



SMALL BUSINESS FOOD WASTE DIVERSION FEASIBILITY REPORT

31.03.2022

Executive Summary

Summary of findings

The findings summarised below were uncovered through visual waste audits and stakeholder engagement. 17 businesses were spoken to throughout the project and the main business types were cafes, bakeries and small retail traders.

Waste profile & generation

- Business precincts generate a variety of waste materials. Thus, business precincts have a great need for diversified waste and recycling stream setups in order to capture materials including cardboard, food waste, soft plastics, rigid plastics, aluminium and glass. Without this type of waste and recycling setup, business precincts could lose over 83% of recyclable materials to landfills.

Business precincts

- Business precincts are characterised by significant pedestrian movement, customer and public seating, adjoining car parking, and space constraints for storage of any kind in or outside of individual premises. Consideration of how waste systems are implemented, and how members of the public interact with business precincts is important to lower adverse community reactions, improve usability and lower traffic issues.

Current waste management practices

- Waste management systems in business precincts are more often than not de-prioritised, outdated, do not operate smoothly, especially when large volumes of waste are generated on-site. Issues with vermin, dumping of waste, and lack of ownership or responsibility for waste services is a common and observable problem.

Trader concerns

- Trader's key concerns are lack of space for waste and recycling (internal and external) and infrastructure such as bins and the cost of waste collection. Cardboard causes traders the most issues due to lack of space in bins and the volume of material.

State government policies and changes

- There is a lack of awareness around the forthcoming changes in state policy and legislation, the mandatory recycling changes and the implications for businesses.

Individual traders and business precincts require a clear plan outlining roles and responsibilities and updates regarding waste policy.

Summary of barriers

- The key barriers for waste diversion in small businesses are; lack of on-site space, aesthetics and odour, inconsistency in existing food rescue systems, lack of resources and council support, and small businesses' lack of understanding of available waste options.

Summary of recommendations

The table below summarises the key recommendations identified throughout the feasibility study. These have been distilled into 7 recommended solutions for Nillumbik Shire Council.

Stage	Recommended Solution	Objective
1	Local food waste diversion solutions	Encourage traders to implement local food rescue and recycling systems, diverting food waste from landfill
2	Council provision of advice and guidance for private waste storage and collection	Develop a fair and consistent bin placement approach, achieve higher resource recovery rates, and align waste infrastructure with <i>Recycling Victoria: a new economy</i> policy.
3	Guidelines for business resource recovery services	Educate traders on setting up an effective waste and recycling system, particularly in relation to cardboard and food waste.
4	Education and community engagement	Create awareness around food waste in the community and keep food waste local by facilitating local and low-cost solutions.
5	Facilitate shared collection points	Increased resource recovery, including food waste and cardboard diversion
6	Facilitate a recycling enclosure	Increased resource recovery, including food waste and cardboard diversion
7	Facilitate cardboard diversion opportunities, including compaction.	Increase cardboard diversion

Project scope

Nillumbik Shire Council retained Reground and Sustainable Resource Use (SRU) to undertake a feasibility study to determine if and how reducing and diverting food waste and cardboard from small businesses is possible in Eltham and Diamond Creek.

This feasibility study includes the identification of and reporting on:

- The barriers to waste diversion for small food businesses in Eltham Town Square and Diamond Creek Plaza
- waste profiles and volumes from audits of businesses in two Nillumbik business precincts
- opportunities for separating and collecting waste and recycling
- opportunities for a local food waste processing system and reuse of food waste in local horticultural and/or agricultural systems
- potential for in situ treatment and sustainable reuse of end products.

To determine the feasibility of food waste diversion and reduction, Reground and SRU undertook:

- discussions with relevant council staff
- engagement with a community reference group
- engagement with traders in each of the targeted areas
- a review of current infrastructure and practices at all sites
- visual waste audits of current waste and recycling streams at selected businesses
- a review of waste management and diversion activities in other similar areas.

Following these actions, Reground and SRU provided the findings, barriers and recommendations to Council for consideration.

This report outlines the universal findings across all business precincts as well as specific findings directly linked to Eltham town square and Diamond Creek Plaza, the two business precincts analysed throughout this feasibility study. Complexities of business precincts need to be considered on all levels as there are a number of universal common and consistent problems, hence why solutions need to be considered at large.

Project objective

To determine the most effective way to reduce and divert food waste and cardboard from small food businesses and assess the feasibility of a local circular economy model.

Method

The project method allowed for the gathering of data on both current behaviours and processes in order to identify barriers and opportunities for avoiding, minimising and diverting waste and recycling from landfill within small businesses in Nillumbik Shire Council.

The project was delivered through the following method;

Step 1: Inception

Reground and SRU held inception meetings with the council project team and the community reference group to establish the key traders, stakeholders, clarify the behaviours desired of them and define problems, and identify a sample group of traders. These sessions established the current challenges and desires for waste within Nillumbik business precincts and provided an opportunity to connect with and hear from those currently involved in the waste management process.

Step 2: Visual waste audits

The project team undertook visual waste audits of the current waste and recycling streams, identifying volume, type, and source of waste produced by the sample group of traders. A key aspect of these audits was the location of bins and skips. Additionally, the project team identified resource diversion opportunities and analysed waste profiles for each precinct.

Step 3: Stakeholder engagement

The project team consulted stakeholders to develop a comprehensive understanding of the current waste management environment within Eltham Town Square and Diamond Creek Plaza. Semi-structured interviews with business owners and staff saw the project team establish the current behaviours, motivations, waste management processes, costs, infrastructure, existing waste issues, and desires of the sample group of traders in detail.

