



Waste Management Plan Guidelines for New Multi Dwelling Developments

A Better Practice Resource for Western Australian
Local Government, Architects and Developers

Prepared for WALGA

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Operation

Management

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 - Increasing resource recovery
- Guiding Principles
 - Waste Hierarchy & Circular Economy
 - Liaison with Local Government

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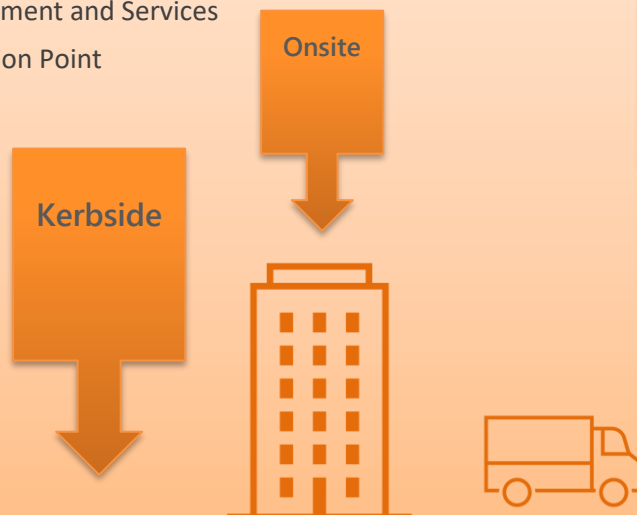
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Terms and Definitions

Term	Description/Definition
Bin	Specialised container used to store general waste, recyclables, food organics garden organics or other waste material.
Bin Store	A waste storage area used to store bins between collections. This may also be referred to as a bin room, compound or bin storage area.
Bulk Waste	Bulk waste includes old and broken furniture, white goods and large electronic items. Bulk waste can be a significant issue within developments with a high residential turnover where 'move in – move out' wastes require disposal.
Caretaker	Person(s) or party appointed by the managing agent to be responsible for the management of waste at the development. A caretaker may be a suitably qualified resident of the development or a third party.
Collection Point	The point where general waste, commingled recycling and food organics are emptied into collection vehicles.
Commercial Residential Development	Development made up of both residential and commercial components
Food Organic Garden Organic (FOGO)	Organic wastes including kitchen scraps and lawn clippings, small branches and garden debris.
General Waste	Also referred to as, rubbish, or landfill waste. General Waste is the remaining waste after other materials have been separated for recycling or recovery. General waste is collected in red or a dark green lidded bin. Hazardous and bulk wastes should not be included in the General Waste bin.
Hazardous waste	Household products that are corrosive, toxic, flammable or reactive if improperly used or disposed of. Can include batteries, fluorescent lamps, gas cylinders, chemicals, paint, cleaning products, medicines and flammable materials and liquids.
Multiple Dwelling Development	In this guide, the term is used to refer to residential developments of more than one dwelling. This ranges from dual occupancies and attached dwellings to high-rise residential unit buildings.
Onsite Collection	When the collection vehicle enters the property and services the development within the property boundary from a designated collection point.

Presentation point	Location/s in which bins are presented to the kerbside for collection.
Recycling	Material that is separated from general waste for the purpose of recycling. Materials include paper, cardboard, glass, plastics, aluminium and steel containers.
WALGA	Western Australia Local Government Association.
WARR Strategy	Waste Avoidance and Resource Recovery Strategy 2030
Waste generation rate	These are the average general waste, recycling and FOGO generation volumes associated with MDDs.
Waste Management Plan	Document that defines how waste will be managed for a proposed development. Requirements for Waste Management Plans may vary between Local Governments.

Abbreviations

Abbreviation	Description/Definition
CALD	Culturally and Linguistically Diverse
DA	Development Application
FOGO	Food Organics Garden Organics
LG	Local Government
MDD	Multiple Dwelling Development
MGB	Mobile Garbage Bin
MSW	Municipal Solid Waste
CDS	Container Deposit Scheme
CRD	Commercial and Residential Development
OHS	Occupational Health & Safety
WA	Western Australia
WMP	Waste Management Plan

How to use this Guide

This guideline discusses the key issues to be considered when designing a waste management system for Multiple Dwelling Developments (MDDs) that require planning approval from Local Governments (LGs).

Details are provided on calculating projected waste volumes, managing specific waste streams and determining the selection and design of waste infrastructure to ensure that it is safe, functional and aims to maximise the diversion of recyclables and organics.

This guideline covers a range of information including both design considerations and the ongoing operation of different MDDs. Local Government, developers and architects should use this guide in the development and assessment of Waste Management Plans (WMPs).

Document Structure

Section		Content
1	Context and Purpose	Background information, key drivers and guiding principles.
2	Waste Streams and Waste Generation	Requirements for projecting weekly waste volumes and an outline of the type of waste that may be generated through the MDDs operations.
3	Waste Storage and Design	Better practice design of waste storage facilities including general design considerations such as the internal transfer of waste, provision for additional waste streams, waste handling equipment, ongoing operational management and the importance of education to enhance resource recovery.
4	Waste Collection	How to incorporate better practice waste collection including early Local Government engagement, general considerations for kerbside and on-site collections and contingency planning.
A	Appendices	The appendices include technical information and basic Waste Management Plan (WMP) checklist and example questions for Local Governments to support putting the guide and its principles into practice.

1 Context and Purpose

This guideline is a tool to provide guidance to Local Government, developers, architects and other professionals to incorporate better practice design, operation and management of waste in new residential MDDs. The Guideline updates WALGA's Multiple Dwelling Development Waste Management Plan Guidelines.

In Western Australia (WA) there is limited consistent guidance and understanding of waste management issues in the design, development, operation and ongoing management of MDDs. The absence of consistent guidance in these types of developments can lead to a range of issues that affect the ongoing operations of the developments, which can include inadequate bin storage areas, difficulty in accessing collection points and illegal dumping of waste.

Waste management systems are essential services that need to be properly designed for in MDDs, not only to ensure the collection of waste is convenient and safe for residents and waste collection staff but is also flexible over the lifetime of the development. Therefore, it is critical that waste management is considered early in the building design process.

The aim of this guide is to ensure:

- Sufficient waste storage capacity has been catered for;
- Enough space has been provided to store waste between collections;
- The bin storage area is designed to encourage resource recovery;
- Sufficient space is allocated to allow safe collection of MGBs;
- Clearance width and heights for waste collection vehicles has been considered;
- There are minimal impacts on residential amenity and health;
- Waste collection systems are made easily accessible for all residents, including those with disabilities; and
- There is guidance on how to improve the performance of waste collection systems.

For a Commercial and Residential Development (CRD), the Commercial and Industrial Waste Management Plan Guidelines produced by WALGA should be used in conjunction to this guideline. Note, residential and commercial waste should be stored and managed separately in a development.

1.1 The Waste Management System Process

The below provides an overview of how the guideline fits into the overall development process and the various stages for a better practice approach to designing a functional waste management system.

Stage	Objective/Activity
1	Include waste management system requirements early in the design phase and contact the Local Government to determine specific requirements, refer APPENDIX B for example questions to present to the Local Government.
2	Consider better practice design approaches suitable for the development including the reduction or reuse of waste on or off-site.
3	Identify the scale and nature of development, including number of dwellings and convenience of access to waste services.
4	Determine waste volumes, infrastructure and equipment requirements. See APPENDIX A , APPENDIX D and APPENDIX E .
5	Determine the methodology for all internal waste movements, covering the point of generation (dwelling) to the point of disposal (bin storage area).
6	Establish a safe and efficient waste collection approach for all stakeholders.
7	Design the waste management system and infrastructure to meeting Local Government waste services/design requirements.
8	Determine ongoing maintenance, management requirements and outline responsibilities.
9	Prepare WMP using checklist (APPENDIX C). The checklist should be used as a guide to ensure the Local Government core waste management practices have been considered and incorporated into the design of the development and addressed in the WMP.
10	Submit WMP to support conditions of approval process (DA or Building Permit).

1.2 Key Drivers

The following sections are recognised as the key drivers for this document.

1.2.1 WARR Strategy

The WA Waste Authority published the Waste Avoidance and Resource Recovery Strategy 2030 (WARR Strategy) in February 2019. The WARR Strategy, outlines the direction required by the State to achieve better practice waste management. It sets ambitious targets for Municipal Solid Waste (MSW) material recovery in the Perth and Peel regions of 67% by 2025, increasing to 70% by 2030. A key strategic element to meet these targets is the introduction of a three-bin kerbside collection system, which includes the separation of FOGO from other waste categories. The intention of the strategy is to see all Perth and Peel Local Governments introduce a three-bin FOGO system for residents by 2025.

The WARR Strategy outlines the key role that Local Governments must play in achieving the strategy's objectives and targets. These include the provision of a suitable household waste collection service

and the delivery of education and awareness programs that seek to encourage behaviour change in the community.



The WARR Strategy highlights the changing nature of waste management and the need for Local Government, developers and architects to move beyond basic design requirements and look at how the design of MDDs can maximise material recovery both now and into the future.

