

Implementation of best practice for the kerbside collection of biodegradable municipal waste

Tonbridge and Malling Borough Council: A Case Study in Best Practice

Summary Report for:

**Tonbridge and Malling Borough Council
&
WREN**



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Tonbridge & Malling Borough Council
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1.0 Background

Environmental problems associated with unsustainable waste disposal have resulted in greater pressure on local authorities to increase recycling rates and divert biodegradable municipal waste (BMW) from landfill. Each authority must demonstrate achievement against Statutory Performance Standards measured by Best Value Performance Indicators (BVPI's) for the percentage of household waste recycled and composted. Waste disposal authorities also have a duty to divert BMW from landfill through the Landfill Allowance Trading Scheme (LATS).

Tonbridge and Malling Borough Council (TMBC) covers an area in the west of Kent of 240 square kilometres. The borough has a population of 108,800 in 46,106 households and includes urban and rural areas. TMBC operate in partnership with Kent County Council (KCC) and other district councils in Kent to achieve increased rates of recycling and composting. TMBC's policy is detailed in the *Joint Kent Household Waste Strategy*¹ and addresses the principles of the waste hierarchy.

In July 2000 TMBC introduced a pilot alternate weekly collection (AWC) service including organic waste. After evaluation, this service was expanded with the aims of:

- Maximising the recycling rate through source-segregation.
- Optimising collection costs by using the same refuse collection vehicle (RCV) for residual and compostable waste.
- Minimising transport distance for both the raw material for composting and the finished product by locating the composting facilities on local farms capable of using all the compost produced
- Providing a long term sustainable end market for the compost by using it cost effectively in the production of food in Kent.

The service involves collection of residual waste in week one, and dry recyclables (mixed paper and cans) and organic waste in week two. Organic waste is collected in 240 litre wheeled bins. This replaced weekly collection of residual waste, fortnightly collection of dry recyclables, and no collection of garden waste or card. The pilot was introduced to 1,000 households. The reasons for AWC and for the pilot scheme were:

¹ A full copy of the strategy is available on line at www.kent.gov.uk/sp/wasteforum/home.htm

- Introduction of garden waste collection while continuing to collect residual waste every week may be seen as an additional disposal route. This results in an increase in the total waste, as householders dispose of garden waste which would otherwise have been composted or left in-situ. AWC of residual waste requires a degree of 'bin space economy' by the householder.
- AWC was new and there was no indication of how it would be received by residents. A pilot would be the best way to learn how to promote and administer the scheme.
- The cost of changing to AWC can have an impact on budgets for new bins and collection vehicles. Separate disposal arrangements must also be made.

Following a successful evaluation of the pilot it was proposed to increase the collection of organic waste to wider areas. However, changes to the Animal By-Products Regulations (ABPR) limited the choice of composting facilities to treat the waste. The impact of these amendments resulted in delays to service expansion and the removal of kitchen waste as a permitted material in the green wheeled bin. In September 2004 the AWC service was expanded to a further 5,000 properties. In 2005 the service was expanded by 12,000 properties bringing the total number of households with AWC to 18,000 (40 % of the borough). TMBC plan to expand to 30,000 properties by September 2006. Further expansion has not been approved but it is estimated that it is possible to expand to around 40,000 properties.

In areas provided with AWC, recycling and composting performance has been improved to 51.8%, residual waste has been reduced by 34% and public satisfaction with the service is 90%. The success of the scheme has been recognized by the Office of the Deputy Prime Minister (ODPM) in their guide '*Organisational Development Resource Document for Local Government*'² with particular focus on the communication and community engagement associated with the service.

2.0 Methodology

2.1 Best practice review

TMBC were keen to ensure that their actions represented best practice. ORA, therefore carried out a review of best practice guides (see full report for list of guides reviewed). Principles were identified and categorised, and actions taken by TMBC were assessed. Sixty

² Full report available on line at: www.odpm.gov.uk/embedded_object.asp?id=1161293

two applicable best practice principles were identified. TMBC have addressed fifty nine of these actions.

