Verge Waste Collection Review

Background Report

May 2024

Executive Summary

The City of Kwinana conducted an assessment to explore options for verge waste collection, seeking the most effective model for Kwinana across environmental, social, economic and governance outcomes. The three primary service options outlined in Figure E-1 were assessed. A Variable Service variant to the pre-booked systems of Option 2 and Option 3, which allows increased flexibility in residents' use of their overall service allocation, was also modelled.

Figure E-1: Options modelled

	Bulk Waste				Green Waste		
	Type	Collections	Total m3	Mattresses/ White goods	Type	Collections	Total m3
Option 1 Current	Scheduled	2	6	Included collection	Scheduled	3	9
Option 2 Pre-booked	Pre-booked	1	3	2	Pre-booked	1	3
Option 3 Hybrid	Pre-booked	1	3	2	1 Scheduled 1 Pre-booked	2	6

Using internal data and benchmark data obtained from other local governments, the analysis modelled the estimated waste tonnages, material recovery rates, and financial impacts associated with each collection option, the results of which are shown in Table E-1.

Table E-1: Modelling results summary. Year 1: 2025-26

	Average Tonnes	Average Cost ($/hh/yr)	Material Recovery Rate	Resource Recovery Rate
Option 1: Current	4,105.04	$82.96	51%	97%
Option 2: Pre-booked	3,098.40	$77.43	66%	98%
Option 2: Pre-booked – Variable		$80.31	62%	98%
Option 3: Hybrid	3,525.18	$82.44	70%	98%
Option 3: Hybrid – Variable		$85.45	68%	98%

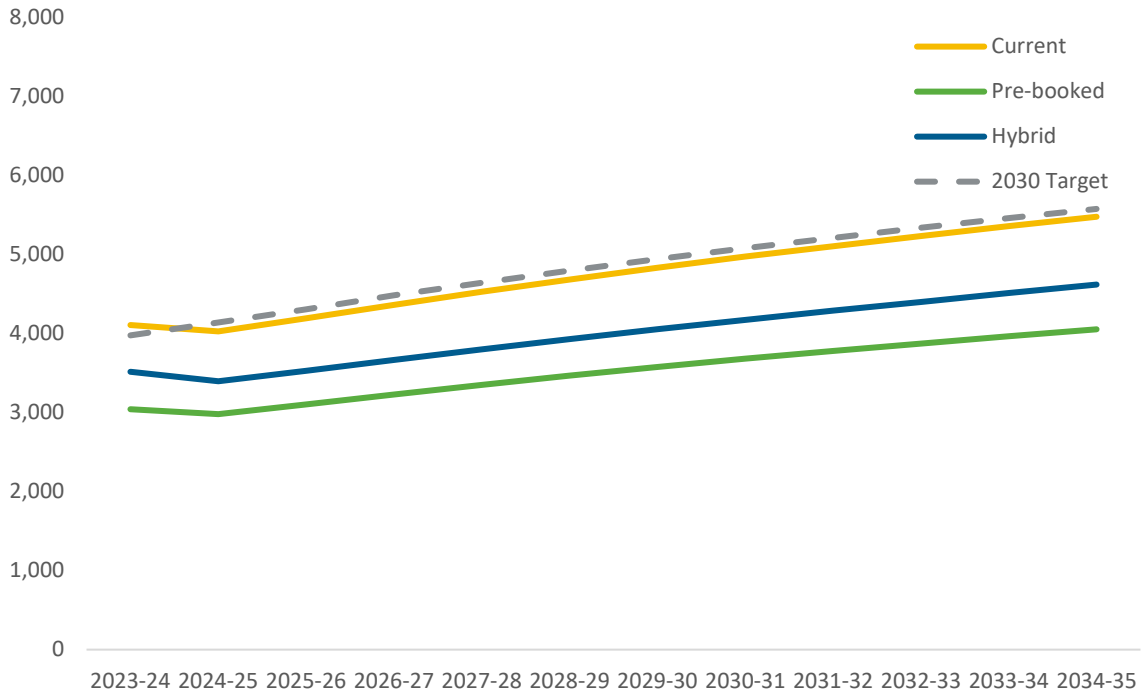
The key findings arising from the analysis detailed in this report are detailed in the following sections.

Tonnage

The modelling considered population growth projections by REMPLAN[10] and waste composition data. The primary conclusions drawn from the modelling were as follows:

- Adopting the 3-bin GO system leads to an estimated 15% transfer of green waste tonnage from verge collections to the GO bin.
- Option 2: Pre-booked, generates the lowest volume of waste, showcasing a 26% reduction in tonnages compared to Option 1: Current.
- Option 1: Current (business as usual), demonstrates the highest modelled waste output among the considered options.
- All proposed options meet the State Waste Avoid Target[15], indicating alignment with waste reduction objectives.

Figure E-2: Forecast tonnages for 3 options against State Waste Avoid Target



A sensitivity analysis was conducted to consider the impact of enabling a combination of collection types within Option 2: Pre-booked and Option 3: Hybrid (both pre-booked options) under a Variable Service option. This analysis found the tonnage would likely remain relatively consistent regardless of whether a Variable Service was implemented or not.

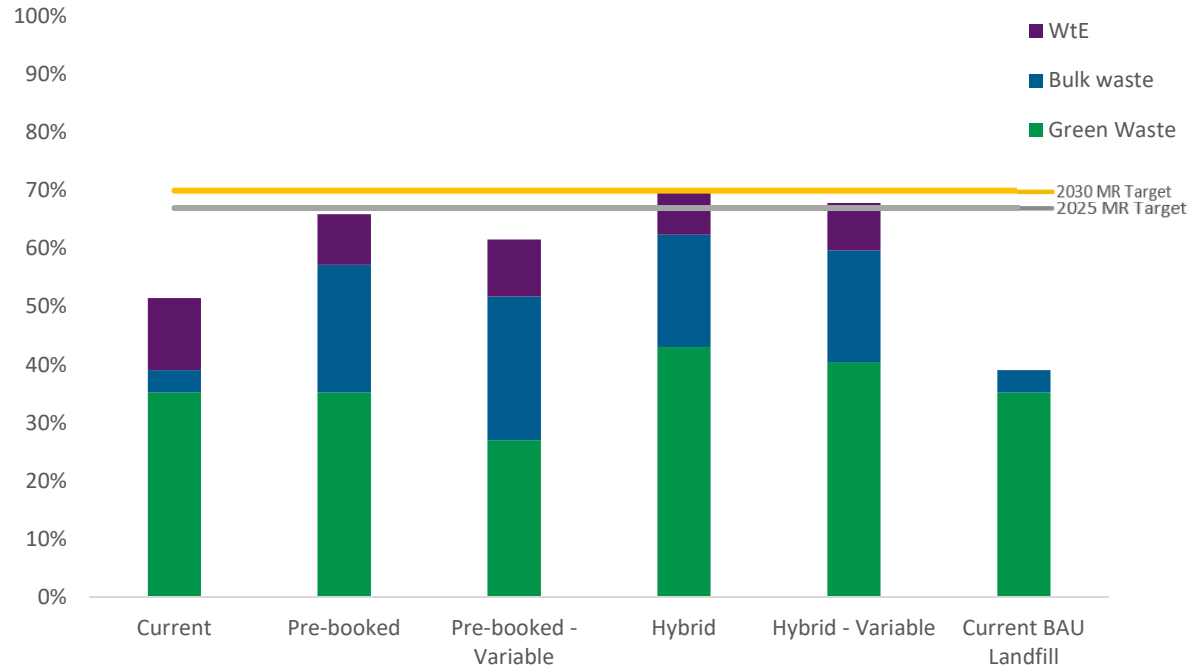
It is worth noting that despite observing a notable decrease in tonnage across both pre-booked options, all proposed options successfully meet the State Waste Avoid Target[15], aiming for a 10% reduction in waste generation per capita by 2030.

Recovery Rates

The modelling took into consideration both material recovery rates, which exclude the energy recovery component, and resource recovery rates, representing waste diversion from landfill. The key findings included:

- Shifting from landfill to Waste to Energy (WtE) results in a 12% increase in material recovery for all options.
- Option 1: Current exhibits the lowest material recovery rate at 51%.
- Material recovery rates reach 66% for Option 2: Pre-booked and 62% if variable.
- Material recovery rates reach 70% for Option 3: Hybrid and 68% if variable.
- Overall resource recovery rates in all options are at least 97%, indicating substantial landfill diversion.

Figure E-3: Material recovery rate composition



It is important to highlight that despite witnessing a notable enhancement in material recovery rates, only the hybrid options meet the material recovery targets outlined in the Western Australia Waste Avoidance and Resource Recovery Strategy 2030[14]. Specifically, these targets aim for a material recovery rate of 67% by 2025 and 70% by 2030.

Financial Implications

A comprehensive financial model was crafted to scrutinise the costs associated with each option over a 10-year timeframe. This model encompasses annual adjustments pertinent to population, household, and contract pricing. The primary findings from the financial analysis were:

- The most cost-effective verge collection option for the City is Option 2: Pre-booked, with an average annual cost of $91.65 per household.
- Conversely, the most expensive verge collection option is Option 3: Hybrid - Variable, amounting to an average annual cost of $105.78 per household.
- All options represent approximately 24% of the City's total Waste Service Charge.

Table E-2: Financial modelling summary – 10-year average

	Average Annual Cost ($/hh)	Average Annual Green Waste Cost	Average Annual Bulk Waste Cost	Total Annual Cost
Option 1: Current	$100.30	$661,783	$1,844,763	$2,506,547
Option 2: Pre-booked	$91.65	$690,620	$1,648,874	$2,339,494
Option 2: Pre-booked – Variable	$99.52	$406,073	$2,020,597	$2,426,670
Option 3: Hybrid	$97.48	$839,664	$1,648,874	$2,488,538
Option 3: Hybrid – Variable	$105.78	$588,599	$1,952,881	$2,541,480

Community Engagement

As part of the evaluation process, the City actively involved the community, engaging residents through meetings with resident associations and advisory groups, as well as interactions at shopping centres and pop-up sessions. The City ensured that residents were thoroughly informed about the three options before discussing preferences.

Residents from diverse areas of the City participated in the survey, yielding a total of 97 fully-informed responses. The engagement results revealed the following insights:

- 70% of all respondents expressed a desire to transition to a pre-booked system, comprising of:
    - 37% expressed a preference for Option 2: Pre-booked.
    - 33% expressed a preference for Option 3: Hybrid.
- 30% of respondents indicated a preference to retain the current system in Option 1.

Risk Summary

The Risk Assessment, surmised in Table E-3, utilised the City's risk matrix to evaluate each option. Key findings included:

- Option 1: Current carries the highest risk compared to the other options. The main risks include non-alignment with Waste Authority Best Practice Guidelines, potential negative public opinion, limited procurement opportunities, moderate risks to health, environment, and properties, as well as a moderately inequitable service.
- Option 2: Pre-booked introduces the least risk among the options, although it still entails a moderate risk to the environment as Option 2: Pre-booked does not have a pre-fire season green waste scheduled collection.
- Option 3: Hybrid presents low to moderate risks, with the main concerns revolving around procurement complexities, risks to health, and retaining a moderately inequitable service.

Table E-3: Risk assessment summary

Risk Types	Risk Level		
	Option 1: Current	Option 2: Pre-booked	Option 3: Hybrid
Non-alignment with Waste Authority Better Practice Guidelines[14]	Moderate	Low	Low
Environmental risk	Moderate	Moderate	Low
Negative public opinion	Moderate	Low	Low
Procurement considerations	Moderate	Low	Moderate
Risk to human health	Moderate	Low	Moderate
Risk to properties	Moderate	Low	Low
Increased cost	Low	Low	Low
Equitable service	Moderate	Low	Moderate
Overall risk profile	Moderate	Low	Low/Moderate

Multiple Criteria Analysis (MCA)

The evaluation of the verge collection service options was conducted using a three-level scoring system against each criterion. A scoring scale of 3 (advantageous), 2 (neutral), or 1 (disadvantageous) was employed, with the highest score indicating the most advantages.

Table E-4: MCA summary

Factors	Criteria	Weighting %	Weighted Score by Option		
			Option 1: Current	Option 2: Pre-booked	Option 3: Hybrid
Environment	Waste diversion	15	15	45	30
	Material recovery	15	15	45	45
Economic	Cost to household waste service charge	15	30	45	30
	Value for money	15	45	30	30
Social	Simplicity and accessibility	8	24	16	16
	Public demand for service	7	14	21	14
	Waste awareness and behaviour change	5	5	15	15
Governance	Alignment with State Strategy	10	10	30	30
	Procurement Options	10	10	30	10
Score		100	**168**	**277**	**220**

The MCA results, as shown in Table E-4, indicate that based on the weighted scores:

- Option 2: Pre-booked attained the highest score of 277
- Option 3: Hybrid scored next highest with 220
- Option 1: Current received the lowest score of 168.

Recommendation

Based on the findings of the assessment, it is recommended that the City implement Option 2: Pre-booked - Variable Service in 2025/26 at the conclusion of the current service contract.

This proposed system is tailored to offer a convenient disposal method for a wider majority of residents and improves environmental, social and governance outcomes while maintaining near-cost-neutrality.

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Introduction

Background

The implementation of the City of Kwinana Waste Plan 2021-2025[2] has been identified as one of several key drivers towards the achievement of the City's Strategic Community Plan 2021-2031[5] Outcome 1 – A naturally beautiful environment that is enhanced and protected.

Reviewing verge waste collections is action 3.1.3 in the City's Corporate Business Plan[4].

> *3.1 Investigate options for Bulk Waste Collection:*
>
> > *The current verge collection service will be reviewed to ensure the City provides the most effective and efficient verge collection service for the Kwinana community's needs into the future.*

Verge waste collection is a service provided by the City to collect a range of materials that cannot be disposed of in kerbside bins. These materials, collected from residential verges, are placed out for bulk material recovery or disposal. Verge collection services can be grouped into the following categories:

- Bulk waste
  - White goods and metal products
  - E-waste
  - Mattresses
  - Furniture and other bulky waste
- Green waste
  - Garden organics

Purpose

The purpose of this review is to identify the optimal verge waste collection delivery model for the community across environmental, social, economic and governance outcomes. The aims are to:

- Improve streetscapes;
- Reduce incidences of illegal dumping;
- Minimise waste generation;
- Maximise material recovery;
- Offer cost-effective service;
- Enhance data collection and reporting;
- Improve service for residents; and
- Increase service efficiencies.

Strategic Context

Western Australian Waste Strategy 2030

In 2007, Western Australia's *Waste Avoidance and Resource Recovery Act 2007 (WARR Act)* came into effect. The *WARR Act* drove the Western Australian Waste Authority's creation of the "Waste Avoidance and Resource Recovery Strategy 2030[15]" (Waste Strategy 2030). The Waste Strategy 2030 stipulates the below objectives:

Figure 1: State Waste Strategy Targets[15]

Avoid	Recover	Protect
Western Australians generate less waste.	Western Australians recover more value and resources from waste.	Western Australians protect the environment by managing waste responsibly.
• 2025 – 10% reduction in waste generation per capita • 2030 – 20% reduction in waste generation per capita	• From 2020 – Recover energy only from residual waste • 2025 – Increase material recovery to 70% • 2030 – Increase material recovery to 75%	• 2030 – No more than 15% of waste generated in Perth and Peel regions is landfilled • 2030 – All waste is mangaged and/or disposed to better practice facilities

A guiding principle of the State Waste Strategy 2030[15] is the waste management hierarchy. Governments across Australia commonly adopt the waste management hierarchy as the ideal structure for moving towards sustainable resource management.

Figure 2: Waste Management Hierarchy[15]

The City's current method for handling residents' verge bulk waste does not encourage behaviours aligned to the waste management hierarchy as reuse and repurposing are not encouraged, and recycling is limited due to limited source separation opportunities.

Waste Authority Better Practice Guidelines

Waste Authority developed Guidelines for Local Government Vergeside and Drop-off Services - Better practice principles in March 2022[14], with the aim to maximise diversion by identifying better practice solutions for verge collection services.

In developing the Guidelines, a review of local government verge collection services was conducted. The review determined that on average, bulk verge collections account for 10% of a local government's entire waste stream, of which 58% is recovered, noting that most of the recovery is attributed to the collection of green waste[14].