1.2.2 Population and Planning

WA's population of approximately 2.6 million is projected to reach between 3.5 million by 2050, with most of the growth expected to occur in Perth and Peel regions. It is acknowledged by the Department of Planning, Lands and Heritage that our current method of development in these regions cannot be sustained, and that a shift in our land use planning is required. A key element of the approach is the control of urban sprawl by supporting infill development, particularly through the use of high density living around major activity centres and transport hubs¹.

Greater emphasis needs to be placed on the waste management systems supporting MDDs as their importance will only grow over time as residential density increases in the Perth and Peel Regions.

1.2.3 Increasing Resource Recovery

MDDs are often associated with lower resource recovery and diversion rates when compared to single dwellings. Low recycling participation and high contamination levels from MDDs in particular can significantly affect resource recovery performance for some Local Governments.

This could be caused by a number of factors including:

- Inadequate planning for waste management;
- Inconsistent systems and approaches;
- Insufficient ongoing management and education;
- Absence of regulatory support;

¹ Department of Planning, Lands and Heritage, Australia (2018)
https://www.dplh.wa.gov.au/getmedia/404a6895-f6ec-4829-87df-8de5b80075b8/FUT-PP-Perth_and_Peel_Sub_Region_March2018_v2

- Cost and economic considerations;
- Culturally and linguistically diverse residents;
- Lack of understanding of waste management technologies; and
- Difficulties associated with organics recovery.

This guideline provides information involving better practice for waste management to help address the above factors.

1.3 Guiding Principles

The following sections are recognised as the main guiding principles for this document.

1.3.1 Waste Hierarchy

The waste hierarchy is a widely accepted decision-making tool that assists with prioritising waste management practices in order of their general environmental desirability.

The key principle is to ensure waste is dealt with as high up the hierarchy as possible, with avoidance being the most favourable approach, followed by methods of recovery including reuse, reprocessing, and finally energy recovery. The least preferred option being disposal to landfill. Disposal typically recovers the least value from materials and provides the least environment benefit.



1.3.2 Circular Economy

The circular economy complements the waste hierarchy and aims to move away from the typical linear model where we take resources to make into products that we then use, and dispose of, to a circular model which keeps materials and energy circulating in the economy through life cycle thinking and resource efficiency efficiencies.

A circular economy is all about keeping resources in use for as long as possible and extracting the maximum value from them through the whole of their life and at the end of their life thereby getting as much value out of the products and materials as possible, thus changing the way we produce and use products thus reducing waste and impacts on the environment.

It is critical that effective waste management systems are carefully designed upfront in new MDDs to enable a circular economy approach. High density MDDs have the capability to generate large volumes of waste material that have the potential to be recovered. Waste management systems used at MDDs should maximise the ability to recover resources and reduce waste going to landfill.



1.3.3 Amenity, Health and the Public Realm

When waste management is not properly considered during the design phase, it has the potential for long term negative impacts on residents and Local Governments. It can result in nil or minimal bin storage areas, overflowing bins, illegally dumped waste, excessive bins presented in the public space, traffic impacts, costly waste servicing and undesirable noises and odours.

Local Governments have a responsibility to ensure waste services are undertaken in a sanitary manner and designed in line with relevant Waste and Health local laws. Due consideration is required during the design and planning phase to maximise the benefits to the community over the long term. Failure to do so may result in ongoing impacts to the residents and the Local Government.

1.3.4 Liaison with Local Government

Liaison with Local Government officers is crucial to the development of a better practice waste management systems for MDDs. Local Governments are responsible for the collection of municipal solid waste under the *Waste Avoidance and Resource Recovery Act 2007* (WARR Act) and play a significant role in waste management for the State.

Waste collection services vary between Local Governments and early consultation allows developers and architects to better understand Local Government collection service options, local waste planning requirements and what is expected as part of new developments.

The waste management system should be designed to accommodate Local Government waste planning requirements.

Refer **APPENDIX B** for some example questions which can be sent to Local Governments to get a better understanding of the services they may offer.



2 Waste Streams and Waste Generation

MDDs are likely to generate a range of waste materials including general waste, recycling, FOGO, household hazardous waste and bulky waste, refer Table 2-1.

The anticipated waste generation for general waste, recycling and FOGO within MDDs should be calculated using the figures in **APPENDIX A**.

Within a prepared WMP, there should be a summary of the anticipated waste generation and estimated quantity of mobile garbage bins (MGB). The number of MGBs required for general waste, recycling and FOGO should be clearly identified. The intended land uses, floor areas, dwelling sizes etc. should be indicated, to clearly show how the waste generation of the development was calculated, with any assumptions explained.

Table 2-1: Waste Material Types

Waste Stream	Description
General Waste	General waste is made up of non-hazardous materials that cannot be recovered or recycled through other available waste streams such as nappies or ceramics.
Recycling	Material that is separated from general waste for the purpose of recycling. Materials include paper, cardboard, glass, plastics, aluminium and steel containers.
FOGO	<p>FOGO can be categorised as a combination of organic materials including:</p> <ul style="list-style-type: none"> • Food scraps; • Clippings, pruning's & grass cuttings; • Branches; • Tea bags & coffee grinds; • Tissues & paper towels; and • Pet poo. <p>Depending on the Local Government, different services could be offered (e.g. garden organics only) therefore it is recommended the Local Government is consulted with directly.</p> <p>Due to the putrescible nature of food organics, it is better practice to have this waste stream collected a minimum of once per week.</p>
Household Hazardous Waste (HHW)	<p>This type of waste could be hazardous to the environment, flammable, toxic, explosive or corrosive and should not be combined with any other waste stream. If not disposed of correctly, HHW can pose a threat to human health and the environment.</p> <p>These could include items such as:</p> <ul style="list-style-type: none"> • Chemical waste; • Batteries;

	<ul style="list-style-type: none"> • Fluorescent lamps; and • Gas cylinders. <p>Refer Section 3.5.2.3 for more information.</p>
Bulky Waste	<p>Bulky wastes are items typically household wastes regarded as too large for the kerbside bin system such as sofas, fridges, television sets and mattresses.</p> <p>Bulky wastes can cause major issues with MDDs which experience high residential turnover where bulky wastes would need disposing of more regularly.</p> <p>Refer Section 3.5.2.1 for more information.</p>

3 Waste Storage and Design

A number of long-term problems can arise from inadequate consideration of waste storage in MDDs. To avoid these issues, it is vital to consider waste management in the design and planning of MDDs.

It is crucial to integrate waste management into the design process early in order to minimise any future improvements or retrofitting as this process can be difficult and costly for everyone involved.

3.1 Principles of Design

Design considerations and better practice management for MDDs are discussed in Table 3-1.

Table 3-1: Principles of Design and Better Practice Management

Design Objective/Consideration	Better Practice Design Management
Noise Management	<ul style="list-style-type: none"> • Locating bins and collection points away from residents will reduce the impact of noise during bin use and waste collection • Designing waste collection access to minimise waste collection vehicle reversing manoeuvres • Utilising appropriate surfacing materials to minimise noise for pathways and driveways that bins will be wheeled on • Designing appropriate insulation for chutes (if applicable)
Odour Management	<ul style="list-style-type: none"> • Having well-ventilated waste storage areas • Ventilation openings should be located in close proximity to the ceiling and protected against vermin and should not be connected to the same ventilation system supplying air to the dwellings • Be in accordance with the ventilation requirements of the Building Code of Australia and Australian Standard AS 1668.2 - The use of Ventilation and Air Conditioning in Buildings
Visual Amenity, Hygiene & Vermin Management	<ul style="list-style-type: none"> • Ensure that waste facilities are designed and managed to minimise impacts on residential amenity • Keep communal waste storage areas free of mess and dumped waste by assigning responsibility • Ensure bin lids are not left open • Locating drains to the sewer in an undercover area to prevent rainwater infiltration • Provide more regular cleaning (particularly in hotter periods) • Education to residents around utilising compostable bags/newspaper to contain FOGO material to prevent leakages
OHS Management	<ul style="list-style-type: none"> • Access to waste disposal and services are safe and convenient for all residents, building managers and collection contractors • Designed and operated in a way which prevents any potential risk of injury/illness associated with the collection and disposal

	<ul style="list-style-type: none"> Collection methods and systems must comply with relevant OHS Legislation - <i>Occupational Safety and Health Act 1984</i> and WorkSafe requirements Complete risk analysis to identify risks early in the design and allow modifications to eliminate or minimise likelihood of human injury or damage to property and equipment
Security	<ul style="list-style-type: none"> Maximise surveillance - ensuring clear sightlines by selecting appropriate landscaping and providing adequate lighting and installing CCTV Determining access control requirements to channel or restrict the movement of people - provide lockable storage areas Establish a sense of community ownership to discourage antisocial behaviours Manage spaces to ensure that space is appropriately utilised and well cared including repair or removal of vandalism and graffiti, replacing lighting as required and removal of litter
Affordability	<ul style="list-style-type: none"> Design allows for the collection of all waste streams in a cost-effective manner for residents Futureproofed design and construction to prevent costly alterations/retrofits
Environmental Sustainability	<ul style="list-style-type: none"> Waste systems are designed to maximise source separation of materials and encourage resource recovery Innovative and better practice waste management collection systems and technologies are incorporated Futureproofed design to accommodate potential changes in waste generation rates, materials collected and collection methods

3.2 Bin Storage Area Location

The provision and location of adequate bin storage areas is a key element of better practice systems. The siting of a bin storage area should give consideration to the various elements presented in Table 3-2.