2.2 Waste audits

To quantify the effects of the AWC service, four waste audits were carried out by ORA with the objectives being:

- to provide baseline data against which to measure changes resulting from the introduction of AWC of green waste, dry recyclables and residual waste
- to measure activity in unchanged areas
- to assess waste disposal activity in the pilot area over a longer period of time
- to identify areas where improvements could be made to service performance

Each audit involved collection from approximately 50 participating households per day. Collections were made of residual waste, garden waste and dry recyclables. The waste was sorted and weighed to determine the quantity of each material present. The audits were conducted at the same time of year.

In addition, ORA used the results of the waste audits along with the results of other performance monitoring to assess the success of the AWC service in relation to diversion of waste from landfill to recycling or composting. This is summarised in Section 3.

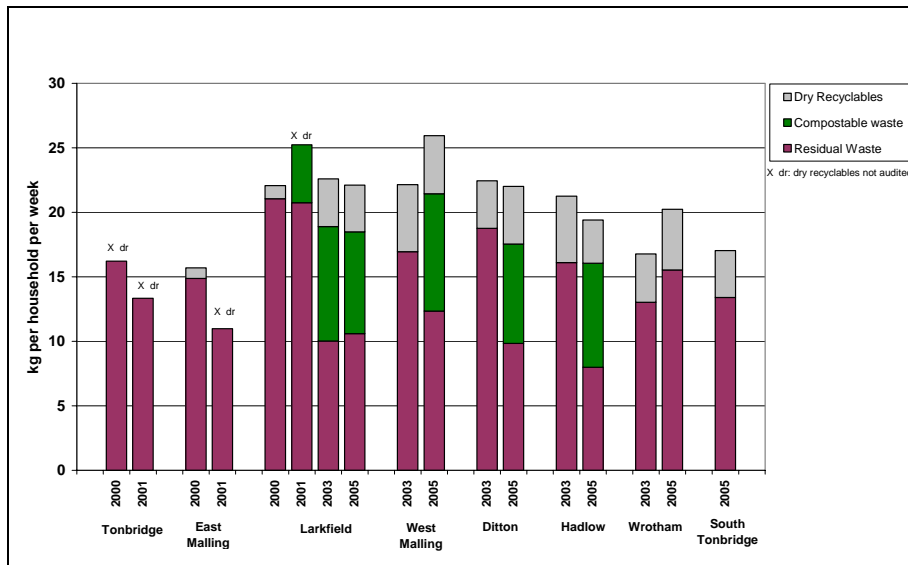
3.0 Service Performance

The composting and recycling rates for areas that receive the AWC service are substantially increased to 54% when compared to the borough as a whole. In 2003-2004 TMBC achieved a recycling and composting rate of 16.82% in comparison to the BVPI target of 20%. In 2004-2005 the recycling and composting rate has been increased to 18.05%.

3.1 Total waste arisings

In areas provided with AWC the average decrease in the weight of the residual waste is 6.3kg/hh/wk which is approximately 34%. This is demonstrated in Figure 1.