The Guidelines offer targets and actions to assist with achieving better practice service. The actions provided have been developed around the Waste Hierarchy with priority given to actions that work to reduce the amount of material placed on the verge for collection.

Table 1: Waste Authority recommended service design[14]

Service Design	Recommendation
Annual service allocation	Mixed bulk waste – **maximum of three cubic metres** of allocation per year per household Recyclable waste – **minimum of three collections** across recyclable wastes
Presentation period	Scheduled service – better practice **five days or less** Pre-booked service – better practice **three days or less**
Servicing period	Garden organics – **garden organics are separate from other collections.** Bulk waste – provide **source-separated services for priority wastes**, such as white goods, mattresses and e-waste
Price signals	Price signals (**user-pays service**) used in the design of a local government's vergeside collection service, when extra hard-waste collections are requested above annual service allocation
Communications and engagement	Communications plan referenced in local government waste planning documentation which: • regularly informs households about how to use the service properly and alternative reuse options • ensures the community has access to suitable facilities to make enquiries, report issues and make bookings • identifies training needs for local government frontline staff
Compliance and enforcement	Incorporate vergeside compliance and enforcement in the local government's overarching compliance and enforcement strategy. Compliance and enforcement plan documented in waste planning documentation and reported annually

Service Design	Recommendation
Contracting	Contracts with service providers have provisions to support high performance, including: • breakdown of costs including cost of activity (e.g. collection, engagement, processing and disposal), cost per tonne of recovery and cost per household • collection and processing methods – by collection type and processing type by weight • reporting on recovery performance – by recovery tonnages/recovery rate • punctuality provisions – with reference to the servicing period • incentives and penalties – based on service efficiency and/or recovery efficiency • flexibility to accommodate changes – especially to support improved recovery
Processing	Mixed bulk waste – **100%** of hard waste processed where no source separation is used Bulk waste – **50% recovery** from all processed hard-waste material and separated waste Garden organics – **90% recovery**
Data	Methodology clearly documented. Data collected as part of a local government's overall waste and recycling data collection activities. Reporting requirements included in waste collection and recycling contracts. Reporting independently verified. Data publicly reported (subject to commercial-in-confidence considerations)

This review considered a better practice service model to achieve the benchmarks defined above. The City's will:

- Review annual service allocation:
  - maximum of 3 cubic metres of mixed bulk waste
  - minimum of 3 collections of recyclable waste
- Specify presentation period
  A shorter presentation period can discourage unwanted behaviours associated with the current service, such as scavenging and illegal dumping. These behaviours affect service costs, customer satisfaction and may present safety and environmental risks.
- Increase material separation through specialised collections
  Source separated waste streams are recovered more effectively. Items such as white goods, mattresses, e-waste and metals can be recycled, and when separated, recovery of these items can increase the City's overall material recovery rates.
- Evaluate feasibility of user-pays system
  A user-pays system will encourage residents to find alternatives to disposal and result in a more equitable service for our community.
- Improve communications and engagement

Pre-booked services will allow the City the opportunity to communicate directly to residents, via phone, website and email, about other waste management options available to them such as reuse options, how to place waste on the verge, and any safety or environmental considerations.

- Data improvement
  Pre-booked options will allow the City to collect data on waste generated within its region and track it accordingly.

City of Kwinana Sustainability Framework

The City's Sustainability Framework[7] provides guiding principles and priority focus areas to aid the City's realisation of the United Nations Sustainability Development Goals outlined in the City's Strategic Community Plan. Verge Collection addresses the following Sustainability Framework principles and priority areas:

Principle 4: Environmental stewardship
Environmental protection and environmental services to retain environmental values and ecological function of local natural assets.

Priority Area 2: Environment and biodiversity
Environment is one of the pillars of sustainability: it underpins all life and provides all ecosystem services. Biodiversity is a key feature of our local environment: its protection is an essential part of maintaining our ecological services and functions.

Priority Area 5: Waste and resource recovery
Waste management is an essential service and impacts everyone in our community. It protects community health and our environment. Waste is also one of the City's largest expense areas.

City of Kwinana Waste Plan 2021-2025

The Waste Plan 2021-2025[2] drives the City's waste management objectives and ensures that waste avoidance and environmental protection are integral to the City's activities. The Waste Plan is guided by the City's Strategic Community Plan[5], the *Waste Avoidance and Resource Recovery Act 2007* and the Waste Strategy 2030[15]. The Waste Plan's overarching objectives directly align with those of the Waste Strategy 2030 as follows;

- Avoid; generate less waste
- Recover; recover more value and resources from waste
- Protect; protect the environment by managing waste responsibly

The Waste Plan includes a range of actions aimed at achieving its objectives, with the review of verge collection practices as one of its key actions.

Table 2: Waste Plan 2021-25[2] actions applicable to verge collection

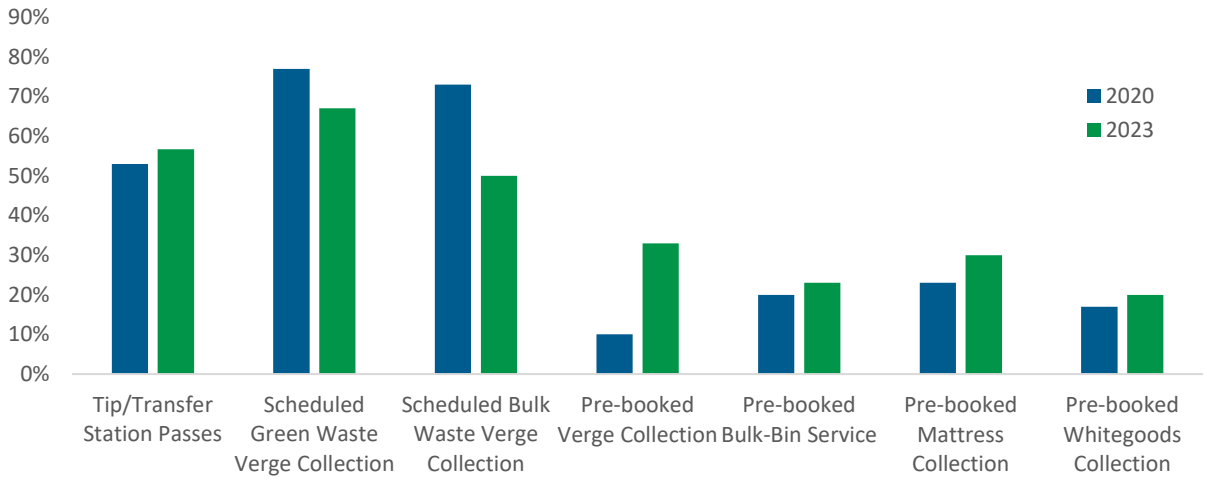
Action	Detailed actions and sub-actions
2. Residual waste to be delivered to WtE facility for recovery	Residual waste being delivered to WtE facility and diverted from landfill
5. Continue recovery of recyclable materials from bulk waste collections by separating streams such as metals, mattresses, e-waste and green waste.	Review bulk waste collection to maximise resource recovery
11. Improve data collection and analysis for kerbside and bulk waste collection services	Analyse existing service data to identify gaps and recommend improvements

Research and Benchmarking

Benchmarking was conducted in both 2020 and 2023, assessing services provided by all Perth Metropolitan Local Governments. The evaluation covered various aspects, including population, kerbside waste service, type of verge collection service, number of verge collection services, size provisions by material type, tip and transfer stations, and the percentage change between the evaluated years.

The analysis indicates that 23% of local governments transitioned from traditional scheduled services to a pre-booked model, resulting in a decrease in the average number of collections provided.

Figure 3: Benchmarking data comparing 2020 data with 2023 (n=30)



Throughout the benchmarking process, several local governments indicated that they currently offer or are considering a user-pays service. This approach would provide residents the opportunity to acquire additional collections from the local government's contractor at the resident's cost, offering a standard service with a minimum set of provisions while allowing those in need of more collections to pay for additional services.

According to benchmarking data, a mere 23% of local governments offering pre-booked collection services provide a flexible offering, while the majority (77%) specify the collection type. On average, these local governments deliver 1 green waste collection and 1.5 bulk waste collections as part of their pre-booked collection services.

Current Service

The current verge waste collection services available to City residents include:

- Two scheduled Bulk Waste collection
    - maximum of $3m^3$ per collection
- Three scheduled Green Waste collections
    - maximum of $3m^3$ per collection

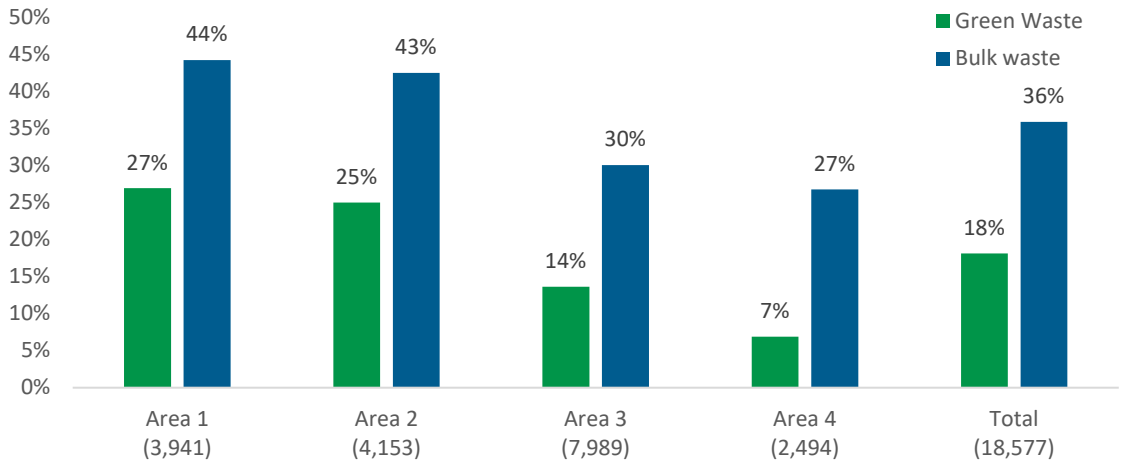
Verge Waste Collection Service

The verge waste collection service involves residents placing their unwanted household waste and large green waste items on their verge prior to their scheduled collection date. Bulk waste items include white goods and metal products, e-waste, mattresses and furniture. Green waste items include tree and shrub cuttings, stumps and logs, and untreated timber up to 1.5 metres in length and 300mm in diameter. The City delivers this service as a contracted service.

Our three verge green waste collections are scheduled throughout the City over 12 weeks (four weeks per collection round) with collections typically occurring in February, May and November each year. Around 18% of households participate in the current green waste collection service within the City. The collected green waste is transported to an accepted facility where it is mulched and reused in local gardens. This results in a 100% material recovery rate for this material type. The City collects an average of 1,400 tonnes of green waste per annum, although with the introduction of the proposed kerbside GO bin in 2024/25, it is expected that 15% of verge waste would be placed in the GO bin, as outlined in the Three Bin Feasibility Assessment 2023[6].

Our two bulk waste collections are scheduled throughout the City over 8 weeks (4 weeks per collection) with collections typically occurring March and October each year. Around 36% of households participate in the bulk waste collection service. There is a reliance on residents to source separate their waste into four piles comprising of white goods and all metal products, e-waste, mattresses and accepted bulk waste items. The City collects an average of 2,500 tonnes of bulk waste per annum, with an average of 6% material recovery from this stream, equating to around 134 tonnes of material recovered per annum. White goods and metals recover 100%, mattresses 75%, e-waste 100%, and bulky general waste items 0%.

Figure 4: City of Kwinana Verge Collection participation rates by area



With the City's current waste composition, the City's verge collection system collects an average of 3,685 tonnes of waste, recovering 1,437 tonnes equating to a 39% recovery rate through verge collection services with the majority of material recovery associated with reuse of green waste.

Figure 5: City of Kwinana Verge Collection tonnage and material recovery rates

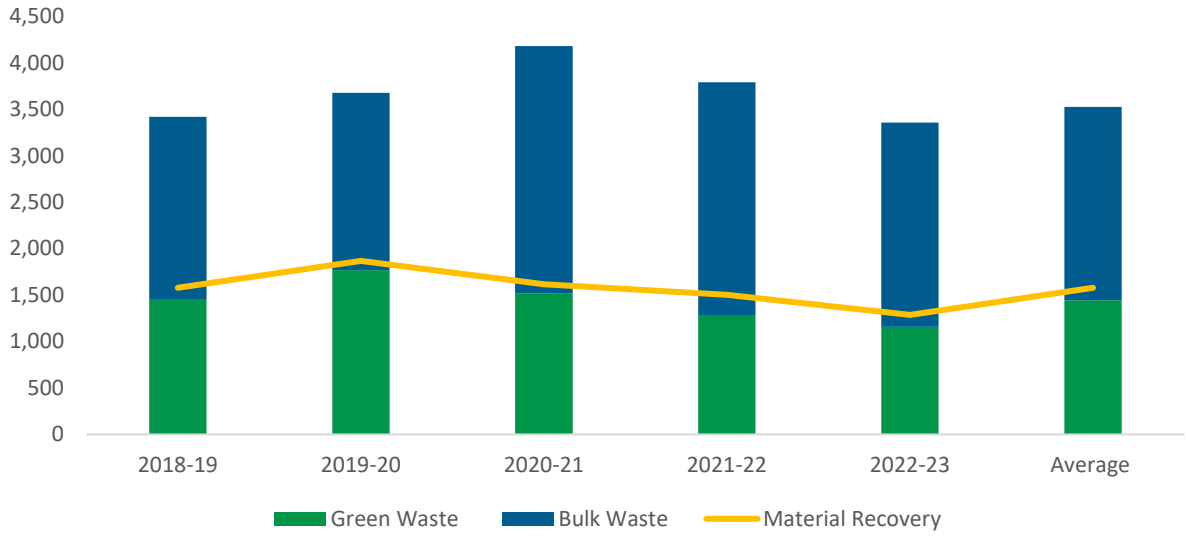
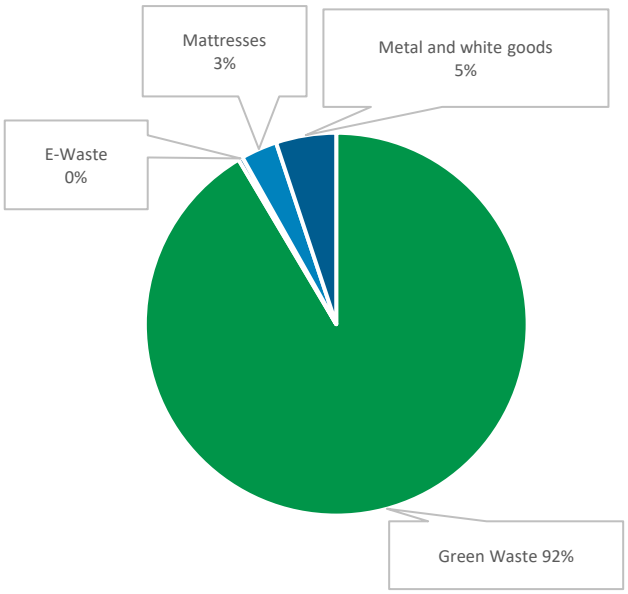


Figure 6: City of Kwinana Verge Collection material recovery composition



Service Options

Three prospective service models with the potential to enhance the current verge collection services were identified for assessment in the review process. To assess the feasibility of implementing these options, the City conducted an evaluation, analysing the advantages and disadvantages associated with each option outlined below.

Table 3: Options explored in Verge Collection Review

	Bulk Waste				Green Waste		
	Type	Collections	Total m3	Mattresses/ White goods	Type	Collections	Total m3
Option 1 Current	Scheduled	2	6	Included collection	Scheduled	3	9
Option 2 Pre-booked	Pre-booked	1	3	2	Pre-booked	1	3
Option 3 Hybrid	Pre-booked	1	3	2	1 Scheduled 1 Pre-booked	2	6

Option 1: Scheduled (Current Service)

The scheduled collection option, being the current service provided by the City, involves setting fixed dates for bulk waste collection throughout the year. Residents receive notification of their collection dates through various channels, including social media, print media, the City's website, and the annual Waste and Recycling Guide. Residents are permitted to place waste on their adjacent verge up to two days before the collection zone collection commences. Early placements or non-compliant piles may lead to infringements under the City's *Waste Local Law 2022*. Non-compliance piles receive a notice in the form of a non-compliance card and sticker/tag (Appendix B: Verge Collection non-compliance Notice). Non-compliant items are not collected, and residents are notified to remove the items. Failure to comply with this notice may result in a warning or infringement issued by the City's Ranger team.

