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SOLID WASTE

Activity Management Plan

Mahere Para Mārō

2021 - 2031

Nelson City Council
Te Kaunihera o Whakatū

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Quality Assurance Statement

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1		Draft for GM Infrastructure			
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Cover Photos:

Top Left: Nelmac collection vehicle in Nelson

Top Right: Sorted and baled PET

Lower left: Second hand Sunday

Lower right: Reducing waste at events (Isel twilight market)

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Overview

This Solid Waste Activity Management Plan (AMP) is action-focused. It provides an account of Council owned and/or controlled assets and services, which are under the responsibility of the solid waste activity, and outlines the management approach to effectively meet demand and expectations now and into the future.

The purpose of the AMP is to provide a waste minimisation and waste management plan to manage and divert waste prior to it reaching the landfill. In simple terms the boundary of the AMP is the weighbridge of the York Valley landfill. While there are areas of common interest any activity on the landfill side of the weighbridge is the responsibility of the Nelson Tasman Regional Landfill Business Unit (NTRLBU).

The AMP gives effect to Nelson City Council's vision of a Smart Little City, Council priorities and guidance, and also key plans including the Nelson Tasman Joint Waste Management and Minimisation Plan 2019 (JWMMP).

This AMP and its financial strategy moves the operational direction from a business-as-usual responsive method to one that takes a proactive approach. This includes being more creative in asset utilisation, the instigation of new services, and exploring various options of management and procurement.

The AMP outlines risks and challenges facing waste management, including the impacts of climate change, and it includes risk management and mitigation solutions.

Key to achieving the waste reduction targets set in the JWMMP is a recognition that the community has an active role to play. The AMP recognises that it is more desirable to provide services and activities which actively contribute to reducing waste. Avoiding the creation of waste and supporting a culture where our community chooses not to create waste is the central premise of all waste minimisation activities in this AMP.

The financial structure of solid waste makes it a 'closed account' with activities and actions funded through gate fees, waste disposal levies from central government, and the landfill levy paid to each Council by the NTRLBU. This makes solid waste independent of residential rates.

This plan focuses on ensuring that not only are assets and waste services maintained in a cost-effective manner, but that an appropriate, environmentally and culturally sound waste management disposal option is available for all waste produced in Nelson. Waste creation and waste minimisation are considered in residential and non-residential settings and in response to our changing local, national and global environment. This includes incorporating the residential intensification in the Nelson city centre, and a move to greater responsibility for re-using and recycling materials locally.

The Purpose of the Plan

The AMP outlines a strategic direction for managing solid waste assets and services to meet current and future demands and priorities.

The AMP has been developed to respond to key themes and priorities, which will be referred to throughout the AMP. Without considering their order of importance these include:

- A population that is growing and ageing
- Working with stakeholders, and iwi partners
- Community engagement
- Mitigating and managing the effects of climate change
- Taking responsibility for emissions which are produced by solid waste activities
- The Future Development Strategy, including an increase in residential intensification
- A vision for Nelson as the Smart Little City
- Government legislation impacting local and Council business
- Improvements in services
- Asset utilisation and efficacy of assets

This AMP informs the Long Term Plan, and is consistent with the Infrastructure Strategy and the Financial Strategy.

It gives effect to the JWMMP. It ensures that decision-making related to asset renewal, activity delivery, and service procurement is consistent with achieving long-term outcomes for waste minimisation.

Asset Description

As any resource, service, or item of economic value, from which any company would gain future economic value is considered an asset, the Solid Waste assets can be considered in three parts.

1) Physical assets which are items owned by Council and which have a positive economic value.

2) Physical assets owned by Council which have costs but do not have associated revenue. These are 'negative value assets'. This is primarily the closed Atawhai Landfill.

3) Agreements for delivery of services which will restrain expenses in the future and which also utilise privately owned assets.

1. Physical assets under the management of Solid Waste (positive value)

Asset	Quantity	Replacement cost	Remaining 'life'
Cast iron streetlitter bins that do not tilt (excluding the metal liner)	25	$100k	11 yrs
Cast iron streetlitter bins with seagull proof lids that do not tilt	49	$254k	15 yrs
Metal bin liners	163	$25k	1-2 yrs
Metal rubbish bins that tilt for emptying	43	$104k	6 yrs
Plastic rubbish bins which hook onto existing posts	34	$6k	2 yrs
Brazier style refuse bin	7	$13k	10
Transfer station compaction hoppers	1	$1.2M	15 yr (partial replacement of hopper walls etc)
Nelson Waste Recovery Centre (NWRC) building over the hopper area including Gantry crane for loading bins of compacted refuse or greenwaste onto trucks	1	$1.5M	25+
Post-compactor cartage containers	7	$350k	5-7 yrs
NWRC recycling area barn	1	$450k	25+ yrs
NWRC recycling area old sorting shed.	1	$380k	25+ yrs
NWRC kiosk building	1	$250k	10+ yrs
Residential recycling bins 240 litre	19,475	$745k	5-7 yrs
Residential recycling bins 120 litre	2,785	$105k	5-7 yrs
Stainless steel recycling bins in CBD and sports fields	4	$50k	9 yrs
Total		**$5.53M**	

Table 1 : Solid waste assets (excluding land) highlighted in red indicate replacement within the term of the AMP. These include metal bin liners, some rubbish bins, cartage containers and residential recycling wheelie bins. The replacement capex renewal cost within this AMP is approximately $1.9M.

2. Atawhai Landfill (Negative value asset)

The Atawhai landfill was closed to new disposal in 1987 and incurs no Emission Trading Scheme (ETS) or waste levy costs. However post-closure emissions require testing, emission monitoring, and maintenance of wells, which are all costs without an associated

revenue (current opex $30k p.a.) As the landfill can only continue to accrue costs and risk, without any tangible benefit to Nelson, this is considered a negative value asset.

There are also potential risks to land and stakeholders which could cost Council in mitigation (detailed in Focus Area 12 of the AMP).

3. Contracts and agreements for services

Contracts and agreements for services are a financial guarantee of service and therefore have a value in the future service to be provided. Operational experience and knowledge of the methodology is in itself an asset, which negates the need for conducting trials when developing future agreements and contracts. The transfer station kiosk is managed by Council staff.

	Contract	**Expiry**	**Who**
Street litter including tidy town	2906	Expires 2021. RFT is scheduled.	Nelmac
Recycling	2974	Expires 2023. RFT is scheduled.	Nelmac
Transfer Station	4018	5+2+2 until 2029.	Fulton Hogan

Table 2: Contracts and agreements providing services to solid waste. A Request for Tender (RFT) is scheduled at least nine months in advance of the expiry of the existing contracts.

Key Issues

The following presents the key issues of solid waste and the proposed solutions and management practices relating to those issues. These are detailed in individual focus areas in section 6 of the AMP. Management of each of these issues will be through innovative waste management solutions that are economically and environmentally efficient, taking into account carbon emissions, social responsibility and community engagement.

1. Meeting the JWMMP target of 10% per capita reduction in waste by 2030.

A 10% reduction will require significant engagement with residents, new services and solutions, and better recycling and reuse. The waste minimisation programme provides a toolkit including education and engagement and behavioural change programmes. There are incentive programmes such as grants and subsidies, and also opportunities for collaboration with our community to both avoid the creation of waste, and through better waste disposal choices to reduce waste to landfill.

It is projected that the proposed kerbside kitchenwaste service could annually divert over 4,000 tonnes of organic material from landfill. This would be 75% of the JWMMP

10% target. The diversion from landfill of construction and deconstruction material which is estimated at over 1,500 tonnes, and the annual diversion of 700 tonnes of tyres would raise the combined diversion to over 6,000 tonnes. These three activities would potentially achieve the 10% target several years earlier than expected.

2. Supporting a culture where people choose not to create waste

A clear statement in the JWMMP is that community collaboration to effectively avoid or reduce the creation of waste is a critical part of achieving our goal of a 10% per capita reduction by 2030. For this reason, waste minimisation activities are a key component of this plan, with an updated allocation of resources to reflect the importance of this area. The global and national understanding of the importance of circular design and economy is also reflected in these programmes, with closing the loop on resource use being an underpinning principle.

The waste minimisation work programme will address several key areas:

- Leadership — Council walking the talk.
- Community – enable a culture where people choose to reduce or avoid waste.
- Individual priority waste streams identified on an annual basis based on data and strategic priorities — for example, food waste, single use plastics, textile waste and construction and demolition waste.

A priority within this area is the need for collaboration with the community, from partnership with Tasman District Council to deliver the JWMMP, to working with iwi, businesses and industry, community groups and schools. Waste minimisation programmes will use a range of tools including education, platforms for collaboration, support for school engagement through Enviroschools, grants and subsidies, and individually designed activities to support change and enable the community. The tools and resources in this work area will also be used to support other solid waste outcomes such as changes to kerbside recycling and reducing littering.

3. Impacts of Climate Change

Managing the impacts of climate change, particularly more intense storms and sea level rise, are considered in this AMP. Solid waste services will not be significantly be affected by the medium-term impacts of climate change. Consideration has been given to the impacts on assets such as the NWRC and the Atawhai landfill, of sea level rise and the predicted increase in storms. It is proposed that during the term of the AMP that council keep up to date on climate change information so as to guide any future risk assessment for these assets.

4. Greenhouse Emissions through Solid Waste operations

The Solid Waste activity is not directly responsible for the emissions produced by the collections, because the emissions are produced by the contractor. However, the AMP presents a holistic approach and considers the emissions from all of the services provided under contract, rather than diverting emission responsibility onto the contractors. The AMP presents opportunities for Council to achieve quantifiable climate change mitigation through the reduction of greenhouse gas emissions from diverted waste and collection services.

Examples include the diversion of food waste from landfill, and engagement activities to reduce domestic food waste. The NWRC annually diverts 1,400 tonnes of greenwaste from landfill. This material is locally processed in an aerobic open windrow system which does not produce methane and produces compost for sale. The quantity diverted from landfill will increase as the cost of refuse disposal increases.

It is proposed that Solid Waste reduce emissions through less vehicle usage and eventually the inclusion of zero emission vehicles in all future collection contracts. Further emission reduction will be through the diversion of emission producing material that is presently being disposed of to landfill. This includes kitchenwaste, mixed greenwaste and refuse loads from the transfer stations, and construction and demolition waste.

5. Streetlitter

The CBD street litter bin collection is currently a low-technology waste collection system. The emptying of the CBD bins is a manual process which puts significant physical strain on the collectors. Due to the design of the bins they cannot be partially modernised. Improvements require a complete replacement.

It is however proposed that the bins be replaced with solar-powered compacting bins. The existing bins could be re-purposed into other locations around the city (such as parks). The solar bins could be purchased, leased, or leased to own — potentially avoiding a significant capex expenditure. Procurement options will be explored in the term of the AMP. As the bins have a larger capacity, they will require less frequent collection, which reduces city traffic disruption, vehicle travel distances, and hence emissions. The bins also have side panels which are appropriate for messaging and community education. Solar bins are a Smart Little City solution to pedestrian refuse in the CBD.

6. Recycling

Council and its contracted service delivery partners are only directly involved in the kerbside collection and sorting of the recyclable materials. Actual recycling occurs 'downstream'. The present contracted residential collection service, which expires in 2023, includes shared financial risk relating to commodity prices and the wheelie bins. The bins require replacement mid-AMP, and are projected to be supplied by the council at a capex spend of up to $1M. Future contracts may include the requirement for bins to be supplied by the contractor, along with quantifiable emission reduction through zero carbon collection vehicles.

Waste minimisation will also include engagement at a national as well as at a local level to promote the removal of the non-recyclable plastic types from the consumption stream as well as the waste stream. This will improve recycling commodity recovery, ensuring that resources are managed to contribute to a circular economy. This will also entail Council engaging with commercial as well as residential waste producers. In Nelson, collection of recyclables from commercial premises is on a user-pays basis. It is proposed that a review be conducted to validate the proportion of actual recycling which occurs through the user-pays collections.

7. Product Stewardship

Product Stewardship is a central government directed policy which will lead to compulsory recycling for products including packaging, plastics, e-waste and tyres. An example of product stewardship is a 'container deposit' which guarantees a refund value for set commodities.

Recycling

As the collection methodology may be included in product stewardship this will potentially influence the costs of the recyclable collection. Due to the guaranteed value for returning certain items, community groups and charities may use this as a fund-raiser, creating competition for high value recyclables and resulting in kerbside collections only being used for the low value materials. This could lead to higher contract costs or more shared risk costs for Council.

Tyres

Product stewardship will require the recycling of tyres or potentially the use of the Golden Bay Cement tyre incineration plant. Golden Bay Cement has an operational plant in Northland and has received $13M from central government for a South Island plant. This will be explored under the term of this AMP. Presently, tyres are cut or shredded and disposed to landfill. Council will assist in the establishment of tyre collection for recycling and divert existing tyre collection systems to the tyre recycling service. It will also maintain an association with any such private enterprise to ensure close management of the site and to avoid the 'Tyre Mountains' that have developed in other regions.

