate (litres)** = SUM(I2:I52),
    - where I2 =IF(G2>0,240*G2*H2/4,0), I3 =IF(G3>0,240*G3*H3/4,0) etc.
- **Weight of recyclate (kg)** = (Volume of recyclate in litres x 53) ÷ 1000 [where '53' is the kg/m^3 volume to weight conversion factor of a co-mingled stream containing paper, card, cans and plastic bottles in a 240l bin from WRAP's Bulk Density Report – see the relevant excerpt in Table 1211 below.]

[41] http://www.wrap.org.uk/sites/files/wrap/WRAP%20ME%20Guidance%20-%20CHP%205.pdf

Table 11 – Bulk density of the co-mingled material[42]

Plastic bottles, news & pamphlets, cardboard and mixed cans			
Vehicle/container	**Rear end loader**	**240 litre wheeled bin (no compaction)**	**140 litre wheeled bin (no compaction)**
Data type	**Field work data: Material bulk density**	**Field work data: Material bulk density**	**Field work data: Material bulk density**
Mean, kg/m3	310	53	70
No. samples	21	191	57
Standard Deviation	53.9	27.2	32.5
Coefficient of Variance	0.2	0.5	0.5
95% Confidence Interval +/- kg/m3	23.1	3.9	8.4
Lowest value	186	14	17
Highest value	407	207	158

[42] http://www.wrap.org.uk/sites/files/wrap/Bulk%20Density%20Summary%20Report%20-%20Jan2010.pdf

5.7 Appendix 7 – Inverclyde Council Additional Communication Materials

A4 Posters


recycle for Inverclyde
How to recycle using your Blue Bins
1 Collect your materials for recycling
2 Wash and squash your cans, plastic containers and plastic bottles
3 Flatten your cardboard
4 Place your cans, paper, textiles, cardboard, plastic bottles and containers and food and drinks cartons into your blue recycling bins
5 Place your blue bins on the kerbside by 7am on your regular collection day
6 Please return your blue bins to the bin storage area
Please use your blue recycling bins located at your flat to recycle food tins and drinks cans, paper, textiles, cardboard, plastic bottles and containers and cardboard food and drinks cartons.
Blue recycling containers
ZERO WASTE SCOTLAND
Recycling Helpline 01475 715901
www.inverclyde.gov.uk
Inverclyde council

5.8 Appendix 8 – Renfrewshire Council Tenemental Monitoring Plan

Renfrewshire Council Tenemental Pilot Project Monitoring Plan

January 2013

Written by: Tim Reid (informed in part by WRAP Monitoring and Evaluation guidance[43], especially Chapters 5 & 8 and WRAP's Recycling Collections for Flats[44])

[43] http://www.wrap.org.uk/content/monitoring-and-evaluation-guidance
[44] http://www.wrap.org.uk/content/recycling-collections-flats-monitoring-evaluation

1 Monitoring options

1.1 Background

Zero Waste Scotland has identified an opportunity for individual Scottish Local Authorities to better understand their waste collections from tenements refreshing and updating the methods and materials used to communicate with householders in flats and tenements. A number of pilot projects have been approved to compare and contrast the effect of communication materials and messaging on the participation rate of households in these services and on the quantity and quality of recyclates from tenements and flats.

Renfrewshire Council's pilot project will focus on the following communication activities and monitor the capture and quality of materials pre- and post-intervention:

- Internal Communications: How to improve internal communications between Waste Services Strategy and Operations, and between the Waste Services Team and other relevant Council departments; and wider external agencies to deliver improved recycling performance in tenement properties;

- External communications: Explore the impact of the following communication activities: explanation letters; leaflets; personalised bin stickers; and a multi department approach to direct public communication.

This document outlines the methods which will be used to monitor the impact of communication materials against the stated outcomes.

In flatted properties performance monitoring is complicated by the difficulty of identifying households that participate in schemes where recyclate is bulk collected. It is usually only in door-to-door recycling schemes that is it possible to monitor direct participation, as recyclate is presented outside each individual address.