This service lacks effective material separation due to incorrect initial placement by residents and mixing of material by scavengers, resulting in a low material recovery rate.

Advantages:

- Operationally effective with no booking system required, offering cost-effective service.
- Equal service provided to all residents.
- City's experienced with this service.
- Residents can plan for collection.

Disadvantages:

- Poor visual amenity, inviting scavenging and reducing safety for pedestrians.
- Potential to attract pest species if waste is placed out early.
- High waste generation.
- Moderate material recovery rate (39% landfill, 51% WtE).
- Set schedule inconveniences residents who are away during place-out dates.
- Residents must wait for the scheduled service dates.
- City growth pressures service delivery as properties must be serviced in the specified timeframe.
- Occurrences of illegal dumping of non-compliant materials onto existing bulk waste piles.
- Regular placement on private property, especially vacant blocks, which are not collected from and must be subsequently managed as illegal dumping.

- Challenges for accurate data collection.
- Presentation difficulties, including lack of space on the verge for some households and risk of property/infrastructure damage during collection.
- High compliance workload for Rangers.
- Reinforces the public notion that the City will remove waste if placed on the verge.
- Limited opportunities for education regarding non-compliant waste and recycling options.
- Procurement challenges due to limited suppliers offering scheduled collection services in the region.

The existing service model deviates from Waste Authority Better Practice Guidelines[14] and does not align with the objectives of the Waste Strategy 2030[15].

Option 2: Pre-booked

A pre-booked system would offer residents the flexibility to dispose of bulky waste items at a time that is convenient to them throughout the year. Each property is allocated two collections, including one bulk waste collection and one green collection, in addition to up to two collections of mattresses and/or white goods. Furthermore, additional collections could be purchased for a fee beyond annual allocations on a user-pays basis.

Residents would book the service through an online portal or by contacting the City's contractor, selecting the types of waste they wish to dispose of, with available collection dates determined by the provider. Items are placed on the verge two days prior to their collection date in separate piles or within a bulk bin receptacle, promoting increased material separation for improved recycling.

Advantages:

- Streamlined booking process and specialised collections enhance convenience for residents.
- Opportunities for collaboration with Non-Government Organisations (NGOs) for free reuse collections.
- Enhanced educational opportunities during booking, encouraging residents to consider alternative disposal options (such as donating to charity).
- Decreased waste tonnages (estimated 26% reduction) through improved material separation and disposal only of unrecoverable items.
- Increased material recovery (14%) through improved source separation.

- Improved data capture for better planning and accurate regulatory reporting.
- Decreased costs (10-year average: $167k saving per annum) due to reduced waste volumes and cleanup expenses.
- Improved visual amenity with waste only placed at select households at any one time and for shorter, controlled periods.
- Enhanced safety by minimising risks and reducing the potential for contact with structures.
- Improved convenience for residents with a streamlined booking process and specialised collections.
- Reduced compliance workload for Rangers.
- Presentation difficulties decreased by specifying alternative locations during the booking process.
- Improved opportunities for collaboration with Non-Government Organisations for free reuse collections.
- Alignment with the WA Waste Strategy, City's Waste Plan and Sustainability Framework.

Disadvantages:

- Administration and transition challenges with a change to a different system.
- Reduced number of collections may result in residents who currently heavily use the scheduled service feeling underserviced and potentially aggrieved by a user-pays style system.
- Tenancy/ownership change inequity if annual allocation is utilised before a sale/change of tenancy.
- Possible extended lead times for bookings during peak demand periods, such as preceding fire season.

Local Governments operating a pre-booked verge collection service have reported a 26% reduction in waste collected and a 30% increase in material recovery. This option provides an opportunity to enhance material recovery, improve visual amenity, and decrease overall waste generation within the City, aligning with Vergeside Better Practice[14] recommendations outlined in Table 1.

Option 3: Hybrid

A hybrid service would combine a pre-booked collection service (as outlined in Option 2: Pre-booked) with an additional scheduled green waste collection in October/November,

immediately prior to fire season (December to March). This approach allows residents the convenience of pre-booking and disposing of bulky items at their convenience while preparing effectively for the fire season. Residents are entitled to two pre-booked collections per property per year and up to two collections of mattresses and/or white goods, as outlined in Option 2: Pre-booked, along with one scheduled green waste collection. Additional pre-booked collections beyond the annual allocations can be obtained for a fee on a user-pays basis.

Residents would receive information about their pre-fire season/summer collection dates through various channels, including social media, print media, a dedicated page on the City's website, and the annual Waste and Recycling Guide.

The advantages and disadvantages of Option 3: Hybrid are identical to Option 2: Pre-booked with the exception of the following:

Advantages:

- Operational effectiveness during peak season (Spring) when demand could potentially exceed pre-booked capacities.
- Residents can plan for collection before the fire season, reducing fire risk.
- Achieves the best material recovery rate (70%).

Disadvantages:

- Additional administration for go-backs and oversized piles from the scheduled collection.
- Slightly inequitable service as only a proportion of households would benefit from the pre-fire-season scheduled green waste collection.
- Set schedule inconveniences residents who are away during place-out dates.
- Risk of illegal dumping management demands, especially when incorrectly placed within private property and, therefore, not collected during verge collection.
- Retains some risk of property/infrastructure damage.
- Retains a level of compliance workload for Rangers.
- Procurement challenges due to limited suppliers offering both collection services.
- Increased cost, generally higher due to a higher participation rate for pre-summer green waste collection.
- Increased tonnages compared to Option 2: Pre-booked (though lower than Option 1: Current).

Local Governments implementing a pre-booked verge collection service experience reduced waste compared to scheduled collections and achieve a high material recovery rate (70%). This option presents the best opportunity to enhance material recovery, improve visual amenity, and decrease overall waste generation within the City, while also addressing the fire season's fuel load through a specialised collection.

Variable Service

A Variable Service option was also assessed as a potential addition to Option 2: Pre-booked and Option 3: Hybrid as a customisable service able to be tailored to individual residents' needs. Recognising the diverse requirements highlighted during the engagement phase of the Review, such as additional green waste, mattresses, white goods, or bulk waste collection requirements, this service option would offer improved flexibility within limits to better serve a broader range of residents. Under this Variable Service type, each property would receive two collections per annum of any combination of bulk waste or green waste, as opposed to strictly one of each. The Variable Service would also retain the inclusion of up to two collections of mattresses and/or white goods, but would also enable residents to forgo their mattress and white goods collections in favour of an additional green waste collection. Further collections beyond the allocated amount could also be obtained for a fee on a user-pays basis.

The advantages and disadvantages of the Variable Service option are identical to those of the corresponding Option 2: Pre-booked and Option 3: Hybrid with the exception of the following:

Advantages:

- Customisable service tailored to residents' needs.

Disadvantages:

- Decreased material recovery compared to non-variable relevant option (4% and 2% decrease respectively).
- Does not fully align with the WA Waste Strategy[14] and City's Waste Plan[2].
- Administration challenges due to increased complexity of eligibility.
- Increased costs per household compared to non-variable relevant option (10-year average - $7.86 and $8.30 increase respectively).

This option presents significant potential for enhancing material recovery, improving visual amenity, and reducing overall waste generation within the City, while offering residents a tailored service. Nevertheless, it's worth noting that allowing up to two bulk waste collections deviates from the Vergeside Better Practice Guidelines.

Modelling

Effective waste management requires a holistic understanding of various factors, encompassing tonnages, composition, material recovery, and cost modelling. This financial assessment and modelling aims to equip us with the necessary insights to make informed decisions, optimise resource allocation, and foster sustainable waste management practices that align with economic considerations and environmental objectives.

Assumptions were integral to this assessment. Household growth projections were derived from REMPLAN[10]. It is assumed that by 2024/25, the City will send all residual waste to WtE and implement the GO (Garden Organics) bin system. It is also assumed that transitioning to the GO system will lead to a 15% reduction in green waste from verge collections.

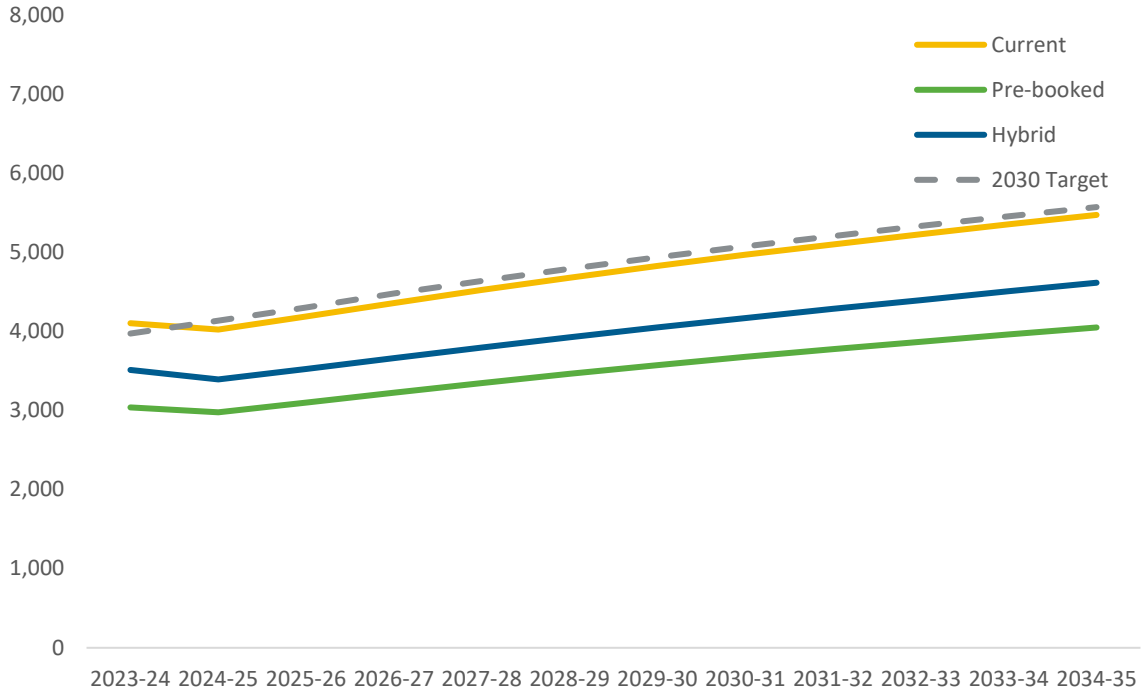
Tonnage

Using the City's longitudinal waste collection data, workings from Three Bin Feasibility Assessment 2023[6] and benchmark data obtained from other local governments, waste stream tonnage modelling was undertaken for each verge service option. Tonnage modelling was assessed against State Waste Strategy 2030[15] material reduction targets of:

- 5% decrease in waste generation per capita by 2025; and
- 10% decrease in waste generation per capita by 2030

Following the City's transition to a three-bin GO system in 2024/25, tonnage forecasts indicate that all three proposed options achieve a minimum 10% decrease in waste generation per capita. When comparing the three options, it is observed that Option 2: Pre-booked generates the least amount of waste, achieving a 26% reduction in tonnages compared to Option 1: Current while Option 3: Hybrid reduces tonnages by 16% in comparison to Option 1: Current.

Figure 7: Forecast tonnages



Variable Service

Based on statistical analysis of Variable Service, it's presumed that the tonnage will remain relatively consistent whether the City opts to implement a variable service or not.

Material Recovery

Material recovery modelling was undertaken for each verge service option using the City's longitudinal waste collection and compositional data, workings from Three Bin Feasibility Assessment 2023[6] and benchmark data obtained from other local governments. Material recovery modelling was assessed against State Waste Strategy 2030[15] recovery targets of:

- 67% material recovery by 2025; and
- 70% material recovery by 2030

As indicated in Verge Waste Collection Service, the City's current material recovery rate stands at approximately 39%. Within this, 92% is attributed to the collection and recovery of green waste, 5% to metals and white goods, 3% to mattresses, and a small portion from E-waste.

With a commitment to divert all residual waste to WtE starting in mid-2024, it is assumed that 20% of residual waste material will be recovered through this process. Additionally, pre-booked sorting is expected to recover 30% of the reclaimable material before it is sent to

WtE. Consequently, Option 1: Current is projected to achieve a 51% material recovery rate, Option 2: Pre-booked a 66% material recovery rate, and Option 3: Hybrid a 70% material recovery rate.

Figure 8: Material recovery rate and resource recovery rate

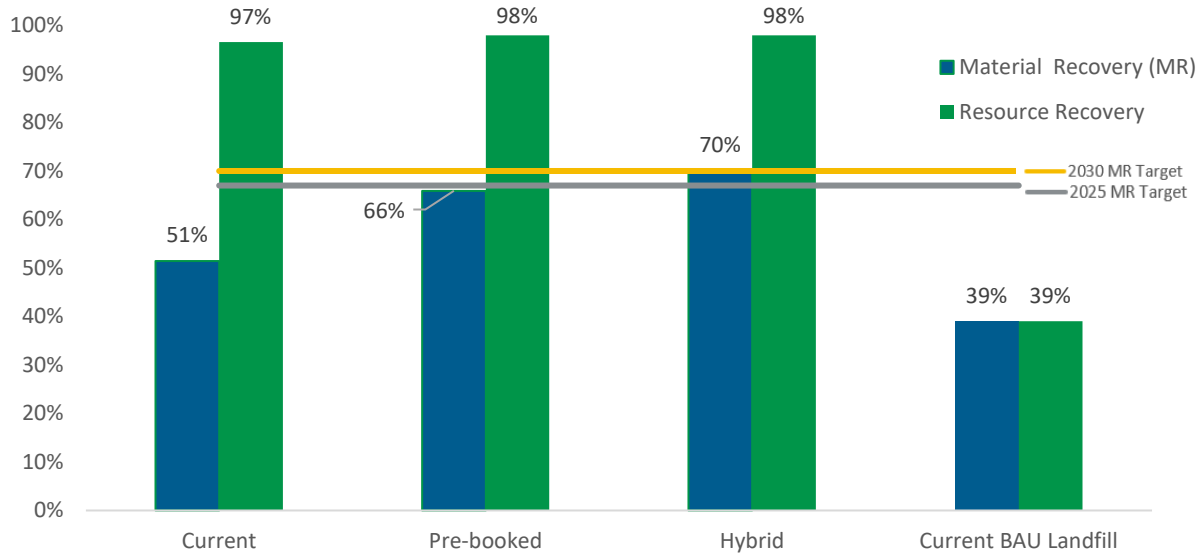
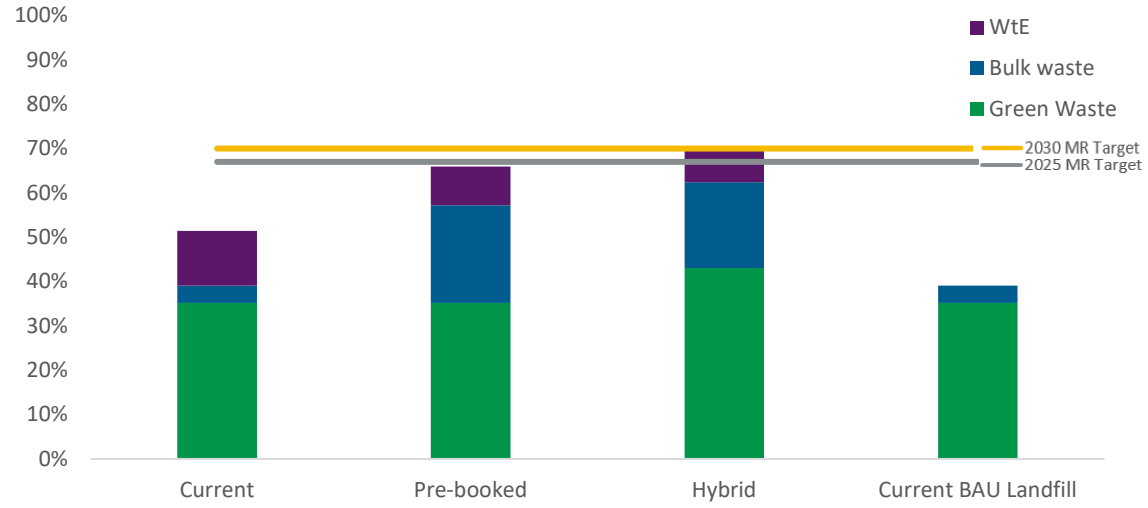