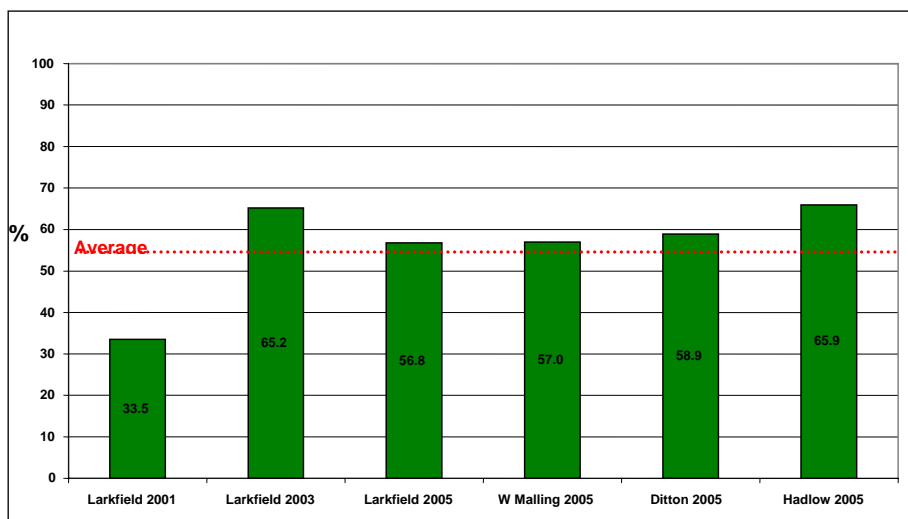
Figure 1: Total waste arisings



3.2 Source segregated garden waste collection

The capture rate of compostable waste in areas provided with AWC is very high, compared with other schemes evaluated by ORA, with an average of 56% and is demonstrated in Figure 2. There is a limited amount of garden waste and card remaining in the residual stream indicating that a high proportion of BMW is being diverted from landfill. An effort by TMBC to raise awareness of the service and increase capture rate would result in increased rates of composting.

Figure 2: Capture rate for compostable waste



3.3 Source segregated cardboard collection

In areas where cardboard is separately collected there is still a proportion in the residual bin. An effort to increase the capture rate would result in increased rates of composting.

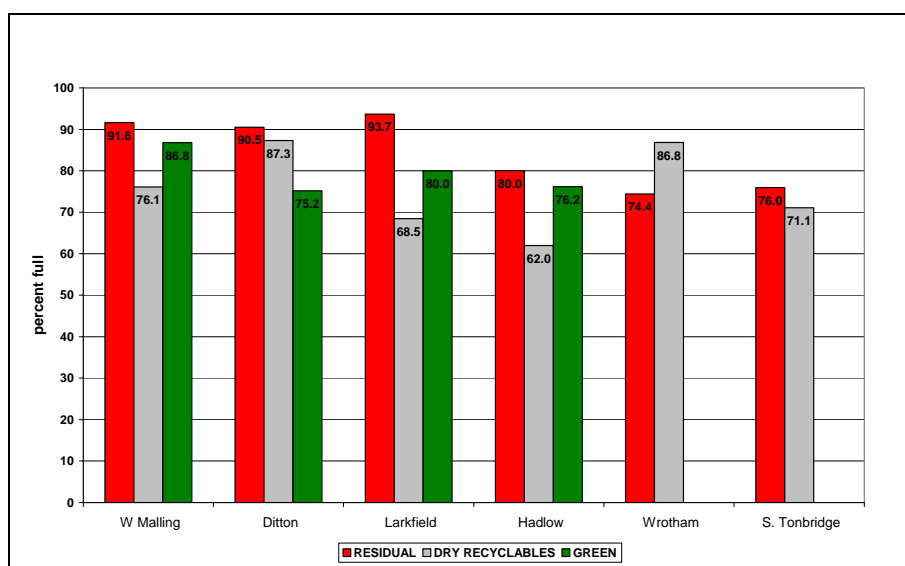
3.4 Source segregated dry recyclable collection

The average percentage of targeted recyclable material captured by the kerbside collection is 71.5% in those areas provided with AWC. There is a small amount remaining in the residual bin. TMBC should attempt to capture a higher proportion of the paper and metal in the residual bin which would increase the proportion of waste being diverted from landfill.

3.5 Rate of bin filling

During the most recent waste audit a record was kept of the rates of bin filling (i.e. how full the bins were in percentage terms). The average results from each area are demonstrated in Figure 10.

Figure 3: Bin Fill Rates



The chart demonstrates that on average the majority of the bins used, whether for residual recyclable or organic waste, are not overfilled and have spare capacity. Even with AWC the residual bin is not overfilled on average although the fill rates are higher than those areas without AWC.

4.0 Implementation of Best Practice

This section summarises the principles considered to be best practice associated with the implementation of recyclable collection schemes, and identifies the actions taken by TMBC in relation to their AWC service.