Table 1 shows the various monitoring methods available for recycling schemes in flatted properties. The most appropriate method will largely depend on the exact scheme type, existing data and available resources. In some cases it may be most beneficial to gauge performance using a number of indicators.

Table 114 – WRAP's Key Performance Indicators for monitoring recycling and food waste collection schemes from flats[45]

Type of monitoring	Definition	Frequency	Door to door	Bring Banks	Chutes	Collection points on each floor
Percentage of eligible households served	The percentage of eligible households that have received / have access to a recycling service (allows the progress of the roll out of a service to be monitored)	Monthly (during the roll out of a service)	Yes	Yes	Yes	Yes
Set out rates	The proportion of households that put out recycling or food waste on one collection opportunity	6 monthly - annually	Yes	No	No	No
Participation rates monitored through containers set out at least one in a	Participation rate is the proportion of households that take part at least once in the defined period. Participation rate is calculated over three collection opportunities because many households don't put out their container each time, normally because it isn't full or they	6 monthly - annually	Yes	No	No	No

[45] http://www.wrap.org.uk/sites/files/wrap/13a%20Performance%20Indicators.pdf

Type of monitoring	Definition	Frequency	Door to door	Bring Banks	Chutes	Collection points on each floor
defined period	forget.					
Claimed participation rates recorded through resident surveys	The number of households claiming to use a recycling system	6 monthly - annually	Yes	Yes	Yes	Yes
Reuse, recycling and composting rate (NI 192)	The percentage of waste produced that is reused, recycled or composted	Monthly and annually	Yes	Yes	Yes	Yes
Kilograms per household per week and per year	The amount of material recycled or disposed per household per year	Monthly and annually	Yes	Yes	Yes	Yes
Annual cost per household	The costs of delivering a scheme each year	Every 12 months (or more frequently if costs change regularly e.g. due to overtime payments)	Yes	Yes	Yes	Yes
Cost per tone	The cost per tonne of material collected	Every 12 months (or more frequently if costs change regularly e.g. due to overtime payments)	Yes	Yes	Yes	Yes
Capture rates	The proportion of a targeted material that has been collected (by the scheme) rather than disposed of. This requires waste audit data	Annually	Yes	Yes	Yes	Yes
Contamination rates	The percentage of material in the recycling / composting stream that is not targeted for collection and therefore is not recycled.	Dependent on collection type (separated/comingled/door to door etc). See M&E guidance for further information	Yes	Yes	Yes	Yes
Number of containers rejected due to contamination	Number of containers that contain unacceptable amounts of contamination	Monthly	Yes	Yes	Yes	Yes
Resident satisfaction with services (measured through resident surveys).	The percentage of residents reporting they are satisfied with a service as a percentage of the total surveyed	Annually – check internally as your Council may already conduct resident surveys.	Yes	Yes	Yes	Yes
Complaints / positive feedback	Complaints and positive feedback from different sources e.g. caretakers, residents, call centres	Monthly	Yes	Yes	Yes	Yes
Issues and incidents e.g. missed collections, arson, vandalism of containers	The number of reported incidents associated with a recycling system	Weekly	Yes	Yes	Yes	Yes

1.2 Set-out and participation

For the Renfrewshire Council tenement pilot each household will receive its own grey residual bin and blue recycling bin marked with individual flat numbers/letters. This will therefore allow for the monitoring to include participation monitoring at some stage in the process.

For a household to be defined as a participant it must present its recycling at least once in a defined period – this is usually three consecutive collection days. The 'set out rate' is defined as the percentage of households that present the relevant container/materials for collection on any one collection day.

It should be noted that participation is not the same as set out. As a result, participation rates are not the same as set out rates.

Set-out rate = ("Number of households recorded as setting out on any day" ÷ "Number of households monitored on that day") x 100(%)

Set-out rate is normally calculated on each of the three collection days which are monitored to derive the participation rate.