The project team consulted current waste contractors such as Trash n Stash and Veolia, where possible, to understand current waste contracts and servicing options. Followup calls with some members of the community reference group were also provided to gain deeper insights into the traders' motivations and desires.

Step 4: Feasibility Report

Reground and SRU collated and analysed all soft and hard data collected in steps 1-3 to inform the feasibility report and recommendations for potential waste avoidance, minimisation and diversion pathways.

Consideration to precinct-wide solutions

Council is not responsible or currently not equipped for servicing traders or implementing waste management systems for traders in the business precincts. However, as the waste systems in Eltham town square and Diamond Creek Plaza in Nillumbik affect the public, council looks for opportunities to improve amenities for ratepayers in Nillumbik.

Waste management and resource recovery systems in business precincts are systemic issues that affect traders and councils state-wide. They will continue to be areas for opportunity as the *Recycling Victoria: a new economy* policy is implemented. The policy will introduce recycling mandates for businesses. Each business precinct is unique in its infrastructure, aesthetics and operations. The state government should consider whose responsibility it is to enforce recycling mandates in business precincts and communicate this to local councils and traders.

Consideration should be given to the following aspects when implementing effective waste management systems at any business precinct:

- costs to trader
- type of business
- type of waste generated
- billing style (i.e. centralised billing, individual billing)
- internal and external bin space available on-site or elsewhere
- distance from business to potential bin areas
- convenience and ease of use of waste and recycling systems
- linguistic diversity
- visual appeal and overall aesthetics
- statewide standards (i.e. bin colour, four bin policy)
- local laws.

Stakeholders

The key stakeholders within business precincts are

- council staff, specifically waste, economic development and environment teams
- traders
- precinct building managers
- waste contractors
- community members in general.

Throughout engagement with these stakeholders, we have identified stakeholder roles, responsibilities and motivations, outlined in the table below.

Stakeholder	Waste-related role	Motivation
Council	Regulatory	Resource recovery Carbon reduction Low complaints
Trader	Arrange waste contract Generating & disposing of waste	Money Aesthetics
Waste contractor	Waste collection	Money
Precinct building managers	Arrange waste contracts for precinct Implement waste management practices	Money Efficiency
Community	Engage with public-facing waste infrastructure	Aesthetics Resource recovery
Local farming community	Food waste collection	Need for food waste for compost and animal feed purposes

Project findings

Waste audit findings

Visual waste audits of the two business precincts identified the core waste profiles and unrecovered recyclables currently ending up in the general waste stream. Two visual waste audits were undertaken at each precinct, both 6 weeks apart. Currently, most waste material discarded by traders in both business precincts ends in the general waste stream. Only a small proportion of traders have commingled recycling and cardboard-only bins and no traders have food and organic waste bins. Some traders have food waste collections for animal feed. Food waste made up less than 21% of the general waste profile. Diversion opportunities across all streams need to be considered.

Waste profile

The most common materials found across waste streams are

- cardboard
- food waste
- soft plastic
- rigid plastic
- aluminium
- glass.

Other materials found near or in waste streams are:

- expanded polystyrene (EPS)
- cooking oil
- milk crates.

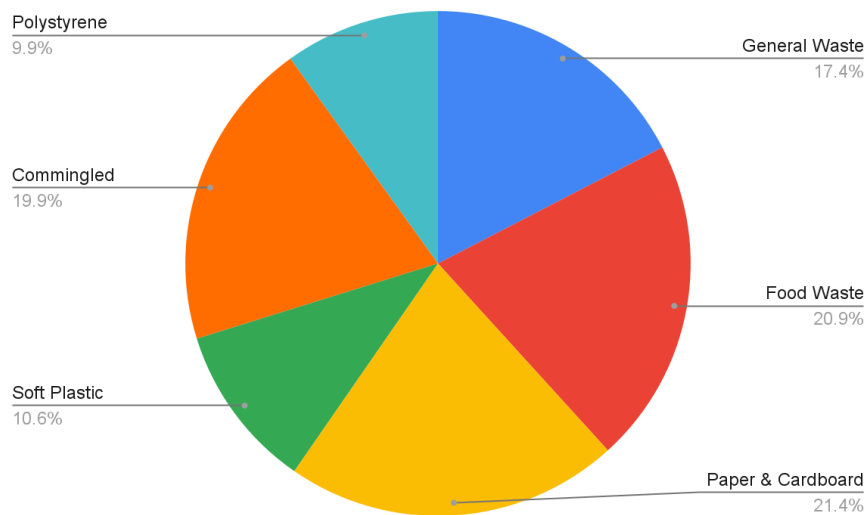


Avoidable and unavoidable food waste was found in the general waste streams

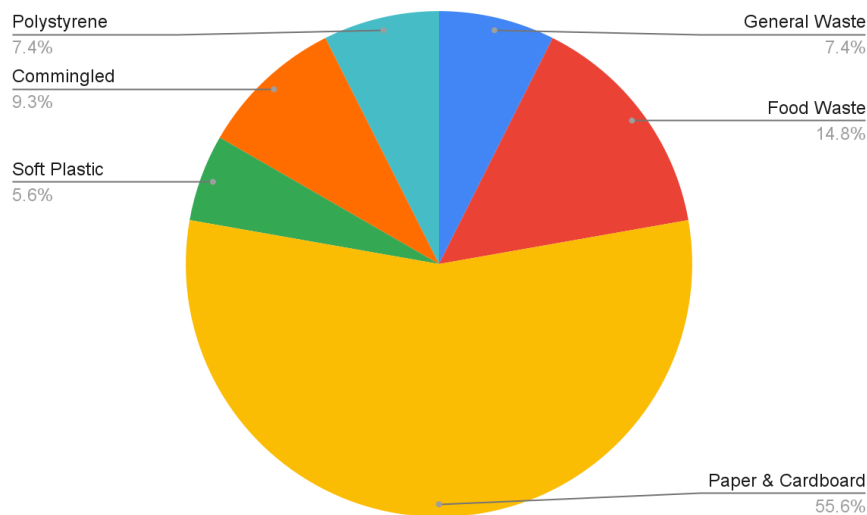
The graphs below present the composition of the general waste stream across both precincts. This visual waste audit assessed 1924L of waste materials in the general waste stream at Eltham town square and 2100L Diamond Creek Plaza. Overall, it was observed that only 17% of the waste was unrecyclable general waste. The project team identified the remaining proportion to be recoverable.