E-Waste

Product stewardship will require recycling or reuse of e-waste. Council has developed a strong relationship with local community groups which it has supported through e-waste recycling subsidies and grants. Nelson Environment Centre (NEC) has expressed an interest in expanding its e-waste recycling at the NWRC, which will provide a local solution and local employment.

8. Construction and Deconstruction

Currently, unsorted materials from construction sites are disposed to landfill. This is primarily due to the labour-cost of sorting the materials. It is also common practice that buildings are demolished rather than deconstructed. There is an identified need for a methodology to divert the materials and to encourage the deconstruction of buildings. Council proposes to do further waste minimisation work with the building sector and to assist the communication and cooperation between the construction sector, the deconstruction sector, and community groups. The aim is to divert materials generated at construction and deconstruction sites away from landfill. Community groups are presently developing sites from which they can use or re-sell the materials. While this reduces emission-producing tonnage from landfill, it also has identifiable social outcomes in employment and training. One group intends to build houses for donation to those in need using diverted construction waste. Council will be the conduit between the companies and groups but will not establish the sites or purchase any assets to facilitate this work.

9. Community expectations and Government priorities.

The AMP considers how to respond to community expectations, and national government and Council priorities, which have demonstrated an increased priority for waste reduction and better management of all waste streams.

Kitchenwaste

In the 2020/21 annual plan submissions there was significant support for a kerbside kitchenwaste collection service. There are a range of potential collection and processing options to be considered early in the term of the AMP.

At the completion of the 2020/21 trial a review will be conducted, and if it is the decision of Council to proceed, Expressions of Interest will be sought so that the processing system that most aligns with Council policies and priorities can be pursued. Kitchenwaste will potentially have the largest single-activity effect on tonnes to landfill and also on carbon emissions. It would also increase operational expenses. However it is presently projected that, as per the financial summary, the collection and processing costs would be offset by the increase to the central government waste disposal levy. This increase in the cost of disposal will provide solid waste with the required increase in revenue.

CBD Recycling

There has been strong interest in a recycling service in the CBD. The expectation is that pedestrians should have access to recycling bins rather than only to refuse bins. Previous CBD recycling has been less than successful due to contamination. This has included items such as foodwaste, mattresses, furniture, hazardous products, gas cylinders, and packaging from commercial deliveries. This time Council proposes to place solar compacting bins dedicated to recycling alongside some of the solar compacting rubbish bins. The narrow mouth bin design reduces the opportunity for contamination. Council also proposes to install at least two 'reverse vending machines' in the CBD. These machines can only accept bottles, aluminium cans, and some plastics. Due to the machine's association with the container deposit scheme, it also rewards the recycler through phone credits or donations to charity.

Levels of Service

Table 3: levels of service

ACTIVITY	COMMUNITY OUTCOME	LEVEL OF SERVICE	PERFORMANCE MEASURE	PERFORMANCE TARGET			
				21/22	22/23	23/24	24/25
Waste minimisation engagement programme	Our unique and natural environment is healthy and protected Our communities are healthy, safe, inclusive and resilient	Whole community engagement	Reduction of waste per capita by 10% by 2030	Total waste less than 565Kg /capita	Total waste less than 545Kg /capita	Total waste less than 525Kg /capita	Total waste less than 500Kg /capita
Divert materials from landfill	Our unique and natural environment is healthy and protected Our infrastructure is efficient, cost effective and meets current and future needs	Maximise the diversion of reusable resources Maximise the diversion of organic materials	Increase in diverted tonnes through e-waste, reuse shops, etc.	Create 2021 baseline	Increase of 2% above 2021 baseline	Increase of 3% above 2021 baseline	Ongoing 4% above 2021 baseline
			Reduction in greenhouse gas emissions (through greenwaste diversion)	NWRC greenwaste diverted more than 1115t /yr.	NWRC greenwaste diverted more than 1142t/yr.	NWRC greenwaste diverted more than 1171t/yr.	NWRC greenwaste diverted more than 1200t/yr.
			Quantifiable diversion of general organic material from landfill.	Reduction from previous year	Reduction from previous year	Reduction of 5% from 2019 JWMMP organic	Reduction of 6% from 2019 JWMMP organic
Managing and reducing street litter	Our unique and natural environment is healthy and protected	Streets are clear of litter	Reduction in justifiable complaints	Reduction in service requests	Reduction in service requests	Reduction in service requests	Reduction in service requests

	Our infrastructure is efficient, cost effective and meets current and future needs						
			Litter removal services are provided promptly	Reduction in complaints	Reduction in complaints	Reduction in complaints	Reduction in complaints
			Reduction in greenhouse gas emissions associated with providing services	Reduction in line with Council targets	Reduction in line with Council targets	Reduction of 200t CO_2 /yr from 2020 calculation	Ongoing reduction of 200t CO_2/yr from 2020 calculation
Provision of domestic kerbside recycling collection service	Our unique and natural environment is healthy and protected Our infrastructure is efficient, cost effective and meets current and future needs	That all residents have reliable access to a kerbside collection service Appropriate materials are managed in accordance with Council policies	Contractual expectations relating to safety and working standards are maintained	Reduction in service requests relating to collection	Reduction in service requests relating to collection	Reduction in service requests relating to collection	Reduction in service requests relating to collection
			Glass is colour sorted	Higher than 95%	Higher than 95%	Higher than 95%	Higher than 95%
			Community is educated on sorting and cleaning recyclable materials	Contamination less than 179t/yr.	Contamination less than 174t/yr.	Contamination less than 169t/yr.	Contamination less than 164t/yr.
Nelson Waste Recovery Centre (NWRC) Refuse and Greenwaste	Our infrastructure is efficient, cost effective and meets current and future needs	That residents have access to a facility for the disposal of residential and light commercial refuse	Transfer station meets contractual operational expectations in regard to service and safety	No contractual failures	No contractual failures	No contractual failures	No contractual failures

Future Demand

Future demand for Solid Waste services can be viewed as;

1) Demand according to volume modelling in relation to existing services.

2) Demand according to new expectations from residents.

3) Demand from central government or Council guidance.

When considering existing services, combined with demand volume modelling, it can be determined that Nelson's growing population and future residential development in the city centre, combined with the existing trend of an increase in waste per capita, is likely to lead to an increase in service demand for existing waste services.

There is also a need to model demand according to expectations from the public for new waste management systems. These include services such as foodwaste or kitchenwaste, greenwaste and e-waste. Residents have also expressed more interest in being informed about what happens to the collected recyclables. There is a, not unreasonable, expectation that not only should recyclables be collected but that they should also be recycled safely and responsibly. Recent local and national coverage relating to exporting of recycling, plastic bags, and the environmental impacts of waste has raised awareness but also expectations that these products will be recycled in a socially and environmentally responsible way. However generally residents are looking to Council for the solutions rather than individual residents taking financial or operational responsibility for their own waste. A key part of managing this expectation will be the need to build community capacity to avoid or reduce waste and develop a circular economy approach to how resources are used in future.

As an example of expectations, central government priorities are focused on a reduction of carbon emissions through less waste to landfill and steps towards a circular economy. Residents generally want a waste management service which removes their waste while meeting their environmental or social concerns.

The needs of both parties may be influenced at a national level by activities such as the introduction of a mandatory product stewardship scheme and broadening/increasing waste levy activities. However, at a local level this will involve developing a collaborative approach between Council and residents, supported by tools and resources to enable the community to avoid/reduce waste.

Management of both expectations and demands requires an accurate and ongoing measurement of waste from each source, with the results guiding management or planning for the most effective means of service delivery. For this reason Council requires more data collection from previously unrecognised diversion, such as re-use shops, and to be engaged in the York Valley landfill waste assessments and administrative decisions relating to disposal codes and customer disposal criteria. This is further defined in the monitoring and improvement section of this executive summary.

Lifecycle Management Plan — Assets

The historical strategy has been to maintain and the replace required assets, usually like-for-like, while following a policy of appropriate end of life management. However, ownership of an asset restricts operational options. The purchase of an asset with a 10 year lifespan ensures the activity will continue for that timespan in the same manner. This limits the introduction of improvements or new technologies. In other words, event if an asset fails to align with Council intentions, financial reasons can limit options for asset renewal.

Some areas of solid waste technology is advancing quickly, providing solutions to an innovative and rapidly moving market, so this AMP proposes a change to the traditional asset ownership model.

Although this is a significant change from the approach in the previous Solid Waste AMP this AMP proposes that asset ownership be reviewed against alternative financial options such as lease, lease to own, or that assets are potentially included in the service contract to be supplied by the contractor. This would allow the greatest flexibility and offer the greatest opportunity to be at the forefront of technology and environmental improvements. The review would identify increases or decreases to costs, and determine whether a capex or opex model would be the most appropriate.

Council proposes that assets be managed in relation to their efficacy in delivering the required services. Where an asset is failing to meet the required operational standard a full review will be conducted into the purpose of the asset and whether it should be removed, modified, or replaced. Exact replacement would only occur if the asset is contemporary technology.

Existing assets will be maintained in line with existing plans through the term of their asset life with appropriate maintenance in line with the asset use, and then disposal will be in line with both the AMP and the waste hierarchy. Assets will be repurposed where possible, recycled as required, and disposed of in a manner that is both environmentally sound and economical.

Significant asset replacements during the term of the AMP are indicated in Table 1. This includes at least part of the hopper and compactor mechanism at the NWRC. There has been little technological improvement since its instigation, so this is proposed to be a like-for-like capex replacement. Replacement of the kerbside recyclables wheelie bins in 2024-25 could possibly be changed to being part of the new service contract and thus become an opex spend, while the old bins would be recycled. Streetlitter bins are due for a technology upgrade which is designed to improve both the collection service and lower the emissions generated from collections. There are lease options for alternate bins so streetlitter bins may become either opex or capex. Once replaced, the stainless steel CBD recycle bins will be repurposed.

Lifecycle management plan — services

The Solid Waste activity includes services which are performed on behalf of Council through service contracts. These include the recyclables collection service, the streetlitter bins, water blasting in the CBD, and the refuse hoppers and cartage for the Nelson Waste Recovery Centre. (See Table 2.)

The services performed on behalf of Solid Waste are managed through effective contract management. The contract management of services has its own lifecycle with contracts being produced to align with existing Council policies and the Long Term Plan (LTP). This has led to a proactive approach to contracts, with recent contracts including social outcomes and emission monitoring prior to these being a formal procurement requirement in Council contracts.

In future contracts, the length of the contract term and the conditions of the contract will be sufficiently agile to take into account the environmental direction of the policies of central government, as well as supplying certainty of service.

During the life of the contract the working relationships and close contract management approach ensures all parties are aware of the political, social, and economic environment under which they operate. Council and the contractors maintain a cooperative approach which ensures the use of appropriate technology, that service is of the required standard, and which also considers the ongoing viability of the contractor.

Prior to the end of any contract the service and the contract are reviewed to determine the improvements to services that could be applied to any future contract. This provides an opportunity to include expectations such as zero emission collection vehicles, social outcomes, and potential improvements in health & safety or technology.

All contracts are developed, evaluated, awarded, and managed in line with Council policies and procedures, which ensures a coherent, cooperative approach.

Risk Management Plan

The AMP considerations of risk management planning and significant risks includes following.

Nelson City Council is committed to using risk management principles and techniques to understand and appropriately manage all internal and external factors and influences which affect the achievement of its objectives. Doing this will:

- Provide a reliable basis for sound decision making.
- Increase the likelihood of achieving objectives.
- Provide an agreed basis for prudent risk taking.
- Enable the organisation to understand the level of risk associated with each decision as well as Council's aggregate exposure to risk.
- Improve accountability and assurance of control.
- Enable Council to avoid threats and seize opportunities.
- Foster an organisational culture based on reasonable foresight and responsible hindsight.

The Council's standardised risk assessment method explicitly follows the process outlined in section 5 of AS/NZS 31000:2009.

Risk analysis involves consideration of the sources of risk, the consequences and the likelihood that those consequences may occur.

The following consequences are considered:

- Health and Safety
- Asset performance/Service Delivery
- Environmental/Historical/Cultural

- Financial
- Climate Change
- Political/Community/Reputational
- Relationship with Iwi
- Legal compliance
- Information/Decision support

The consequences of an event are rated 1–5 (Insignificant to Extreme). Likelihood is then rated 1–5 (Rare to Almost certain) to calculate a risk level rated 1–5 (Very Low to Very High).

The objective of risk analysis is to separate the low impact risks from the major impact risks, and to provide data to assist in the evaluation and treatment of the risks.

Table 4: Summary of risks to the main solid waste activities. Consequences of an event are rated 1–5 (Insignificant to Extreme). Likelihood is then rated 1–5 (Rare to Almost certain) to calculate a risk level rated 1–5 (Very Low to Very High).