4.1 Planning

4.1.1 Best Practicable Environmental Option (BPEO)

It is recommended that the **BPEO process is used** when considering the relative merits of a waste management system. Identification of the BPEO involves assessment of the cost and benefits of alternative courses of action and is defined³ as:

"the outcome of a systematic consultative and decision making procedure which emphasises the protection and conservation of the environment across land, air and water. The BPEO procedure establishes for a given set of objectives, the option that provides the most benefits or the least damage to the environment, as a whole, at acceptable cost, in the long term and short term".

TMBC used the principles of BPEO in all stages of planning for recyclable collection services. In 2000 TMBC produced a report for the Environmental Health Committee⁴ evaluating options for collection and disposal of garden waste. The report identified home composting as the most sustainable means of disposal, but acknowledged that take up would be restricted and was unlikely to have enough of an impact on BMW diversion to meet targets. Other options were analysed giving consideration to:

- financial impact (including vehicles and other resources necessary)
- environmental factors (including diversion from landfill, and air pollution)
- potential effectiveness (including coverage and take up rate)

TMBC determined that AWC would offer the most significant revenue savings, least environmental impact, and best results for coverage, diversion of BMW and recycling/composting performance. An initial pilot was proposed to demonstrate effectiveness and provide the opportunity to change the service dependant upon public response.

4.1.2 Proximity Principle

Best practice should include **consideration of the proximity principle**. This is the minimisation of transport distances (and thus economic and environmental cost) by situating waste management facilities close to the waste source.

When considering treatment options, TMBC applied the proximity principle. TMBC acknowledge the proposed incinerator to be built in the borough, yet note that in

³ Defined by the Royal Commission on Environmental Pollution

⁴ Full Report: 'Environmental Health Committee Report of Director of Health and Housing – 3rd April 2000' available from TMBC on request.

environmental terms it is preferable to consider composting. At the time it was deemed that on-farm treatment would be the preferred option with the end product being used on the farm itself. The farms would be located close to the waste source and the end user would be an integral part of the process. Since the introduction of the service in 2000, changes to the ABPR have impacted on the types of wastes suitable for treatment on-farm. TMBC have reviewed the options available and plan to provide an in-vessel composting (IVC) facility within the borough by the end of 2006.

4.1.3 Stakeholder Consultation and Feasibility

When planning a waste collection service it is best practice to **consult all stakeholders as early as possible and to ensure full member support**. TMBC gained member support through committee reports whilst residents were consulted via public meetings and distribution of leaflets.

It is best practice to **assess the suitability of collection methods through a feasibility study, waste audit, cost modelling and a pilot scheme**. TMBC carried out all of these activities.

4.1.4 Area Specific Factors

Best practice guidance recommends that **consideration is given to factors which may impact on the success of the service including area specific characteristics and socio-demographic factors** including type of housing, narrow streets and areas of high transient population. TMBC have considered these issues and addressed them individually.

It is recommended that **consideration is given to the time of year appropriate for the introduction of a new service**. This is particularly true for AWC of biodegradable waste where there may be issues regarding odours and flies. TMBC decided that the AWC service would start in spring, when volumes of green waste are increasing and autumn (when adequate staff resources are available again having spent several months concentrating on assisting residents with the initial spring implementation).

4.2 Waste minimisation

It is best practice to **encourage waste reduction at source** through promotion of home composting and waste minimisation.

The 'War on Waste' campaign⁵ is a borough wide initiative focusing on waste reduction. It advises residents to buy products made from recycled/ recyclable materials. It addresses reuse

⁵ More information can be found online at <http://www.kent.gov.uk/sp/waronwaste/home.html>

by promoting re-usable products and considering whether a product can be repaired rather than thrown away. TMBC have promoted waste minimisation through the following actions:

- provision of 10,090 subsidised compost bins to residents.
- encouraging residents to register with the Mailing Preference Service to reduce the amount of junk mail received.
- encouraging residents to dispose of materials not included in the kerbside collections at household waste recycling centre's or bring sites.
- promoting Oxfam banks for collection of old books, CDs and tapes which are sold in their shops.