An average set-out can be calculated by adding together the three set-out rates for each collection day and dividing the sum by three. Average set out rate can be used to calculate kg produced per household (kg/hh) using tonnage data.

'Participation rate' is defined as the percentage of households that present materials at least once across the three consecutive collection days – three collection cycles is the most appropriate period to monitor as many households don't put out their container each time or are away. 'Participation rate' is calculated according to the following formula:

Participation rate = ("Number of households recorded as setting out at least once in a defined period[46]" ÷ "Number of households monitored in that period") x 100(%)

Figure 1 - **Graphical example of set out and participation rate calculations**[47]

Heath Terrace	No. 1	No. 3	No. 5	No. 7	No. 9	Set out
Collection 1	✓	✓	×	✓		3/5 = 60%
Collection 2	✓	×	×	✓	✓	3/5 = 60%
Collection 3	×	✓	×	×	×	1/5 = 20%
Participation	✓	✓	×	✓	✓	4/5 = 80%

Average set out 7/15 = 47%

When monitoring communication campaigns, the monitoring (i.e. three consecutive collections) should be completed just before the campaign starts, and should not be carried out again until one month after the campaign has finished. This allows for the campaign impact to be felt. Figure 2 gives some examples. Due to time constraints this monitoring regime will not be possible – see section 2.3 for the proposed timeline.

[46] Usually three consecutive collection days

[47] http://www.wrap.org.uk/sites/files/wrap/WRAP%20ME%20Guidance%20-%20CHP%205.pdf

Figure 2 - Timetable examples for monitoring communications campaigns

Weekly collections

Week	-3	-2	-1	Campaign	+1	+2	+3	+4	+5	+6	+7
Monitor?	✓	✓	✓						✓	✓	✓

Fortnightly collections

Week	-5	-3	-1	Campaign	+1	+2	+3	+4	+5	+7	+9
Monitor?	✓	✓	✓						✓	✓	✓

Monthly/four-weekly collections

Week	-12	-8	-4	Campaign	+4	+8	+12	+16
Monitor?	If possible	✓	✓			✓	✓	If possible

1.3 Fill level monitoring

For fill level monitoring, surveyors should accompany the normal collection crew on the normal collection day. For each block or site:

1. Note the number and size of each container for each material
2. Take a note of the fill level of each container (e.g. ¼, ½, ¾ or full)
3. Collect any additional information required e.g. contamination, instances of graffiti, missing signage, broken infrastructure, access issues, capacity issues etc.
4. Convert the fill level(s) of each material to a volume in m^3
5. Convert the volume of each material to a weight using, for example, WRAP's Material Bulk Densities Report[48]

An aggregated tonnage can then be derived for all addresses monitored.

It is assumed that all bins are 240 litres for all households in the Renfrewshire Council pilot.

By conducting fill level monitoring on residual waste bins and converting volume to weight using WRAP conversion factors it would also be possible to derive an approximate recycling rate for the pilot area. It should be noted that estimating fill level for residual bins is less straightforward as waste is usually deposited in black bags and often comes in different shapes.

1.4 Contamination monitoring

Contamination can be monitored by conducting a visual check during the set-out and fill level monitoring exercise. Waste Aware Officers should take a note of a) whether or not contaminating materials are visible on the surface and b) the types of contaminating materials. Any materials known to be common contaminants can each be given a dedicated column on the data collection sheets. In this way it would be possible to state e.g.:

- The percentage of households where contamination was observed
- The percentage of households where no contamination was observed
- The percentage of households where food was a contaminant
- The percentage of households where black bag waste was a contaminant

The level of contamination may vary from household to household. In order to monitor improvement it may be necessary to use a more descriptive method whereby a code is recorded to describe the level of contamination (see Table 2 for details)

[48] http://www.wrap.org.uk/sites/files/wrap/Bulk%20Density%20Summary%20Report%20-%20Jan2010.pdf

Table 2 – Potential contamination codes to use

Classification	Quantity	Description
X	None	Only target materials observed.
S	Single	Only one article of contaminated material.
F	Few	More than one article but evidence of separation.
M	Many	No apparent attempt at material separation i.e. looks like residual waste.