	Health & safety	Asset performance	Service delivery	Environmental	Financial	Political / reputational	Information / Support
NWRC	Risk of incidents, traffic, residents actions	Hoppers, cranes, buildings, site,	Multiple contracts in place. Strong management required	Risk of environmental incidents from inappropriate behaviour of residents	Required machinery replacement or significant site modification	Residents have high expectations of the site	Data collection
Risk rating	3	3	2	2	2	3	1
Greenwaste	Risk of incidents, traffic, residents actions	Dependency on Hoppers, cranes, buildings, site,	FH contract in place for collection and cartage	Risk of environmental incidents from inappropriate behaviour of residents	Dependent on a private company for processing	Residents have high expectations of the service	Data collection
Risk rating	3	3	1	1	2	1	1
Recyclables collection	Kerbside activity has risks partially contracted out	Service is dependent on Nelmac maintenance	Monitoring systems and close contract management	Risk of collected materials contaminating the environment	Dependency on markets for materials and international agreements	Residents' expectations. Political changes influencing collections	Data collection and monitoring and tracking collections
Risk rating	3	3	2	1	4	3	1
Streetlitter	Kerbside activity has risks partially contracted out	Service is dependent on Nelmac maintenance	Monitoring systems and close contract management	Risk of collected materials contaminating the environment	Disposal site for collected material	Residents' expectations	
Risk rating	2	3	2	1	1	2	
Kitchenwaste	Kerbside activity has risks partially contracted out	Service is dependent on private collector maintenance	Monitoring systems and close contract management	Risk of collected materials contaminating the environment	Disposal site for collected material	Residential expectation	
Risk rating	2	3	2	1	2	2	

Financial Summary

The revenue of solid waste is derived from the Waste Disposal Levy from central government, the 'gate revenue', and also Nelson's share of the Landfill Local Disposal Levy from the NTRLBU. In summary:

1. The Waste Disposal Levy (WDL) is a fee charged by central government for waste to landfill. While it is currently $10 per tonne it will be $60 per tonne by 2023. A share (approximately 50% based on population) is returned to the region to fund waste minimisation activities.
2. The 'gate' is the revenue derived from the NWRC where residents pay for the disposal of refuse and greenwaste.
3. The Landfill Disposal levy (LDL) is the share Nelson receives from the NTRLBU.

Solid Waste activities operate in a 'closed account' with revenue streams which are retained within the activity, in effect making the activity financially independent of Council rates. The costs of all Solid Waste projects are compiled and the revenue from the waste disposal levy and the gate takings at the NWRC are deducted. The balance is the amount of revenue required from the landfill levy. If this amount is obtained from the landfill business unit, the Solid Waste budget balances without any further revenue being required. Where the landfill revenue is less than expected, Solid Waste activities are adjusted to match, ensuring an independently balanced budget.

Nelson City Council and Tasman District do not liaise with either the NTRLBU or each other to determine the value of the LDL that they will request. The ability for Council to deliver on its objectives is dependent in a large part by the quantum of the LDL received from the NTRLBU. For the 2021/22 financial year NCC requested $3M and TDC requested $2.7M. Both councils therefore received $2.7M. As this resulted in an effective shortfall of $300k, some initiatives cannot be undertaken or have to be delayed, or would have had to be funded from rates. The AMP recognises that in a post COVID-19 environment it will prove challenging to add costs to an already tight financial outlook. Consequently the programme will be adapted to suit the available LDL for each year without the expectation of funding from rates.

Table 5 : Financial summary of solid waste activities

No.	**Opex**	21/22	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31
1	Waste minimisation	$357k	$357k	$357k	$357k	$357k	$357k	$357k	$357k	$357k	$357k
2	Nelson Waste Recovery Centre	$1.62M	$1.62M	$1.62M	$1.62M	$1.62M	$1.62M	$1.62M	$1.62M	$1.62M	$1.62M
3	Greenwaste	$126k	$126k	$145k	$145k	$160k	$160k	$160k	$160k	$160k	$160k
4	Recyclable kerbside	$1.43M	$1.43M	$1.7M	$1.7M	$1.7M	$1.7M	$1.7M	$1.7M	$1.7M	$1.7M
5	Kitchen waste kerbside	$200k	$800k	$1.3M	$1.3M	$1.3M	$1.3M	$1.3M	$1.3M	$1.3M	$1.3M
6	Streetlitter	$250k	$225k	$225k	$100k	$100k	$100k	$225k	$225k	$225k	$100k
Subtotal	**Total expenses**	**$3.98M**	**$4.56M**	**$5.34M**	**$5.36M**	**$5.36M**	**$5.36M**	**$5.36M**	**$5.36M**	**$5.36M**	**$5.36M**
7	Gate revenue	$860k	$860k	$860k	$860k	$860k	$860k	$860k	$860k	$860k	$860k
8	WDL	$200k	$1M	$1.4M	$1.4M	$1.4M	$1.4M	$1.4M	$1.4M	$1.4M	$1.4M
9	Streetlitter funded from transport activity	$172k	$225k	$225k	$225k	$225k	$225k	$225k	$225k	$225k	$225k
Subtotal	**Total Revenue Excluding LDL**	**$1.23M**	**$1.8M**	**$2.2M**	**$2.2M**	**$2.2M**	**$2.2M**	**$2.2M**	**$2.2M**	**$2.2M**	**$2.2M**
10	Projected LDL required	$2.7M	$2.7M	$3.1M	$3.0M	$3.0M	$3.0M	$3.1M	$3.1M	$3.1M	$3.0M
	Capex										
11	NWRC hopper and cartage bins partial replacement			$150k		$250		$500			
12	Recycling wheelie bins				$370k	$370k					

Comments; Refer to column 1

1. Waste minimisation projects including: construction and deconstruction $45k, polystyrene $15k, minimisation at Council facilities $20k, waste minimisation at events $15k, community engagement $120k, e-waste subsidy $20k, compost subsidy $15k, compost education $25k, schools $30k, resources $10k, JWMMP $31k, SWAP $11k.
2. The NWRC will incur an increase in costs due to the increase in the WDL for refuse disposal. This will be directly proportional to the increases in gate revenue, so no increase is demonstrated in this table to either NWRC or gate revenue.
3. Greenwaste disposal costs will increase as the volume diverted from landfill increases (due to the increased refuse disposal costs caused by the WDL).
4. Recyclable kerbside costs starts with existing contract costs and increases to allow for the use of EV vehicles. This does not include the potential for the wheelie bins being included in the contract. The 2021/23 totals also include an allowance for shared risk relating to variable commodity values.
5. Kitchenwaste — Council proposes to start a residential kitchenwaste kerbside collection service in 2023. The Table demonstrates costs to establish the service.
6. Streetlitter includes the lease or lease-to-own of solar powered compactor bins. Therefore they are not a capex item. The value in the Table is the amount above the existing budgeted streetlitter amount, which has been included as revenue (line 9) and is what would be required if a lease option is the preferred procurement method.
7. The gate revenue at the NWRC will increase in direct proportion to the increase in costs of disposal, so no increase has been applied to either cost or revenue.
8. The WDL line demonstrates the increase of revenue to Nelson, due to the increase in the WDL from $10 to $60/tonne. As approximately 50% of the levy is returned to Nelson's Solid Waste activity, by 2023/24 it will return approximately $1.4M/yr.
9. The amount presently budgeted for streetlitter collection relates to the existing bins. If leased solar bins are instigated the total cost will be the amount in line 6 plus the amount in line 9.
10. The LDL required for Nelson from the NTRLBU. If this amount is not realised, activities will be adjusted to ensure that this amount matches the actual LDL for that year.
11. Capex item 'partial replacement of hoppers and cartage containers is dependent on volumes which produce 'wear and tear'. If volumes decrease or increase, the time to which the cost is applied may move accordingly.
12. As they have not been included in the opex section, wheelie bins have been included as a capex item, although Council proposes to include them in the collection contract. Both options have the same bottom line result.

Monitoring and Improvement Programme

The AMP has guiding documents such as the JWMMP which in itself has performance and waste diversion targets. That these targets will be met is taken as a given, but the AMP targets go beyond a reduction in waste. In this AMP the focus for solid waste has shifted from waste disposal to waste recovery.

This summary has already stated the need for improved data collection and for decisions to be directed by that data. This does not require any programme to be individually economical but that every programme should be able to yield an identifiable environmental, economic, social or cultural benefit.

This AMP has a strong operational focus which will achieve not only diversion from landfill but the processing of diverted materials in a socially conscious, environmentally sound, and potentially economically sustainable manner. However, improvements to the service contracts such as the introduction of new technologies like zero emission vehicles and improved streetlitter and CBD recycling collection systems, will also create an awareness of better practice, and encourage residents to take more responsibility for their waste and waste reduction. Community engagement through education, subsidies to encourage alternative waste management such as home composting, and the introduction of a kerbside kitchenwaste service will make residents as aware of waste reduction as they have become about exported recycling.

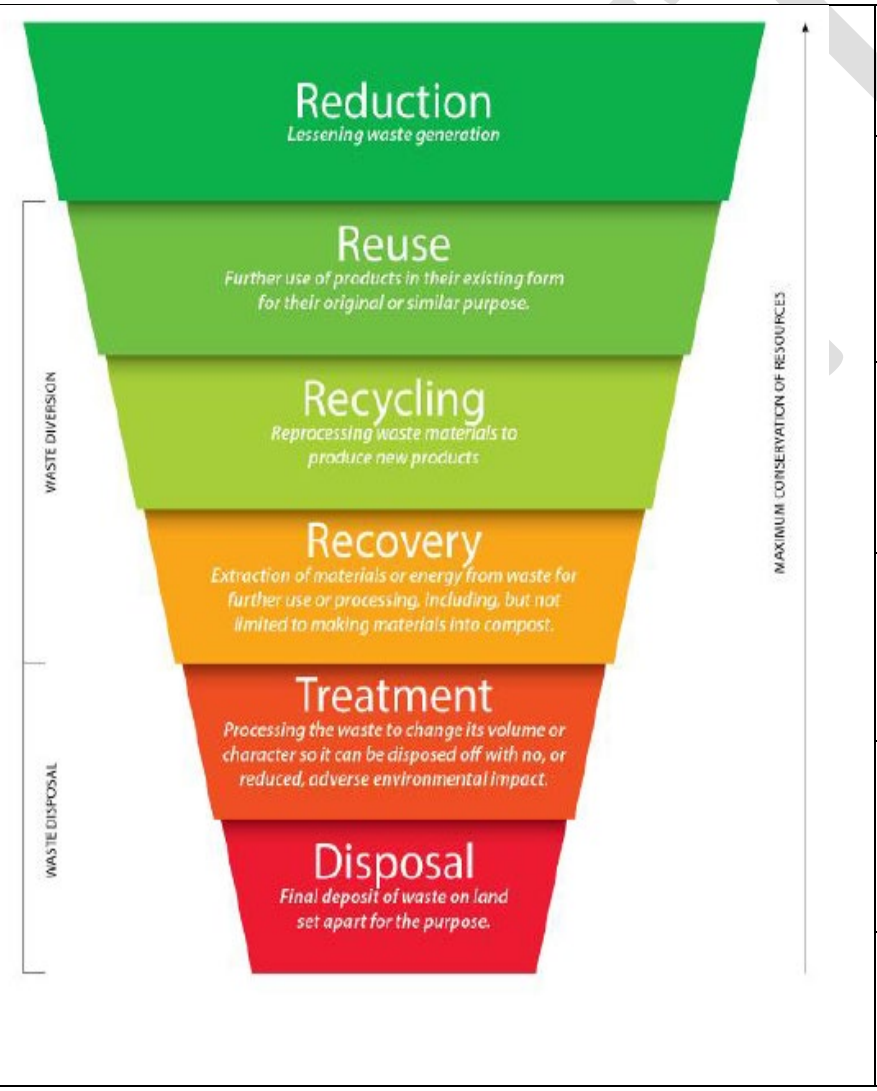
In order to achieve this wider programme, there is a need to review all data, and ensure that the social engagement is sufficiently flexible to be able to bring forward or push back projects to align them with the highest degree of awareness, and to maximise their ability to succeed. This will require a constant updating of data, and the setting of annual reviews of that information. Where a project is not meeting expectations there must be an intent to change or refocus that activity.

This requires collection of information that is not presently collected or compiled, including the weights and types of diverted material by companies with which Council does not have service agreements. This AMP suggests that a review is conducted to determine the ability or appropriateness of accessing this information so as to build an accurate Nelson-wide picture of all waste streams. This could include a system of reporting by charities or NGOs as well as utilisation of landfill information beyond the purposes for which it is presently collected. The cost of this would be aggregated across existing Solid Waste activity lines.

1. Introduction

The Solid Waste Activity Management Plan (AMP) gives effect to the Nelson Tasman Joint Waste Management and Minimisation Plan (JWMMP). The JWMMP, completed in September 2019, expresses a vision for the "communities of the Nelson Tasman region to work together to reduce waste", with a target to reduce waste to landfill by 10% per person by 2030.