TMBC anticipated that AWC would encourage waste minimisation. Householders tend to utilise as much collection capacity as is provided. AWC limits weekly capacity meaning that residents are more likely to separate recyclable and compostable material to save space in the residual bin, which should result in a reduction in total waste arisings.

4.3 Communication

The success of recyclable collections is heavily dependent upon the effectiveness of communication. It is best practice to **engage with residents as early in the process as possible** to ensure understanding and gain support. **Information should be available to all residents, in different formats on request. Resources should be made available to communicate effectively**, especially at implementation stage. It is recommended that a dedicated **helpline** be provided to residents affected by changes.

TMBC have used a variety of communication methods. All information is available in different formats and languages, and includes a video available to residents. At each stage of implementation TMBC invited local media to discuss the service with their Director of Environmental Health. This was a way of pre-empting adverse publicity, answering questions and providing detailed information.

Best practice recommends that **new collection services are branded to allow instant recognition and continuity**. TMBC have branded all literature for the organic waste collection service with colour images showing the types of waste which can be collected (as seen on the right). This is an effective way of enhancing communication material and providing information.



It is best practice to provide **feedback to residents throughout the duration of the service** for motivation and to provide information. TMBC provide information to residents through biannual newsletters which invite comment and provide feedback.

The positive way in which TMBC have approached public liaison and communication has been recognised by the ODPM in their *Organisational Development Resource Document for Local Government*⁶. The report puts the success of the garden waste collection service down to *an inclusive approach to problem solving and encouraging discussion*. It states that *the scheme was well communicated to the community with TMBC seeking feedback and feeding changes back to the public*. It considers that the scheme was *an environmental success and readily accepted by the public. It engaged the community over a three-month period, with a clear game plan and timely communications*.

4.4 Partnership working

DEFRA encourage **partnership working between local authorities** and it is considered best practice as a means of:

- sharing knowledge
- demonstrating best practice
- making cost savings
- providing procurement opportunities

TMBC work in partnership with other authorities in Kent. Waste management objectives are defined in the *Kent Household Waste Strategy*. The authorities are committed to using funds cost effectively, addressing the waste hierarchy, exceeding targets and exploring innovative methods for managing household waste. The development of treatment facilities to serve multiple authorities has been achieved with the proposed IVC facility likely to treat waste from TMBC and Tunbridge Wells. A profit sharing agreement is in place between TMBC and KCC where savings generated by diversion of waste from landfill are divided between the two authorities and invested in improving recycling services.

4.5 Health and safety

It is best practice that **appropriate health and safety issues are identified and that adequate training is given to personnel involved in the collection of waste**. Areas of

⁶ Full document available online at: www.odpm.gov.uk/embedded_object.asp?id=1161293

training specific to waste collection are manual handling, and operation of the tail lift on the refuse vehicle. TMBC have ensured that all appropriate staff have been trained in these areas. When considering AWC it was suspected that there may be an issue regarding the generation of particulate matter from the loose garden waste. TMBC requested an independent review including a risk assessment. The review concluded that there was no significant risk and as such TMBC took no further action. An additional issue is the need for collection staff to open the garden waste bins and investigate whether there is any contamination. As such, collection staff have been issued with extra long gloves to protect their hands.

4.6 Employee education and training

To ensure that performance of the waste collection service is maximised, it is best practice to ensure that **all those involved in the service are educated through training and development.**

TMBC provide training and updates to collection crews along with one-to-one contact during the implementation stages of schemes. Administration staff receive information and training at each stage of implementation to ensure that they are best equipped to handle queries. Council members are informed on the performance of the service through reports and evaluation against pre-determined criteria.

4.7 Policies and procedures

It is best practice to provide **procedures and to review them for appropriateness as required.** TMBC have produced various procedures which are regularly reviewed including assisted waste collection, bin replacement, side waste, bin overfilling, and complaints.