Table 3-2: Bin Store Location Considerations

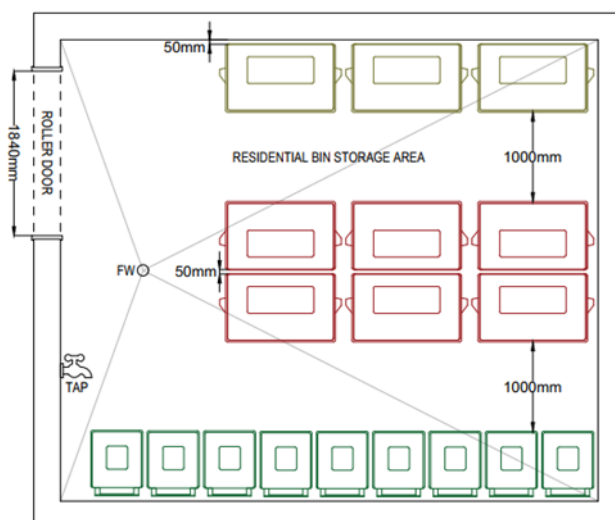
Location Consideration	Rationale
Placed in a convenient location for residents	<ul style="list-style-type: none"> Permit easy, direct and convenient access for the users of the facility Low participation rates in recycling most often occur if the system is not convenient. Providing occupiers with a readily accessible means of disposing of both waste and recycling in one convenient location, is likely to improve recycling rates and reduce resource loss to the general waste stream
Location in a high residential traffic area	<ul style="list-style-type: none"> Increases convenience Encourages good housekeeping

Location Consideration	Rationale
Located an appropriate distance from dwellings	<ul style="list-style-type: none"> Locating bin stores and collection points away from private residences will reduce the impact of noise as well as minimise any potential impacts from odours
Close to point of collection	<ul style="list-style-type: none"> Permit easy transfer of bins to the collection point (where required) Permit easy, direct and convenient access for collection service providers

3.3 Bin Storage Area Design

Poor designs can have serious implications for the waste management within MDDs as failure to provide adequate waste storage and collection can severely impact the servicing arrangements for Local Governments.

The bin storage area should be designed to provide, adequate room for manoeuvring bins for collection, cleaning of the storage area regularly and undertaking maintenance and servicing as required. It is undesirable to locate other services and utilities (such as electrical boards, gas meters or conduits) within bin storage areas, as it can clutter the area and increase the risk of damage to amenities during collection or cleaning.



Note, Local Governments may have design considerations specific to the Waste and Health local laws endorsed by the Local Government, therefore it is essential the Local Government is consulted early in the design phase.

Local Governments generally require the design of Bin Storage Areas to consider the information shown in Table 3-3.

Table 3-3: Bin Store Design Considerations

Consideration	Design Feature
Location/Size	<ul style="list-style-type: none"> • Bin Storage Area located behind the building setback line, not visible from the property boundary or areas trafficable by the public • Undercover where possible and designed not to permit stormwater to enter into the drain • Conveniently located for disposal of waste and recyclables by residents/cleaners/management • Limit double stacking of rows of bins. The bin store should ideally be large enough for the bins to sit next to each other, not behind each other as residents may not take responsibility for rotating bins. Alternatively, giving the caretaker/cleaners the responsibility for bin rotation of empty and full bins to ensure residents will always have access to forward facing bins for easy disposal of material • Consideration for people with disabilities, in accordance with the Disability Discrimination Act (1992)
Construction	<ul style="list-style-type: none"> • Constructed of brick, concrete, corrugated compressed fibre cement sheet or other material of suitable thickness • Where located outside, walls no less than 1.8m in height • Appropriate signage which demonstrates how to use the waste system and identifies any hazards or potential dangers, including those from the use of waste handling equipment. Signage should conform to the relevant Australian Standards (e.g. bin colours) and safety signs, pictorial guides and community languages should be used where appropriate.
Noise/Odour/Vermin	<ul style="list-style-type: none"> • Containing a smooth and impervious floor draining to the sewer • Provided with a tap for washing of bins and connected to an adequate supply of water • Ventilated in accordance with Australian Standard 1668.2 • Doors to be self-closing and vermin proof
Security	<ul style="list-style-type: none"> • Bins are reasonably secured from theft and vandalism • Bins screened from public view • Not readily accessible by the public
Collection/Movement	<ul style="list-style-type: none"> • Access point for collection is to be of suitable size for the size of the bins used and the collection method proposed • Adequate aisle/door widths for easy manoeuvring of bins in and out • The bin transfer ramp grades should not exceed 1:14 for MGBs <360L • The bin transfer ramp grades should not exceed 1:20 for MGBs 360L – 1,100L • The bin transfer ramp grades should not exceed 1:30 for bulk bins > 1,100L

3.4 Bin Storage Area Size

To determine the adequate size for a bin store, consideration should be given to the waste generation rates (**APPENDIX A**), the bin sizes to be utilised (**APPENDIX D**) and the frequencies of the collection service as determined by the Local Government.

Bin stores should be adequately sized to accommodate the required number of bins, at the designated collection frequency, with adequate room for residents and any other users of the waste system to easily access all bins and to allow bins to be easily moved around and serviced.

It is better practice to size bin storage areas with enough space to store at least one weeks' worth of waste. Increased collection frequencies should not reduce the need to provide adequate bin storage space. This is to ensure that there is sufficient capacity to store accumulated waste in a significant event such as a pandemic, natural disaster, fuel shortage or industrial action.

[\[link to online storage calculator\]](#)

3.5 Bin Storage Area Flexibility

It is crucial that the size of the bin store is flexible to enable changes to the waste management process as may be required in the future.

3.5.1 Kerbside Storage Expansion

The potential future uses and expansions of a MDD may affect waste generation rates, storage and equipment requirements and collection frequencies. In addition, the development may also have to adapt to the potential changes in Local Government waste services.

It is expected that Local Governments will be introducing MGBs for the separate collection of FOGO within MDDs in line with the State Government's WARR Strategy 2030. To be able to accommodate this change, additional space should be included in the bin store to allow for the change when it is implemented.



Flexibility can be integrated into the sizing of a bin store by incorporating the following:

- Additional spacing for future bins and waste equipment;

- Designing aisle widths and doorways greater than the minimum bin widths to allow for future changes in bin sizes. For example, installing double doors/roller door allows easy movement of a variety of bin sizes; and
- Sizing communal bin storage areas to allow for a potential increase in waste generation from the development or a change in allocated council services per dwelling.

3.5.2 Additional Waste Streams

Additional waste streams (bulky wastes and charity receptacles etc) should also be considered when determining the size of a bin storage area as these waste types cannot be placed into the standard MGB system (general waste, recycling or FOGO bins).

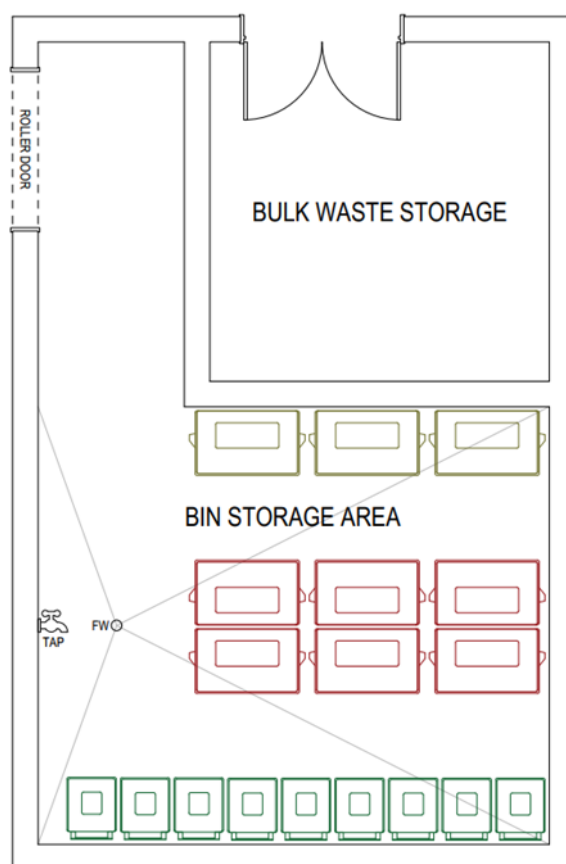
3.5.2.1 Bulk Waste Storage

Space should be allocated for temporary holding of bulky wastes not suitable for collection using the kerbside MGB system and can include any internal and external household items such as sofas, fridges, television sets, mattresses and outdoor lounge or patio furniture. This additional space should be provided to accommodate the bulky waste generated during tenancy moving periods in MDDs, which is typically higher than that of single use dwellings. Residents in MDDs are required to dispose of various unwanted household items on a regular basis and material must be stored onsite temporarily.