The JWMMP includes the following waste hierarchy diagram. This is the single most significant guide to waste management and minimisation and solid waste activities. The waste hierarchy is used in the waste evaluation process. It indicates priorities for taking action to reduce and manage waste. The aim of the waste hierarchy is to extract the maximum practical benefits from products and to generate the minimum amount of waste.



Reduction Lessening waste generation
Reuse Further use of products in their existing form for their original or similar purposes
Recycling Reprocessing waste materials to produce new recyclable products
Recovery Extraction of materials or energy from waste. (Including compost)
Treatment Processing of waste so it can be disposed of without adverse environmental impact
Disposal Final deposit of waste on land set aside for that purpose

Fig. 1: The waste hierarchy.

In recent years the waste generated by residents and companies in Nelson has increased in scale, variation and complexity. Council provides services, facilities, programmes and collection systems to manage the various waste streams. This ensures waste is disposed of in a manner which aligns with environmental, social, and cultural expectations, and complies with national and international regulations and standards.

Private waste companies, Non-Governmental Organisations (NGOs), and community groups supplement Council-provided waste services in Nelson. Some of these organisations have built operations based on Council activities and policies. The organisations are therefore reliant on Council contracts, just as Council depends on them to deliver waste services. Clear long-term plans and a clear direction are essential to maintain these symbiotic relationships.

Community and Council priorities for the treatment of waste have changed over time. In the past, Council was expected to provide an 'out of sight out of mind' solution for the lowest possible cost. In contrast, residents now have a clear preference for sustainable waste management and a circular economy. This was evidenced by the reaction to off-shore plastic recycling as residents expressed concerns about global as well as local environmental outcomes, and want a waste system which actively supports residents to achieve good waste outcomes.

To achieve the desired outcomes, the waste management role of council now has an increased focus on community engagement, and waste avoidance and reduction, as well as considering operational parameters. The key point to consider is how can we reduce the need for waste management. Many of the decisions that will achieve this sit outside of Council's direct control and for that reason there is a recognised need to collaborate with our community.

As well as waste management and minimisation, Nelson residents have also indicated a clear direction on climate change. Climate change is a significant and urgent international, national, and local issue. At a local level council has a key role in how it works with the community to create a resilient and low emissions future, and implements adaptive measures to manage and minimise risks related to climate change.

In 2019, Nelson City Council declared a climate emergency. Council is committed to examining how its plans, policies, and work programmes can address the climate emergency, and to ensure that a climate emergency strategy is embedded in all of its strategic plans in future.

How Council delivers its services will play a significant role in building community resilience and meeting emission reduction targets. The AMP has a focus on how waste can be diverted from landfill before it adds to greenhouse gas emissions at the landfill. The AMP also considers route efficiency and vehicle procurement decisions such as the use of e-vehicles where viable. It also addresses adaption to climate change and a reduction of emissions from solid waste services.

Links to Council's vision, mission, goals and objectives

Vision

Nelson is a Smart Little City

Mission statement

We leverage our resources to shape an exceptional place to live, work and play.

Community outcomes

Councils are required by the Local Government Act 2002 to have Community Outcomes – a statement of the measures of success that Council is working to achieve for the community. Solid Waste activities contribute to six of the eight Community Outcomes, as outlined below.

Community Outcome	How this Council activity contributes to the outcome
Our unique natural environment is healthy and protected	Nelson's environment is protected by an efficiently managed waste service which reduces landfill use, protects the environment, and provides safe disposal of waste for residents
Our urban and rural environments are people-friendly, well planned and sustainably managed	Residents are supplied with a recycling service and litter collection keeping their streets and recreational areas free of dumped refuse and litter. Waste activities are actively managed to reduce greenhouse emissions.
Our infrastructure is efficient, cost effective and meets current and future needs	Contracts and assets are managed to ensure the most efficient services which maximise recycling recovery, provide a waste hierarchy approach to waste disposal while minimising disruption to traffic or the environment
Our region is supported by an innovative and sustainable economy	Impact on businesses and economic activity are minimised by understanding and managing the collection service. Clean streets and a Smart Little City approach to waste is beneficial to tourism.
Our communities are healthy, safe, inclusive and resilient	Developing a circular economy ensuring that food is not wasted and people make better use of resources
Our Council provides leadership and fosters partnerships, a regional perspective and community engagement	Council walks the talk in terms of waste minimisation associated with its own activities, and actively seeks to collaborate with Tasman District Council and other organisations on waste minimisation initiatives.

Table 6. Community outcomes

Solid Waste goals

The goal of solid waste is for Council to provide a streetlitter and recyclables collection service, and appropriate disposal or reuse of waste materials, to prevent harm to people and property, to contribute to community wellbeing and protect the environment from litter, pollution, traffic disruption, and to mitigate greenhouse emissions.

The goal of the waste minimisation activities is for Council to provide resources and support to enable our whole community to make choices about reducing or avoiding waste. These can range from financial support through to behaviour change programmes, events and education.

AMP framework and key elements of the plan

The framework of AMP follows the generic layout identified in section 4.2 of the International Infrastructure Management Manual 2015.

The AMP has the following key elements:

- Why we need a plan (Introduction)
- What we provide (Levels of service)
- Planning for the future (Future demand)
- How we provide the service (Lifecycle management)
- Dealing with uncertainty (Risk management plan)
- What it will cost and how we pay for it (Financial summary)
- What we're doing to improve (Plan improvement and monitoring)

Relationship with other planning documents

The AMP aligns with the Joint waste Minimisation Plan (JWMMP) 2019 and also the Infrastructure Strategy and the Long Term Plan (LTP). It also takes direction from post-JWMMP resolutions from Council.

Infrastructure assets included in the Plan

The infrastructure assets included in the AMP are the solid waste assets relating to the services of the NWRC, which includes the reuse shop, the customer service office and the hopper and cartage facilities. It also includes assets for the streetlitter collection service, the dumped litter and Tidytown service, and the recycling service. These assets, and their utilisation and maintenance are itemised in section 4.1.

Key stakeholders

As noted earlier, Council relies on a range of organisations to deliver waste services in Nelson. The following table identifies the main stakeholders and partners and defines their area of activity.

Stakeholder or partner	Subjects of relevance	
Residents, businesses, schools and community organisations	Kerbside collection Waste disposal Opportunities to avoid or reduce waste including, reduce, reuse and recycling Food waste Climate change Street litter	Residents have expectations that include collection services and clean streets. As residents cannot directly access a landfill, residents expect access to a transfer station to dispose of refuse and greenwaste. Some residents are actively involved in NGOs and social actions promoting sustainable lifestyles. Residents have demonstrated a desire to see action on climate change, particularly relating to post disposal emissions. Residents have expressed an interest in playing an active role in avoiding or creating waste. Schools are actively engaged in teaching good resource use/waste minimisation. Businesses are looking for advice and support on how to reduce/avoid waste.
Local iwi	Atawhai Landfill Kaitiakitanga Waste disposal	Specific issues relating to Atawhai Landfill located near to Whakatū Marae, emissions, environmental issues (ie waterways) and mahinga kai. Kaitiakitanga and the perspective of te ao Māori should be reflected in how Council plans and delivers waste minimisation, which requires building relationships with iwi partners.

Nelmac (Which is a Council Controlled Trading Organisation)	Recycling Street litter Illegal disposal Recycling drop off	Operates the kerbside recyclable collection contract for plastic, fibre and glass; the street litter contract; Tidytown (water blasting blue lines etc.) and illegally dumped refuse collection. Operates the public recyclables drop off at the NWRC.
Materials Recovery Facility (sorts the recycling) Smart Environmental	Recycling (Nelson Kerbside)	The Regional Materials Recovery Facility (MRF) in Richmond Tasman, owned jointly by Smart Environmental limited and TDC, sorts and sells commodities from the Nelson and Tasman kerbside recyclables collection. The MRF is dependent on the collections for materials to sort. Sorting contracts are with collectors not councils. Also accepts colour separated glass and transfers it to Visy in Auckland.
Nelson Tasman Regional Landfill Business Unit (NTRLBU)	Transfer station Kerbside refuse Waste minimisation	Refuse operators and transfer stations require a landfill. Increased waste diversion will influence landfill revenue. Activities in the AMP will influence the level of greenhouse gas emissions from landfill.
Other private companies, for example Can Plan, Waste Management, Envirowaste, Green Waste to Zero and Community Composting		Refuse and greenwaste services, including skips.

Table 7: Stakeholders and partners of solid waste activities.

Organisation structure

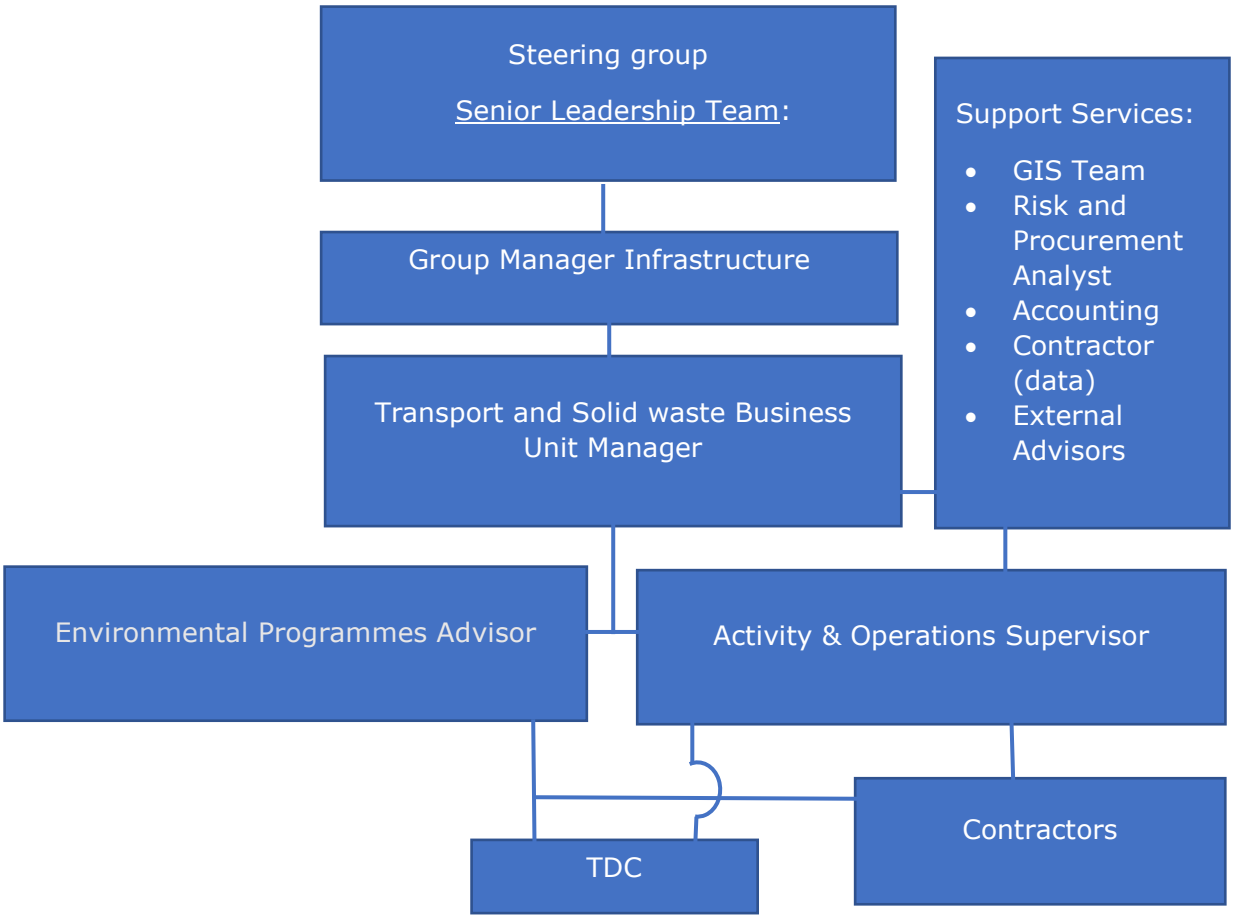


Fig 2 demonstrates the organisational structure of solid waste

1.1. Goals and Objectives of Asset Ownership

Reasons and justification for asset ownership

Council owns assets and also enters into service delivery contracts to provide effective and efficient waste management and minimisation services for Nelson. Decisions on asset or service procurement and renewal are made to align with the direction in the Long Term Plan and evolving Council priorities.

Assets must be practically and economically fit for purpose, and flexible enough to meet Council and community expectations of the services associated with that asset. Therefore, one of the goals of any purchase of a new asset is operational flexibility.

There must also be a clear plan for the lifecycle of the asset, which includes ensuring that changes to assets match new contract periods, and that refurbishment or replacement takes into account any relevant changes in available technology. Assets may also need to be altered to match social expectations, such as waste services

associated with inner city living or changes to open spaces. Therefore, this AMP must also align with other Council plans.