2 Monitoring actions

2.1 Proposed monitoring regime

The suggestions in this document have been written in the assumption that each household will have its own bin but the bins will not have been allocated to individual households until after the pre-intervention monitoring.

Table 3 shows the suggested monitoring actions and performance indicators that could be used for the pilot.

Table 315 – Proposed monitoring regime

Type of monitoring	Pre intervention	Post intervention	Unit of measurement
Set-out rate (including set out rate per block)	Yes	Yes	% of households presenting a bin (In the pre survey a more accurate description would be '% of bins presented')
Participation Rate	No	Yes	% of households presenting a bin at least once in a given period
Average volume yield per household	Yes	Yes	Litres/household/week, litres/setting out household/week, litres/participating household/week
Average weight yield per household[49]	Yes	Yes	kg/household/week, kg/setting out household/week, kg/participating household/week
Contamination monitoring	Yes	Yes	% of presented bins: a) contaminant free b) contaminated with one item c) contaminated with a few items d) contaminated with many items
Recycling Rate (based on conducting additional fill level monitoring of residual bins)	Yes	Yes	% recycled

2.2 Number of households to survey

According to WRAP guidelines, a sample of at least 1,100 households is required for a standard participation survey in own-door properties. For any areas with fewer households all households should be included in the participation survey. **All households in the pilot study should therefore be included in the monitoring and evaluation.**

[49] It is understood that the pilot area will not be served by a dedicated collection vehicle. Any weight measurement can only be derived using volume to weight conversion factors and this process is open to more error due to different co-mingled compositions and levels of contamination

2.3 Timeline

It is understood that intervention is due to take place on Sunday 17th February. There is therefore limited time for pre-intervention monitoring – there will most likely be only one or two opportunities to measure set-out. It will therefore not be possible to conduct monitoring on three consecutive collection days prior to intervention. (The calculation of a participation rate is also not possible in the pre-intervention survey as bins cannot be attributed to individual households.)

Ideally, post intervention monitoring should commence one month after the end of the campaign and should continue for three consecutive collection days, however, this will not be possible for a project end date of 31st March.

Table 454 below outlines the recommended monitoring timeline. Both the recycling and residual bins should be monitored each week starting from Sunday 3rd February. Following the installation of the new bins and the application of individual house numbers it should be possible to derive a participation rate on data collected from Cycle 2 to Cycle 4, however, any positive effect of the intervention is unlikely to have taken place by this point. It is, however, hoped that an improvement in service use will be seen in week on week improvements in set-out rate.

If resources are available, Renfrewshire Council may wish to conduct further monitoring following the project end date. In order to best evaluate the improvement in performance, post-intervention monitoring should start on 14th April and take place over three consecutive collection cycles (i.e. Cycle 6 to Cycle 8 in Table 454 below).

Table 4 – Proposed monitoring timeline

Cycle	Blue	Grey
Cycle 1 (bins to be replaced during this cycle)	3rd Feb	10th Feb
Cycle 2	17th Feb	24th Feb
Cycle 3 (intervention ends after this cycle)	3rd Mar	10th Mar
Cycle 4	17th Mar	24th Mar
Cycle 5 (optional)	31st Mar	7th Apr
Cycle 6 (optional)	14th Apr	21st Apr
Cycle 7 (optional)	28th Apr	5th May
Cycle 8 (optional)	12th May	19th May

2.4 Integration of new bins

Following the back court audit and replenishment of bins (to one bin per household) pre-intervention **monitoring should ideally not be carried out until households have been in possession of the new bins for at least one whole collection cycle**. If pre-intervention monitoring is conducted too soon after the installation of new bins (e.g. one week) the set-out and materials presented may not be representative of a full collection cycle and will not be directly comparable with any data collected post-intervention. This is also relevant to any residual waste bins being monitored.