We expect that food waste levels at Diamond Creek Plaza are higher than recorded because businesses reported that they transferred waste to shared skips daily, often in the evening. These skips were collected and emptied every day except Sunday. Visual audits were conducted during the day resulting in an underrepresentation of the actual food waste volumes.

Eltham Town Square - general waste profile by material



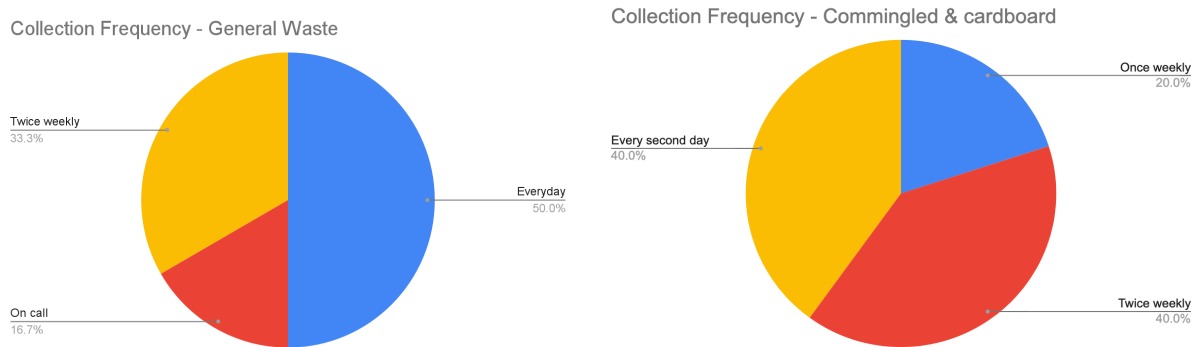
Diamond Creek Plaza - general waste profile by material



Collection frequency

The graphs below present an overview of the collection frequency for the general waste, commingled and cardboard streams. This data is based on eleven bins or skips and collection frequency was advised by traders. Traders at Diamond Creek Plaza and Midway Arcade in Eltham

Town Square reported that bins consistently overflowed on collection days. Another trader reported that their bins were intentionally overserved to help with the vermin and bird issues, as their bins are situated beside customer seating areas.



Business types and key waste materials

Each business generates different waste materials and therefore, has different waste stream needs. The table below presents the types of businesses and the key waste materials generated onsite.

Business type	Number of businesses in Eltham	Number of businesses in Diamond Creek	Key waste materials generated
Cafe, restaurant, bakery, pub	11	7	Food waste incl. coffee Cardboard Commingled recycling
Office (E.g. Accountant)	2	1	Cardboard Commingled recycling
Retail (e.g. homewares, bookstore, pharmacy)	6	2	Cardboard Soft plastics Polystyrene
Florist	1	-	Soft plastics Organic waste
Misc. low waste (e.g., dry cleaner, real estate, gym)	6	3	Commingled recycling
Beauty services (i.e. hairdresser)	3	2	Organic waste Cardboard

Fresh food store (including butcher)	1	3	Food waste Soft plastics Cardboard Commingled recycling Milk crates

Trader consultations & site visit findings

Retail Areas

Both the Eltham and Diamond Creek project sites are characterised by significant pedestrian movement, customer and public seating, adjoining car parking, and space constraints for storage of waste and other materials.

In seeking solutions to the waste management challenges, particularly the current lack of food waste recovery, primary requirements of these multi-use zones can act as inhibitors to resource and waste handling. As project sites have high foot traffic, safety is paramount when addressing the collection and transfer of wastes.

Council has spent significant funding on creating areas for community activity in Eltham and Diamond Creek. Despite this, the amenities and aesthetics of these areas are currently being impacted by waste infrastructure. This is particularly challenging at Eltham Town Square where retail outlets face both Main Road and Commercial Place. The retail outlets at these sites can generate significant waste and recycling output, and storing and collecting this material in a manner that doesn't inhibit the regular functions of the precinct are challenging. This project considered practical solutions that deliver a circular outcome without requiring council servicing or compromising precinct amenity.



Poor condition skips and bins are scattered throughout Eltham town square

Waste Generation

The two areas analysed in this feasibility study have a high level of food retail activity and this is reflected in the waste generation of the precincts, which saw high levels of waste across various streams. National data has shown that annually, while some businesses such as professional and technical offices generate waste as low as 300 kg per EFTE, accommodation and food services is the highest generator of waste at 4500 kg per EFTE.

As with all projects aiming to increase circularity in waste, a commitment to the waste hierarchy and education on waste avoidance and reduction actions can help to deliver the strongest economic and environmental outcomes for businesses and for Council.