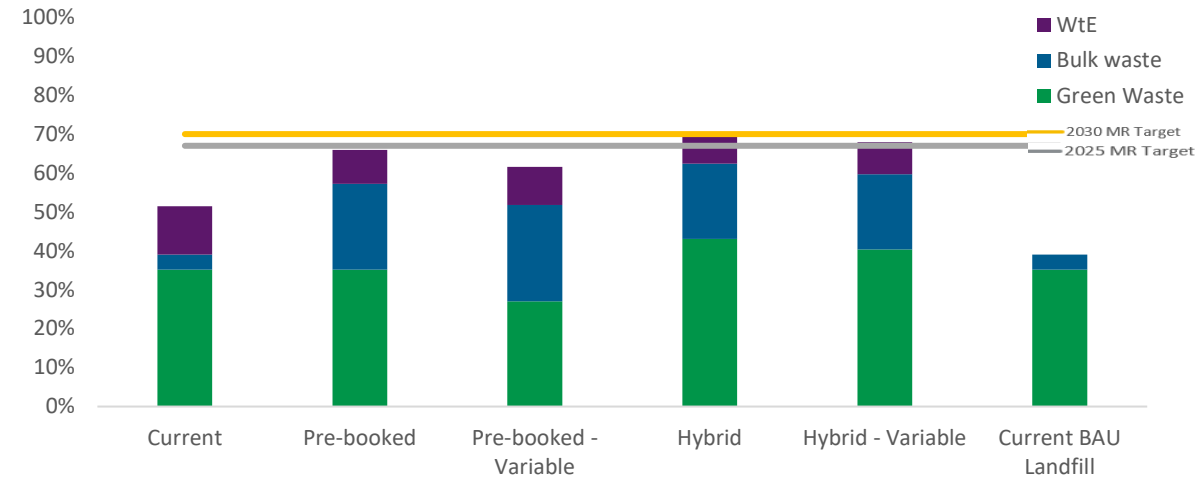
Figure 9: Material recovery rate composition



Variable Service

Based on statistical analysis, it is expected that forecast material recovery rates for Option 2: Pre-booked and Option 3: Hybrid would be reduced if a Variable Service was applied to either. In Option 2: Pre-booked, the variable material recovery rate is projected to be 62%, indicating a 4% decrease. Likewise, in Option 3: Hybrid, the variable material recovery rate is expected to be 68%, resulting in a 2% decrease.

Figure 10: Material recovery rate composition including variable service



Cost

Following the modelling of tonnage and material recovery, the forecast material quantities through each waste stream were cost modelled using contact rates and/or industry average pricing data as stipulated in Appendix E: Table of Assumptions, and household quantity data from REMPLAN[10].

Through a systematic examination of costs, it becomes evident that there is minimal disparity among all options, with the most significant variation observed between Option 1: Current and Option 2: Pre-booked. Option 2: Pre-booked is more cost-effective than Option 1: Current, translating to a reduction of $8.65 in costs per household per annum or $167,053 total decrease in annual system costs (10-year average). Option 3: Hybrid emerges cheaper than Option 1: Current, leading to a $2.82 reduction in costs per household per annum or a $61,868 decrease in annual system costs (10-year average). It must be noted that this cost reduction is largely a result of the reduction in standard service provision and a user-pays approach to additional service compared to Option 1: Current.

Figure 11: Longitudinal cost forecast (10-years)

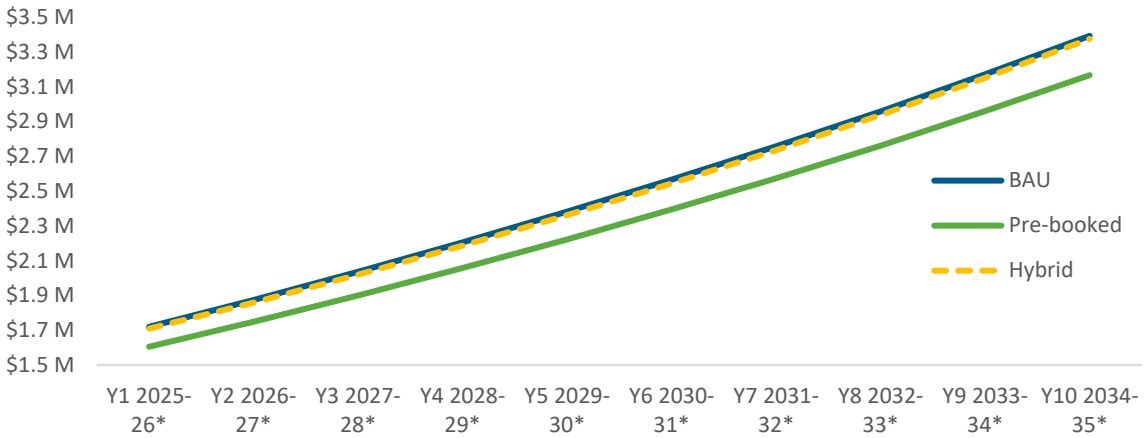
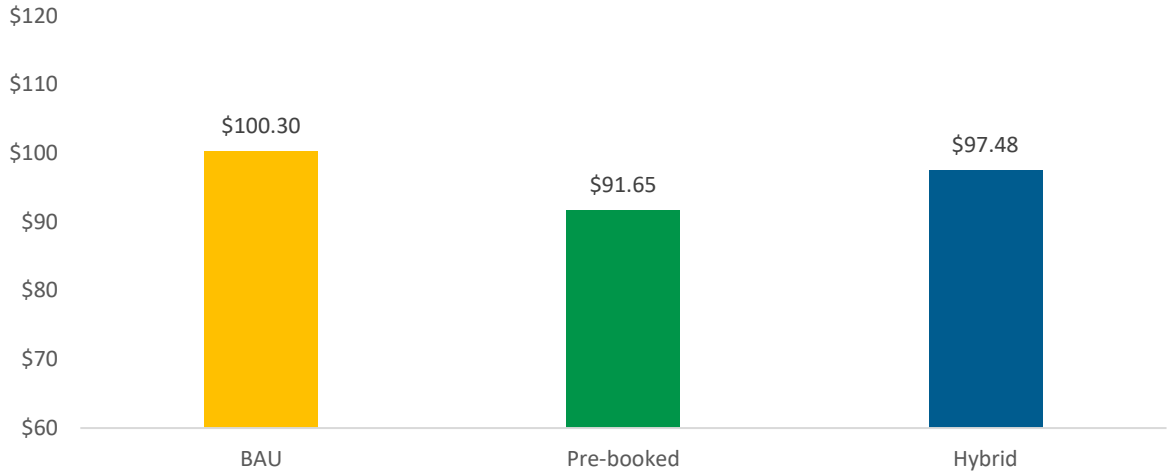


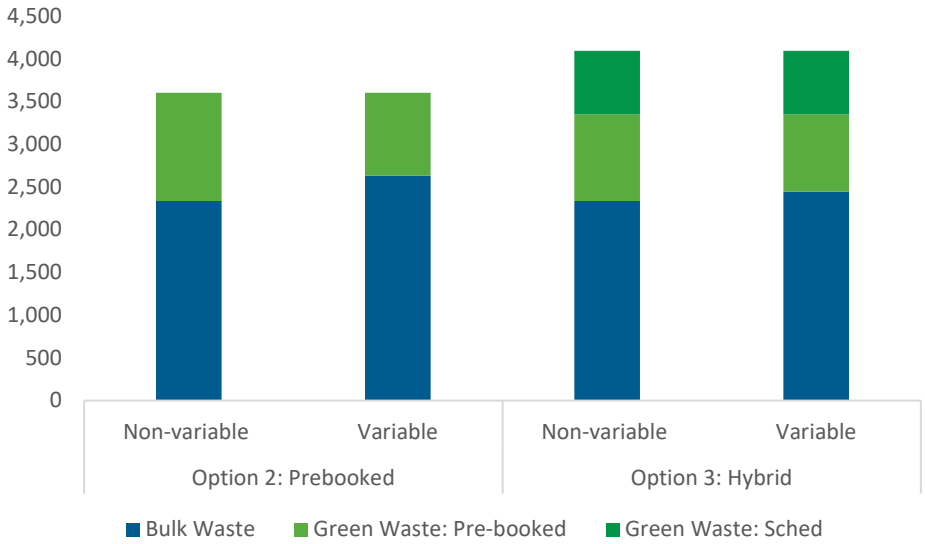
Figure 12: Cost forecast per household per annum - 10-year average



Variable Service

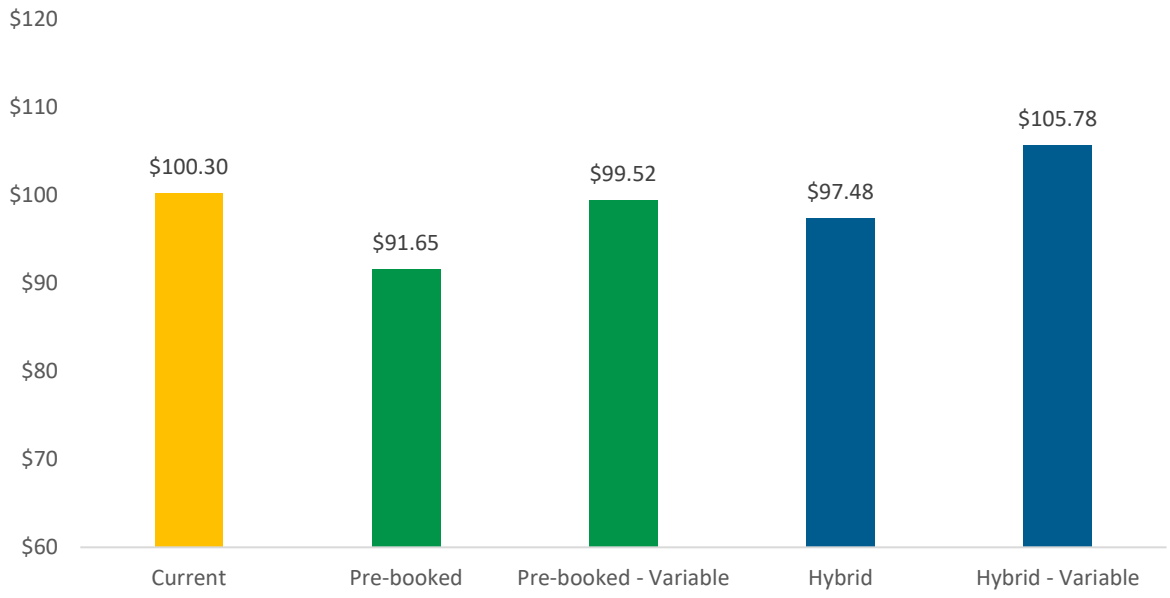
Based on statistical analysis of Variable Service, it is anticipated that costs would rise compared to the standard modelling if the variable service were implemented. The utilisation composition is expected to change by 23%, with a forecast reduction in green waste tonnage and an increase in bulk waste tonnage, as displayed in Figure 13.

Figure 13: 10-year average tonnage



With this assumption, the 10-year household average for Option 2: Pre-booked – Variable is projected to be $99.52, which is $0.79 lower per household compared to Option 1: Current and $7.86 higher per household compared to Option 2: Pre-booked. Similarly, in Option 3: Hybrid, the projected 10-year household average is $105.78, $5.47 higher per household compared to Option 1: Current and $8.30 higher per household compared to Option 3: Hybrid.

Figure 13: Cost forecast per household per annum, including variable service - 10-year average



Engagement

Over the years the City has actively engaged with residents regarding their waste collection services. Regular MARKYT Community and Wellbeing Scorecard Reports compare the City's performance against other local governments, while surveys help identify residents' needs and preferences. Using the City's engagement framework, a targeted engagement plan was developed and implemented in consultation with the Council and Executive Leadership Team. This approach emphasised reviewing feedback from recent engagements, utilising a conversational method to gather informed perspectives, avoiding the pitfalls of mass surveys that might result in uninformed responses.

During the 2023 engagement sessions, the Variable Service was developed in response to the diverse needs of our community. This initiative aimed to accommodate the varying preferences and requirements identified through our comprehensive engagement process.

2020: Bulk Waste Survey

In 2020, The City conducted a Bulk Waste Collection Review, promoting an online survey through social media, direct emails, e-newsletters and Marketplace displays which resulted in 1,132 respondents (Appendix A: Bulk Waste Collection Review Outcome). The purpose was to understand our community's priorities and assess their satisfaction with the service.

Key findings of this survey showed:

- High level of satisfaction with the current service (81%)
- Priorities for service outcomes:
    - Highest priority: Convenience
    - Medium priority: Cost, waste reduction and increased recycling
    - Lowest priority: Streetscape appearance
- Future service preferences: Ranked 1st or 2nd
    - Retain scheduled verge collection: 54%
    - Willing to change to pre-booked: 29%
    - Tip-passes only were least preferred: 17%

Due to the findings of this survey in 2020, at the time it was recommended to:

- Reduce verge green waste collections from 4 to 3 per annum
- Reduce time of waste on verges
- Amended collection zones

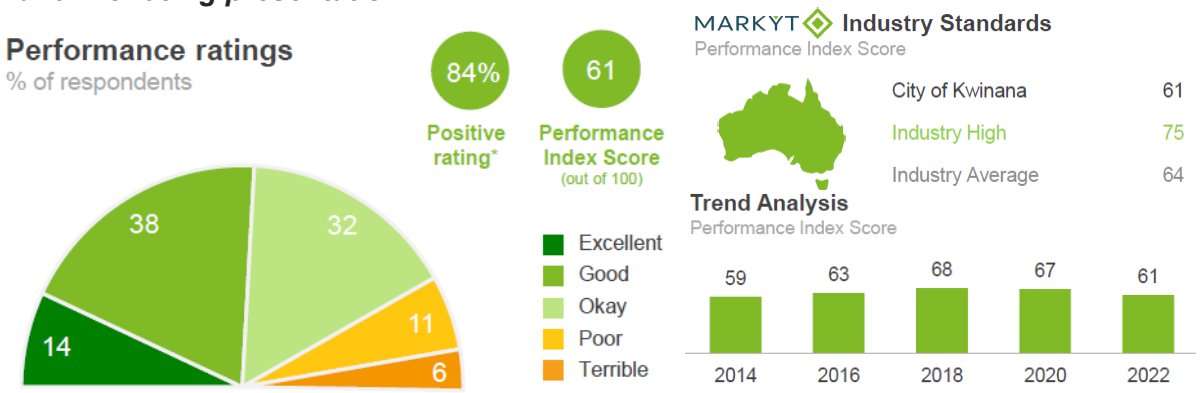
All recommendations were actioned in 2020/21 and are part of our Current Service.

2022: MARKYT Community and Wellbeing Scorecard Report

Biennial MARKYT Community and Wellbeing surveys measure the Kwinana community's perception of services provided by the City, allowing the City to identify areas of importance and recommendations for improvement. The 2022 MARKYT Community and Wellbeing survey found that, among a range of other services, waste and recycling are priority areas for the community.

The 2022 MARKYT Community and Wellbeing survey surveyed 797 residents. This survey found that verge collection satisfaction had decreased during recent years.

Figure 14: Exert from verge waste performance rating from 2022 MARKYT Community and Wellbeing presentation



Community driven recommendations related to verge waste through this survey include:

- Provision of more bulk rubbish disposal options to keep verges clear of rubbish and discourage illegal dumping, such as:
    - More frequent verge collections
    - Pre-booked collections
    - Free skip bins
    - Tip passes
- Reduce rubbish on verges outside designated collection times by issuing warnings and fines.