2.5 Data to be collected

Table 55 summarises the suggested data to be collected. It is also recommended to monitor the set-out and fill level of the residual bins in order to estimate recycling rates. Exact data collection requirements are discussed later in the document.

Table 516 – Information to be collected

Information to record	Blue	Residual
Flat number on any bins already marked by residents	Pre-intervention	Pre-intervention
Bins set-out	Yes	Yes
Fill level	Yes	Yes
Contamination level (coded)	Yes	No
Contaminating materials present	Yes	No
Additional comments	Yes	Yes

2.6 General roles and responsibilities

2.6.1 Presented bins

The waste aware officers will record the required data during the collection round. It is recommended that two officers share the monitoring duties as this allows for more information to be gathered in a short space of time. The monitors should walk just ahead of the collection crews in order to capture any bins set-out at the last minute, however, they should give themselves enough time to collect all the required information. Monitors should be aware of any gaps between addresses so that the collection vehicle doesn't have a chance to overtake.

2.6.2 Bins not presented

It is also recommended that a third waste aware officer conducts a similar survey of the bins in the back courts which were not presented for uplift. Alternatively this can be conducted by the two waste aware officers following the monitoring of set-out bins. This will give supplementary information about set-out and usage.

2.6.3 Bins not replaced

It is understood that, in some cases, bins are not returned to their normal back court position after they have been emptied. If this is a concern for the Council, it is recommended that surveyors return a few days after each collection day to conduct a follow up survey of bins still present at the kerbside. A blank survey sheet would be appropriate for this task. Alternatively, if the Council wishes to monitor the residual bin set-out, an extra column could be added to the data collection sheets to collect information regarding blue bins presented on grey bin week, and vice versa.

2.6.4 Consistency

It is advised that the same waste aware officers conduct the monitoring and evaluation throughout the whole trial – this will ensure consistent fill level and contamination assessments.

WRAP's guidelines on monitoring suggest that a protocol is developed for recording the data in order to avoid subjective judgements. The guidelines[50] recommend considering the following points:

- If a container is rejected because of contamination, is this counted as set out?

[50] http://www.wrap.org.uk/sites/files/wrap/WRAP%20ME%20Guidance%20-%20CHP%205.pdf

- If monitoring 'fullness', be clear on the interpretation of what this means.
- If there is more than one container per household, are these to be counted and noted?
- If a number of containers are grouped together there are ways in which to allocate them to households. Examples include:
    - look for markers on the containers that identify them with a property;
    - if the containers are for a house in multiple occupation, use a similar system, starting at the bottom of the building and working up;
    - if a container is across two property boundaries, allocate it to the property that it is predominantly in; and
    - if there are many containers at a 'bulking point', first look for identifying markers and assign those to the indicated properties. Then assign the remaining containers to the houses nearest the bulking point.

2.7 Preparing paperwork

When preparing the data collection sheets it is good practice to list the addresses in the same order as the collection crews normally travel and to leave enough spaces at the top of each page and at the back of the booklet to include addresses or streets not on the list.

It is also useful to visit the area in advance to check your address list and note any potential difficulties.

2.8 Instructions for surveyors

2.8.1 Pre-intervention set-out (if house number decals have not yet been applied)

For participation monitoring prior to intervention individual bins may not be identifiable as being from individual households. In this case the following process should be observed (see also Table 6).