Activity management, including the choice of asset and 'future-proofing', is now an essential component of activity planning. Where an asset was once purchased based on economic longevity (the longer its life and the cheaper the better), assets are now chosen to align with public expectations, improvements in waste disposal and recycling methods, and to reduce Council's carbon emissions.

Technology is now moving faster than asset life. If assets are disposed of before end of their useful life, the actual total-cost of the improvement increases significantly and this must be factored into decision-making.

Council provides some services which utilise physical assets owned by Council. This includes the kerbside recyclables collection and the streetlitter collection. While these services are contracted to private or Council-owned companies, the assets require Council managed maintenance and replacement to maintain the service.

Where Council chooses to change an asset to improve the standards of service, safety, or to lower emissions, the contractor will have to adapt to using the new asset. This adaptation may require investment in machinery or methodology and Council may be required to cover the cost of the change. This may take the form of a payment for, or direct supply of machinery, or it may involve increased contractual costs. For example, the choice of a different kerbside recyclables wheelie bin replacement may happen mid-contract. In such a scenario the contract may need to be adjusted to match the timing of the bin replacement to ensure appropriate machinery is in place for the term of the contract.

2. Levels of Service

Activity Management Plans set out the level of service Council seeks to provide to the community. Levels of service are the standards Council aims to meet when providing a facility or service in support of community outcomes. They are the measurable effect or result of a Council service, described in terms of quality, quantity, reliability, timeliness, cost or similar variables.

Levels of service are not a compulsory obligation — instead they indicate Council's goals for an activity. Council aims to achieve these goals while being aware of the cost implications of any changes to the levels of service.

Many stakeholder groups will have different, and sometimes conflicting, expectations of levels of service. These expectations need to be managed to reduce conflict and unnecessary costs.

This section defines the current levels of service and performance as well as the proposed levels of service, and how they will be assessed. These performance measures are included in the Long Term Plan 2021–2031, and will be reported on annually through the Annual Report or quarterly through Quarterly Reports to the relevant Committee.

2.1. Current Levels of Service

Council wishes to have levels of service (LOS) that are relevant to customers and users, relate to good asset management practices, and are appropriate to the property or facility. The levels of service need to be meaningful to the customer, the organisation, and the asset, and set appropriate standards to manage the lifecycle costs. Fundamentally, the success of the organisation is judged on its levels of service. Reviewing the levels of service from the 2018–28 AMP and refining them to match desired outcomes has been a focus of this AMP. The following is a summary of the factors that have influenced Council decisions on setting service levels for 2021–31:

- LOS should meet customers' needs.
- LOS should be responsive to the challenges of climate change.
- Industry benchmarking comparisons should be relevant to Nelson's needs.
- LOS are aligned to management contracts and any strategic plans.
- LOS should be meaningful to management for performance monitoring.
- LOS should be easy to collate and measure, and data should provide useful information.
- LOS should support financial forecasting.
- Legislative requirements are treated as non-negotiable requirements and only used if they have relevance to customer's needs.

ACTIVITY	COMMUNITY OUTCOME	LEVEL OF SERVICE	PERFORMANCE MEASURE	PERFORMANCE TARGET			
				21/22	22/23	23/24	24/25
Waste minimisation engagement programme	Our unique and natural environment is healthy and protected Our communities are healthy, safe, inclusive and resilient	Whole community engagement	Reduction of waste per capita by 10% by 2030	Total waste less than 565Kg /capita	Total waste less than 545Kg /capita	Total waste less than 525Kg /capita	Total waste less than 500Kg /capita
Previous LOS: Waste minimisation engagement programme	We reduce consumption so that resources are shared more fairly	Council provides consumer education and support which leads to behaviour which minimises the quantity of waste to landfill	Decrease in per capita tonnage of waste disposed to landfill	maintain	maintain	maintain	maintain
Divert materials from landfill	Our unique and natural environment is healthy and protected Our infrastructure is efficient, cost effective and meets current and future needs	Maximise the diversion of reusable resources Maximise the diversion of organic materials	Increase in diverted tonnes through e-waste, reuse shops, etc	Create 2021 baseline	Increase of 2% above 2021 baseline	Increase of 3% above 2021 baseline	Ongoing 4% above 2021 baseline
			Reduction in greenhouse gas emissions (through greenwaste diversion)	NWRC greenwaste diverted more than 1115t /yr	NWRC greenwaste diverted more than 1142t/yr	NWRC greenwaste diverted more than 1171t/yr	NWRC greenwaste diverted more than 1200t/yr
			Quantifiable diversion of general organic material from landfill	Reduction from previous year	Reduction from previous year	Reduction of 5% from 2019 JWMMP organic waste	Reduction of 6% from 2019 JWMMP organic waste

Previous LOS: Divert materials from landfill	Our unique and natural environment is healthy and protected	Diversion options are available for all types of solid waste identified for disposal and diversion	Decrease the number of residents who are dissatisfied with the solid waste services	Maintain	Maintain	Maintain	Maintain
Managing and reducing street litter	Our unique and natural environment is healthy and protected Our infrastructure is efficient, cost effective and meets current and future needs	Streets are clear of litter	Reduction in justifiable complaints	Reduction in service requests	Reduction in service requests	Reduction in service requests	Reduction in service requests
			Litter removal services are provided promptly	Reduction in complaints	Reduction in complaints	Reduction in complaints	Reduction in complaints
			Reduction is greenhouse gas emissions associated with providing services	Reduction in line with Council targets	Reduction in line with Council targets	Reduction of 200t CO_2/yr from 2020 calculation	Ongoing Reduction of 200t CO_2/yr from 2020 calculation
Previous LOS: Managing and reducing street litter	Our unique and natural environment is healthy and protected	All council solid waste activities and services comply with resource consent conditions, site management plans and appropriate legislative requirements	100% compliance with resource consent conditions. Measured by number of consent breaches	Maintain	Maintain	maintain	Maintain
Provision of domestic kerbside recycling collection service	Our unique and natural environment is healthy and protected Our infrastructure is efficient, cost effective and meets current and future needs	That all residents have reliable access to a kerbside collection service Appropriate materials are managed in	Contractual expectations relating to safety and working standards are maintained.	Reduction in service requests relating to collection	Reduction in service requests relating to collection	Reduction in service requests relating to collection	Reduction in service requests relating to collection

		accordance with Council policies	Glass is colour sorted	Higher than 95%	Higher than 95%	Higher than 95%	Higher than 95%
			Community is educated on sorting and cleaning recyclable materials	Contamination less than 179t/yr	Contamination less than 174t/yr	Contamination less than 169t/yr	Contamination less than 164t/yr
Previous LOS: Provision of domestic kerbside recycling collection service		Cost effective and sustainable solid waste services available to all the community	No rates are required to support solid waste activities	Maintain	Maintain	Maintain	maintain
Nelson Waste Recovery Centre (NWRC) Refuse and Greenwaste	Our infrastructure is efficient, cost effective and meets current and future needs	That residents have access to a facility for the disposal of residential and light commercial refuse	Transfer station meets contractual operational expectations in regard to service and safety	No contractual failures	No contractual failures	No contractual failures	No contractual failures
Previous LOS: Nelson Waste Recovery Centre (NWRC) Refuse and Greenwaste		Cost effective and sustainable solid waste services available to all the community	No rates are required to support solid waste activities	Maintain	Maintain	Maintain	Maintain

Table 8: levels of service compared with previous levels of service

2.2. Customer Research and Expectations

The community can provide feedback on the proposed levels of service through the Long Term Plan consultation process. Council also undertakes a range of consultation processes related to service provision. These formal and informal consultation processes are outlined below.

Consultation Process	Date/Frequency	Reasons for Consultation	Extent of Consultation	Applicable to which Customer Value
Historical and Proposed				
Residents' Survey	Most years since 1998	Rate satisfaction with services provided by Council.	300–400 residents surveyed by telephone.	N/A
Long Term Plan process	Every 3 years	Legislative requirement of the Local Government Act 2002.	Public, business and Industry submissions requested. Advertising in local papers.	Sustainability Reliability Capacity Responsiveness
Annual Plan process	Each year that changes to the Long Term Plan are proposed	Legislative requirement of the Local Government Act 2002.	Public, business and Industry submissions requested. Advertising in local papers.	Sustainability Reliability Capacity Responsiveness
Joint Waste Management and Minimisation Plan process	Every 6 years	Legislative requirement of the Waste Management Act 2008	Public, iwi and business – all Council media channels, advertising	Sustainability Reliability Capacity Responsiveness
Other waste minimisation surveys	Approximately 1 per year	Testing community attitudes on reducing/avoiding waste	Surveys carried out where opportunities arise	Responsiveness capacity
Online engagement platforms such as Shape Nelson	Ongoing	Gathering supplementary community data	Feedback provided by website visitors.	Sustainability Reliability Capacity Responsiveness

Table 9: Customer research and expectations

Residents' Survey

The purpose of the Residents' Survey is to obtain statistically representative resident feedback on Council activities which relate to performance measures and identify areas for improvement.

Council has been conducting annual surveys of residents since the late 1990s, covering a range of topics. Where possible, questions are repeated to enable comparisons over time. Council's current approach to annual residents' surveys is to run a long (20-

minute) survey every three years, timed for the year before the Long Term Plan (LTP), for example, 2017. This allows a wider range of topics to be covered to inform LTP decision-making. In the intervening years, such as in 2016, shorter surveys (up to 10 minutes) are undertaken. These focus on collecting data to report on LTP performance measures and to inform Activity Management Plans.

Annual Plan 2020–2021 Consultation

Annual Plan consultation took place in early 2020, and attracted a significant number of submissions relating to waste. A key issue for submitters was diverting food waste from landfill, with strong support of the trial of a kerbside collection for domestic kitchenwaste scheduled for the end of 2020. This trial is funded through the Climate Change Reserve Fund in recognition of the greenhouse gas emissions generated by organic waste in landfills.

Joint Waste Management and Minimisation Plan Consultation

The most recent consultation on the JWMMP occurred in 2018/2019, after Council completed a Waste Assessment in 2017 (as required by the Waste Minimisation Act 2008). The purpose of the JWMMP consultation was to review the original 2012 JWMMP. This review led to the introduction of a target of 10% reduction per capita waste to landfill by 2030, as well as some changes to the section on Kaitiakitanga. Both Nelson City Council and Tasman District Council recognised that achieving the 10% target will be contingent on cost, which is discussed in section 6.1 of the AMP. The updated JWMMP was adopted in September 2019.

2.3. Strategic and Corporate Goals

Organisation strategic goals and impacts on levels of service

The Solid Waste Activity Management Plan has been developed to respond to Council's key themes and priorities:

1. A population that is growing and ageing
2. Working with stakeholders, including iwi
3. Mitigating and managing the effects of climate change
4. The Future Development Strategy, including an increase in residential intensification
5. A vision for Nelson as the Smart Little City
6. The development of our city centre
7. Government legislation impacting Council business.

This AMP contributes to the Long Term Plan 2021–2031, and is consistent with the Infrastructure Strategy and the Financial Strategy. It gives effect to the Nelson Tasman Joint Waste Management and Minimisation Plan 2019, ensuring that decision-making related to asset renewal and service procurement is consistent with achieving long-term outcomes for waste minimisation.

Nelson Tasman Joint Waste Management and Minimisation Plan

The JWMMP vision is: "communities of the Nelson Tasman region work together to reduce waste". This includes an ambition to reduce waste per capita to landfill by 10% by 2030, using the following three goals and objectives:

1. Avoid the creation of waste

Our community's culture makes waste avoidance and reduction the actions of choice

Members of our community work together collaboratively to avoid the creation of waste.

2. Improve the efficiency of resource use

Our communities have access to good information on the efficiency of resource use.

Our community can easily use a wide range of services to divert material away from landfill.

The proportion of material diverted from landfill will increase over time and the quality and range of diverted material will improve.

Our community will actively support and encourage product stewardship

3. Reduce the harmful effects of waste.

Our community can easily access and use services for the safe disposal of waste

We manage our waste management services to avoid or mitigate any adverse public health, cultural and environmental effects.

Waste management and minimisation services and all related activities are safe to operate and use.

To achieve these JWMMP goals and objectives, seven core principles have been adopted by the councils, and these will be referred to in this AMP. The principles are:

1. The Waste Hierarchy
2. Global Citizenship
3. Kaitiakitanga and Stewardship
4. Product Stewardship
5. Full-cost Pricing
6. The Life-cycle Principle
7. The Precautionary Principle.

2.4. Legislative Requirements

The activities of the Solid Waste Unit, and Nelson City Council, are prescribed by the Local Government Act and the Waste Minimisation Act, and are also influenced by the RMA, and climate change legislation. Some of the most significant are outlined below.

Local Government Act 2002

The Local Government Act sets out the requirements of Council to deliver services and the responsibility of the Council to assess the services provided, including waste management. The Local Government (Community Well-being) Amendment Act (2019) amended the purpose of local government, reinstating the promotion of the social, economic, environmental, and cultural well-being of communities in the present and for the future.