Current Waste Management Practices

The current waste services and practices at Eltham only achieve poor to moderate landfill diversion rates and create challenges with bin placement and odour. At Diamond Creek, the waste system is outdated and neglected, and there are issues with vermin, dumping of waste and a lack

of ownership and responsibility for waste services and setup. At both centres, there is some, albeit minimal, sharing of bins by traders.

The skips and bins vary in condition from well-kept to old and dirty. Some are clearly signed but the consistency of bin and lid colours is not regulated, and some bins are not in any way easily accessible to staff. The local service provider Trash n Stash is dominant at the Eltham centre. Their skips are generally of a good quality. Despite the project team confirming that Trash n Stash offers organic waste collection, there are currently no food waste bins on site. Food waste bins are something to be pursued with this contractor.

Overall, waste services are dominated by general waste collection with some cardboard and commingled recycling collection. There is some, but limited, recovery of edible goods for food rescue charities and for primary producers for animal feed. Four traders have a form of food rescue system in place which involves them either putting food waste or ground coffee outside their business for collection by the public or donating leftover food to food rescue charities. This is an informal community-based approach with no consistency, meaning generally, organic waste is destined for landfill. It was also found that food rescued from one trader ended up in landfill from another site, thus transferring the ownership of the food waste.

The waste contract for the shopping centre at Diamond Creek is over ten years old and only consists of general waste collection. This is managed by the building management team at VBCS. Updating this would result in decreased waste-to-landfill, better infrastructure, and cost savings for traders.

There is a desire from some traders to introduce additional recycling streams particularly cardboard and soft plastics from retail stores. However, when asked about introducing food waste, concerns around lack of internal space and cost were raised. The larger traders such as Sushi Wushi, Miss Pryor and Local Fine Foods were willing and able to separate food waste. However, other traders such as Papa Bear Cafe, Corner Caf and Third Chapter expressed constraints on internal space.

Trader concerns

The key concerns voiced by traders in Eltham Town Square were lack of space and infrastructure for bins, and cost of waste services. Traders who used shared bins reported frequent bin overflow. Cardboard was the material that caused the most issues due to the lack of space in the bin.

Waste at Diamond Creek Plaza is managed by a building management corporation and traders pay corporate waste fees. With the exception of IGA and Priceline, all businesses in the precinct share the general waste skips located at the back of the plaza. Many traders reported the lack of maintenance and high corporate waste fees to be significant issues they face.



Two shared general waste skips at Diamond Creek Plaza, collected six days a week

Universal barriers to waste and recycling at business precincts

The key barriers faced by small businesses in diverting food waste, cardboard and other materials are:

- lack of on-site space
- aesthetics and odour
- inconsistency of existing food rescue systems
- lack of resources such as money and staffing
- unclear council regulations and minimal council support
- lack of understanding of available waste options amongst small businesses

Lack of space

Traders consistently report the current lack of space for internal and external bins to be a major barrier to good waste practices. On-site space is limited for transfer bins and standard waste bins or skips. Inclusion of general waste bins is prioritised, but the lack of space for sufficient volume or number of general waste bins causes waste contractors to over-service traders, resulting in unnecessarily increased truck movements and costs. Internal transfer bins also pose issues as space behind counters or in storerooms is also limited.

Aesthetics and odour

The locations of bins in high foot traffic areas compromises the visual appeal of business precincts produces unwanted odours and can attract vermin to public spaces. Waste setups can obstruct local traders' operations, especially those with kerbside seating or seating located close to skips.

Inconsistency of existing food rescue systems

The pre-existing food waste rescue and food waste diversion systems operate inconsistently. Systems that involve allocated charities collecting leftover food on specific days seem to work well. However, further investigations found that this system does not work consistently and thus is ineffective, resulting in food waste ending up in the general waste bin.

Minimal council support

The lack of resources and support for upgrades to waste and recycling processes and infrastructure makes it challenging for traders and the community to capitalise on waste avoidance and diversion opportunities. Without funding and resources, councils are not able to encourage the use of effective waste management systems with high resource recovery rates, or facilitate consistent, small-scale food waste collection networks.

Small businesses' lack of understanding of available waste options

Our investigations found that it is not feasible to recycle food organics on-site due to space constraints and odour issues. Similarly, it is not a viable option to process mixed food waste at unlicensed sites. A range of waste collection companies can provide food waste recycling collections. This material is then processed at a regional food composting facility. Coffee grounds are a significant component of food waste and already naturally source-separated onsite. It is viable to collect these grounds separately, and provide them to local community uses as a for soil enhancer. There are a range of additional recycling diversion pathways and shared collection options that many traders are unaware of or ill-equipped to enact.

Universal recommendations

The following recommendations form part of a holistic waste management system in which many problems and opportunities can be addressed simultaneously. Many councils face these problems, which will not resolve themselves and will prevent the achievement of resource recovery targets without sufficient government resources and funding. The goal is to make dealing with waste reduction effective and safe for all, and align with local and state government climate action strategies, *Path to Half* and *Recycling Victoria :a new economy* policies.

Food Waste Diversion Recommendations

Food Recovery Hierarchy

The food recovery hierarchy prioritises actions to prevent and divert food waste.



Avoidance and reduction

Waste avoidance offers the greatest environmental and economic benefits for businesses and should be the first explored solution. Studies have shown that food waste can be reduced by over 20% through better stock control, refrigeration and updated food preparation and handling practices. The state government *Path to Half* report highlights the need to prioritise avoidance throughout the entire food chain.

Avoidance and reduction can greatly reduce costs, one of traders' primary motivations. The savings in waste collection costs associated with changes in bin size and collection frequency are worth pursuing. A concerted effort in highlighting these savings could benefit traders and see less high-impact resources, like food waste, entering the waste stream.