A procedure specific to the AWC of garden waste is contamination. Contamination can result in whole vehicle loads being rejected for composting and having to be treated at landfill sites. This could have an effect on performance against BVPI targets. TMBC have instructed collection crews to inspect the contents of the bin for obvious contamination. If a small amount of contamination is present then it is removed, the bin is emptied, and the contaminating material is left along with an explanatory note. If there is a high degree of contamination or it is hard to remove, the bin is left and information provided to the resident.

4.8 Operation and management

It is best practice to **monitor success of schemes in relation to performance objectives and to identify areas where improvement can be made.** Pre-defined performance objectives should be identified.

TMBC monitor collection services for diversion and capture rates. However, the participation rate associated with the services has not been accurately measured. Several key criteria have been identified on which the success of the service is assessed prior to expansion. These are:

- Financial
- Environmental
- Operational
- Popularity

TMBC have demonstrated performance to justify expansion of the service. Waste audits have been carried out prior to expansion of the AWC service to confirm performance and to provide base data on which to assess success in new areas.

TMBC carried out a survey of resident's opinions of the AWC service after the initial pilot to assess whether or not to expand. The results demonstrated that 94% of residents agreed with the recycling activities, and a significant number believed that the service encouraged more recycling and composting. As a result it was decided to progress with implementation of AWC to the wider borough.

Once a service is implemented, it is **best practice that the council identify all the resources necessary to ensure long term success**. This may include recruitment, training, monitoring and IT systems.

TMBC have demonstrated strategic planning through the recruitment of additional staff including a waste inspector and administration officer at the implementation stage. Regular training has been provided to ensure that employees are fully qualified to maximise success of the scheme.

5.0 Future Scenarios

Table 1 demonstrates the tonnage of various recyclable and compostable materials which could be diverted away from landfill under different scenarios of participation and capture rate:

Table 1: BVPI performance modelling

Properties with AWC	30,000		40,000			40,000	
			Variation in participation levels			Variation in capture rates	
Participation rate	70	90	70	80	90	80	80
Capture rates (organics)	60	60	60	60	60	70	80
Capture rates (Dry Recyclables)	70	70	70	70	70	70	80
TONNAGE COLLECTED (Tonnes)							
Total Household Waste (1)	51,676	51,676	51,676	51,676	51,676	51,676	51,676
Separate Compostable collections (2)	7,098	9,126	9,464	10,816	12,168	10,816	10,816
Separate Kerbside Dry Recyclables (3)	5,710	5,710	5,710	5,710	5,710	5,710	5,710
Separate Bring sites (4)	3,867	3,867	3,867	3,867	3,867	3,867	3,867
Non Recyclable Waste (5)	35,001	32,973	32,635	31,283	29,931	31,283	31,283
ADDITIONAL TONNAGES AVAILABLE FROM NON RECYCLED WASTE (Tonnes)							
Option 2: Inclusion of kitchen waste (6)	957	1,230	1,275	1,458	1,640	1,701	1,944
Option 3: Inclusion of plastic, all 46106 households (7)	517	665	517	591	665	591	675
Option 4: Inclusion of Glass (8)	670	861	670	765	861	765	875
Option 5: Capture 50% paper from residual (9)	912	1,172	1,216	1,389	1,563	1,389	1,389
RECYCLING RATE - CURRENT SERVICES (%)							
BVPI 82a	18.5	18.5	18.5	18.5	18.5	18.5	18.5
BVPI 82 b	13.7	17.7	18.3	20.9	23.5	20.9	20.9
Recycling rate	32.3	36.2	36.8	39.5	42.1	39.5	39.5
RECYCLING RATE - CHANGES TO SERVICE (%)							
Option 2	34.1	38.6	39.3	42.3	45.3	42.8	43.2
Option 2+3	35.1	39.9	40.3	43.4	46.5	43.9	44.5
Option 2+3+4	36.4	41.5	41.6	44.9	48.2	45.4	46.2
Option 2+3+4+5	38.2	43.8	44.0	47.6	51.2	48.1	48.9
Option 2+ 5	35.9	40.8	41.7	45.0	48.3	45.4	45.9