Table 6 – Set-out monitoring process for unmarked bins (prior to intervention)

- For each address/block rows will be provided in the data collection sheets which correspond to the number of bins - each row should correspond to an individual bin. This will be informed by the audit and replenish exercise.
- For each presented blue bin identified with a flat letter/number, enter the flat letter/number in one of the empty rows provided in the column 'Flat' and enter a '1' in the column marked 'Set-out'.
- For each presented blue bin that cannot be attributed to an individual flat, enter a '?' in one of the empty rows in the 'Flat' column and enter a '1' in the column marked 'Set-out'.
- For each address/block fill in the remaining empty rows in the 'Flat' column with '?' and enter a '0' in the column marked 'Set-out' to signify that these bins have not been presented.[51]
    - For any addresses where no bins have been presented it is essential to enter '0'

[51] It is understood from the bin audit that some addresses have less (and some more) than 6 bins each. The data recorded for bins not set out should therefore be checked on an address by address basis with regards to this information and amended where necessary.

in the data collection sheets (rather than leave blank). This allows the data analyst to know that the address has not been missed in the monitoring process.

- Please note in the '*Comments*' column if any bin receives an assisted lift. If the bin receives an assisted lift but has not been used please enter a '*0*' in the '*Set out*' column
- For any addresses/blocks not surveyed enter an 'E' in the 'Set-out' column in each individual flat row.
- If required, enter a '1' in the 'Wrong bin' column for each bin that has not been replaced from the previous week.
- If there are more than six bins presented at any address please use the empty space in the data sheets to record this information – remember to enter address too.

Table 7 – Collection sheet example for unmarked bins

No.	Flat	Correct bin			Wrong bin	Contamination						Comments
		Set out	Size	Fill		Code	Plastic bag	Black bag waste	Food	Nappies	Other	
1	B	1	1	1		X						
	D	1	1	3		M	1	1			1	Wood, child's toy
	?	1	2	4		F	1	1				
	?	1	1	5		S	1					
	?	0										
	?	0										
2	?	1	1	3		X						
	?	1	1	3		X						
	?	0										
	?	0										
	?	0										
	?	0										

2.8.2 Post-intervention set-out (and also pre-intervention if house number decals have already been applied)

Following the planned intervention each bin should be marked with an individual flat letter. In this case the following process should be observed (see also Table 898).

Table 8 – Set-out monitoring process for marked bins (post intervention)

- Each row in the data collection sheet will correspond to an individual bin/household
- For presented bins a '1' should be entered in the corresponding row. A '0' should be entered for any bins that have not been presented.
    - For any households where no bins have been presented it is essential to enter '0' in the data collection sheets (rather than leave blank). This allows the data analyst to know that the address has not been missed in the monitoring process.
- Please note in the '*Comments*' column if any bin receives an assisted lift. If the bin receives an assisted lift but has not been used please enter a '*0*' in the '*Set out*' column

- For any households not surveyed enter an 'E' in the 'Set-out' column.
- If required, enter a '1' in the 'Wrong bin' column for each bin that has not been replaced from the previous week.
- If there are more than six bins presented at any address please use the empty space in the data sheets to record this information – remember to enter address too.

Table 9 – Collection sheet example for bins marked with decals

No.	Flat	Correct bin			Wrong bin	Contamination						Comments
		Set out	Size	Fill		Code	Plastic bag	Black bag waste	Food	Nappies	Other	
1	A	1	1	3		M	1	1			1	Wood, child's toy
	B	0										
	C	1	2	4		F	1	1				
	D	0										
	E	1	1	5		S	1					
	F	1	1	1		X						
2	A	0										
	B	0										
	C	1	1	3		X						
	D	0										
	E	1	1	3		X						
	F	0										

2.8.3 Size and fill level

For all presented bins, under 'Size', enter the size of bin based on its size relative to a normal 240 litre bin. See Table 10 for details.

Table 1017 – Data entry for bin sizes

Classification	Description
0.5	120 litres
0.6	140 litres
1	240 litres
1.5	360 litres

For all presented bins, under '*Fill*', enter the fill level of the contents of the bin as described in Table 8. In the subsequent volume calculations, recording '5' will suggest that the overflowing or side waste represents approximately a quarter of the volume of the bin – '5' should therefore not be entered if the lid is only slightly raised.