This is important to avoid illegal dumping of bulk waste and ensure items are not stored on the verge when not permitted, creating a hazard and impacting on amenity.



This space could be accommodated within the bin store or can be allocated as a separate storage area in close vicinity to the bin store and easily accessible by residents and specialty waste collectors. Bulky items may be collected by either independent waste contractors or the Local Government/their contractor. When allocating space for the storage of bulky items, consideration should be given to the intended method and frequency of collection, with less frequent collections requiring a larger storage area.



Once space is provided to store bulky wastes, there is the opportunity to encourage residents of the MDD to reuse/repurpose these available unwanted materials. This approach is in line with the Waste Hierarchy to ensure waste is dealt with as high up the hierarchy as possible, with avoidance being the most favourable approach, followed by methods of recovery and reuse.

The majority of Local Governments provide a bulk waste service once or twice per year to residents at single use dwellings, however whether this is provided to MDDs may differ between Local Governments. If it is provided to MDDs then the types of materials accepted and the collection service offered will need to be clarified with the Local Government.

3.5.2.2 *Speciality Waste Storage*

Sufficient space should be allowed for temporary storage of speciality wastes not suitable for existing kerbside MGBs to promote greater recovery of waste. This may include provision of storage for speciality wastes such as soft plastics, clothing, polystyrene and e-waste.

E-waste contains both hazardous materials (which can harm the environment and human health) and valuable materials which can be recovered. For both these reasons, there is potential that this waste material will be banned from landfill by 2024, and therefore consideration should be given to this possibility.



Specialty wastes should be collected in a designated area of a MDD and once sufficient volumes have been accumulated, they can be transported to an appropriate facility for disposal or redistributed to charity or local community groups (if available).

3.5.2.3 Household Hazardous Wastes


MDDs have the potential to generate a number of household hazardous wastes items (HHW) that cannot be placed into standard MGBs. If these items are not properly disposed of, they can cause harm to the environment and community.

MDD property/building managers in conjunction with the Local Government should provide information to residents about what HHW items are not appropriate for disposal in the kerbside bin system, and where these materials can be taken for correct disposal. Given the hazardous nature of these materials, no provisions should be made for the collection and temporary storage of these items internally.

Under WA's HHW Program, household hazardous waste can include chemical waste and other hazardous materials, such as batteries, fluorescent lamps and gas cylinders. HHW most likely to be generated by MDDs can include those shown in Table 3-4.



Table 3-4: HHW Materials

Common HHW Materials	
Batteries	
Light globes (compact fluorescent lamps and tubes)	
Aerosols (CFC-based, paints, lacquers, pesticides etc)	
Household chemicals (e.g. cleaning products)	
Expired fire extinguishers	
Engine coolants and glycols	

The HHW Program provides the WA community with safe HHW disposal alternatives. Residents can safely dispose of discarded household chemicals and hazardous materials for free at any of the HHW Permanent Facilities in WA. Note, residents do not need to be a member of the Local Government managing the HHW Facilities to be able to dispose of HHW.



HHW facilities throughout WA can be located using the below link:
<https://www.wastenet.net.au/programs/hhw.aspx>.

3.6 Internal Waste Movement and Design

To ensure dwellings are designed to encourage positive resource recovery behaviour and maximise diversion from landfill, internal bins should be available throughout the MDD for the source separation of waste streams (general waste, recycling and FOGO where applicable) within the dwelling and in common areas.

Any internal bins should be colour coded and labelled in accordance with Australian Standards (AS 4123). This specifies standard sizes and details the colour designations for bodies and lids of MBGs that relate to the type of materials they will be used for. This will assist residents, visitors and management to dispose of separate waste materials in the correct bins.

When preparing a WMP, it must include details on how waste will be transferred internally by residents from the point of generation to the point of disposal.

WASTE STREAM	LID COLOUR	EXAMPLE
 <p>GENERAL WASTE</p>		
 <p>RECYCLING</p>		
 <p>FOOD ORGANICS GARDEN ORGANICS</p>		

3.6.1 Residential Dwellings

Developers should aim to incorporate sufficient space within the kitchen, laundry room or other convenient location within the dwelling for the temporary storage of accumulated waste.



As part of a three bin FOGO service, Local Governments will typically provide residents with kitchen caddies to encourage the collection of food scrap waste. Therefore, consideration needs to be given

in the dwelling design to be able to accommodate a separate general waste and recycling bin and a kitchen caddy within the kitchen.



Ways to encourage recycling and minimise contamination within residential internal bins are discussed in Table 3-5.

Table 3-5: Residential Dwelling Design Considerations

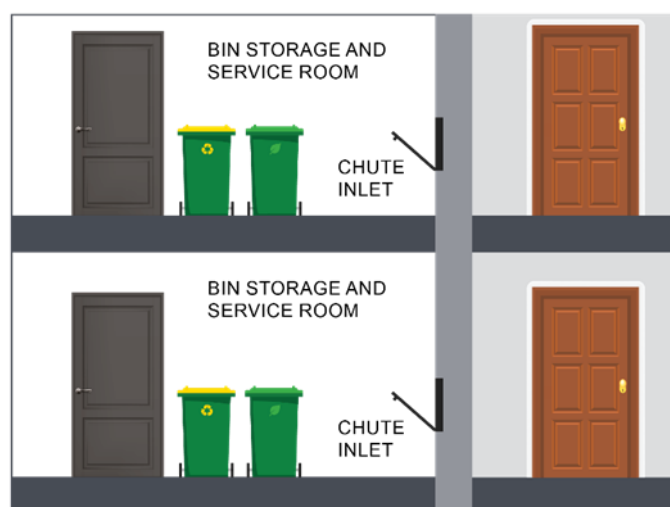
Consideration	Rationale/Action
Provision of adequate internal storage space within dwellings	<ul style="list-style-type: none"> Accommodate the temporary storage of at least 2 days' worth of general waste, organics (where applicable) and recycling Typically, within kitchen or laundry
Provision of reusable, robust containers	<ul style="list-style-type: none"> Assists residents in transporting recyclable materials from their dwelling to recycling bins to discourage plastic bags Use reusable, washable tote-bags instead
Encouraging a sense of bin ownership, responsibility and accountability	<ul style="list-style-type: none"> Numbering bins associated with the dwellings (where available)

Consideration	Rationale/Action
Providing adequate signage in public area	<ul style="list-style-type: none"> Educates residents about the location and use of the waste management system, including what materials are suitable for recycling

In MDDs residents are typically responsible for taking their waste directly to either:

1. A communal bin store, typically located on ground or basement level close to the collection location;
2. Waste chute system; or
3. Bin holding room situated in close proximity to residents (typical in larger MDDs).

For large MDDs, it is better practice to provide a bin holding room on each residential level for residents to deposit their waste. These bins would then be transported on a regular basis (typically daily) by the caretaker/building manager to the main bin store for consolidation. Due to the malodorous nature of wastes, the bin holding room and any lifts used to transport bins will need to be cleaned on a regular basis. For high density developments a service lift should be available with smooth washable surfaces to facilitate cleaning with a caretaker/building manager engaged to manage the system.



3.6.2 Common Areas

Internal bins should also be available throughout the MDD in all common spaces and amenity areas. These bins should be in line with what is provided in the residential dwelling (e.g. general waste, recycling and FOGO) so that the waste streams are consistent and can help reduce contamination.

Typical common areas found in large MDDs can include foyers, gyms, BBQ areas, communal dining spaces, lounges and rooftop terraces.

A strata manager/caretaker would be required to take the waste from these common areas directly to the communal bin storage area, waste chute system or bin holding room for consolidation.

3.6.3 Bins and Containers

APPENDIX D contains details of typical bin sizes that may be used by Local Governments. For MDDs, the bins for general waste, commingled recyclables and FOGO are typically provided by the Local Government or the Local Governments waste contractor. They are manufactured in a variety of standard sizes and are designed to be lifted and emptied by purpose-built waste collection vehicles.



MGBs should be fitted with permanent lids and conform with Australian Standard for Mobile Waste Containers (AS 4213). The standard MGB type used for MDD waste collections in Western Australia are typically referred to as ‘wheelie bins’ (incorporating 2 or 4 wheels) which are easy to manoeuvre. These MGB sizes typically range in size from 120L – 1,100L. Refer Table 3-6 for the better practice application of using different bin sizes.

Details of the size and quantity of the bins to be used must be provided within a WMP.