There is a general willingness from many traders to improve waste handling and waste reduction outcomes, however, state-wide education and avoidance programs are required to achieve this.

Food Rescue

Food rescue is socially and environmentally beneficial. There are well-established systems that work for many types of food businesses and are usually free of charge. Some coordination between traders and local food networks could extend this system, benefiting businesses and the broader community, and will increase system efficiency.

Organisations need to consider the complexities of transferring ownership of food waste when donating to food rescue charities. There is also a surplus of bread for donation and reduction in bread production is essential to avoid pushing the waste disposal downstream.

Dehydrators, compactors, other in-situ technologies

There is a range of technologies claiming to resolve food waste at the site of generation. Many of these prioritise food waste transport reduction over actual recycling. Dehydrators and macerators essentially contribute to waste collection costs, but achieving little in waste and carbon reduction. Dehydrators use significant energy in moisture reduction. This counteracts transport emissions avoided, and often the dehydrated material is subsequently sent to landfill. Macerators often result in food organics being discharged to sewer, which is a loss on the pathway for the carbon-rich food organics. The cost of onsite application of these technologies is high, and their use at sites with multiple waste generators presents additional challenges. These challenges include lack of space for equipment, identifying the management responsibility of processing, and contamination control. Some technologies also have food organics exclusions (bones, meat, oils) that limit their inputs. It is considered impractical, costly and ineffective to pursue on-site processing of food organics at most business precincts.

Food and organics collection

Commercial food waste collection is now a readily available service offered to businesses for a fee. Food waste is a highly regulated waste stream that is part of a complex recycling process. While local end destinations are ideal, the quantity and quality of material will present challenges to localised, non-commercial end destinations. We recommend arranging a pre-existing commercial contractor to collect food waste from traders. As not all businesses generate equal volumes of food waste, establishing shared bins amongst groups of traders will reduce the overall cost of the food waste collection service, ensure bins are full when collected and help with aesthetics and number of bins in the precinct.

Coffee Grounds

Coffee grounds make up a large portion of the organics streams generated by cafes and are already captured as a single stream in 'knock-boxes'. They are practical for diversion through local, small-scale composting, and are an easy way to support a local food economy and decrease waste-to-landfill. Organisations such as Reground offer a regular

fee-for-service collection and deliver coffee grounds to local gardens free of charge. Systems like this provide the service consistency that traders require, combined with a highly-desired local, community-based end destination that reduces emissions. Similarly to food waste bins, we recommend that traders consider sharing coffee ground bins.

Alternatively, cafes can offer coffee grounds to customers on a free-to-take basis. The risk of this service is that ground coffee is not consistently collected, or ends up in the wrong bin, however, it can function as a conversation starter between businesses and the community.

The combination of food waste avoidance programs, food rescue, food waste and coffee ground collection can drastically reduce the volume of organics in the general waste stream.

Cardboard & Paper Diversion Recommendations

Cardboard and paper is a major waste material coming out of businesses across different sectors. Over 800,000 tonnes of cardboard remains unrecycled nationally, much of it at small business locations. Cardboard consumes large amounts of space in both general waste and commingled recycling bins and additionally produces high volumes of methane in landfill. Providing access to regular, single-stream cardboard collections is important in reducing waste to landfill and lowering carbon emissions. A separate bin for cardboard and paper usually delivers clean and consistent waste materials for recycling and in turn is one of the cheapest waste and recycling streams. Keeping these materials out of the general waste and commingled recycling streams tends to reduce costs as a result.

When adequate space and resources are available, cardboard balers are a good option for optimising space in bins. Balers reduce the size of cardboard waste by up to 60% and offer an in-situ alternative to a cardboard recycling skip. If charged per pickup, they also prove to be a cost-effective solution as significantly more cardboard can be recycled in a bale than a standard cardboard skip. The ability to share a cardboard baler will be a benefit for both larger and smaller traders. This will increase resource recovery while reducing overall waste collection costs.

Other recommendations

Shared bins

We recommend that traders in business precincts are encouraged to share bins and the associated costs. Bin sharing is a cost-effective solution that can increase resource recovery when introduced correctly. Bin sharing will also move bins off the kerbside and into less public-facing areas, reducing the number of bins scattered around the precinct and waste related traffic.

Supplier Return

Traders could achieve further waste reduction by arranging suppliers to take back packaging during delivery using reverse logistics. Traders should be encouraged to discuss this with their suppliers.

Actions include:

- supply of goods in reusable crates and trays that get returned for subsequent use
- return of polyethylene milk bottles in crates back to dairy suppliers
- return of soft plastic wrap to suppliers for aggregation and recycling.

Commingled recyclables

Commingled recycling collections can address remaining bottles and other rigid plastic packaging. As most businesses will not generate large quantities of these materials and their internal bins will not require emptying on a daily basis, it is practical for skips to be shared and located further away from public spaces.

Soft Plastics

Commercial sites generate a range of soft plastic packaging. This includes freight-based packaging and the primary packaging of ingredients and goods. Typically, this packaging is polyethylene or polypropylene. Both are recyclable if delivered contaminant-free to recyclers equipped to take flexible material. We recommend a commercial collection of soft plastic packaging. Reground offers this in combination with their coffee grounds collection service.

Education and minimisation

An education campaign focused on the first two stages of the waste hierarchy, avoidance and reduction, will help build awareness within traders of the waste they generate onsite. This should provide practical tips on how they can avoid generating waste upstream, and advice on how to effectively introduce additional recycling streams.