(**NB** If surveyors are able to access back courts and monitor bins that have not been presented at the kerbside a fill level for each of the non-presented bins can also be recorded for supplementary information, however, this should be clearly marked so as not to be included in the set-out volume calculations.)

Table 11 – Fill level codes to use

Classification	Description
0	empty (or practically empty)
1	up to and including a quarter full
2	approximately half full
3	approximately three-quarters full
4	approximately full
5	overflowing, lid up or side waste

2.8.4 Contamination

For all presented bins, under '*Contamination*':

- Enter the level of contamination described in Table 8
- For any contaminating materials visible on the surface enter a '1' in the relevant column
    - Give any details of 'Other' contaminants in the 'Comments' column.

For all bins with visible contaminants, enter a '1' under each relevant contaminating material. Give any details of 'Other' contaminants in the 'Comments' column.

It is important that the contents of the bin are not moved to ensure a consistent approach - if one monitor looks deeper into than another the comparison will be unreliable. **Never touch the contents of the bin** – this is also a health and safety issue.

(**NB** If surveyors are able to access back courts and monitor bins that have not been presented at the kerbside the contamination details of the non-presented bins can also be recorded for supplementary information, however, this should be clearly marked so as not to be included in the set-out contamination calculations.)

Table 12 – Contamination codes to use

Classification	Quantity	Description
X	None	Only target materials observed.
S	Single	Only one article of contaminated material.
F	Few	More than one article but evidence of separation.
M	Many	No apparent attempt at material separation i.e. looks like residual waste.

It has been noted that previous contamination monitoring at Renfrewshire Council has involved recording an estimated percentage of contamination. If estimated correctly this information can be used to estimate the volume of contamination (in litres) and can be useful when assessing the improvement in performance. Surveyors may therefore wish to collect this additional information **in addition to** the contamination code recommended by WRAP – this can be recorded either in the Comments column or in a newly created column, say "% contamination".

3 Use of data

3.1 Quality control

It is very important to check the quality of the data after the first round of data collection and after the second round if problems are found. It is therefore easier to create separate data collection sheets for each collection day.

If more than one person is collecting data throughout the pilot it is good practice to check each other's work for quality and consistency.

3.2 Data entry

(After the three collection cycles), enter the data into Excel (or another spreadsheet package) or a database.

'Set out' should be entered as '1' and 'not set out' as '0'. Properties marked 'E' for any or all of the collections should be deleted from the dataset.

Enter the bin size, fill level and contamination code data as recorded on your paper data collection sheet.

For individual material contamination enter a '1' if the contaminating material was present and '0' for bins that were presented and did not have any contaminants present. Leave the cell blank if the bin was not set out.

WRAP recommends undertaking a 10% check of the monitoring sheets against what has been entered in the spreadsheet. This should not be done by the same person who entered the data. If data input errors are found, then all the data must be checked.

For participation monitoring, any households that have not been monitored on all three collection days should be excluded from the spreadsheet and no cells should be left blank.

For a pre/post evaluation of intervention, households that are not being monitored at both phases should be removed from the file – if not, there is a danger that they will be included in the analysis.

3.3 Spreadsheet calculations

3.3.1 Set-out and participation

Use the formulas in Figure 3 as guidelines to derive the set-out and participation rates.

Figure 3 – Spreadsheet calculations for set-out and participation[52]

	A	B	C	D	E
1	Property	Collection 1	Collection 2	Collection 3	Participant?
2	1 Heath Terrace	1	1	0	=IF(B2+C2+D2=0,0,1)
3	3 Heath Terrace	0	0	0	=IF(B3+C3+D3=0,0,1)
4	5 Heath Terrace	1	1	1	=IF(B4+C4+D4=0,0,1)
5	2 Heath Terrace	1	0	1	=IF(B5+C5+D5=0,0,1)
6	4 Heath Terrace	0	1	0	=IF(B6+C6+D6=0,0,1)
7					
8		Set out rates			Participation rate
9	Set out rate	=SUM(B2:B6) /COUNT(B2:B 6)*100	=SUM(C2:C6) /COUNT(C2:C 6)*100	=SUM(D2:D6)/ COUNT(D2:D6) *100	=SUM(E2:E6)/ COUNT(E2:E6)*100
10	Average set out rate	=SUM(B2:D6) /COUNT(B2:D 6)*100			