2023: Engagement

From September 2023 to March 2024, the City engaged with 97 residents regarding this verge waste collection review, through meetings with specialised groups as well as residents at shopping centres and pop-up events. These meetings and discussion sessions explored the options the City was considering, explaining the key aspects of each options while answering all questions raised by residents to ensure informed feedback was being obtained regarding their preferred option. Findings on preference were as follows:

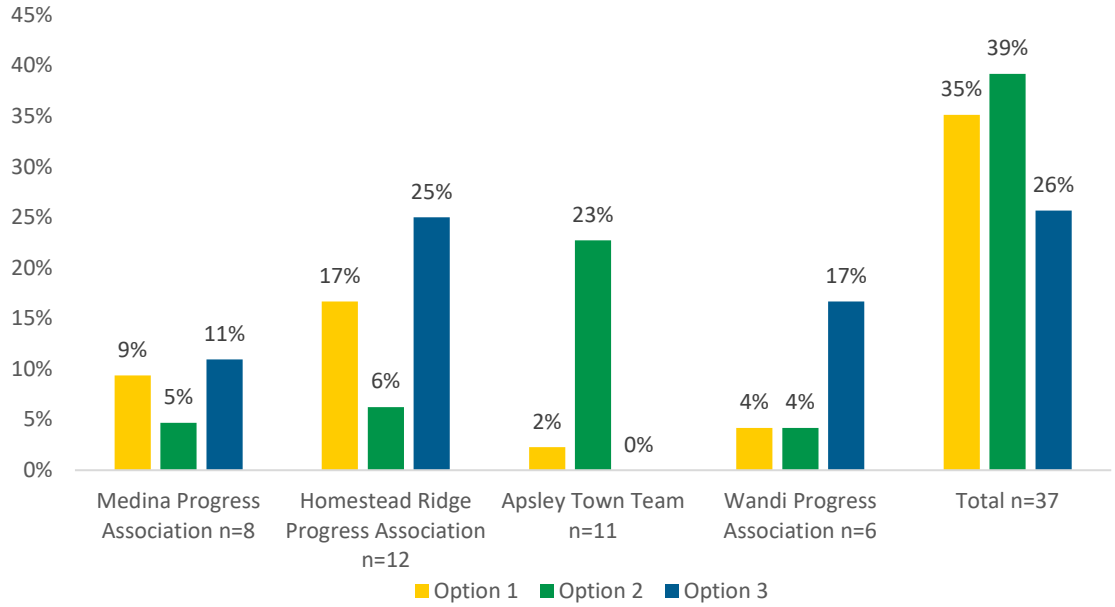
Progress Associations:

37 residents from 4 progress associations were consulted with the following:

- Medina Progress Association
- Homestead Ridge Progress Association
- Apsley Town Team
- Wandi Progress Association

Figure 15: Image from Apsley Town Team engagement session 18 September 2023

Figure 16: Progress association engagement results



Findings showed that 39% of respondents preferred Option 2: Pre-booked, 35% preferred Option 1: Current, and 26% preferred Option 3: Hybrid. This indicates that a majority, 65%, wish to transition to a variation of the Pre-booked system.

Advisory Groups:

Medina Aboriginal Cultural Centre (MACC):

The intended engagement with Boola Maara was disrupted due to the group's transition to a committee of Council during the review engagement timeframe, which resulted in no meetings being held late 2023 or early 2024. Consequently, the City opted to engage with residents at the MACC to gather perspectives on the three waste management options under consideration. Following discussions with 15 participants, concerns were raised regarding the following aspects:

- Size of bin/ amount that can be placed out for pre-booked collections ($3m^3$)
    - Advised that all options will allow $3m^3$ per collection
- Need the ability to dispose of more than 2 mattresses each year
- Concerns with restrictions on what could be placed in a skip bin/ out for verge collections
    - Advised that there are restrictions on what can be placed out for the current scheduled service as well
- A resident stated that they enjoy going through piles to collect reusable items
    - Acknowledged that direct access to reuse items placed out by others would be reduced under the pre-booked options, however, also spoke about the several risks of residents going through piles

Access and Inclusion Reference Group:

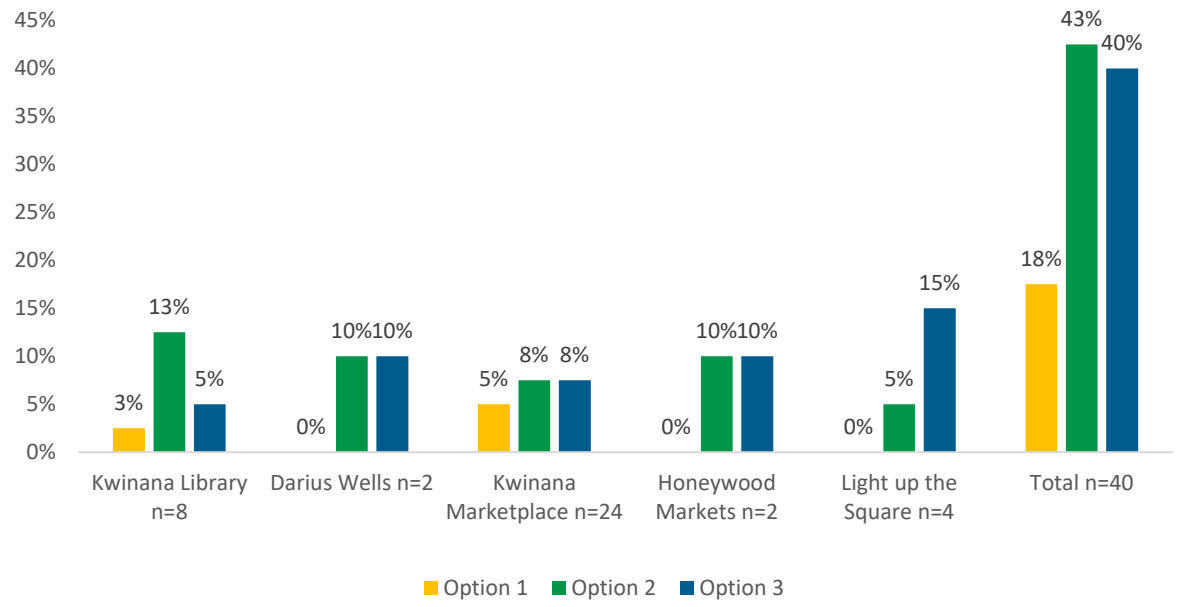
The City convened with the Access and Inclusion Reference Group at the John Wellard Community Centre to gather their insights on the three waste management options under consideration. Similar to the approach with the MACC, the primary aim of the session was to grasp their perspectives and concerns with the options being assessed. After engaging with 5 participants, the following issues were highlighted:

- Concerns were voiced regarding the challenge faced by individuals with limited mobility or strength in lifting items into a skip bin
    - Advised that the City could address this concern through the procurement phase, if a pre-booked service were to be progressed, to ensure that options are available to accommodate those unable to place items in a standard skip bin, such as bins with a drop side entry and/or collection of material from the verge rather than in a bin
- Residents expressed a desire for an in-home service for individuals unable to move waste from inside their homes
    - Advised this feedback could also be explored in the procurement of future collection contracts under any of the service options being assessed

Community Events:

40 residents were engaged across 5 consultation events. These included engagement sessions held at the City of Kwinana Library, Darius Wells, Kwinana Marketplace and Honeywood Markets.

Figure 17: Findings from community event engagements

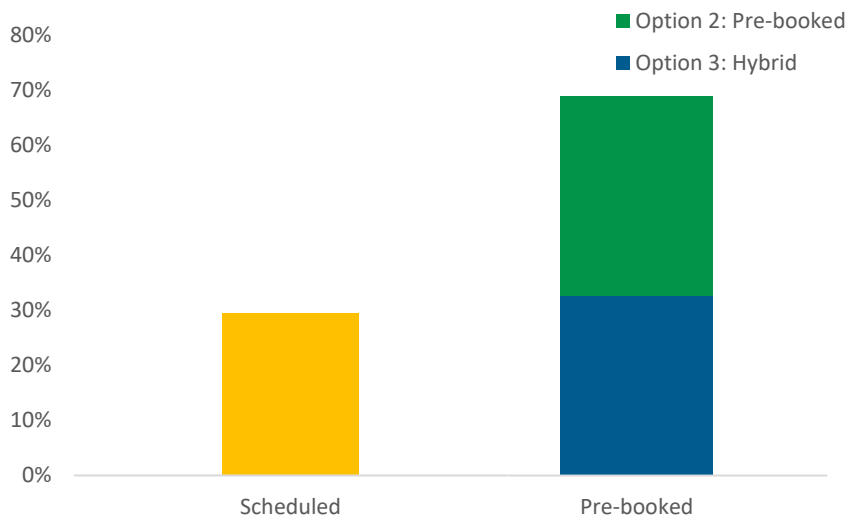


Findings showed that 43% of respondents preferred Option 2: Pre-booked, 40% preferred Option 3: Hybrid, and 18% preferred Option 1: Current. This indicates that a majority, 83%, wish to transition to a variation of the Pre-booked system.

Summary

Findings from progress association sessions and community consultations reveal that 37% of respondents favoured Option 2: Pre-booked primarily due to convenience it offers. 33% of respondents preferred Option 3: Hybrid citing reasons such as preparing for the fire season and the convenience and flexibility it provides. Those who did not prefer Option 3: Hybrid cited the absence of a garden as a key reason why they do not favour this option. Lastly, 29% favoured Option 1: Current, with planning in advance being a significant factor, while concerns about mess/ scavenging and work commitments restricting them from using this service being the primary reasons for not choosing this as their preferred option. This indicates that a majority, 70%, wish to transition to a variation of the Pre-booked system.

Figure 18: Combined totals of all feedback



Risk Assessment

The development of an efficient verge collection service must involve a thorough analysis of the potential risks associated with each option being considered. The objective of this risk assessment is to methodically assess and pinpoint potential hazards, vulnerabilities, and variations among the services under consideration. The City's Risk Management Framework was utilised to formulate the risk assessment approach and consider the risks and appropriate control measures for each service option being assessed.

Table 4 outlines the risk assessment summary based on residual risk once treatments have been implemented. See Appendix F: Risk Register for the full risk assessment.

Table 4: Risk assessment summary – Residual risk

Risk Types	Risk Level		
	Option 1: Current	Option 2: Pre-booked	Option 3: Hybrid
Non-alignment with Waste Authority Guidelines[14]	Moderate	Low	Low
Environmental risk	Moderate	Moderate	Low
Negative public opinion	Moderate	Low	Low
Procurement considerations	Moderate	Low	Moderate
Risk to human health	Moderate	Low	Moderate
Risk to properties	Moderate	Low	Low
Increased cost	Low	Low	Low
Equitable service	Moderate	Low	Moderate
Overall risk profile	Moderate	Low	Low/Moderate

Option 2: Pre-booked has resulted in the lowest risk profile. It consistently scored lowest across all of the key risk themes, except for environmental risk where it performed moderately. Option 1: Current was assessed as the highest risk profile with a moderate risk rating and Option 3: Hybrid was in between these options with a low-moderate risk rating.

Multiple Criteria Analysis

A range of different aspects have been considered in this report relevant to the different options outlined in Service Options. These aspects include policy alignment, mode of service, material recovery, waste diversion, cost, risks, popularity/expectation of service, etc. When considering these aspects, there are various advantages and disadvantages applicable to each option, however, not all aspects are equally important. An MCA is a commonly used tool to apply weightings to varying aspects of a decision making process.

The key aspects of the Verge Review were grouped into factors and criteria that had previously been used during the focus group of the Three Bin Feasibility Assessment[6] completed in May 2023. The focus group determined how strongly participants felt about each factor and criterion in the context of waste management in the Kwinana community.

Following the focus group and discussions with key stakeholders, including Elected Members and Executive, an MCA was developed tailored to the City of Kwinana. As this report was completed less than 1 year ago with similar criteria, factor weightings used in the Three Bin Feasibility Assessment 2023[6] were adapted for this report with the following changes:

- Environmental
    - Replacement of 'greenhouse gas emissions' with 'waste diversion'
- Economic
    - Removal of risk of contaminated organics, (no replacement criterion)
- Governance
    - Replacement of 'processing options' with 'procurement options'

The factors along with the weighting of each of the criteria that make up the factors are outlined below.

Table 5: MCA factors and criteria

Factor	Criteria	Weighting %
Environment (30%)	Waste diversion	15
	Material recovery	15
Economic (30%)	Cost to household waste service charge	15
	Value for money	15
Social (20%)	Simplicity and accessibility	8
	Public demand for service	7
	Waste awareness and behaviour change	5
Governance (20%)	Alignment with State Strategy	10
	Procurement Options	10
Total		**100**

As performed in the Three Bin Feasibility Assessment 2023[6], a three-level scoring system was utilised to evaluate the three options against each criterion. The scoring of 3 (advantageous), 2 (neutral) or 1 (disadvantageous) was based on the evaluated responses to the key descriptive questions used for each criterion outlined in Table 6.

Table 6: Criteria Description and Scoring

Criteria	Description	Scoring		
		3	2	1
Waste diversion	What levels of diversion can be expected?	Highest	Moderate	Lowest
Material recovery	What levels of material recovery can the City achieve?	Highest	Moderate	Lowest
Cost to household waste service charge	What is the expected annual household waste service cost?	$90-$95	$95-$100	>$100
Value for money	Which system represents best value for money for the City?	Highest	Moderate	Lowest
Simplicity and accessibility	How user friendly is the option? Are there any areas that will be excluded from accessing the system? How equitable is this service?	Simple/ Lowest	Neutral/ Moderate	Complex/ Highest
Public demand for service	Which system is most popular with the residents?	Highest	Moderate	Lowest
Waste awareness and behaviour change	Which system introduces the most waste education, thus raising community awareness?	Minimal	Moderate	Significant
Alignment with State Strategy	Which system will best achieve the State targets?	Preferred system	Neutral	Least preferred
Procurement Options	What is the availability for processing options with this bin system?	Abundant	Available	Scarce

Table 7 below details MCA scoring based on table 6 scoring. The weighted score for each criterion is the weighting multiplied by the awarded score.

Table 7: MCA Scoring and Weighting

Factors	Criteria	Weighting %	Awarded and Weighted Score by Option					
			Option 1: Current		Option 2: Pre-booked		Option 3: Hybrid	
			Awarded	Weighted	Awarded	Weighted	Awarded	Weighted
Environment	Waste diversion	15	1	15	3	45	2	30
	Material recovery	15	1	15	3	45	3	45
Economic	Cost to household waste service charge	15	2	30	3	45	2	30
	Value for money	15	3	45	2	30	2	30
Social	Simplicity and accessibility	8	3	24	2	16	2	16
	Public demand for service	7	2	14	3	21	2	14
	Waste awareness and behaviour change	5	1	5	3	15	3	15
Governance	Alignment with State Strategy	10	1	10	3	30	3	30
	Procurement Options	10	1	10	3	30	1	10
Score		100		**168**		**277**		**220**

Upon conducting the MCA, Option 2: Pre-booked resulted in the highest score, encompassing greater governance, environmental, social, and economic scores. It consistently scored highly across all of these dimensions except for simplicity and accessibility, and value for money. Option 1: Current achieved the lowest scores, particularly scoring a 1 in both governance and environmental factors.

Business Cases

This section outlines the key findings, strengths, and weaknesses associated with each option presented in this report.

Option 1: Current

The scheduled collection would be a continuation of the existing service, two bulk waste and three green waste collections scheduled throughout the year. The adoption of this option would represent zero change for residents, the City or outcomes of the service.

Strengths

Value for money

The scheduled collection system offers a cost-effective solution, efficiently servicing numerous properties within a short timeframe. This provides excellent value for money, allowing for two bulk waste and three green waste collections at a comparable cost to two pre-booked collections. Due to this, it has scored a low-risk rating for cost and showed the best value for money based on the MCA.

Simplicity and accessibility

Familiarity with the scheduled collection makes it the simplest option for residents, requiring no change from current practice. All households can access two bulk waste and three green waste collections annually, with dates communicated at the beginning of each financial year, enabling residents the opportunity to plan accordingly. This can also be problematic for residents who are away from home during their designated collection dates, leading to missed collections or prolonged waste placement on verges.