Waste Minimisation Act 2008

The Waste Minimisation Act aims to reduce waste generated and disposed of in New Zealand, encouraging better use of materials and lessening the environmental harm from waste. It is the key legislation for Council's solid waste responsibilities. It states that territorial authorities "must promote effective and efficient waste management and minimisation within their districts". It places a levy on waste disposal to landfills and provides for distribution of waste minimisation grants. The Act required the development of the Nelson Tasman Joint Waste Minimisation and Management Plan 2019, which must be reviewed every six years.

Resource Management Act 1991

This Act ensures that protection of natural resources in New Zealand, such as land, air and water. The Council carries out regulatory duties under this Act, and complies with it in council activities. The Whakamahere Whakatū Nelson Plan, under development, will integrate existing resource management plans such as the Nelson Resource Management Plan and the Nelson Regional Policy Statement.

Climate Change Amendment Act 2008

The Climate Change Amendment Act 2008 provides the basis for the New Zealand Greenhouse Gas Emission Trading Scheme. This Act requires landfill owners to purchase emission trading units to cover methane emissions generated from the landfill.

Climate Change Response (Zero Carbon) Amendment Act 2019

This Act sets a new domestic greenhouse gas emissions target for New Zealand to reduce net emissions of all greenhouse gases (except biogenic methane) to zero by 2050. It also requires central government to develop and implement policies for climate change adaptation and mitigation. To achieve this goal, it establishes a new, independent Climate Change Commission to provide expert advice and monitoring. It has developed a system of emissions budgets as steps towards the long-term target, with a transition period to 2021 to establish the new system. The New Zealand Emissions Trading Scheme (ETS) will be an important tool in delivering emissions reductions and achieving the 2050 target.

Other Legislation

Other legislation which needs to be taken into account in waste management and minimisation planning is listed below.

- The Hazardous Substances and New Organisms Act 1996 controls the handling and disposal of hazardous substances.
- The Civil Defence Emergency Management Act 2002 requires lifeline services to function to the fullest practical extent during and after an emergency, and to have business continuity plans.
- The Health Act 1956 aims to prevent nuisance and promote public health.
- The Local Government (Rating) Act 2002 allows Council to determine a rate or charge for any activity Council chooses to get involved in.

- The Health and Safety at Work Act 2015 outlines health and safety responsibilities for the elimination or minimisation of risks associated with work. The Act enables the Governor-General to make regulations related to hazardous substances.
- The Building Act 2004 requires building consents for building construction, operation and demolition.
- The Litter Act 1979 (and Amendment Act 2006) provides Council with powers to establish litter enforcement officers or "Litter Control Officers" who have powers to issue infringement notices, with fines, to those who have committed a littering offence.

Basel Convention

In addition, New Zealand's commitments to international agreements can influence solid waste activities. This includes the Basel Convention. This international treaty was designed to reduce the movements of hazardous waste between nations, and specifically to prevent transfer of hazardous waste from developed to less developed countries. The Convention is also intended to minimize the amount and toxicity of wastes generated. The effect of the Basel Agreement is that mixed recyclables such as a single bale of plastics containing 3,4,5,6 & 7 plastic types, or a bale of a single type of plastic with less than 99% purity, are now considered waste and cannot be exported to other countries.

3. Future Demand (planning for the future)

Details of future demand for each activity has been included in the focus areas in section 6 of this AMP. This section explains the basis on which each activity's future demand has been modelled.

3.1. Demand Drivers

Factors that will influence demand:

1. Behaviour and expectations
2. Population
3. Landfill acceptance criteria and waste composition
4. Central government and Council requirements and policies (including greenhouse gas emission reduction targets)

Demand Forecasts

Projected growth or decline in demand for services has been modelled. In some activities this is based on several competing factors.

For example, there is an expectation that a recycling collection service will be provided and that residents will use the service. The volume of recycling would be expected to increase in line with increases in population. However, as people learn about the waste hierarchy and make better purchasing decisions, the volume of recyclables to be collected may reduce. As product stewardship is introduced, more materials may be recycled. If the value of certain recyclables increases, these materials may be separated out for fundraising activities rather than included in the kerbside collection.

Activity	Detailed in section	Demand forecast	
NWRC	6.8		
Recycling drop off	6.8	consistent	
Greenwaste disposal	6.6		
Refuse disposal	6.11		
E-waste	6.9	increase	In line with the introduction of product stewardship
Streetlitter	6.4	increase	
CBD recycling	6.5	increase	
Recycling kerbside	6.3	consistent	While some products may reduce the overall tonnes are expected to be consistent
Recycling inner city	6.3	increase	In line with more inner city residents

Table 10: The forecasting of demand by activity. Each activity is detailed in individual activity chapters within section 6

Nelson Population and Household Projections:

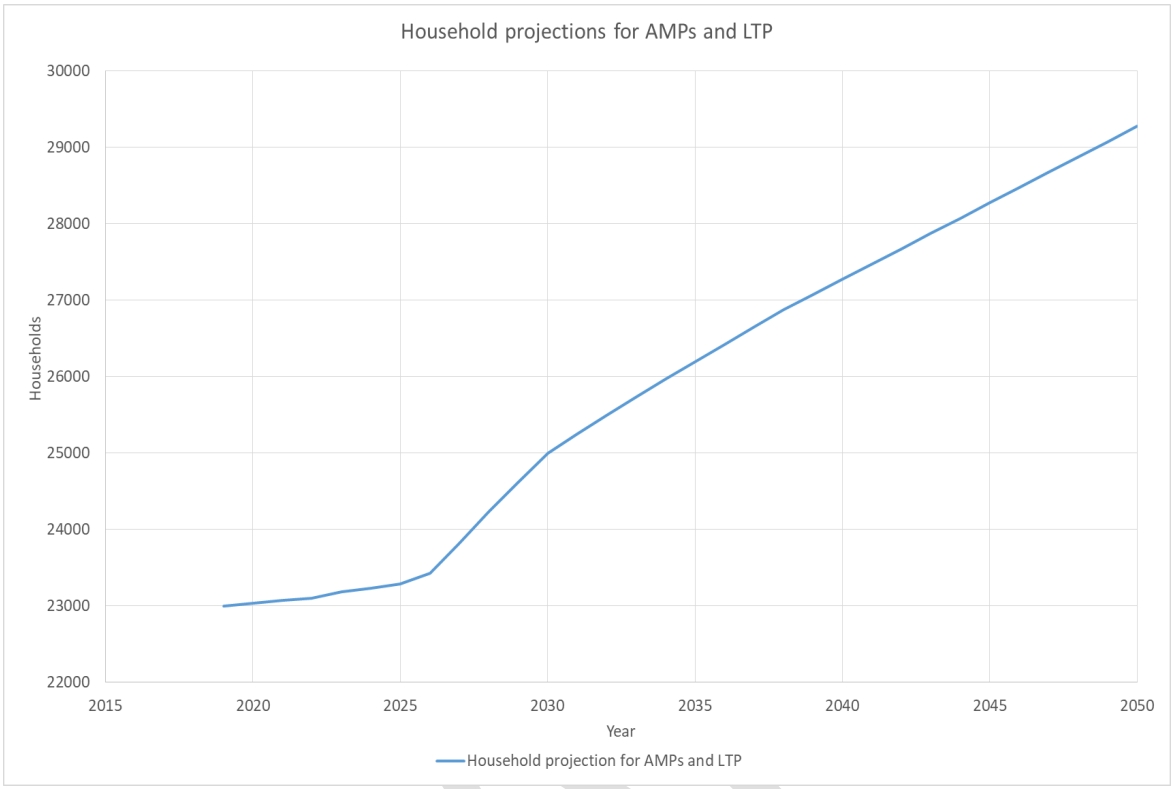


Figure 3 : Household projections

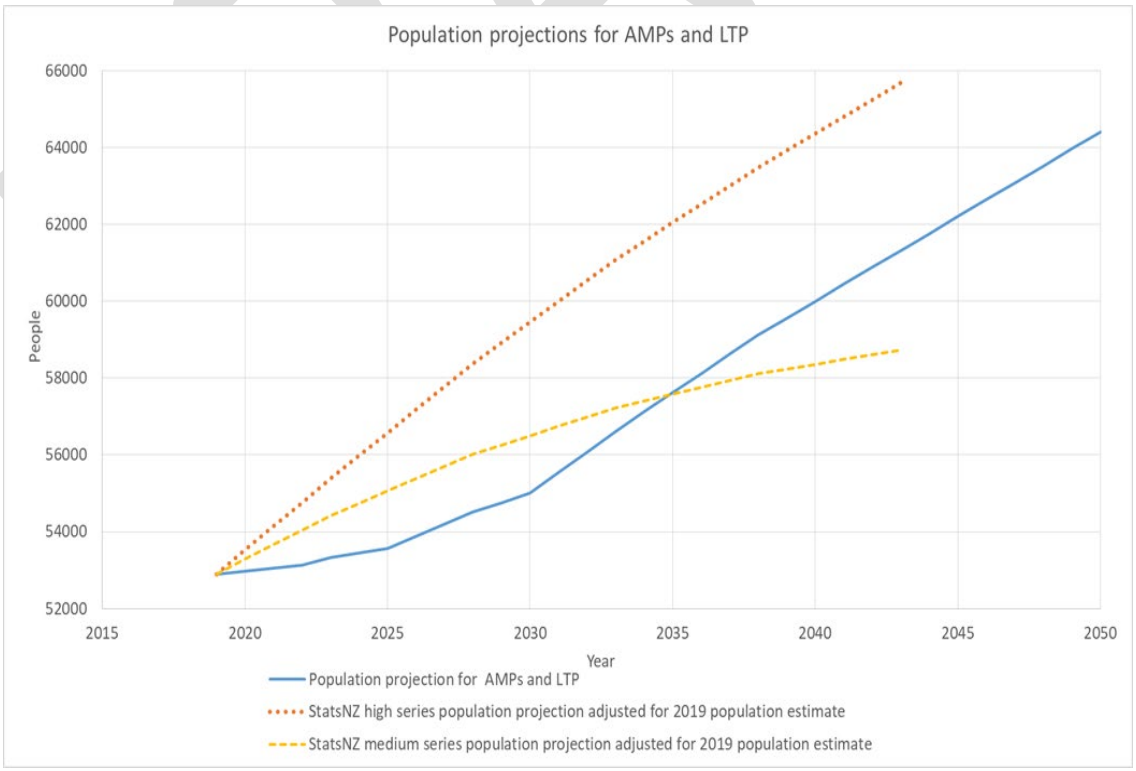


Figure 4: Population projections

One of the key issues facing Nelson is the ageing of its population, which will have a significant impact on the types of services Council will be need to provide in future. Waste disposal expectations, and issues such as access to services for residents who may no longer drive, need to be considered. The geography of some areas of Nelson, which includes steep driveways and narrow streets, may also make it more difficult for older residents to utilise waste services.

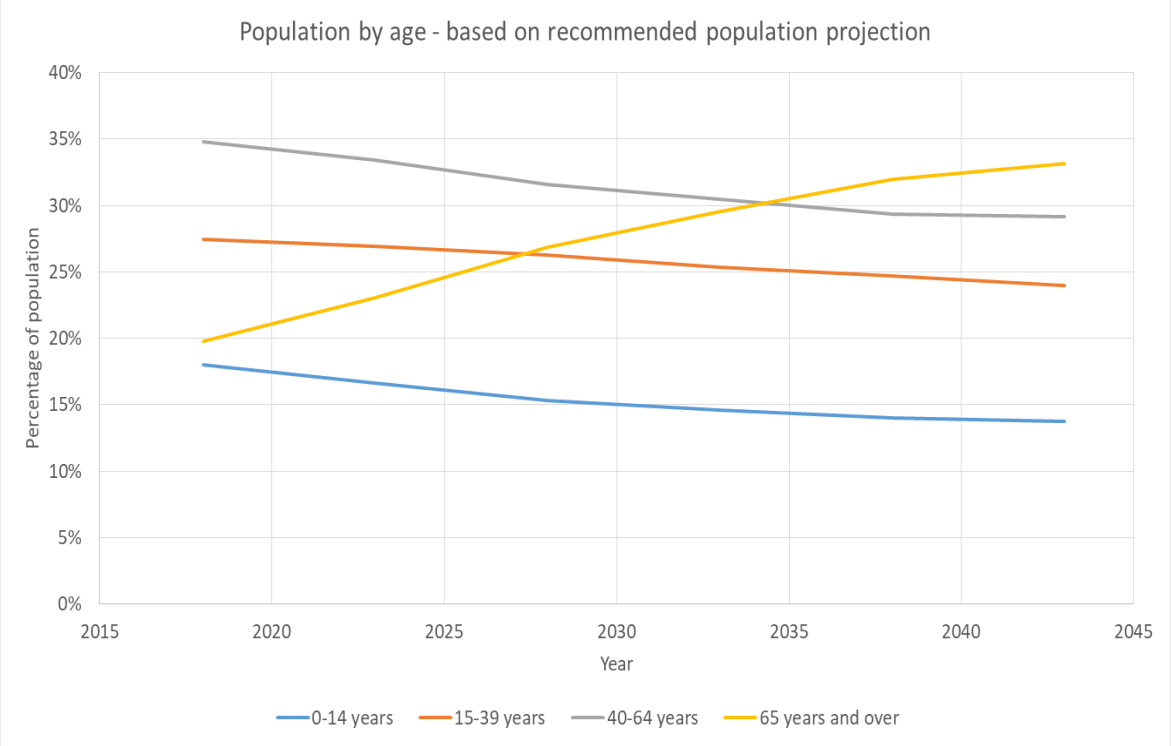


Figure 5 shows the projected trends for each age group from 2018

3.2. Demand Impacts on Assets

The capacity of the current assets is reviewed in section 4. However, spare capacity does not necessarily mean that the asset is in the appropriate form for that service. While there may be unutilised capacity in the existing assets, the demand drivers listed in section 3.1 may suggest an alternative asset design as being more appropriate. This may be as simple as whether the rider of a mobility scooter can reach the mouth of a streetlitter bin, or whether a central government directed kerbside collection methodology negates the practicality of the existing wheelie bins. A demand management plan is required to assess the combined implications of demand, asset design and utilisation.