Table 3-6: Bin Sizes and Better Practice Consideration

Bin Size	Better Practice Consideration
< 360L	<ul style="list-style-type: none"> • Bins should not need to be wheeled more than 75m in all circumstances • For aged persons or persons with a disability, the distance should be limited to 50m • The bin transfer grade should not exceed 1:14 • Bins should not need to be wheeled oversteps (neither up nor down)
360L – 1,100L	<ul style="list-style-type: none"> • Bins should not be wheeled oversteps (neither up nor down) • Bins should not need to be wheeled more than 5m • The bin transfer grade should not exceed 1:20 • The use of a mechanical assisted carting (e.g. bin tug or trolley) should be considered
>1,100L (bulk bins)	<ul style="list-style-type: none"> • Manual manoeuvring of bulk bins should be avoided wherever possible. Where it cannot be avoided the bins should not need to be wheeled more than 3m • The bin transfer grade should not exceed 1:30

If MGBs have to be emptied into larger bulk bins/skips, equipment should be provided to reduce the need to manually lift and empty the bin. If this cannot be avoided, the bin storage area will need to incorporate sufficient space to locate and operate a bin lifting device. The bin lift should be fitted with safety features (e.g. safety cage) to prevent injury to operators and should be secured to prevent use by residents.

3.6.4 Waste Chutes

Waste chutes are large tubes that are used to move waste via gravity to a collection location and can be an efficient way to move waste in tall buildings. However, strong consideration should be given to their use to ensure they align with the guiding principles set out in Section 1.3. If chutes are intended in a MDD, a caretaker/building manager must be engaged to manage the system.

Refer Table 3-7 for a summary of strengths and limitations which can be associated with waste chutes.

Table 3-7: Waste Chutes Strengths & Weaknesses

Strengths	Limitations
User friendly, and lower cost than potential vacuum or manual collection of bins from bin stores	Can discourage source separation practices (e.g. recyclables/hazardous wastes could be put down general waste chute with little accountability)
Reduced requirement for cleaners/management to transfer bins from each floor to a communal waste room	Blockages – cardboard boxes or bulky waste items. Cardboard, paper and plastics that are flammable could easily become stuck in the chute and cause a fire hazard.
Reduces the need for bins and saves space with the construction of a service room in place of a bin holding room on each floor	Noise, odour issues, spillage and overflow. Waste tearing open bin-liners, resulting in food waste, oil and grease accumulating on the insides of the chute
Modern chutes systems could potentially be linked to a vacuum waste system where this is available	Chutes are mainly suitable for general waste and are not well suitable to transfer recyclables. The height/drop can result in the damage, or even destruction, of the recyclable material. Glass materials are one of the main concerns as it can smash at the bottom resulting in a lot of noise and potentially glass fragments being distributed on the bin storage area floor.
Minimises potential for waste leakage in communal areas	Depending on number of bins/design/location of bin store at bottom of chute, significant time requirement for staff in transferring and returning bins to/from collection point

Can be used in conjunction with compactors and automated track systems to reduce time swapping empty/full bins

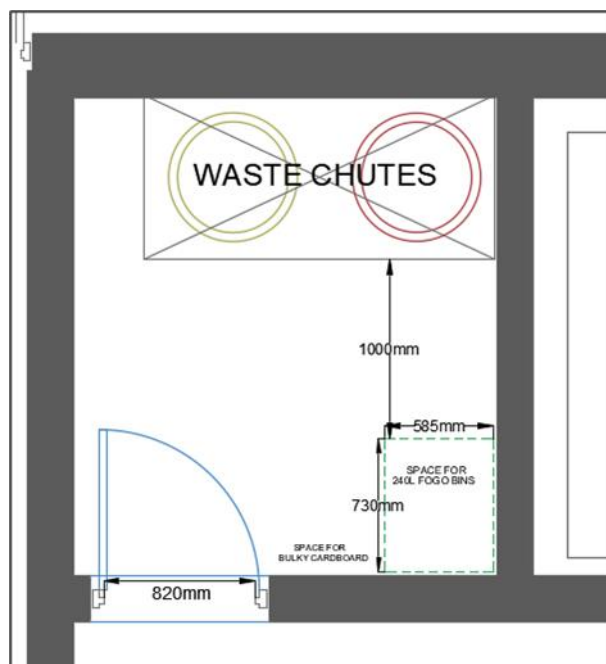
Waste is invisible to residents once deposited, less visual nudge into waste prevention behaviours compared to when being faced with volume produced

If the MDD opts to utilise a waste chute system, the use of a dual chute system is encouraged whereby separate chutes are used for general waste and recyclables leading to a central waste and recycling collection area in the bin store. A third waste chute for FOGO is not considered practicable due to concerns with local health laws, odour, grime and poor bin storage area maintenance.

Chutes should be designed with insulation to avoid noise disturbing neighbouring units and fire risks, have adequate separate ventilation systems to mitigate odour and should be cylindrical (diameter of 500mm or greater) to avoid waste being caught within. See manufacturer(s) for exact specifications.



A service room should be provided on each floor of the development to allow access to the waste chutes and allow for materials that should not be put into the chute (e.g. FOGO material, large cardboard boxes, broom handles) to be stored for manual collection. Chutes should not open onto any habitable or public space.



Chutes should terminate in a bin storage area and discharge directly into a bin or waste compactor in a manner that avoids spillage and overflow. Building management/caretaker/cleaners would be required to exchange full bins with empty bins at the terminus of the waste chute system.

Access to chute rooms/moving parts at the terminus should be restricted to trained building management/staff only. Residents should be restricted from accessing rooms containing compacting equipment or chutes to help prevent damage or injury from misuse of this equipment.

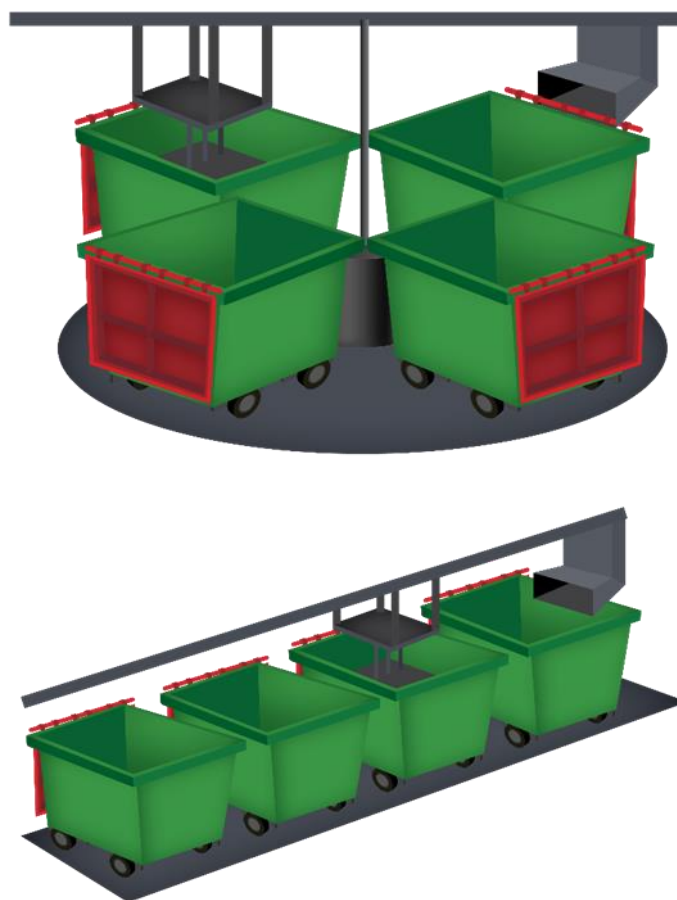
The WMP is to include chute specifications and details for mitigating glass breakage at the termination of the chute as well as ongoing cleaning and maintenance of the chute system. Details of waste systems must be provided including waste chute systems, compactors, and any other waste management equipment or devices to be used. All waste handling equipment must conform to the relevant design and safety standards. The WMP must also establish and delegate responsibility for the tasks required for ongoing monitoring and maintenance of waste management services and equipment.

Contingency plans should also be considered in the event of equipment failure and their consequences, such as the breakdown of a compaction unit or a waste chute becoming blocked.

3.6.4.1 Automated Bin Tracks

An automated track system (linear or carousel design) can be utilised at the terminus of waste chutes. An automated system is designed to rotate a number of bins through the use of sensors under the waste chute which is activated when the bin is recorded as full.

The automated track systems can be designed to send the building manager/caretaker a digital alert of the bins capacity to ensure the swapping of empty and full bins is done in a timely manner. The automated track systems will reduce the amount of work for the cleaners in swapping full and empty waste bins. Each waste stream should utilise its own waste track system at the terminus of the chutes.



3.6.4.2 Compactors

Compactors can be used to reduce the volume of waste by compaction of the waste material through manual or automated means. Compactors can be incorporated into the chute automated track system, or as standalone equipment that compacts directly into a bin.

General waste is typically compacted to a maximum compaction ratio of 2:1 to reduce OHS problems and mechanical damage caused by heavier bins resultant from higher compaction rates. Recycling material must not be compacted unless it is clean cardboard in a separate collection to co-mingled recycling material.

Compactors require regular maintenance and should only be installed in buildings that have a caretaker/building manager onsite. Sufficient space must be allocated to store at least 3 days of uncompacted waste in case the compactor is out of service.

Automated compactors must have restricted access to help prevent damage to the machine and injuries to residents. Automated compactors must be fitted with an optical or visual sensor to provide warning to the caretaker that a bin must be replaced. A closed-circuit camera (CCTV) may also be utilised providing it is monitored frequently.