3.3.2 Contamination

A similar approach to the set-out calculation can be used for the individual contaminating materials (i.e. =SUM(xx:xx)/COUNT(xx:xx)*100), however, contaminated containers should be expressed as a percentage of those set out, rather than as a percentage of all the households in the pilot. By leaving the contaminating materials cells blank for those bins not set-out you will derive the correct rate e.g. '% of bins set out that contained nappies'.

Under the contamination code column you will need to calculate the percentage of each contamination level using the formulas (assuming the contamination code data is in column F in rows 2 to 52 and the set-out data is in column B in rows 2 to 52):

- % of set-out bins with no contamination =(COUNTIF(F2:F52,"X")/SUM(B2:B52))*100
- % of set-out bins with a single contaminant =(COUNTIF(F2:F52,"S") / SUM(B2:B52))*100
- % of set-out bins with a few contaminants =(COUNTIF(F2:F52,"F") / SUM(B2:B52))*100
- % of set-out bins with a many contaminants =(COUNTIF(F2:F52,"M") / SUM(B2:B52))*100

3.3.3 Fill level , volume and weight

To calculate the volume and weight presented you will need to create a new column (say column I) and use the formulas (assuming the bin size data is in column G and fill level data is in column H, for rows 2 to 52):

- **Volume of recyclate (litres)** = SUM(I2:I52),
    - where I2 =IF(G2>0,240*G2*H2/4,0), I3 =IF(G3>0,240*G3*H3/4,0) etc.

Weight of recyclate (kg) **= (Volume of recyclate in litres x 84) ÷ 1000 [where '84' is the kg/m³ volume to weight conversion factor of a co-mingled stream with glass in a 240l bin from WRAP's Bulk Density Report – see the relevant excerpt in**

[52] http://www.wrap.org.uk/sites/files/wrap/WRAP%20ME%20Guidance%20-%20CHP%205.pdf

- Table 13 below.]

4 Co-mingled: Plastic bottles, news & pams, cardboard, mixed cans and glass Plastic bottles, news & pams, cardboard, mixed cans and glass			
Vehicle/container	**Rear end loader**	**Rear end loader**	**240 litre wheeled bin**
Data type	**Field work data: Material bulk density**	**Self monitor data: Material bulk density**	**Field work data: Material bulk density**
Mean, kg/m3	405	413	84
No. samples	18	89	79
Standard Deviation	111.9	98.7	33.8
Coefficient of Variance	0.3	0.2	0.4
95% Confidence Interval +/- kg/m3	51.7	20.5	7.4
Lowest value	239	186	20
Highest value	758	724	171

Table 13 – Bulk density of the co-mingled material[53]

5 Co-mingled: Plastic bottles, news & pams, cardboard, mixed cans and glass Plastic bottles, news & pams, cardboard, mixed cans and glass			
Vehicle/container	**Rear end loader**	**Rear end loader**	**240 litre wheeled bin**
Data type	**Field work data: Material bulk density**	**Self monitor data: Material bulk density**	**Field work data: Material bulk density**
Mean, kg/m3	405	413	84
No. samples	18	89	79
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95% Confidence Interval +/- kg/m3	51.7	20.5	7.4
Lowest value	239	186	20
Highest value	758	724	171

[53] http://www.wrap.org.uk/sites/files/wrap/Bulk%20Density%20Summary%20Report%20-%20Jan2010.pdf

5.9 Appendix 9 - Renfrewshire Council Additional Communication Materials

Residual Bin Decal

Contamination Decal