Weaknesses

Poor environmental outcomes

The modelling suggests that the scheduled collection service can achieve a material recovery rate of 51%, the lowest material recovery rate for all options considered. This is 19% less than the Waste Strategy 2030[15] material recovery target of 70% by 2030. Lower

material recovery also goes against the globally accepted circular economy principles, leading to Option 1: Current being awarded the lowest waste diversion and material recovery rate within the MCA above.

Additionally, the public disclosure of collection dates amplifies scavenging activities, thereby heightening the risk to residents, environment, property, and infrastructure. The movement of waste during these activities contributes to windblown litter, escalating the likelihood of waste reaching waterways and natural surroundings. This poses an increased threat to the ecosystem and public well-being, contributing to the moderate risk rating of this option.

Limited education opportunities

Despite outreach efforts through mailouts, webpages, and social media, there are limited opportunities to educate the community about non-compliant items and improper waste placement. This poses a risk to property, life, and infrastructure, leading to a high workload for compliance enforcement, resulting in the lowest MCA score for waste awareness and behaviour change.

Key Risks

Non-alignment with Guidelines

Option 1: Current ranks lowest when considering the waste hierarchy, circular economy, and behaviour change concepts outlined in the State Waste Strategy 2030[15]. It demonstrates the lowest waste avoidance and material recovery rate. Additionally, it does not align with the service design specified within Waste Authority Better Practice Guidelines[14] as Option 1: Current permits more than $3m^3$ of bulk waste per annum, lacks sufficient enforcement measures regarding presentation periods and non-compliance, and does not address waste processing in cases where source separation is not practiced effectively by residents.

Procurement difficulties

There is a minimal number of companies offering scheduled collection services in Western Australia, therefore, the market for this service type is constrained and uncompetitive. Difficulties may arise in securing service contracts, and competition from other local governments securing collection dates from the same small pool of contractors poses potential challenges in effectively managing the waste collection service. Due to these factors, a moderate residual risk rating remains regarding Option 1: Current procurement considerations.

Risk of damage to property, infrastructure and life

Throughout the year, residents may accumulate and stockpile waste, anticipating scheduled collection, leading to potential issues such as waste becoming a habitat for vermin or posing a fire risk.

The City publicly promotes collection dates which may attract scavengers, heightening the risk to residents, the environment, property, and infrastructure. The movement of waste can contribute to windblown litter, escalating the likelihood of waste reaching waterways and natural surroundings. Windblown waste has the potential to enter roadways, footpaths, and waterways, causing damage to property, infrastructure, life, and the environment.

With limited resident education opportunities without a booking process, the incorrect placement of waste in close proximity to infrastructure, particularly those that cannot be seen such as water meters and electricity connection domes, can result in safety risk and asset damage during scheduled collections. Further, missed collections or prolonged waste placement on verges may occur if residents are away during their designated place out dates which may also pose a risk to property, infrastructure and life.

Due to these factors, the risk to human health and property resulted in a moderate risk-rating.

Inequitable service

All residents, irrespective of their property type or personal needs, contribute to and are eligible for the same standard service. For example, residents without gardens, who are unlikely to utilise any of the 3 green waste collections, still bear the cost of these services. This creates an inequitable service where residents pay for services they cannot benefit from. The current service structure reflects this imbalance, with a participation rate of 18% for green waste and 36% for bulk waste, indicating that only a small portion of the community utilises the allocated services. Despite this, all ratepayers are obligated to contribute to the service costs, resulting in a moderate risk-rating for equitable service.

Option 2: Pre-booked

The pre-booked collection system entails offering year-round collections to residents, encompassing one bulk waste, one green waste collection, and the flexibility of up to two mattress or white goods collections, with a limit of two items per year, all scheduled at the convenience of individual residents. To streamline the process and enhance awareness, an

online portal and phone service will be employed for booking, ensuring educational information is provided at the point of booking.

Strengths

Alignment with Waste Authority Guidelines

Option 2: Pre-booked aligns with guidelines stipulated in Waste Authority Better Practice Guidelines[14] to avoid, recover and protect. Due to its annual allocation reduction of bulk waste to $3m^3$ per annum, an increase of recyclable waste collections and providing a user-pays system, it meets annual service allocation and price signals service design recommendations. The reduction in tonnages not only addresses environmental concerns but also enhances the capacity for effective material separation. This involves both source separation and manual sorting after the waste is transferred to a sorting facility. Consequently, the outlined strategy contributes to a high Governance rating within the MCA.

Greater education opportunities

Implementing an online and phone booking system and engaging in direct communication with residents booking this service provides ample opportunities for the City to effectively educate its residents on alternate disposal, permitted materials and correct placement. Being able to offer avenues to alternative disposal methods, such as donations or gifting, not only reduces the volume of waste reaching landfills but also generates social benefits; residents who may be financially constrained can then access such items at affordable prices rather than these items being disposed of as waste.

Moreover, an enhanced focus on education will alleviate the compliance workload for Rangers. This proactive education while booking approach can, therefore, improve the aesthetics of streetscapes, reduce the occurrence of windblown items entering waterways, and ensure hazardous items are kept off verges, while reducing in-field resourcing demands on the City. Further, in the MCA, both the environmental and social aspects receive high scores, emphasising the comprehensive advantages derived from improved education efforts.

Greater environmental outcomes

The modelling suggests that Option 2: Pre-booked collection service has the potential to achieve a material recovery rate of 66%. While this falls slightly short of the Waste Strategy 2030[15] material recovery target of 70% in 2030, it still surpasses Option 1: Current by 26%. Notably, Option 2: Pre-booked generates the least amount of waste due to the reduction in annual allocations.

The education provided at the point of booking ensures that items are not left out for extended periods, thereby mitigating environmental, property, and infrastructure risks associated with prolonged waste presence. This proactive approach helps limit the negative impacts imposed by waste remaining in situ for extended durations.

Additionally, the online and phone booking system provides opportunities to guide residents towards other agencies that specialise in reusable waste, such as NGOs. This encourages residents to opt for reuse rather than disposal, leading to more favourable environmental, social and sustainability outcomes.

Convenient service

Option 2: Pre-booked offers a convenient service that residents can schedule at any time throughout the year. This flexibility allows residents to manage their property, arranging waste removal at their convenience, especially during activities like renovations, moving, or seasonal clean-ups. The ability to book at any time helps prevent residents from accumulating and stockpiling waste in anticipation of a scheduled collection, reducing risks associated with long-term storage, such as vermin infestation and fire hazards.

Residents desiring an extra collection have the option to book additional services, at their cost, through the City's system, leveraging the City's purchasing power to the benefit of the community. This allows residents to benefit from the cost efficiencies achieved by the City, while also providing the security of an insured, safe and reputable contractor procured by the City. Overall, these features contribute to a high Social MCA rating for Option 2: Pre-booked.

Public Demand

The pre-booked service is the preferred system among surveyed residents as detailed in 2023: Engagement, receiving 37% of all votes primarily due to the convenience it offers and concerns around scavenging and mess caused by the other options.

Weaknesses

Reduction in annual collections

The primary drawback of this option stems from the decrease in annual service allocation. Currently, residents are accustomed to receiving 3 green waste and 2 bulk waste collections annually. However, a comparison with other local governments and our low utilisation rates indicates that the City is currently over-providing services to our community, resulting in an inefficient and inequitable collection system. Benchmarking reveals that, on average, local governments offer 1.5 scheduled bulk waste collections and 2 scheduled green waste

collections. Furthermore, those who have transitioned to pre-booked collections typically provide 1.4 bulk waste collections and 1 green waste collection per year. The allocation of 1 bulk waste pre-booked collection will fall below the average annual allocation provided by Perth Metro Local Governments. The provision of 1 green waste collection will align with the average annual allocation.

Key Risks

Improved education results in Environmental and Social benefits. This is depicted in the risk assessment by the reduction of risks to environment, property and health. Enhanced education initiatives yield collective benefits for both Environment and Society factors. This positive outcome is evident in the risk assessment, where the reduction of risks to the environment, property, and health is observed. Despite holding the lowest risk rate overall, Option 2: Pre-booked still retains the following risks:

Difficulties servicing during peak periods

There is an expected surge in demand during peak periods preceding the summer season which may potentially result in a bottleneck in booking collection services, owing to a heightened influx of residents seeking service within the same timeframe. This influx could lead to challenges in securing timely appointments and receiving their intended service promptly.

To address this potential risk, proactive measures could be implemented. One strategy involves actively promoting alternative booking times to residents, thereby distributing the demand more evenly. Encouraging residents to consider flexible scheduling or informing them about potential delays during peak periods can be pivotal. Additionally, creating awareness about the likelihood of increased demand and urging residents to book services well in advance of their usual timelines can help preemptively manage the situation. Further, as part of a procurement process, the City could seek contractors with sufficient resourcing capability to minimise potential wait times during peak periods.

Potential inequitable service

A risk with Option 2: Pre-booked arises from its allowance of 1 bulk waste and 1 green waste collection per annum. In situations where a prior resident exhausts both annual allocations early in the financial year, a new resident would still be charged for the service (pro-rata) but would not be able to utilise the pre-booked service allocations for the property. This could lead to an inequitable service, where a resident cannot access the service due to the prior resident's usage. This risk remains low, however must be noted.

Option 3: Hybrid

Aimed at addressing fire safety concerns, the Hybrid option adds a single additional scheduled green waste collection, immediately prior to the fire season, to the service outlined in Option 2: Pre-booked. In doing so, the hybrid collection system offers year-round collections to residents, including one pre-booked bulk waste, one pre-booked green waste, and one scheduled green waste collection, in addition to up to two mattress or white goods collections.

As with Option 2: Pre-booked, an online portal and phone service will be utilised for booking, providing educational information during the booking process. The scheduled dates for the pre-fire-season green waste collection would be published each year.

Option 3: Hybrid shares the same strengths, weaknesses, and risks as Option 2: Pre-booked, with the following variations.

Strengths

Best environmental outcomes

The modelling suggests that Option 3: Hybrid collection service has the potential to achieve the greatest material recovery rate of 70% aligning with the Waste Strategy 2030[15] material recovery target of 70% by 2030. It surpasses Option 1: Current by 19% and Option 2: Pre-booked by 4%. Option 3: Hybrid generates more waste in comparison to Option 2: Pre-booked, however less than Option 1: Current.

Convenient service

Additionally to the benefits explained in Option 2: Pre-booked Convenient Service, Option 3: Hybrid addresses the anticipated peak demand during late spring and early summer by supplying a scheduled green waste collection in late spring to further mitigate fire hazards. Overall, these features contribute to a moderate Social MCA rating for Option 3: Hybrid.

Weaknesses

Limited education opportunities

Despite outreach efforts through mailouts, webpages, and social media, there are limited opportunities to educate the community about non-compliant items and improper waste placement. This poses a risk to property, life, and infrastructure, leading to a high workload for compliance enforcement. While the introduction of an online booking system for the pre-booked aspect of this collection enhances educational opportunities, it is important to acknowledge that limitations still exist.

Key Risks

Retains risk of damages to property, infrastructure and life

Throughout the year, residents may accumulate and stockpile green waste, anticipating scheduled collection, leading to potential issues such as waste becoming a habitat for vermin or posing a fire risk. Windblown waste has the potential to enter roadways, footpaths, and waterways, causing damage to property, infrastructure, life, and the environment. Missed collections or prolonged waste placement on verges may occur if residents are away during their designated place out dates which may also pose a risk to property, infrastructure and life. Due to these factors, risk to human health and property resulted in a low/ moderate risk-rating.

Retains some inequity

Additionally, to the risk specified in Option 2: Pre-booked Potential inequitable service, where inequity is apparent if the allocation is exhausted early in the financial year, further inequity is present as all residents, irrespective of their property type or personal needs, contribute to and are eligible for the same standard service. Residents without gardens, who are unlikely to utilise any of the green waste collections, still bear the cost of these services. This creates an inequitable service where residents pay for services they cannot benefit from. The current service structure reflects this imbalance, with a participation rate of 18% for green waste, indicating that only a small portion of the community utilises the allocated green waste services. Despite this, all ratepayers are obligated to contribute to the service costs, resulting in a moderate risk-rating for equitable service.

Procurement difficulties

There is a minimal number of companies offering scheduled collection services in Western Australia, therefore, the market for this service type is constrained and uncompetitive. Difficulties may arise in securing service contracts, and competition from other local governments securing collection dates from the same small pool of contractors poses potential challenges in effectively managing the waste collection service. Due to these factors, a moderate residual risk rating remains regarding Option 3: Hybrid procurement considerations.

Variable Service

The Variable Service, incorporated into either Option 2: Pre-booked or Option 3: Hybrid, would offer a tailored waste management solution adaptable to residents' individual needs. It caters to a range of requirements including green waste, mattresses, white goods, or bulk waste collections, providing flexibility within reasonable bounds. Each property would be

entitled to two bulk or green waste collections annually, with the option for up to two mattress or white goods collections, limited to two items per year. Residents would also have the flexibility to swap their mattress and white goods collection allocation for an additional green waste collection. Like Options 2 and 3, additional collections beyond the allocation are also available to residents for a fee on a user-pays basis.

Apart from the strengths, weaknesses, and key risks outlined in their respective business cases above, factors specific to the Variable Service include:

Strengths

Convenient service

The Variable Service stands out for its convenience, allowing residents to schedule up to two bulk waste collections or up to three green waste collection services per annum. This flexibility empowers residents to manage their property efficiently, arranging waste removal at their convenience, especially during events like renovations, relocations, or seasonal clean-ups. The option to book at any time helps prevent waste accumulation and stockpiling, reducing risks associated with long-term storage such as infestations and fire hazards. This variability enables residents to tailor their waste management to their unique needs.

Increased usability:

The Variable Service expands the range of usable services available to residents, allowing them to book up to two bulk waste collections or up to three green waste collections per annum. This flexibility caters to different property sizes and needs, with smaller properties having the opportunity to dispose of additional bulk waste if required, while larger properties can maintain their premises by having up to three green waste collections annually.

Weaknesses

Environmental outcomes

Modelling indicates that the Variable Service has the potential to achieve a material recovery rate between 62% and 68%, slightly below the Waste Strategy 2030[15] material recovery target. This shows a 4% or 2% material recovery decrease in comparison to their non-variable counterpart.

Key Risks

Non-alignment with Guidelines

The Variable Service does not fully align with all service design recommendations specified within the Waste Authority Better Practice Guidelines[14], as it permits more than 3m³ of bulk

waste per annum. However, the Variable Service meets all other recommendations specified within the guidelines.

Difficulties servicing during peak periods:

There is an expected surge in demand during peak periods preceding the summer season which may potentially result in a bottleneck in booking collection services, owing to a heightened influx of residents seeking service within the same timeframe. This influx could lead to challenges in securing timely appointments and receiving their intended service promptly. The introduction of the Variable Service could exacerbate this issue, as residents could potentially book up to three green waste collections per annum.

To address this potential risk, proactive measures could be implemented. One strategy involves actively promoting alternative booking times to residents, thereby distributing the demand more evenly. Encouraging residents to consider flexible scheduling or informing them about potential delays during peak periods can be pivotal. Additionally, creating awareness about the likelihood of increased demand and urging residents to book services well in advance of their usual timelines can help preemptively manage the situation. Further, as part of a procurement process, the City could seek contractors with sufficient resourcing capability to minimise potential wait times during peak periods.

Recommendation

Following the thorough analysis provided in this assessment, the City recommends the adoption of Option 2: Pre-booked – Variable Service, which demonstrated the strongest business case. This choice aligns with most of the objectives outlined in the Waste Strategy 2030[15] and adheres to the principles within the City's Sustainability Framework[7]. The transition to Option 2: Pre-booked – Variable Service aims to improve or achieve the three specified targets of the state Waste Strategy: reducing waste generation (avoid), enhancing waste recovery (recover), and mitigating instances of illegal dumping (protect). Additionally, introducing an option for residents requiring services beyond their annual allocation to pay for any additional service at a competitive cost (compared to privately procured bulk waste disposal) contributes to a more equitable service for all residents.

The proposed system is designed to facilitate a convenient disposal method that suits most residents, contributing significantly to the overall success of waste management initiatives within the City.