Demand	Impact
Consumer culture continues to drive increase in waste	Pressure on infrastructure
Population growth changes	Pressure on infrastructure
Increased expectations	Expectation of climate change action
Increased expectations	Expectation of a wider range of disposal options
Innovation and Technology	The implementation of 'clean' technologies which align with environmental expectations.
Economy	Changes to the economy influence behaviour. In tighter economic times people want to minimise waste disposal costs.
Legislation	Changes to key legislation affecting the financial resources available or the methodology of collection processes.

Table 11 Demands and the expected impacts

3.3. Demand Management Plan

Solid waste encompasses a range of assets and activities that form part of Council's responsibilities for minimising and managing Nelson's waste. Responsibilities cover a range of contracts, and services for residential and CBD refuse and recyclable collections, food waste, greenwaste and diversion of items such as e-waste from landfill. The Solid Waste activity is also responsible for engagement programmes to support waste minimisation, and maintaining oversight of the closed Atawhai Landfill.

The demand management plan for each asset or activity is included in the focus area (in section 6). This includes demand forecasts, impacts on assets and future planning.

The purpose of Council's waste minimisation programme is to support a culture where the community chooses to avoid and to reduce waste generation. There is a growing recognition in the community of the value of making better use of resources through concepts such as circular economy, as well as the link between reducing waste and reducing climate change impacts. Council anticipates that a growing percentage of residents will choose to actively divert waste or reduce consumption, and the waste minimisation component of this AMP focuses on providing the tools to support this.

Demand management strategies are an alternative to the creation of new assets and services to manage waste. These strategies aim to modify customer demands for waste services to achieve:

- the delivery of cost-effective services
- deferral of the need for new assets and optimisation of the performance/ utilisation of the existing assets
- Sustainable management of existing assets.

3.4. Asset Programmes to Meet Demand

The major programmes are outlined in section 6 of this AMP, and the costs are included in section 7. In summary, the major programmes are:

1. Expansion of waste minimisation projects +$150k/yr.
2. Residential kitchenwaste collection +$1.3M/yr.
3. Solar compacting streetlitter bins +$225k/yr.

During the term of the AMP the main asset replacements will be:

1. Partial replacement of NWRC hoppers and refuse cartage containers $900k
2. Replacement of yellow lidded recycling wheelie bins $720k

4. Lifecycle Management (how we provide the service)

4.1. Background Data

Asset Lifecycle

Assets have a lifecycle as they move through from the initial concept to final disposal. Depending on the type of asset, its lifecycle may vary from 10 years to more than 50 years. Key stages in the asset lifecycle are outlined in Appendix 2.

The Operations & Maintenance and Renewal programmes focus on maintaining the current service potential of the assets. The key consideration is the condition of the current assets, although asset performance is often an indicator of asset condition.

In contrast, the Development programme focuses on closing gaps between the current and desired levels of service by increasing the potential of the solid waste system. This is primarily driven by the performance of assets and the need to accommodate population growth in the city, and the need to implement the JWMMP.

The following table is a list of physical Assets and their condition and asset life expectancy.

Asset	Quantity	Location	Condition	Life expectancy
Cast iron Bins	25	CBD streets		10 yr +
Cast iron bins with seagull lids	49	CBD and carparks streets	Painted in 2019	15 yrs.
Tilt bins	43	Bus stops, dairies	Average condition but require high maintenance	6 yrs.
Plastic bins	34		Poor condition. Being phased out	1-2 yrs.
Brazier bins	7			10 yrs.
Stainless recycle bins	4	Sports fields		7–9 yrs.
240 litre recycle wheelies	19475	Distributed to residents	Variable because lifespan is according to frequency of use	5–7 yrs.
120 litre recycle wheelies	2785	Distributed to residents	Variable because lifespan is according to frequency of use	5–7 yrs.
Unused 240 litre wheelies	130	NWRC storage	Unused	10–12 yrs.
Unused 120 litre wheelies	620	NWRC storage	Unused	10–12 yrs.
Unused 65 litre blue glass crates	450	NWRC storage	Unused.	To be sold

Asset	Quantity	Location	Condition	Life expectancy
Unused 45 litre blue glass crates	880	NWRC storage	Unused	To be sold
Gantry crane	1	NWRC	Good	10 yr. +
Compactor	1	NWRC	Good	10 yr. +
Hoppers	2	NWRC	Medium	Partial replacement in 6-8 yrs.
Cartage containers	7	NWRC	Average – maintenance scheduled	5-7 yrs.
Recycling shed	1	NWRC	No maintenance work required	
Sorting shed	1	NWRC	No maintenance work required	
Reuse building	1	NWRC	No maintenance work required	
Kiosk	1	NWRC	Good	10 yrs. +

Table 12 General comments on asset quantity, age, size, material, location, and current issues

4.1.1. The following table is a list of physical assets describing their location and utilisation

Asset	Description and utilisation
Cast iron Bins	25 x 100 litre bins which contain a metal bin liner. They are sited in the CBD. Their location is mapped (A230043) but they can be moved to match seasonal requirements. Identified issues with emptying due to design.
Cast iron bins with seagull lids	49 x 100 litre bins that contain a metal bin liner. These are sited in the CBD. These were general cast iron bins but have had a flip top seagull-proof lid added. Bins were painted when lids were fitted in 2019/20. Their location is mapped (A230043) but they can be moved to match seasonal requirements. Identified issues with emptying due to design/
Tilt bins	43 x 100 litre bins. Green or silver bins on a post which tilt outward for emptying. These do not have the same issues with emptying as cast iron bins. Locations are mapped. Bins are generally outside dairies and bus stops
Plastic bins	34 x plastic 40 litre bins which hook onto a post. These are all in poor condition. They are regularly vandalised (set on fire) and are being replaced by tilt bins as capex spend allows. Location is mapped.
Brazier bins	7 x 100 litre bins. The brazier (vertical metal strips) bins contain a metal bin liner.
Stainless recycle bins	4 x stainless steel boxes. Each contains 1 x 120 litre bin for glass and 1 x 120 litre bin for recycling. They are located in the CBD, Tahunanui Sportsgrounds, and Saxton Field.

	Although provided for recycling, they suffer from misuse and unacceptable levels of contamination. Very little material from these bins is ever recycled.
240 litre recycle wheelies	19,475 x 240 litre black bins with yellow lids. These have been individually assigned to a residential property and there is a GIS based tracking of all bins and locations using the serial numbers of the bins.
120 litre recycle wheelies	2,785 x 120 litre black bins with yellow lids. These have been individually assigned to a residential property and there is a GIS based tracking of all bins and locations using the serial numbers of the bins.
Unused 240 litre wheelies	130 x unused 240 litre recycle wheelie bins to be used for new properties and replacements.
Unused 120 litre wheelies	620 x unused 120 litre recycle wheelie bins to be used for new properties and replacements.
Unused 65 litre blue glass crates	450 x 65 litre blue glass crates to be sold to residents via Nelmac or Council.
Unused 45 litre blue glass crates	880 x 45 litre blue glass crates to be sold to residents via Nelmac or Council.
Gantry crane	1 maintained under Contract 4018.
Compactor	1 maintained under Contract 4018.
Hoppers	2 maintained under Contract 4018.
Cartage containers	7 x $30m^3$ containers which lock onto the compactor to accept compressed refuse or greenwaste, which are then loaded onto the truck for cartage. Utilised under Contract 4018 but maintained by Solid Waste.
Recycling shed	1 x $180m^2$ barn-style building within the NWRC recycling yard. This is utilised by Solid Waste for storage of bins etc.
Sorting shed	1 x $65m^2$ industrial building within the NWRC recycling yard. Due to the in situ machinery, it has limited immediate options for use.
Reuse building	1 x $400m^2$ open industrial building in the NWRC which is utilised (along with the $1100m^2$ yard) as a reuse shop under lease to Council.
Kiosk	1 x $25m^2$ portable building within the NWRC which is utilised by Council as the customer service and payment office.

Table 13 : description, utilisation of assets

The following table reviews the capacity of the assets. Although the capacity identified is the actual capacity of the asset in some cases there may other limiting factors.

Asset	**Asset capacity**
Cast iron bins	25 bins with a total of 9,968 collections per year. Maximum capacity is 126 tonnes per year.
Cast iron bins with seagull lids	49 bins with a total of 19,539 collections per year Maximum capacity is 247 tonnes per year.
Tilt bins	43 bins total 9822 collections per year. Maximum capacity is 124 tonnes per year

Plastic bins	34 bins with a total of 7,766 collections per year. Maximum capacity is 40 tonnes per year.
Brazier bins	7 bins with a total of 1,599 collections. Maximum capacity is 21 tonnes per year.
Stainless recycle bins	As noted in the previous table, very little material from these bins is ever recycled.
240 litre recycle wheelies	Audited recycling weighs on average 70 grams per litre. By comparing actual collections against the capacity of the bins, it can be determined that the recycling collected in 2019/20 was under 30% of the maximum possible capacity. This is primarily because most people do not leave their bins out on every collection day.
120 litre recycle wheelies	
Unused 240 litre wheelies	Adequate stock to meet requirements.
Unused 120 litre wheelies	Adequate stock to meet requirements.
Unused 65 litre blue glass crates	Adequate stock to meet requirements.
Unused 45 litre blue glass crates	Adequate stock to meet requirements.
Gantry crane	Utilised as required, with seasonal variation. Annual refuse: 5,179 tonnes. Greenwaste: 1,155 tonnes. Estimated to be operating at 70% of maximum capacity.
Compactor	
Hoppers	
Cartage containers	
Recycling shed	Fully utilised for storage of materials and items belonging to Solid Waste
Sorting shed	
Reuse building	Leased to Nelson Environment Centre. Fully utilised.
Kiosk	Fully utilised.

Table 14: Asset capacity

4.2. Operations and Maintenance Plan

The following table reviews physical assets in line with management of their maintenance

Asset	**Operation & Maintenance**
Cast iron bins	Currently maintained through annual spend of $60-$100k. Metal liners require replacement on a 2-3 year cycle. It is proposed that these bins be replaced with solar compacting bins (section 6.4) with a lease option, which would eliminate replacement or maintenance spend.
Cast iron bins with seagull lids	
Tilt bins	Bins are maintained and replaced as required. Damage from vehicles is the primary cause of replacement.
Plastic bins	Bins are being replaced with tilt bins. New bin and install $3k each.
Brazier bins	Metal bin liners replaced on a 2–3 year cycle.

Stainless recycle bins	Cleaned under the Tidytown contract. Posters etc. removed from the sides of the bin under Contract 2974 — special requests. Repairs as required.
240 litre recycle wheelies 120 litre recycle wheelies	Bins are supplied to new customers. Residents are charged for replacement bins delivered under Contract 2906. Where the collector damages a bin, the collector is liable for the cost of its replacement. Maintenance and cleaning of the wheelie bins is the responsibility of the resident.
Gantry crane Compactor Hoppers	Operational maintenance under Contract 4018. Reporting schedule for machine checks and certifications for gantry crane. Engineering report completed bi-annually to determine life expectancy etc.
Cartage containers	Operational maintenance under Contract 4018. Reporting schedule for bin condition. Engineering report completed bi-annually to asses condition and maintenance requirements Livery managed by Solid Waste, exclusive of Contract 4018.
Recycling shed	
Sorting shed	Annual building Warrant of Fitness. Damage caused by other parties is repaired at their cost. Maintenance managed by Solid Waste.
Reuse building	Leased to Nelson Environment Centre. Fully utilised. Maintenance included in Nelson Environment centre lease.
Kiosk	Maintenance and repairs managed by Solid Waste.

Table 15 Operation and maintenance of Solid waste assets

4.3. Renewal/Replacement Plan

The AMP includes two areas of significant renewal expenditure.