Following the delivery of a trader-specific waste education campaign, a public and community-focused campaign should be facilitated. This could increase awareness in the community of businesses changing their waste practices and encourage support for these businesses. For example, a certification-style sticker in the windows of businesses that have taken part in food waste avoidance programs can be a strong way to bring community and business communities together.

Destinations for food organics and other recyclable streams

The following table summarises the range of service efforts that can dramatically reduce the flow of resources to landfill. Indicative volumes and ballpark costs have been included as a guide, however, this will depend on the number of traders using each stream and overall volume.

Material	Lid colour	Service profile	Providers	Ballpark cost	Comments
Food Rescue	N/A	Daily collections	Oz harvest, Second Bite	N/A	Minimum quantities reqd.
Supplier Return	N/A	Pallets, crates, bottles, trays	Suppliers	N/A	Eliminates cost and bins
Cardboard/Paper	Blue	Regular skip collection of flattened material or compactor	Many	\$10/per 1100L	Minimal cost based on value of contents
Coffee Grounds	Grey	Regular 120L bin collections, or informal local	Reground through local gardens and local	\$35/120L bin	Regular reporting on waste diversion and includes overall waste

		arrangements	composting outlets		avoidance program
Commingled Recyclables	Yellow	Bin or skip 240L to 1100L	Many providers	\$20/1100L	MRF processing
Food Organics	Lime Green	Bin or skip 240L to 660L	Many providers	\$28/240L	Regional metro processing
Soft Plastics	N/A	Collected in bags	Reground	\$20-\$26.25/480L	Selected plastics recyclers
Residual Waste	Red	Bin or skip 240L to 3500L	Many providers	\$18/660L	With comprehensive avoidance, reuse and recycling this should be massively reduced
Cooking oil	N/A	Oil drums	Many providers	Free of charge	Prevents drainage and odour issues

I. Project-specific recommended solutions

The challenges faced by Nillumbik Shire Council are not dissimilar to those being faced by other councils in Victoria. The findings from this project are universal and should be shared throughout other councils to provide state-wide guidance on how to deal with waste management and resource recovery within business precincts.

The recommendations listed below are specific to Eltham town square and Diamond Creek Plaza. Introducing a combination of food waste diversion methods could be significantly impactful.

Recommendation 1: Local food waste diversion solutions

While it was found that in-situ food waste processing solutions are not feasible, other local solutions can be implemented by traders. These include:

- Food rescue

Charities such as FareShare, SecondBite and local organisations such as Odyssey House collect edible food on a daily basis.

- Ground coffee collection

Reground, a Melbourne-based social enterprise, collect ground coffee from local businesses and deliver it free of charge to their network of home gardeners, farms, schools and community gardens for reuse in composting.

- Food for animals

Local Food Connect has a network of local farms in the Nillumbik area that require feed for animals. This network can be utilised for diverting edible and inedible food.

Recommendation 2: Council provision of advice and guidance for private waste storage and collection

Council currently play a regulatory role in waste management at business precincts and there is a lack of advice or process for traders when dealing with waste storage and collections. A fair and consistent approach for sharing recycling bins amongst all traders could be implemented to achieve higher resource recovery rates, in alignment with *Recycling Victoria: a new economy policy*.

This could involve:

- developing a process that sees council play a facilitatory role rather than a regulatory
- implementation of a fair and equal process for allocating waste areas, streams, and bins to all businesses
- allocation of shared waste spaces for traders in close proximity to shop front but away from pedestrian zones, including enclosures
- implementation of a procedure that considers changes to businesses (i.e. a new business opens, or businesses ownership changes). This should include a review of the allocated shared space, volume and types of waste generated and revision of current shared collections, if necessary. For example, if a cafe space becomes a retail store, the food waste volume would likely need to be decreased and cardboard and soft plastics increased.

The outcome is to have a process that is implemented across all council departments (local law, economic development, etc.), which supports the council's climate action strategies. This would require council resources to support and facilitate this approach.

Recommendation 3: Guidelines for business resource recovery services

Council could consider developing thorough guidelines for resource recovery systems, including allocation and mapping of service areas for business precincts.

These guidelines could consider:

- accepted bin areas in the precinct
- bin and skip location and whether these are compatible with pedestrian flows and seating areas
- bin types and bin and lid colours, to ensure that these are consistent with national standards and to prevent contamination
- bin signage
- guidance for initiating local food rescue
- education for food waste avoidance and minimisation
- recommendations for internal setup and transfer bin
- cardboard avoidance, reduction and disposal education.

The guidelines could also cover location of skips and bins. As much as possible, bins should be located either on business sites or in consolidated zones away from seating and pedestrian flow areas.

Bin and lid colours are crucial to clean recycling streams and help with stream association and prevention of contamination.

The condition of bins and skips is crucial to minimising impacts of odour and vermin. It is also important for meeting the community's expectations of amenity and aesthetics. Dirty, smelly and broken bins are not compatible with pedestrianised areas. A guideline for this will enable Council to control the impacts of waste and recycling handling in complex areas and manage community satisfaction. In order to maintain compliance with the guidelines, bins and skips will need to be kept in good condition and thus require regular cleaning, both inside and out.

The signage on bins and skips is equally important. Often bins carry no educational signage or stickers that focus predominantly on collection company promotion. Consistent signage has proven highly important when bins are shared amongst traders or staff members, as this ensures the correct items are going in each stream with as little contamination as possible. As many of the bins and skips are in public spaces, there is the potential for the public to place material in the bins. This signage can address what can be included, and also address common issues such as contamination, overfilling of bins, and bagging of recyclables.