It is recommended that the City implement a Pre-booked - Variable Service by undertaking a transition project and contract procurement through the 2024/25 financial year and commence the service in August 2025 at the conclusion of the City's current collection service contract.

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Appendix

Appendix A: Bulk Waste Collection Review Outcome 2020

Appendix B: Verge Collection Non-Compliance Notice

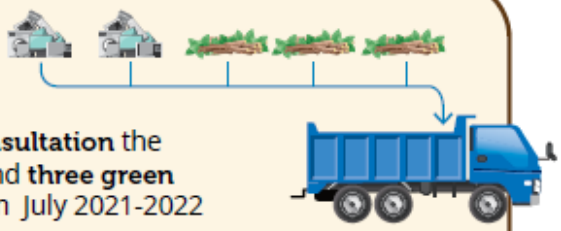
Appendix C: 2023 Engagement Graphics

Appendix D: Verge Waste Composition

Appendix E: Table of Assumptions

Appendix F: Risk Register

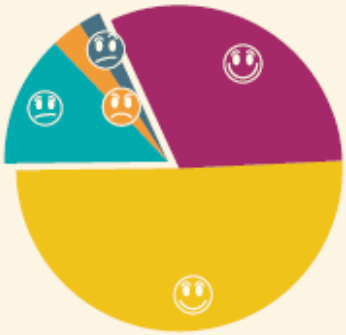
Bulk Waste Collection Review Outcome



After extensive **benchmarking** and **community consultation** the City of Kwinana will proceed with **two bulk waste** and **three green waste verge collections per year**, commencing from July 2021-2022

1,132 responses

were submitted to the survey *(open from September to October 2020)*

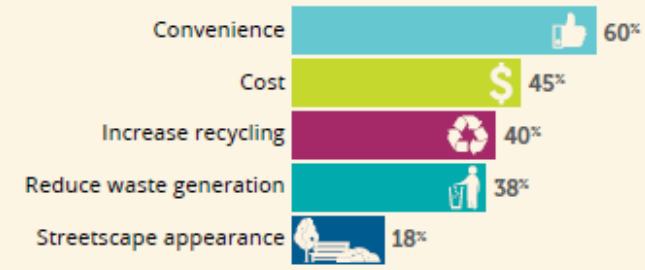


- 31% Highly satisfied
- 50% Somewhat satisfied
- 13% Not satisfied
- 3% Highly un-satisfied
- 2% Unsure

over 80% were satisfied with the current verge collection services.

Important factors...

Which factors are most important to the community?



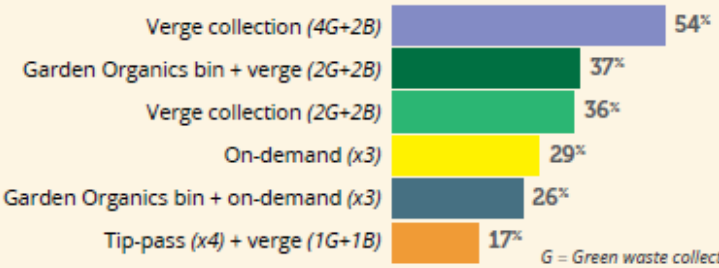
Highest priority was convienience

Lowest priority was street appearance

Percentages based on total first and second preferences

Thinking ahead...

Which services would the community like to see in the future?



Strong preference for continued verge collections

Lowest preference was tip passes

G = Green waste collection, B = Bulk waste collection, totals per annum

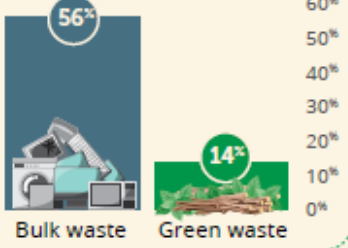
In comparison...

Kwinana's current **4x** green waste collections is **higher** than **any other** Metro Council

With almost all providing **2x or fewer**

Current service usage...

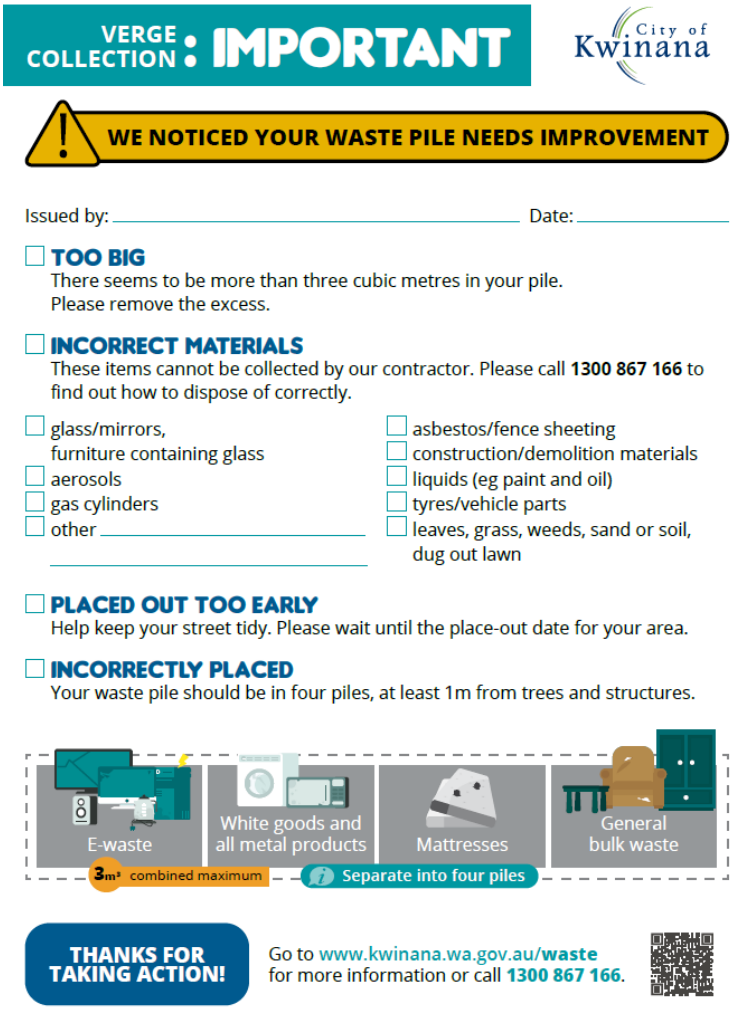
Household usage of current green waste collection service is low



Appendix B: Verge Collection Non-Compliance Notice

Sticker and Tape template

Verge collection compliance notice



Appendix C: 2023 Engagement Graphics

Appendix D: Verge Waste Composition

5-year average

Material	Proportion by weight	Tonnes collected 5-year average	Material Recoverable	Recycling		Refuse		Total Material Recovery
				%	Tonnes	%	Tonnes	
Green Waste	39.01%	1,437.4	Yes	100%	1,437.4	0%	0	1,437.4
Bulk Waste	60.99%	2,247.7	Partially	6%	133.7	94%	2,114	133.7
Total Verge Waste	100.00%	3,685.1	Partially	43%	1,571.2	57%	2,114	1571.2 (43%)

Material	Proportion by weight	Tonnes collected 5-year average	Material Recoverable	Recycling		Refuse		Total Material Recovery
				%	Tonnes	%	Tonnes	
Other Bulk Waste	57.9%	2,097.9	No	0%	0	100%	2,097.9	0
Metal	2.2%	79.6	Yes	100%	79.6	0%	0	79.6
Mattresses	64.3%	64.3	Partially	75%	48.2	25%	16.1	48.2
E-Waste	0.2%	5.9	Yes	100%	5.9	0%	0	5.9

Appendix E: Table of Assumptions

General Assumptions

Factor	Input	Source
CPI	4.68%	Australian Bureau of Statistics[1]
Adopted growth rate	3.13%	REMPLAN Forecast[10]
Number of households	20,737	City data
Participation rate – Scheduled	60%	City data
Participation rate – Pre-booked	40%	Predicted[8,11,12]
Tonnage decrease – Pre-booked	26%	Predicted[8,11,12]

- Predicted figures for Year 1 (2025/26) are based on available data.
- CPI, growth rate, and household numbers are determined using 5-year averages.
- Tonnage is calculated using a 5-year average of kilograms per household figures.
- With the initiation of the Three Bin GO system in 2024/25, a 15% decrease in green waste is anticipated.
- Household growth follows projections from REMPLAN.
- Variable service tonnage constant with their non-variable counterpart, and no change in utilisation of mattresses or white goods is predicted

Green Waste Assumptions – Y1 2025/26

Factor	Input	Source
Green Waste tonnage	1,474.50T	City data
Hybrid Green Waste tonnages	-20%	Predicted[8,11,12]
GO bin impacts	-15%	Three Bin Feasibility Assessment 2023[4]
Green Waste recovery rate	100%	City data
Green Waste scheduled collection cost	Contract rate	Current contractor
Green Waste pre-booked collection cost	$60.05	Industry average[8,11,12]
Green Waste processing cost	$91.93	Industry average[8,11,12]

Bulk Waste Assumptions – Y1 2025/26

Factor	Input	Source
Bulk Waste tonnage	2,712.53T	City data
Bulk Waste recovery rate – Total	6.2%	City data
Bulk Waste recovery rate – Residual waste	0%	City data
Bulk Waste recovery rate - Metal	100%	City data
Bulk Waste recovery rate - Mattresses	75%	City data
Bulk Waste recovery rate – E-waste	100%	City data
Bulk Waste composition – Residual waste	93.3%	City data
Bulk Waste composition – Metal	3.5%	City data
Bulk Waste composition – Mattresses	2.9%	City data
Bulk Waste composition - E-waste	0.3%	City data
Bulk waste scheduled collection cost	Contract rate	Current contractor
Bulk waste pre-booked collection cost	$60.05	Industry average[8,11,12]
WtE cost – Residual waste	Contract rate	Current contractor
Processing and transport cost – Mattress	$52.40	Industry average[8,11,12]
Processing and transport cost – E-Waste	$34.65	Industry average[8,11,12]
Processing and transport cost – White goods	$44.70	Industry average[8,11,12]
Processing and transport cost – Large furniture	$70.82	Industry average[8,11,12]

The City utilised industry averages and documentation from neighbouring Local Governments to assess their verge collection services, incorporating insights from the City of Kwinana. Specifically, they integrated data from:

- City of Wanneroo's Bulk Waste Review[7].
- City of Vincent's Bulk Waste Options Considerations Detailed Options Report[10].
- City of Joondalup's Vergeside Bulk Waste Collection Service Review[11].

Appendix F: Risk Register

Bin System	Risk Event	Risk Themes	Risk Theme Description	Risk Effect/ Impact	Risk Assessment Context	Consequence	Likelihood	Rating (before treatment)	Risk treatments in place	Risk treatments required/Response (Opportunities for Improvement List)	Consequence	Likelihood	Rating (after treatment)	Risk Status	Risk owner/ author	Comments
Option 1: Current	Non-alignment with the State Best Practice Verge Collection Guidelines (Waste Authority)	Failure to fulfil statutory regulations or compliance requirements	Guidelines help plan and implement the Verge services provided to the community. Guidelines align with the Waste Avoidance and Resource Recovery Strategy 2030 (Waste Strategy) allowing local governments to achieve the Waste Strategy's material recovery targets for municipal solid waste (MSW). Failure to align with guidelines will reduce likelihood of achieving Waste Strategy targets.	Compliance	Strategic	Moderate	Almost certain	High	Reduce - mitigate risk	Reduce annual allocations to meet Guidelines service design recommendations to: - Mixed bulk waste – maximum of three cubic metres of allocation per year per household. - Recyclable waste – minimum of three collections across recyclable wastes.	Moderate	Possible	Moderate	Open	Elected Members Senior Management	Reducing service allocations will result in the City meeting service delivery goals, yet unlikely to meet State Waste Strategy "recover" target.
	Inferior environmental outcomes as a result of the decision to remain with a scheduled collection system	Inadequate environmental management	Waste Strategy targets specify requirements to avoid waste generation by 10% and recover 70% of material by 2030. Reducing waste and recovering material result in a better environmental outcome.	Environment	Strategic	Moderate	Almost certain	High	Reduce - mitigate risk	Reduce annual allocations to meet Guidelines service design recommendations to: - Mixed bulk waste – maximum of three cubic metres of allocation per year per household. - Recyclable waste – minimum of three collections across recyclable wastes. Implement material recovery performance standards in tender procurement process and contract KPIs specifying minimum material recovery rate.	Moderate	Possible	Moderate	Open	Elected Members Senior Management	Option 1 material recovery is anticipated to be 51%, 29% lower than the Recovery target. Forecasts show that Avoid targets will be met by all proposed options.
	Increased negative public opinion on the City's environmental stance if system is maintained	Inadequate environmental management	Waste Strategy targets specify requirements to avoid waste generation by 10% and recover 70% of material by 2030. Failure to meet targets could result in a negative public perception of the City's environmental stance.	Reputation	Strategic	Moderate	Possible	Moderate	Reduce - mitigate risk	Reduce annual allocations to meet Guidelines service design recommendations to: - Mixed bulk waste – maximum of three cubic metres of allocation per year per household. - Recyclable waste – minimum of three collections across recyclable wastes. Publicly display verge collection material recovery performance on City's website.	Moderate	Rare	Low	Open	Elected Members Senior Management	Negative public perception relating to the City's environmental stance can be mitigated, however additional risks come from residents who want to see a change in the system as surrounding LGs are changing which will need to be managed effectively.
	Difficulties with securing contractors to by the City due to limited market capacity	Inadequate supplier/contract management	Limited suppliers provide verge collection services which may result in difficulties in procuring contractor to service the community.	Service Delivery	Strategic	Major	Possible	High	Reduce - mitigate risk	Seek to understand the current market's ability to offer scheduled service. Establish contingencies for the failure of the contractor to provide the required services or reduce annual service allocations.	Major	Unlikely	Moderate	Open	Elected Members Senior Management	There is a restricted market as there are few companies that provide scheduled collection services resulting in competition between LGs as many LGs wish to have scheduled collections at the same time each year. As more LGs move onto pre-booked services, companies are starting to provide both scheduled and pre-booked services, reducing companies' capacity. City growth will add pressure on service delivery.
	Risk to human health by thrown or blown waste.	Inadequate safety and security practices	Waste that is thrown or blown can block the line of sight for vehicles and/or cause waste to intrude onto footpaths and/or roads causing risk by blocking or damaging.	People/Health	Operational	Moderate	Possible	Moderate	Reduce - mitigate risk	Restrict to a specific timeframe through enforcement and education to ensure risks are known. In incidences where residents are away during the collection period requiring early placement, some risk is retained despite mitigation measures.	Moderate	Unlikely	Moderate	Open	Manager	Education is limited in scheduled collections. A comprehensive engagement/ communication plan would be required to mitigate risks as well as a comprehensive compliance process.
	Damage risk to	Inadequate	Lack of ample space on the	Property	Operational	Moderate	Likely	High	Reduce -	Improve education around placement of	Moderate	Possible	Moderate	Open	Manager	Some items are hidden under piles resulting in