It should be expected that the responsible entity (strata/corporate body) shall be liable for all bin replacement costs and/or repair costs relating to damage caused as a result of any bin compaction process.

3.6.5 Bin Holding Rooms

While waste chute systems can increase the ease of residential waste disposal, their use has proven to be problematic in high rise MDDs. Their design to reduce the speed of material can tear open bin-liners, resulting in food wastes/oil/grease collecting on the insides of the chutes. This material can be very difficult to remove and could result in odour, vermin and air-borne disease issues.

As an alternative to waste chutes, MDDs can utilise a Bin Holding Room on each level for residents to deposit wastes into available bins, and the caretaker/cleaners would be tasked to transport these bins to the main Bin Storage Area on a regular basis (typically daily) for consolidation. Each bin holding room should be designed with sufficient space for the storage of two days' worth of waste for all residents on that level.



Bin holding rooms must have provision to be easily cleaned as required due to the putrescible nature of waste being temporarily held in these rooms. This would need to be managed and maintained by the strata/property management.

Due to the malodorous nature of this waste, the bin holding rooms and any lifts used to transport bins to the Bin Storage Area will need to be cleaned. For high density complexes, surfaces with smooth washable surfaces should be utilised along with a caretaker/building manager engaged to manage the system.

3.7 Additional Design Considerations

3.7.1 Signage, Education on Ongoing Management

Consistent and clear signage is a key element of effective source separation and minimising incorrect disposal. It is highly important that signage is consistent throughout the MDD.

Signage should be provided to demonstrate to users how to use the waste system and to identify any hazards or potential dangers, including those from the use of waste handling equipment. Signage should conform to the relevant Australian Standards (e.g. bin colours) and safety signs, pictorial guides and community languages should be used where appropriate.

Waste Sorted (<https://www.wastesorted.wa.gov.au/>) provides range of materials that can be used to communicate with residents on the importance of separating waste and sorting it correctly to reduce contamination.



There is also benefit in using visual aids and colour consistency to re-enforce messaging, such as storing bins for various waste streams against colour coded walls. This enables easy identification of what materials should be placed in each bin and to ensure bins are always returned to the same position to maintain consistency.

Bin Storage Areas could include notice boards where reminders to any changes in the waste system or information on meeting targets or reached milestones can be posted to keep residents informed. It can also be used to provide reminders every now and then on the importance of appropriate disposal of waste, how they may reduce the amount of waste entering the system, and how this is helping to improve the environment.



Ensuring adequate waste education is constantly available will assist with the transient nature of residents and help point out any differences between different Local Government services. Where the strata body/building management holds residents' inductions, these should include the use of the waste system. The strata body/building management, in conjunction with the Local Government,

should issue education materials (e.g. resident handbooks, welcome packs, flyers, leaflets, stickers) on the correct use of the waste systems and the materials which can/cannot be recycled.

Ongoing education and overall management is crucial to monitor resident behaviour and identify requirements for further education and/or signs. Any undesirable behaviour, such as dumping waste on the floor rather than in bins, needs to be addressed quickly to prevent these behaviours from becoming more prevalent.

Active strata bodies/caretakers/management are highly recommended for all MDDs, particularly those with large communal bin storage areas, and are considered vital for effective ongoing management.

3.7.2 Alternative Organics Processing Options

While the WARR Strategy 2030 promotes the use of a three-bin system facilitating the collection of FOGO, this may not be viable at all MDD's. In such instances, alternative processing options may be considered (see Table 3-8). All alternatives are expected to require a certain level of expertise to maintain, and this responsibility should be clearly detailed in the strata/building and WMPs.

In addition, Local Governments may have specific requirements, or guidelines relating to FOGO management and servicing and therefore it is not intended that this guide would override any other existing policies, but rather provide additional guidance as appropriate.

Table 3-8: Alternative Organics Processing Options

Processing Opportunity	Description
Small Scale Onsite Composting	<ul style="list-style-type: none"> Communal open space areas, or roof garden could be dedicated to composting of FOGO for growing vegetables or areas used to house worm farms Communal worm farms require greater commitment from residents, or caretakers, but can be located in common areas or basement carparks Best assigned to an individual such as a caretaker, building manager, or dedicated resident for on-going management
Volume Reduction System	<ul style="list-style-type: none"> Typically food dehydrators (such as Gaia and Closed Loop) which will reduce volumes of waste while producing a nutrient rich soil enhancer that requires further processing to become quality compost Systems typically require a caretaker to operate, load bin lift and empty outputs at the end of each processing cycle Ultimately end product from many processing units will need to be taken offsite for further processing.



3.7.3 Innovations and Opportunities

The traditional linear approach to waste management provides a ‘take-make-dispose’ attitude to waste management which put demands on resources when products are discarded and lost out of the system when thrown away.

Developers have the opportunity to design waste storage areas in line with better practice principles and develop waste management systems that could be more than just a bin store. For example, a large scale MDD/precinct could incorporate a ‘micro waste transfer system’ approach whereby various waste streams are collected, repurposed or appropriately transported by the property management/caretaker to the disposal facility as required.



Improving waste and recycling management performance will demonstrate to potential residents and visitors to the MDD a commitment to corporate, social and environmental responsibility objectives. Reducing waste to landfill will provide financial savings from reductions in collection and the impacts of future cost increases.

In addition, improving performance will contribute to environmental targets and reducing greenhouse gas emissions derived from landfill disposal, and once waste reduction initiatives are implemented they will enhance waste management operations.

A breakdown of waste materials and potential opportunities for diversion away from landfill are included in Table 3-9. The separation of these materials may assist with working towards MDD accreditation (e.g. Green Star Accreditation).

Table 3-9: Opportunity for Waste Materials

Waste Stream	Material	Opportunity
Soft Plastic	Plastic Bags	<p>Include an additional small side bin next to recycling bins for plastic bags used to carry the recycling to be deposited in separately.</p> <p>Collected as a single stream to go to recyclers, discuss with suppliers to find alternatives.</p>
Mixed papers	Old newspaper and glossy magazines	Find uses in house or bundle for separate collection by waste contractor.
Glass	Non CDS eligible bottles and jars	Collected as a single stream to go to recyclers.
CDS eligible beverage containers	Plastic, HDPE, LPB/aseptic and aluminium beverage containers	Separate into own waste stream for collection by waste contractor and negotiate a reduction in collections costs out of the 10c return levy, or implement initiatives for collection by residents in association with community groups, or have staff collect and refund provided by collection have returns used for staff events when reduction targets/milestones are met.

Waste Stream	Material	Opportunity
		Include specialty collection containers in common areas/near tenancies for residents and visitors to deposit their containers.
Specialty wastes	Batteries, globes, mobile phones, e-wastes, small appliances, shoes, belts, gas bottles, items not able to be put in the bin system	Organise collections for disposal to dedicated recyclers, and donation of good working items to charities/community groups. Often gas can be recovered and recycled and re-gas and test existing gas bottles.
Bulk wastes	Furniture and white goods	Provide a space for reuse/repurposing for use by other residents/staff of the MDD Donation of good working items to charities/community groups, organise for recycling by dedicated collectors e.g. scrap metals.
Textiles	Linen and clothes	Donation of items in good condition to charities/community groups, organise for disposal to dedicated recyclers e.g. rag distributors.
Residual – problematic wastes	Aerosols, composite plastic paper packaging, x-rays, bubble wrap, plastic clothes hangers, crockery and pottery, plastic screw on lids, etc.	Some items may be aggregated into its own stream and taken to specialist recyclers, or donated to charity/community groups, other items may need to be prevented from entering the waste system through sustainable procurement opportunities. Continue to investigate opportunities and discuss upcoming opportunities with waste contractor.



4 Waste Collection

Appropriate waste collection vehicle standards should be incorporated into the development design, including those specified in legislation, regulations, guidelines, codes and any local traffic requirements. Developers should consult with the Local Government and other relevant authorities as early as possible to ensure compliance can be achieved.

Better practice design allows for waste collection vehicles to travel in a forward direction at all times.

WMPs must contain details on collection method to be used and generally include the following information:

- Type/size of collection vehicle to be utilised;
- Movement of collection vehicle (swept path analysis);
- Collection point/s;
- Transfer of waste to the collection vehicle; and
- Frequency of collection.

4.1 Local Government Engagement and Services

Local Governments are responsible for the collection of municipal solid waste under the WARR Act and have a significant role in waste management and collections. Early engagement with the Local Government is therefore a key element when determining waste collection methodologies for MDDs.

Any waste management system should be designed to accommodate Local Government provided collection services. However, some Local Governments may only be able to offer MDDs the same (or similar) services as those offered to single residential dwellings (e.g. general waste collections weekly and recycling fortnightly).



The type of waste management services that can be provided to individual MDDs will vary according to a Local Government's service and the specifications of the waste collection vehicles. For example, some Local Governments can service the larger bins (660L/1100L) while others can only service 120L-360L mobile bins.