Education regarding food rescue, food and cardboard waste production will reduce the production of these waste materials and see higher landfill diversion rates. Simple instructions such as "Flatten your cardboard before disposal" and "Separate food waste from general waste" may result in a reduction in collection frequency and thus lower collection costs.

Recommendation 4: Education

This solution aims to create awareness around food waste in the community and keep food waste local, creating a circular economy within Nillumbik. Traders commented throughout the stakeholder engagement that Eltham was a conscious community, and it was evident that there is a desire to reduce waste and keep food waste local. Therefore, we recommend undertaking a food waste reduction campaign to facilitate food waste diversion networks within the community.

This stage would involve:

- generating awareness around the impact of food waste
- education to traders on how to minimise food waste and to leverage food rescue organisations.

Recommendation 5: Shared collection points, Eltham

In Eltham, it would be preferable for bins and skips to be located outside the town square area on Pryor or Arthur Streets or in surrounding car parks. If multiple skips are to be located together, a shared collection point will help with aesthetics, access, cost reduction, and vermin and bird control.

Council could indicate the location of the shared collection point and traders could handle implementation and setup, including establishing the recycling streams required, expected volumes, and ongoing collection costs amongst the group of traders using them. Two shared collection points currently exist in the town square and in Midway Arcade, and are self-managed. There is opportunity to increase resource recovery at both existing bin areas, as well as additional shared collection points, by introducing additional streams. Centralised billing and bin sharing should reduce overall waste costs for traders.

Collection points need to be user-friendly, convenient and offer a financial benefit to traders through reduced overall waste collection costs. Setups of collection points may vary in the streams they include depending on the location, traders' waste profile, and number of traders using the facility.

Traders could receive guidance on collectively facilitating conversations with waste contractors to negotiate costs and more effective waste contracts. This could be a 'how to' guide including a script with details on initiating and having these conversations to reduce costs to traders and increase resource recovery.

Consultations found that traders are willing to travel up to two minutes to transfer waste materials. This is roughly 150 metres and sometimes may require a transfer trolley.

Shared collection points are a solution that would require initial facilitation from council but would see effective waste management processes implemented throughout Eltham town square and be mostly self-managed following establishment.

This stage would involve:

1. making traders aware of the transition to the new waste set up in the area
2. providing and facilitating use of guidelines developed in recommendation 3
3. facilitation of trader groups including spaces available, volumes of waste generated per group and streams required.

Recommendation 6: Enclosure, Diamond Creek Plaza

Diamond Creek Plaza currently offers all traders in the precinct (except IGA and Priceline) access to shared general waste skips. These skips are collected six days a week and have had consistent issues with overflow and reported resident dumping of waste. We recommend working with the building management at Diamond Creek Plaza to redesign the current waste infrastructure and implement better waste management practices such as introducing additional recycling streams for the site. This should reduce the overall cost of waste management at the precinct and increase resource recovery.

We recommend redesigning the waste area at Diamond Creek Plaza by

- installing a caged and locked waste enclosure to prevent dumping, reduce vermin and improve aesthetics of waste area
- introduce food waste, cardboard, commingled and soft plastics streams
- negotiate a new waste contract that reflects the waste profile of the business precinct and reduces the current cost

Recommendation 7: Cardboard Diversion

As anticipated, cardboard was a common waste stream lacking optimised diversion throughout both precincts. As aforementioned, cardboard is a very low-cost recycling stream to collect and can greatly reduce general waste and commingled recycling bills if recycled separately.

Four recommendations for cardboard diversion are;

- *Avoidance; addressing upstream behaviours*

Facilitate education sessions or guidelines for traders to speak with their current suppliers and ask that certain products do not come in cardboard. By equipping traders on how to have these conversations with suppliers, a decrease in single-use cardboard will be seen in businesses.

This has proven effective in the past when traders worked consistently with suppliers. Solutions include using reusable crates which are returned to the supplier on delivery.

- *Diversion; baler*

Resources permitting, we would encourage precincts with shared facilities to implement a communal cardboard baler into their waste system. A baler comes at a ballpark cost of \$10,000 and once traders learn how to operate it, is easy to use and maintain.

- *Diversion; cardboard skips*

Recommend that cardboard skips be included in the shared collection points highlighting the significantly lower price point.

Conclusion

This study has shown that implementing circular economy practices into business precincts to divert food waste and cardboard from landfill will be challenging without some minimal resources and facilitation from council. Waste in business precincts is a state-wide problem and most councils face the same challenge of limited to no resources available to address the consistent and common issues that arise.

In Nillumbik, it is feasible to achieve a circular economy for food and cardboard within Eltham town square and Diamond Creek Plaza utilising commercial options. Implementing resource recovery systems for these streams could see 55% of general waste material diverted from landfill instead of the current 17%. For this to be successful, it needs to be implemented and supported by guidance material and education.

It was found that it was not feasible, however, to implement a local or on-site food waste collection service through community-led initiatives as this would require council facilitation and investment in the form of staff hours and money. Three local food waste diversion solutions were presented in this study which could be easily implemented by traders themselves along with introducing FOGO bins into their current system.

While the *Recycling Victoria: a new economy* policy affects on commercial sites are yet to be determined, all businesses will require commingled recycling at a minimum. This is an opportunity for local councils and the state government to work with traders to introduce effective waste reduction systems aligned with local and state objectives. A multi-council facilitation project would see different approaches implemented in a variety of business precincts and provide a strong baseline for other businesses to implement effective systems with high resource recovery rates. Such a facilitation approach is currently being developed for consideration under the current Sustainability Victoria Councils fund grant round.