Bin System	Risk Event	Risk Themes	Risk Theme Description	Risk Effect/ Impact	Risk Assessment Context	Consequence	Likelihood	Rating (before treatment)	Risk treatments in place	Risk treatments required/Response (Opportunities for Improvement List)	Consequence	Likelihood	Rating (after treatment)	Risk Status	Risk owner/ author	Comments
	property and infrastructure due to fleet collecting waste.	safety and security practices	verge, particularly in newer estates or laneway blocks, results in a great risk to properties due lack of safe placement locations. Damages can be made to vital infrastructure such as power domes and water meters or trees and fences.						mitigate risk	waste with residents and do not collect waste if it is too close to property and infrastructure.						the risk being retained even if treatments are implemented. Regular placement on private property, especially vacant blocks, also which are not collected during verge collection.
	Non-compliance items being placed on verge resulting in safety risks to the community and property.	Inadequate safety and security practices	Non-compliant items such as glass can cause injury to residents and/or property.	People/Health	Operational	Moderate	Likely	High	Reduce - mitigate risk	Improve education around placement of non-compliance with residents and do not collect waste if it is a non-compliant item. Create an enforcement plan to enforce non-compliance incidences.	Moderate	Unlikely	Moderate	Open	Manager	Education is limited in scheduled collections. A comprehensive engagement/ communication plan would be required to mitigate risks as well as a comprehensive compliance process.
	Risk to property, life and environment due to fire from high fuel load being retained on verge/ property.	Inadequate safety and security practices	Green waste left for a duration of time dries causing a potential fire hazard.	Property	Operational	Moderate	Unlikely	Moderate	Reduce - mitigate risk	Restrict quantity of waste to 3m3, contain waste and ensure waste is placed out two days before collection commences in each area through enforcement and education. In incidences where residents are away during collection period requiring early placement, some risk is retained despite mitigation measures. Implement timeframe performance standards in tender procurement process and contract KPIs specifying waste must be collected within one week of area commencement date.	Moderate	Rare	Low	Open	Manager	Education is limited in scheduled collections. A comprehensive engagement/ communication plan would be required to mitigate risks as well as a comprehensive compliance process.
	Increased waste service costs imposed on residents.	Inadequate project/change management	Financial implications are imperative to evaluate as costs are to be recovered for service through Waste Service Charge through annual rates.	Financial	Strategic	Moderate	Likely	High	Reduce - mitigate risk	Reducing service allocations will reduce annual verge collection costs for service. Without a reduction of service, the indexed collection and disposal costs will be passed onto ratepayers	Moderate	Rare	Low	Open	Elected Members Senior Management	Reducing service allocations will result in the City reducing costs associated with verge collections while providing service used by most residents providing an equitable service.
	Service inequity due to residents paying for a service that they do not require.	Business and community disruption	Failure to provide equitable service to residents could damage City's reputation.	Reputation	Strategic	Minor	Likely	Moderate	Reduce - mitigate risk	Reducing service allocations will provide a service for most residents as currently, 39% of residents use bulk waste collections and 18% use green waste collections. Without a reduction of service, the indexed collection and disposal costs will be passed onto ratepayers	Minor	Possible	Moderate	Open	Elected Members Senior Management	Reducing service allocations will ensure the City is providing service used by most residents providing an equitable service. Additionally providing a user-paid service will ensure residents feel serviced. No service model will meet the needs of all residents and all service models carry residual risk of disgruntled ratepayers who feel they are either under or over-serviced for their particular needs
Option 2: Pre-booked	Non-alignment with the State Best Practice Verge Collection Guidelines (Waste Authority)	Failure to fulfil statutory regulations or compliance requirements	Guidelines help plan and implement the vergeservices provided to the community. Guidelines align with the Waste Avoidance and Resource Recovery Strategy 2030 (Waste Strategy) allowing local governments to achieve the Waste Strategy's material	Compliance	Strategic	Moderate	Almost certain	High	Reduce - mitigate risk	Provide an educational booking system that encourages alternatives to disposing reusable items such as donating or gifting items. Booking system to advise how to donate items to charities or gift items to others through pay-it-forward groups. Provide opportunity to purchase user-pays additional services for additional	Moderate	Unlikely	Moderate	Open	Elected Members Senior Management	Reducing service allocations will result in the City meeting service delivery goals, yet unlikely to meet State Waste Strategy "recover" target with a 65% material recovery rate anticipated before risk treatment is applied. It is likely that with treatment, target will not be reached.

Bin System	Risk Event	Risk Themes	Risk Theme Description	Risk Effect/ Impact	Risk Assessment Context	Consequence	Likelihood	Rating (before treatment)	Risk treatments in place	Risk treatments required/Response (Opportunities for Improvement List)	Consequence	Likelihood	Rating (after treatment)	Risk Status	Risk owner/ author	Comments
			recovery targets for municipal solid waste (MSW). Failure to align with guidelines will reduce likelihood of achieving Waste Strategy targets.							waste. As anticipated costs are cheaper for green waste, it is likely that implementing a user-pays service will encourage residents to dispose of additional green waste.						
	Inferior environmental outcomes as a result of the decision to transition to a pre-booked service	Inadequate environmental management	Waste Strategy targets specify requirements to avoid waste generation by 10% and recover 70% of material by 2030. Reducing waste and recovering material result in a better environmental outcome.	Environment	Strategic	Moderate	Almost certain	High	Reduce - mitigate risk	Provide an educational booking system that encourages alternatives to disposing reusable items such as donating or gifting items. Booking system to advise how to donate items to charities or gift items to others through pay-it-forward groups. Provide opportunity to purchase user-pays additional services for additional waste. As anticipated costs are cheaper for green waste, it is likely that implementing a user-pays service will encourage residents to dispose of additional green waste.	Moderate	Unlikely	Moderate	Open	Elected Members Senior Management	Option 2 material recovery is anticipated to be 65%, 5% lower than the Recovery target. Forecasts show that Avoid targets will be met by all proposed options.
	Increased negative public opinion due to change in service.	Inadequate environmental management	Based on 2020 engagement, 81% of residents stated they are happy with the current service, however, 2023 engagement showed that majority of residents favoured option 2.	Reputation	Strategic	Moderate	Possible	Moderate	Reduce - mitigate risk	Stage transition to option 2 by implementing option 3 initially until residents become familiar with new system prior to transitioning to option 2.	Moderate	Possible	Moderate	Open	Elected Members Senior Management	Negative public perception may be experienced due to low engagement numbers in 2023 engagement in comparison to 2020 engagement.
	Difficulties with servicing community during peak periods.	Inadequate supplier/contract management	During peak periods, it may be difficult to secure a booking due to number of residents requiring it in Spring.	Service Delivery	Strategic	Moderate	Almost certain	High	Reduce - mitigate risk	Ensure procurement process is thorough in regard to service allocations/ maximum collections during peak periods of time. Educate and encourage residents to book during off-peak times	Moderate	Possible	Moderate	Open	Elected Members Senior Management	There is a restricted market as there are few companies that provide pre-booked collection services, however, there are more that provide pre-booked in comparison to scheduled services. As more LGs move onto pre-booked services there may be more pressure on this service. City growth will add pressure on service delivery. Ensuring ample education will ensure transparency is adhered to if there are delays in the service.
	Risk to human health by thrown or blown waste.	Inadequate safety and security practices	Waste that is thrown or blown can block line of sight for vehicles and/or cause waste to intrude onto footpaths and/or roads causing risk by blocking or damaging.	People/Health	Operational	Moderate	Possible	Moderate	Reduce - mitigate risk	Improve education regarding timeframes and placement of waste during booking process.	Moderate	Unlikely	Moderate	Open	Manager	Education is paramount to ensure compliance. Risks would be mitigated by ensuring residents agree to T's and C's prior to placing items on verge.
	Damage risk to property and infrastructure due to fleet collecting waste.	Inadequate safety and security practices	Lack of ample space on the verge, particularly in newer estates or laneway blocks, results in a great risk to properties due lack of safe placement locations. Damages can be made to vital infrastructure such as power domes and water meters or trees and fences.	Property	Operational	Moderate	Possible	Moderate	Reduce - mitigate risk	Improve education around placement of waste with residents and do not collect waste if it is too close to property and infrastructure. Comprehensive booking system requiring signed declaration stating resident agrees to terms and conditions of service, advising penalties if they fail to adhere to terms and conditions.	Moderate	Rare	Low	Open	Manager	Some items are hidden under piles resulting in the risk being retained even if treatments are implemented. Regular placement on private property, especially vacant blocks, also which are not collected during verge collection. Risks would be mitigated by ensuring residents agree to T's and C's prior to placing items on verge.
	Non-compliance items being placed on verge resulting in safety risks to the community and property.	Inadequate safety and security practices	Non-compliant items such as glass can cause injury to residents and/or property.	People/Health	Operational	Moderate	Possible	Moderate	Reduce - mitigate risk	Improve education regarding non-compliance with residents and do not collect waste if it is a non-compliant item. Create an enforcement plan to enforce non-compliance incidences. Comprehensive booking system requiring	Moderate	Rare	Low	Open	Manager	Education is paramount to ensure compliance. Risks would be mitigated by ensuring residents agree to T's and C's prior to placing items on verge.

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										signed declaration stating resident agrees to terms and conditions of service, advising penalties if they fail to adhere to terms and conditions.						
	Risk to property, life and environment due to fire from high fuel load being retained on verge/ property.	Inadequate safety and security practices	Green waste left for a duration of time dries causing a potential fire hazard.	Property	Operational	Moderate	Unlikely	Moderate	Reduce - mitigate risk	Improve education regarding timeframes and placement of waste during booking process.	Moderate	Unlikely	Moderate	Open	Manager	Education is paramount to ensure compliance. As residents can book throughout the year it is less likely that residents will remove green waste and store it making option 2 a safer option in regards to fuel load retention.
	Increased waste service costs imposed on residents.	Inadequate project/change management	Financial implications are imperative to evaluate as costs are to be recovered for service through Waste Service Charge through annual rates.	Financial	Strategic	Moderate	Almost certain	High	Reduce - mitigate risk	Reducing annual service allocations from 5 scheduled collections (2 bulk and 3 green) to 2 pre-booked (1 bulk and 1 green) maintains existing costs. Reduced annual service allocations meet the needs of most residents based on current utilisation data.	Moderate	Rare	Low	Open	Elected Members Senior Management	Reducing service allocations will result in the City reducing costs associated with verge collections while providing service used by most residents providing an equitable service.
	Service inequity due to residents paying for a service that they do not require.	Business and community disruption	Failure to provide equitable service to residents could damage City's reputation.	Reputation	Strategic	Minor	Possible	Moderate	Reduce - mitigate risk	Providing user-pays service will ensure all residents can obtain service. Exceptions may be explored for residents who require the service.	Minor	Unlikely	Low	Open	Elected Members Senior Management	As residents will only receive 1 bulk waste and 1 green waste collection, residents may use service early in the financial year prior to moving out of their property which will result in the next resident not having access to this service for the remainder of the year. No service model will meet the needs of all residents and all service models carry residual risk of disgruntled ratepayers who feel they are either under or over serviced for their particular needs
Option 3: Hybrid	Increased negative public opinion due to change in service.	Inadequate environmental management	Based on 2020 engagement, 81% of residents stated they are happy with the current service, however, 2023 engagement showed that majority of residents favoured option 2.	Reputation	Strategic	Moderate	Possible	Moderate	Reduce - mitigate risk	Improving education and advising a staged approach will ensure residents learn the service and understand that we listened to them during the engagement process	Moderate	Rare	Low	Open	Elected Members Senior Management	Negative public perception may be experienced due to low engagement numbers in 2023 engagement in comparison to 2020 engagement.
	Difficulties with securing contractors to by the City due to limited market capacity	Inadequate supplier/contract management	Limited suppliers provide verge collection services which may result in difficulties procuring contractor to service community.	Service Delivery	Strategic	Major	Likely	High	Reduce - mitigate risk	Seek to understand the current market's ability to offer both services. Precure scheduled and pre-booked separately to ensure contractor. Establish contingencies for failure of contractor to provide the required services.	Major	Unlikely	Moderate	Open	Elected Members Senior Management	There is a restricted market as there are few companies that provide both collection services resulting a competition between LGs. As more LGs move onto pre-booked services, companies are starting to provide both scheduled and pre-booked services, reducing companies' capacity. City growth will add pressure on service delivery.
	Difficulties with servicing community during peak periods.	Inadequate supplier/contract management	During peak periods, it may be difficult to secure a booking due to number of residents requiring it in Spring.	Service Delivery	Strategic	Moderate	Almost certain	High	Reduce - mitigate risk	Ensure procurement process is thorough in regard to service allocations/ maximum collections during peak periods of time. Educate and encourage residents to book during off-peak times	Moderate	Possible	Moderate	Open	Elected Members Senior Management	Providing a green waste collection during peak green waste period (Spring) results in a moderate initial risk.
	Risk to human health by thrown or blown waste.	Inadequate safety and security practices	Waste that is thrown or blown can block line of sight for vehicles and/or cause waste to intrude onto footpaths and/or roads causing risk by blocking or damaging.	People/Health	Operational	Moderate	Possible	Moderate	Reduce - mitigate risk	Improve education regarding timeframes and placement of waste during booking process.	Moderate	Unlikely	Moderate	Open	Manager	Education is paramount to ensure compliance. Risks would be mitigated by ensuring residents agree to T's and C's prior to placing items on verge.
	Damage risk to property and	Inadequate safety and	Lack of ample space on the verge, particularly in newer	Property	Operational	Moderate	Possible	Moderate	Reduce - mitigate risk	Improve education around placement of waste with residents and do not collect	Moderate	Rare	Low	Open	Manager	Some items are hidden under piles resulting in the risk being retained even if treatments are

Bin System	Risk Event	Risk Themes	Risk Theme Description	Risk Effect/ Impact	Risk Assessment Context	Consequence	Likelihood	Rating (before treatment)	Risk treatments in place	Risk treatments required/Response (Opportunities for Improvement List)	Consequence	Likelihood	Rating (after treatment)	Risk Status	Risk owner/ author	Comments
	infrastructure due to fleet collecting waste.	security practices	estates or laneway blocks, results in a great risk to properties due lack of safe placement locations. Damages can be made to vital infrastructure such as power domes and water meters or trees and fences.							waste if it is too close to property and infrastructure. Comprehensive booking system requiring signed declaration stating resident agrees to terms and conditions of service, advising penalties if they fail to adhere to terms and conditions.						implemented. Regular placement on private property, especially vacant blocks, also which are not collected during verge collection. Risks would be mitigated by ensuring residents agree to T's and C's prior to placing items on verge, however, engagement is difficult for scheduled service.
	Non-compliance items being placed on verge resulting in safety risks to the community and property.	Inadequate safety and security practices	Non-compliant items such as glass can cause injury to residents and/or property.	People/Health	Operational	Moderate	Possible	Moderate	Reduce - mitigate risk	Improve education regarding non-compliance with residents and do not collect waste if it is a non-compliant item. Create enforcement plan to enforce non-compliance incidences. Comprehensive booking system requiring signed declaration stating resident agrees to terms and conditions of service, advising penalties if they fail to adhere to terms and conditions.	Moderate	Rare	Low	Open	Manager	Education is paramount to ensure compliance. Risks would be mitigated by ensuring residents agree to T's and C's prior to placing items on verge, however, engagement is difficult for scheduled service.
	Risk to property, life and environment due to fire from high fuel load being retained on verge/ property.	Inadequate safety and security practices	Green waste left for a duration of time dries causing a potential fire hazard.	Property	Operational	Moderate	Unlikely	Moderate	Reduce - mitigate risk	Improve education regarding timeframes and placement of waste during booking process. Restrict to a specific timeframe through enforcement and education to ensure risks are known for scheduled collection. In incidences where residents are away during collection period requiring early placement, some risk is retained despite mitigation measures.	Moderate	Unlikely	Moderate	Open	Manager	Education is paramount to ensure compliance. As residents can book throughout the year it is less likely that residents will remove green waste and store it making option 2 a safer option in regards to fuel load retention. Risk is retained for Spring green waste collection.
	Increased waste service costs imposed on residents.	Inadequate project/change management	Financial implications are imperative to evaluate as costs are to be recovered for service through Waste Service Charge through annual rates.	Financial	Strategic	Moderate	Almost certain	High	Reduce - mitigate risk	Reducing annual service allocations from 5 scheduled collections (2 bulk and 3 green) to 2 pre-booked (1 bulk and 1 green) maintains existing costs. Reduced annual service allocations meet the needs of most residents based on current utilisation data.	Moderate	Rare	Low	Open	Elected Members Senior Management	Reducing service allocations will result in the City reducing costs associated with verge collections while providing service used by most residents providing an equitable service.
	Service inequity due to residents paying for a service that they do not require.	Business and community disruption	Failure to provide equitable service to residents could damage City's reputation.	Reputation	Strategic	Minor	Likely	Moderate	Reduce - mitigate risk	Providing user-pays service will ensure all residents can obtain service. Exceptions may be explored for residents who require the service.	Minor	Possible	Moderate	Open	Elected Members Senior Management	As residents will only receive 1 bulk waste and 1 green waste collection, residents may use service early in the financial year prior to moving out of their property which will result in the next resident not having access to this service for the remainder of the year. Inequity is also present as all residents will be paying for Spring green waste collection yet many residents do not require this service. No service model will meet the needs of all residents and all service models carry residual risk of disgruntled ratepayers who feel they are either under or over serviced for their particular needs