With regards to CRDs, Local Government is not required to provide waste services to commercial tenancies and therefore may nominate to service the residential component of the development. In this case, a private waste contractor should be engaged to collect commercial waste.

To enable better practice management, developers should liaise with Local Government officers as early as possible to discuss specific requirements and options. To help reduce the potential risk associated with design and waste collection services, it is encouraged that waste collection services are over engineered and additional space for extra bins is provided as well as ensuring that the largest possible collection vehicles can service the MDD.

4.2 Waste Collection Point

The waste collection point is the point from which bins are collected and transferred from the storage area to a collection vehicle or dedicated servicing location. The identification of a suitable location for this is a crucial aspect for any development. It is of particular importance for large MDDs which may require a large number of bins and developments with limited access.

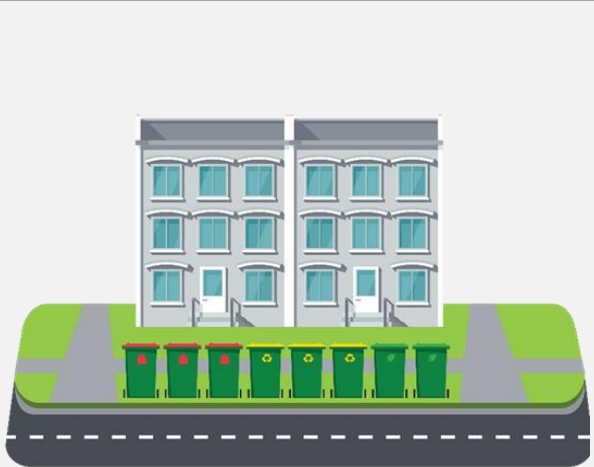
Depending on specific requirements of the Local Government, collection points may be on the property (on-site collection) or on the street (kerbside collection). Alternative options may also be available (e.g. a wheel-in and wheel-out service) and these should be discussed with the Local Government directly.

4.2.1 Kerbside Collection

Where MGBs are presented along the kerbside for pick-up, 1m² floor area should be allocated for each bin to allow sufficient space to enable servicing. MGBs typically presented for kerbside collection range from 120L – 360L depending on the sizes offered by the Local Government. Note, the presentation of bulk bins (>360L) is not generally permitted by Local Governments.

Better practice design for kerbside collection should consider the information shown in Table 4-1.

Table 4-1: Kerbside Collection Considerations

Better Practice Kerbside Collection Considerations	
Local Government planning requirements, policies and guidelines (e.g. requirement for hardstand or bin pad)	
Size and location of property street frontage (Bins should not be located near intersections, ramps, round-a-bouts, pedestrian crossings, or on busy roads or in narrow lane ways)	
Consideration on aesthetics and public realm	
Existing and potential traffic controls	
Potential disruptions to local traffic, pedestrian and vehicle movements	
Impacts adjacent land uses (e.g. noise)	

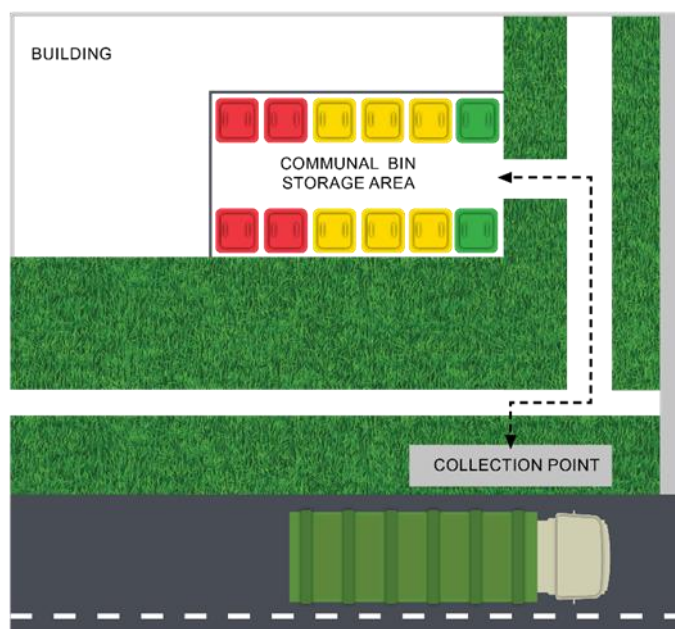
Transfer distance of bins from bin store to kerbside for collection (level surface, away from gradients and vehicle ramps)	
Adequate street access for the waste collection vehicle (presence of parked cars and not be restricted by vehicle loading/unloading bays)	

As not all Local Governments support kerbside bin presentation areas for MDDs, developers should check this with the Local Governments officers regarding specific local requirements and service options.

In high density MDDs, residents should not be responsible for the presentation of bins for collection as there is usually no individual ownership of bins. In this scenario, a caretaker or equivalent should be responsible for transferring bins to the collection point. The caretaker should return bins as soon as possible following collection. As a general rule, the collection point should be located as close as possible to the bin storage area.

Kerbside collection is predominately undertaken by side lift collection vehicles, however in some instances this could be completed by a rear lift vehicle.

Below is an example of an appropriate waste collection point at the front of a development for collection of mobile bins by a side lift waste collection vehicle.



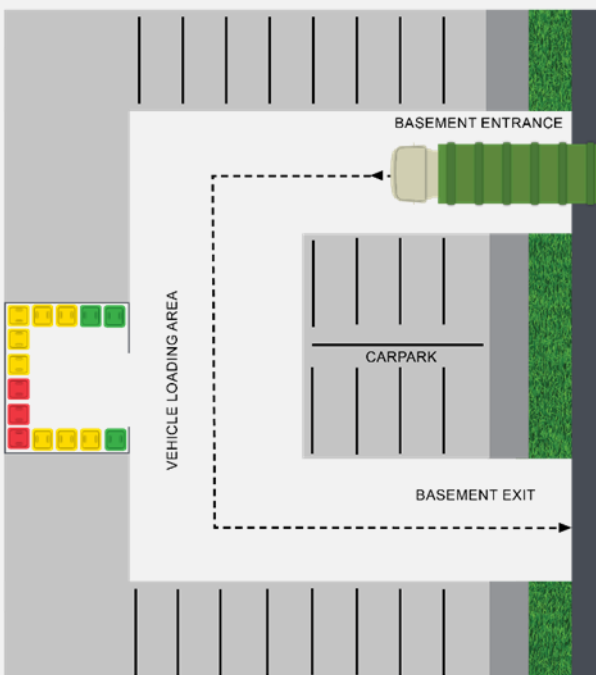
4.2.2 On-site collection

If a waste collection vehicle is required to drive on-site, the property needs to be suitable in terms of strength, width, geometric design and clearances (overhead obstacles, air conditioning ducts, sprinklers etc).

MDDs will need to demonstrate how they will accommodate waste collection vehicles onsite to collect waste. The development design should allow clearances to permit a standard waste collection vehicle that can enter and exit in forward gear. Swept path analysis will need to be provided to show how the waste collection vehicle will enter/exit and service the development.

Better practice design for on-site collection should consider the following, as shown in Table 4-2.

Table 4-2: On-site Collection Considerations

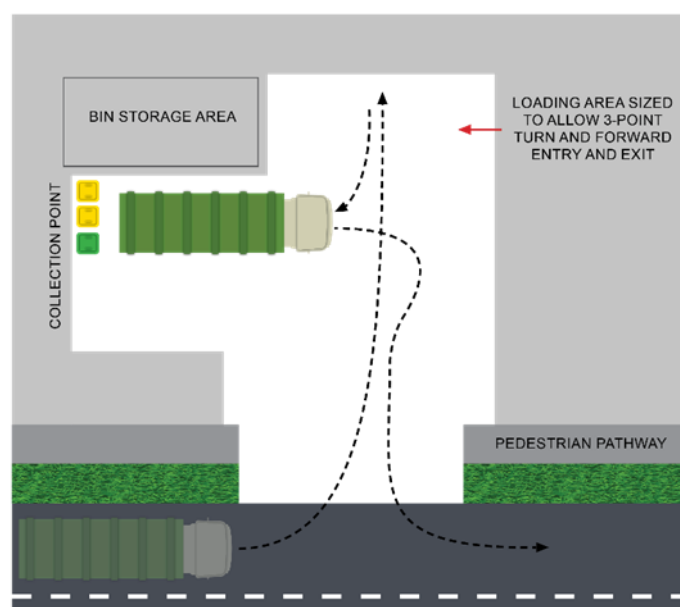
Better Practice On-site Collection Considerations	
Providing access so that collection vehicles can complete the waste collection with a continuous forward movement with the ability to enter and exit the property in a forward gear (need for reversing is minimised);	 <p>The diagram illustrates a site layout for waste collection. It features a central 'VEHICLE LOADING AREA' with a dashed line indicating a truck's path. The path starts at the 'BASEMENT ENTRANCE' (top right), moves left, then down, then right, and finally down to the 'BASEMENT EXIT' (bottom right). A 'CARPARK' is located in the center. To the left of the loading area is a row of colored boxes (yellow, red, green). The site is surrounded by parking spaces and green landscaping.</p>
Appropriate location and collection times to minimise adverse impacts on the amenity for residents, neighbours and the public occurring from noise or odour associated with bin collection;	
Waste collection trucks being able to operate in a safe and efficient manner without impacting on local traffic;	
Interference with pedestrian or vehicular movements is minimised;	
Adequate clearance and lifting heights for bin servicing;	
Truck movements being clear of power boxes, water meters, light poles, junction boxes and letter boxes;	
Consideration towards any ramp gradients the truck will have to traverse on	
Internal footpaths being designed with flush kerbing to take waste truck load;	
Adequate design of pavement or roadway to support collection vehicles (e.g. designed to carry a waste truck with an all upload of 25,000kg and allow for waste trucks moving over driveway pavement, kerbing, junction boxes and drainage structures);	

On-site collections are predominately undertaken by a rear lift waste collection vehicle, however larger bins (>1,100L) may require collection by a front lift vehicle.