Appendix

Appendix 1: Waste contracts & contractors

- List of current waste and recycling contractors in Eltham town square and Diamond Creek Plaza
 - Trash n Stash
 - Veolia Environmental Services
 - Speedie Waste
 - Visy
 - Remondis
- Summary of Diamond Creek Plaza waste contract
 - Original contract created and signed in 2014
 - 2x 3 metre squared general waste skips
 - Collected six days, Monday - Sunday
 - Charged per collection
 - Cost is \$3,000-4,000 per month
 - Waste volume between 230-460kgs

Appendix 2: Summary of working group findings

Session 1

Understanding the barriers, desires and opportunities from the working group.

Barriers

- Space is the biggest issue particularly for small cafes, separation of waste streams is difficult as there is no one to put additional internal or external bins
- Staff education is required as the actions aren't made by the decision-maker
- Process needs to be clear consistent and convenient
- Solutions need to make financial sense

Opportunity

- Diamond Valley Green Waste Share is a Facebook page aimed at connecting individuals with individual food outlets. The biggest barrier is infrastructure within the outlet to store food waste.
- Would like a centralised solution in the town square, in a carpark
- If food waste bins were available traders would like to separate it
- Community want the town square to look better and the bins hidden so they can hang out there

Session 2

Presenting a summary of findings and recommendation to the working group.

Feedback

- Leverage the ShareWaste or Diamond Valley Green Waste Facebook platform
- Requires a standardised system
- Local Food Connect could provide a collection network
- Questions are the traders desire and motivators

Appendix 3: Trader Interviews

Business Name	Summary of interview
Third Chapter, Eltham	• Two 660L bins (commingled and general waste) located in the enclosure in the town square • Generate a lot of food waste on-site • Unsure if they would have space to add an internal food waste bin to their setup • Birds were reported to be an issue with customer seating • Overall happy with the current process
Inzagi, Eltham	• One 240L general waste bin stored in the storeroom of the shop • Main materials are paper, cardboard and soft plastic • Soft plastics and cardboard gets taken back to their headquarters
Pop and Seed, Eltham	• Does not have space for their own bin or skip on-site • Currently has a 660L bin at home where she takes her waste • Mostly cardboard waste which gets taken to the Nillumbik recycling centre
Sushi Wushi, Eltham	• General waste, commingled recycling and oil drums are located in alley next to business • During busy periods commingled, which consists of majority cardboard, is collected three times per week • Would like to have a food waste bin and have enough space for internal and external bins
Miss Pryor, Eltham	• Two 660L skips, general waste and cardboard are located on curbside • Bins are locked and are overserviced to keep the birds away • They would be interested in having a food waste bin and have enough space, cost is the biggest concern but this has not been explored within the business • Would walk 2-3 minutes to an enclosure to transfer waste
Papa Bear, Eltham	• They pay separately for one 240L commingled recycling bin located in the shared waste room in the arcade which

	gets collected every second day, share the general waste bin with the remainder of the arcade • Coffee ground is put out every day and collected by the community most days, 3-4 days per month it is not collected and ends up in the general waste bin, has been spread by word of mouth • There is no internal space for any additional recycling streams
House of Flowers, Eltham	• Produces a lot of soft plastic and organic waste • Shares bins with others in the arcade, reported that this overflow most days • Would like a organics bin and has the space, has looked into this themselves but not actioned • Doesn't recycle cardboard as it doesn't fit in the commingled recycling bin
Bakers Delight, Eltham	• Two 660L skips in the shared enclosure in the centre of the town square, one commingled recycling and one general waste shared with Ferguson Plarre Bakehouse. • Have a schedule for charities and food rescue organisations to collect bread on a daily basis • No concerns or issue with their current set
Ferguson Plarre Bakehouse, Eltham	• Shared bins with Bakers Delight • Ordering is done in small batches to avoid food waste • Main type of waste is paper, cardboard, milk cartons
Cornercaf, Eltham	• Two 660L skips, one general waste and one commingled recycling are located on footpath • Bins are in very poor condition and in a very inconvenient position • Business owner would like to see changes in space allocation and aesthetics
Mojo Clothing, Eltham	• Generates a lot of soft plastics, small amounts of cardboard and paper • Shared bins currently work well but lack signage and additional streams • They would really like a soft plastics stream and would happily separate internally

Sammy's Charcoal Chicken, Eltham	• Two 1100L general waste skips, one 1100L commingled skip, currently shared with Barry Plant Real Estate and one other • Skips are located behind the traders and managed by the landlord • Produce a lot of food waste, have not thought about introducing a food waste bin
Mr Rooster on Charcoal, Diamond Creek	• Uses shared bins arranged by building management • Bins are often full of an evening and they take their waste home • Unhappy with the current system, feels like they pay alot for a basic service that doesn't meet their needs
Eight point eight, Diamond Creek	• Uses shared bins arranged by building management • Minimal food waste but would like it to go to a food waste bin • Dumping affects how much waste they can put in each evening • The bins previously used to be in a locked cage and this worked more effectively
Local fine foods, Diamond Creek	• Uses shared bins arranged by building management • Gets blamed for a lot of the overflow as they put a lot of food waste and cardboard in there at the end of each day • The ascethics and lack of maintence reflect poorly on their business as the skips are located outside their back entryway • On an infrequent basis, they leave food waste out at the back entryway in boxes and people know to come collect it for animal feed
Bakers Delight, Diamond Creek	• Uses shared bins arranged by building management • Schedule for end of day bread to be collected by charities and the community • Little waste other than bread
Priceline, Diamond Creek	• Two 1100L skips, one general waste and one cardboard • Majority of waste is cardboard and soft plastics • Employees were not aware of waste setup