Notes

1: Estimated 2005/2006 Total Waste collected

2: Estimated at 338 tonnes per annum per 1000 hh

3: Estimated at 3.66 kg/hh/wk

4: 2004/05 value. Assume no increase with expanding AWC

5: Total waste minus bring sites, compostable and recyclable collections

6: Assumes 1.46 kg/hh/wk

7: Assumes 0.44 kg/hh/wk all 46106 hh

8: Assumes 0.57kg hh/wk all 46106 hh

9: Assumes 1.67 kg hh/wk all 46106 hh

Assumptions are based on the results of the waste audits undertaken by ORA

With the current AWC service covering 30,000 properties by the end of 2006, TMBC can expect to achieve recycling and composting performance of around 32% based on current capture rates and estimated participation rates of 70%. However, if TMBC expand the service to all 40,000 households and collect kitchen waste once the IVC facility is operational, they could see performance of almost 40%.

6.0 Conclusions

- TMBC have applied 94% of the sixty two best practice principles identified in the implementation of their AWC service, which has had a direct result on high performance as measured by the key indicators below.
- TMBC have achieved a 34% reduction in the weight of residual waste arising in areas provided with AWC from an average of 18.2 kg/hh/wk to 11.9 kg/hh/wk.
- The increase in total waste from AWC areas is only 1.75% per year. This is substantially less than the national average of around 3%.
- Overall public satisfaction with waste collection services (BVPI 90a) was 90% in 2003-2004.
- The composting and recycling rates for AWC areas are substantially increased compared with the rest of the borough, to an average of 54%. In 2003-2004 TMBC achieved a recycling and composting rate of 16.8% in relation to the BVPI target of 20%. In 2004-2005 the recycling and composting rate has been increased to 18.1%. As an increasing number of households are provided with AWC BVPI performance will improve given the results demonstrated in the waste audits.
- In areas with AWC, TMBC estimate participation rates as high as 100% for the green waste collection and 80% for dry recyclable collection (compared to less than 50% for dry recyclable collection in areas with weekly collection of residual waste). This has been achieved through public consultation, phased introduction and effective communication. By limiting the frequency of collection, and therefore the weekly capacity of the residual bin available to the resident, the inclination is to segregate more materials for recycling or composting.
- With the present levels of promotional activity, the expectation is that 56.2% of the total compostable waste is source segregated when separate AWC is introduced. Of the compostable material remaining in the residual bin, 75% is kitchen waste and the 8-40mm fraction which is also likely to contain kitchen waste. Kitchen waste is not currently targeted by the green waste collection.

7.0 Recommendations

It is the opinion of ORA based on the findings in this report and the waste audit results that TMBC should undertake the following actions to achieve an even higher level of performance from their recyclable and compostable waste collection:

- Improve monitoring by measuring the participation rate associated with the services within the borough.
- Increase the capture rate of garden waste, cardboard, paper and metals. This could be achieved through a campaign highlighting materials that should be diverted from the residual waste to recycling or composting collections.
- Increase the number of households provided with recycling services by providing a bespoke service to those excluded for logistical reasons such as flats, or those with limited storage space and difficult access.
- Continue with expansion of the AWC of compostable (garden and card) waste to all 30,000 approved properties to achieve an increase in the recycling and composting rate to 32.3%.
- Extend provision of the AWC of compostable (garden and card) waste to all 40,000 properties to achieve an increase in the recycling and composting rate to 36.8%.
- Consider including kitchen waste in the organic waste collection once the in-vessel composting facility is available. The audit results indicate that there is scope for a composting and recycling rate of 34.1% should this waste stream be collected from 30,000 properties, and 39.3% if extended to 40,000 households.
- Promote the performance of the TMBC alternate week collection (AWC) scheme as an excellent example of the positive results which can be obtained as a result of implementing best practice with TMBC's neighbouring authorities and other collection, unitary and disposal authorities across the UK.