Consideration should be given to allowing the largest potential waste vehicle, with an unobstructed 500mm clearance on either side of the vehicle for driver movements and accessibility. An additional 2m unobstructed loading area is required behind the vehicle to operate the rear lift mechanism when emptying the bins.

Swept path analysis should be conducted by a certified traffic engineer to ensure a collection vehicle can safely service the development. A copy of the swept path analysis should be included in the WMP.

The image below shows an example of where reversing has been minimised for on-site collection and adequate space has been provided to allow entry, exit and manoeuvring of the collection vehicle.



4.2.2.1 Contracts and Agreements

Local Governments may choose to not provide their waste collection services on private property unless certain contracts and agreements have been provided. Where collection vehicles are required to enter private property to service bins on-site, a management agreement between the strata/building manager and the Local Government may be required. This is typically required as part of the approvals process and if the agreement is not in place, the Local Government may refuse to collect waste on-site.

These agreements typically include indemnity clauses to protect the Local Government (and their collection contractor if this applies) from any liability associated with loss, damage or claims caused directly or indirectly to any person or property by, through or in connection with the waste removal services or equipment. The indemnity clause should be included on the relevant titles within the MDD, as well as any subsequent strata titles, to ensure that it persists in perpetuity.

4.3 Contingency

Waste management systems in MDDs have the potential to be very complex to ensure that waste is managed effectively. The failure of any individual system component could result in the breakdown of the system and so contingency planning is required to adequately plan for any accidents or issues so that they can be dealt with quickly and efficiently.

Developers should consider the consequences of the failure or inability of the service provider to empty bins. Therefore it is better practice to develop a waste management system that can safely retain one full weeks' worth of waste as contingency in the unforeseen event that the collection contractor is unable to fulfil their servicing agreement on time.

APPENDIX A

Waste Generation Rates

Waste Stream	Dwelling Size	Waste Generation Rate/ Storage Requirement <12 dwellings	Waste Generation Rate/ Storage Requirement >12 dwellings
General Waste (on FOGO system)	1 bedroom	30L/week	40L/week
	2 bedroom	50L/week	60L/week
	3+ bedroom	70L/week	80L/week
Recycling	1 bedroom	40L/week	20L/week
	2 bedroom	60L/week	40L/week
	3+ bedroom	120L/week	90L/week
FOGO	1 bedroom	40L/week	20L/week
	2 bedroom	80L/week	40L/week
	3+ bedroom	140L/week	60L/week

APPENDIX B

Example Local Government Questions

Example Question	Response
Does the Local Government have any specific WMP guidelines and/or preferred waste generation rates?	
Does the Local Government provide on-site collections and/or collections from the kerbside for MDDs?	
What are the types and sizes of the waste collection vehicles used for residential MDDs (specification information with clearances if available)	
Are there any specific requirements for on-site servicing? (i.e., dedicated loading area/zone, can the collection truck stop adjacent to the bin store on-site with traffic measures in place to mitigate traffic concerns?) Any other vehicle restrictions to be aware of.	
What size bins are available for general waste, recycling and garden organics/FOGO for MDDs? (e.g., 120L, 140L, 240L, 360L, 660L, 1,100L etc)	
What are the collection frequencies offered for general waste, recycling and garden organics/FOGO?	
Does the Local Government have any preferred communications approaches which the Developer should use (e.g. signage/education)?	
If there are any other conditions or requirements that are relevant (e.g. bin pad requirements for kerbside collection, Waste Chutes etc.)	

APPENDIX C

WMP Checklist

The checklist below should be used to show that the Local Government’s core waste management practices have been considered and incorporated into the design of the development.

The WMP should include a brief description of the below considerations.

Summary of the Development
<p>A summary of the development including the following information:</p> <ul style="list-style-type: none"> • Location of the Development • Number of floors • Number of dwellings units by size (one, two or three bedrooms) • Details of the intended use of the development
Waste Generation
<p>Waste generation calculations for general waste, recycling and FOGO included (calculated using the appropriate waste generation rates)</p>
<p>Details of the size and quantity of the bins to be used provided</p>
Bin Storage Area
<p>Design details of the bin storage area included, such as drawings including sizes of bins, aisle and access point widths and wash down facilities:</p> <ul style="list-style-type: none"> • Bin storage area size • Bin storage area layout • Storage and management of Alternative Wastes (e.g. bulky waste and HHW) • Wash-down area/tap & drain • Ventilation • Vermin prevention • Noise reduction • Stormwater ingress prevention
<p>Is there sufficient space within the property boundary to store one full weeks’ worth of general waste, recycling and FOGO material likely to be generated at the development?</p>
<p>Is future service flexibility incorporated in the design?</p>
<p>How waste is transported from the source to the bin storage area?</p>
Collection Method and Frequency
<p>Waste Management Plans must contain details on proposed collection method to be used in servicing the development, including:</p>

WALGA

- Local Government/Private waste contractor
- Collection vehicle to be utilised
- Movement of collection vehicle include Swept path analysis (if required)
- Collection location (on-site/kerbside)
- Transfer of waste to the collection vehicle
- Frequency of collection

Has the bin travel route between the bin store and bin collection point been designed to minimise occupational health and safety risks to those transferring the bins?

Waste System

Details of any waste management equipment or devices to be used:

- Chutes
- Compactor
- Bin Lifter
- Other

Waste Service Provider

Provide explanations why the applicant seeks to engage a private collection contractor to service the development rather than the Local Government waste services

Education/Signage

Has clear signage been included to provide instructions on how use the waste system

Ongoing management

Does the WMP delegate responsibility for ongoing monitoring and maintenance of waste management services and equipment.

APPENDIX D

Bin Dimensions

Indicative sizes only for common bin sizes are shown below. Note that not all bin sizes are shown and the dimensions are only a guide and differ slightly according to the manufacturer. Bins must comply with the Australian Standard for mobile waste containers, AS 4123. In addition, it is better practice to allow a minimum 50mm spacing around all sides of the bins, including between walls, other bins and aisles.


Mobile bins (2 wheels)

	Dimensions (mm)	Bins Sizes				
		80L	120L	140L	240L	360L
	Height	870	940	1065	1080	1100
	Depth	530	560	540	735	885
	Width	450	485	500	580	600

Bulk bins (4 wheels)

	Dimensions (mm)	Bins Sizes				
		660L	770L	1,100L	1,300L	1,700L
	Height	1250	1425	1470	1408	1470
	Depth	850	1100	1245	1250	1250
	Width	1370	1370	1370	1770	1770

Skip bins (0 or 4 wheels)

	Dimensions (mm)	Bins Sizes		
		2,000L	3,000L	4,500L
	Height	865	1225	1570
	Depth	1400	1505	1605
	Width	1830	1805	1805

Design Considerations:

- Consideration given to travel paths for transfer of bins to collection point;
- Restrictions on the distance larger, heavier bins can be moved for OHS reasons (e.g. 1,100 litre bins should not be transferred more than 3 metres at a maximum ramp grade of 1:30);
- Bins require clear visible signage using pictures and words to indicate what should be placed in each bin to minimise contamination;
- Adequate circulation space for manoeuvring bins within the bin store must be allowed for with access to each waste stream being readily available during collection; and
- Automated bin tugs, bin lifts and trolleys are available to assist with movement of larger bins when heavy from being filled with compacted wastes or heavier FOGO material.

APPENDIX E

Collection Vehicles

Waste collection vehicles may be side lifting, rear lifting or front lifting. The size of vehicle varies according to the collection service. Developers should consult with the Local Government regarding the type of vehicle to be used.



Swept path diagrams should be provided (and included within the WMP) to demonstrate compliance.

Note, the below are only indicative and will vary between contractors and Local Governments.

Typical Waste Collection Vehicle

Collection Vehicle	Rear Lift	Side Lift	Front Lift
Length	Up to 10.24m	Up to 9.64m	Up to 11.5m
Width	2.5m	2.5m	2.5m
Height (Operational)	Up to 3.5m	Up to 3.9m	Up to 6.2m
Height (Traveling)	Up to 3.5m	Up to 3.6m	3.82m
Bin servicing size	120L – 1,100L	120L – 360L	> 1,100L



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