The walls of the hoppers and the cartage containers are both subject to metal fatigue and wear. The financial summary in section 7 of this AMP includes the cost of this renewal. The need for renewal is dependent on wear, which is caused by the tonnage in contact with the metal. Therefore the renewal will be completed as required but could be earlier or later than indicated.

The renewal is the renewal of the yellow lidded recyclables wheelie bins is also included in the financial summary, and they may also be required earlier or later according to wear and tear. The information available at this time indicates that renewal would be achieved by replacing the bins at their original capacity. However, if changes to the collection methodology are required by central government prior to the renewal time, this may result in the selection of a different bin option.

4.4. Disposal Plan

The disposal of assets will be in line with the waste hierarchy and Council procedures.

5. Risk management Plan (dealing with uncertainty)

5.1. Critical Assets

Critical assets are the ones which would result in a significant failure of service, or significant unbudgeted expenditure to Council, if they broke down or were not available to use. These are the assets which require the closest management. Assets and activities considered to be critical to Solid Waste are:

- Nelson Waste Recovery Centre (waste disposal functions, and kiosk)
- Kerbside collection of recyclable materials
- Streetlitter collection
- Atawhai Landfill (maintenance and monitoring)

The Nelson Waste Recovery Centre (NWRC) is not critical in its entirety. While the closure of the reuse shop or the public recyclables drop-off facility may be inconvenient, the closure would not in itself cause significant social disruption. This was demonstrated during Alert Level 4 lockdown due to COVID-19. However, there is a need for a residential refuse service. The limits of residents' ability to safely store refuse at home was demonstrated during the Level 3 and 4 lockdowns, when refuse collection continued as an essential service.

Residents cannot directly access the landfill, and rely on the transfer station for waste disposal. The local skip and kerbside refuse companies would not be able to meet demand. The closure of the refuse collection for longer than six weeks would lead to dumping or burning of waste, with poor environmental outcomes. Hence the transfer station facility, including the hoppers, must be considered critical.

The other critical component of the NWRC is the kiosk. The kiosk staff collect gate revenue, hazardous materials, and manage most of the site's health and safety issues. The management of the kiosk by a third party contract is an identified risk.

Recycling

The recycling collection contract is critical to maintain the service of collecting recyclables. Even when recyclables were being disposed of to landfill during the COVID-19 lockdown, the collection service was closely managed and was effectively performed. Recycling is another area in which Council is dependent on a third party asset. Without the MRF recycling has to go to landfill. Therefore the management of the collection contract includes a relationship with the MRF, which is the collector's disposal option.

Street litter

Street litter management is not in itself critical. The service does not require specialised collection vehicles and an alternate collector could be established in a matter of weeks. The assets require minimal maintenance and the contract requires minimal management.

Refuse

Council does not provide a kerbside refuse collection service and is dependent on private companies to provide this service. Other companies' assets are therefore critical to Council. While at least three companies provide the service, it is important to monitor

them to ensure they are able to continue this service, and to consider projections of refuse demand against the ability of these companies to grow in order to meet this demand.

5.2. Risk Assessment

CONSEQUENCES					LIKELIHOOD of the given consequence occurring			
Insignificant(1)	Minor (2)	Moderate (3)	Major (4)	Extreme (5)	Descriptor	Qualitative guidance statement	Indicative Probability range %	Indicative frequency range (years)
Medium (5)	Medium (10)	High (15)	Very High (20)	Very High (25)	Almost certain (5)	The consequence can be expected in most circumstances OR *A very low level of confidence/information*	>90%	>1 occurrence per year
Medium (4)	Medium (8)	High (12)	High (16)	Very High (20)	Likely (4)	The consequence will quite commonly occur OR *A low level of confidence/information*	20% - 90%	Once per 1-5 years
Low (3)	Medium (6)	Medium (9)	High (12)	High (15)	Possible (3)	The consequence may occur occasionally *A moderate level of confidence/information*	10% - 20%	Once per 5-10 years
Very Low (2)	Low (4)	Medium (6)	Medium (8)	High (10)	Unlikely (2)	The consequence may occur only infrequently *A high level of confidence/information*	2% - 10%	Once per 10 - 50 years
Very Low (1)	Very Low (2)	Low (3)	Medium (4)	Medium (5)	Rare (1)	The consequence may occur only in exceptional circumstances *A very high level of confidence/information*	<2%	Less than once per 50 years

Figure 6: The risk matrix to be used when considering Table 16

Activity or Asset	Description of risk	Risk assessment
Recycling collection service	Changes at a government level which will impact on collection methodology	15
	Changes at a central government level which will impact on the selection of materials collected	15
	Failure of asset — wheelie bins	6
	Meeting demand for inner city recycling	2
Streetlitter	Failure in streetlitter service, leading to complaints	3
	Failure of asset — cast iron bins	2
	Failure of asset — tilt bins	5
	Failure of asset plastic bins	10
	Failure of Tidytown service	2
NWRC	Risk to public or residents in relation to existing services and operations.	12
	Failure of hoppers and compactor	4
	Failure of cartage containers	4

Table 16: Risk assessment of assets and activities for services supplied by solid waste. The risk matrix (above) should be used to interpret the level of risk that has been assigned.

Information about how Council proposes to mitigate these risks is included in the relevant focus areas in section 6.

5.3. Identified Risks – Discussion

This section identifies several risks which will influence solid waste activities and planning. More detail about management of specific risks related to each activity is provided in section 6 (Focus Areas).

National and international activity such as legislation and international agreements have a significant impact on local waste management. While there is an awareness within solid waste of the policies and direction of international markets and central government, Solid Waste has limited influence on the impacts that result from the following external decisions.

5.3.1. The introduction of China's National Sword policy. The Chinese government (not Chinese industry) set new standards for the purity of recyclables being imported. The new levels exceeded the design parameters of most New Zealand based sorting facilities, reducing exports to China by over 95%. This change created a 'stock outside of China' glut which caused a worldwide collapse of commodity prices. Locally, this created a need for subsidies to ensure the continuation of the recyclables service.

5.3.2. The Basel Convention. This international treaty was designed to reduce the movement of hazardous waste between nations, and specifically to prevent transfer of hazardous waste from developed to less developed countries. It also aims to minimise the amount and toxicity of wastes generated. Mixed recyclables (such as a single bale containing 3, 4, 5, 6, & 7 plastics or a bale of a single type of plastic with less than 99% purity) are now considered waste and cannot be exported to other countries.

These two factors have changed recycling from a profitable and growing business to an industry which relies on subsidies and grants. Council's involvement with the recycling industry is limited to the collection of materials. If the MRF had closed due to the National Sword Policy, Council would have been left with the options of stopping the collection or disposing of recyclable materials to landfill. This scenario actually occurred during the COVID-19 lockdown periods when the MRF was closed. Recycling was collected and, with public notification, landfilled. While COVID-19 generated a degree of understanding towards the situation, there were still complaints and dissatisfied residents.

In 2019 Council decided that it would not collect plastics where there is not a New Zealand based processor available to take them. This changes the acceptance criteria for kerbside collection. Although the impact of this decision is that 90 tonnes of mixed plastics will go to landfill either as contamination or in kerbside refuse bags.

5.3.3. Waste levy landfill

The increase in the Waste Development Levy (WDL) will increase the cost of disposal of refuse. As some residents will try to avoid the higher disposal charges this places Nelson at an increased risk of fly-tipping and illegal disposal.

5.3.4. Natural disasters including the effects of climate change

Natural disasters such as earthquakes and floods pose significant risks to solid waste assets and activities as they have the potential to impact on kerbside collection of refuse and recyclable materials, or their appropriate processing

5.3.5. Service delivery through multiple private contracts

Council is reliant on stakeholders and partners in the private and community sectors to deliver its waste management and minimisation activities. Service delivery and relationships are formalised through service delivery contracts and agreements to ensure that Council priorities and obligations are achieved. While this model functions well, and is efficient in terms of Council time and spending, it does have elements of risk.

5.3.6. Meeting new Council priorities

The present solid waste assets and infrastructure are capable of continuing the present standards of service, but the present standard of service does not meet all the expectations of Council or residents.

5.4. Infrastructure resilience approach

Council can keep informed about potential policy changes at a central government level, and make submissions, and also work with other influencing agencies and lobby groups, while recognising that any long term plans made by Council may need to change due to policy changes at central government level.

While international decision-making is out of the control of Nelson City Council, the risks associated with those impacts can be reduced through:

- keeping informed on international trends
- creating a structure of asset ownership in which Council does not carry the risk
- procuring short term technology solutions or assets where an asset may have a shorter lifespan and therefore be more replaceable
- Structuring contracts with timeframes that match the likely change frequency rather than the lifecycle of very long life assets.

6. Focus Areas

6.1. Focus Area 1: Meeting the target set by the JWMMP

The JWMMP set a target of reducing tonnes of waste per capita to landfill by 10% (compared against the 2019 baseline). This will require a reduction in the average amount of waste per capita.

At a national and a local level, total waste per capita which is increasing, and this is further compounded by population growth. In the past six years, residential waste per capita in Nelson has increased 19% while the population has grown by only 7%. This means people are creating more waste than in the past. It also indicates that while population growth is a factor in estimating future demand for waste disposal, it is not the only element in considering waste projections.

How do we measure reductions in waste?

Waste minimisation engages the community in waste hierarchy practices including reuse and recycling. However, despite the success of these campaigns, many of the targets of waste minimisation will have negligible effect on tonnes to landfill. That's because waste at landfill is measured in tonnes and the JWMMP target is measured in tonnes. Therefore, the diversion of a bulky but lightweight material (such as plastics), may not register as a reduction of waste to landfill even though it may be a primary cause of litter or pollution.

Consequently, the selection of waste reduction targets is therefore based on two criteria.

1) That the material is heavy at point of landfill disposal
2) That diversion will prevent the production of greenhouse emissions.

This has led to the targeting of organic materials such as food, garden waste, and wood. These materials are high density, and will all decompose — producing methane when buried in the landfill. At present these materials are not disposed of separately from other materials. Consequently, the results of the NTRLBU Solid Waste Analysis Protocol (SWAP) has been applied to the known tonnes to calculate the 'total divertible material' which is required to meet the target of the JWMMP.

A combination of the SWAP analysis and the weighbridge data shows that in 2019/20 the proportion of landfill disposal from which the 'waste per capita' figure is calculated was 63,102 tonnes. This amount included 42,616 tonnes of general waste. The general waste was composed of various waste types, but however 46% of it (17,898 tonnes) was a combination of garden waste, foodwaste, putrescible waste and timber. Diversion of all of this material would achieve a 28% reduction of per capita waste to landfill.

For this reason, the plans in this AMP to achieve the target of the JWMMP include activities such as home composting engagement, a proposed kitchenwaste kerbside collection service (section 6.7) diversion of construction and deconstruction materials (section 6.2) and waste education or subsidies towards the use of greenwaste disposal.

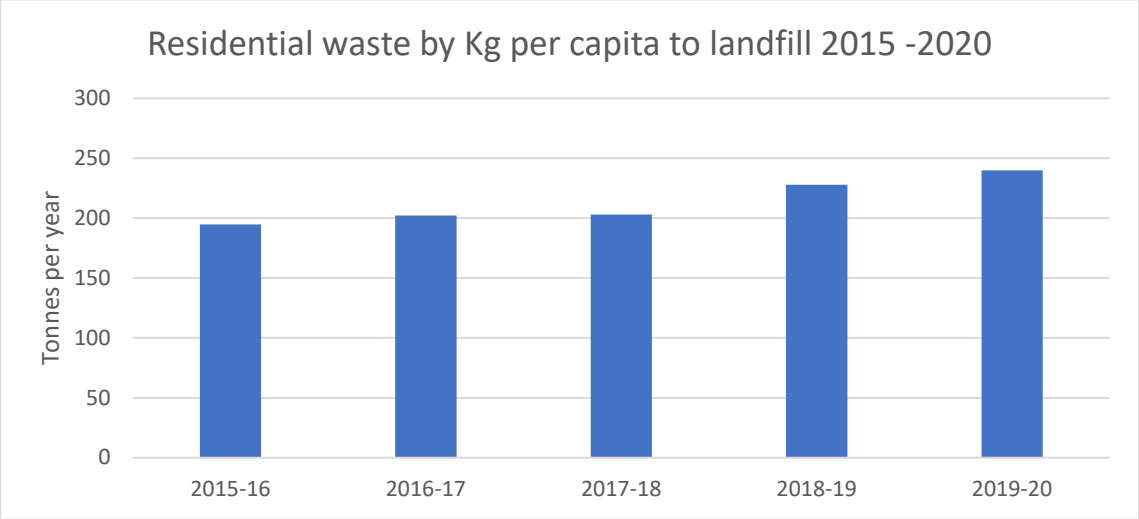


Figure 7 residential waste per capita to York valley landfill 2014 to 2020. This demonstrates an increase in waste per capita.

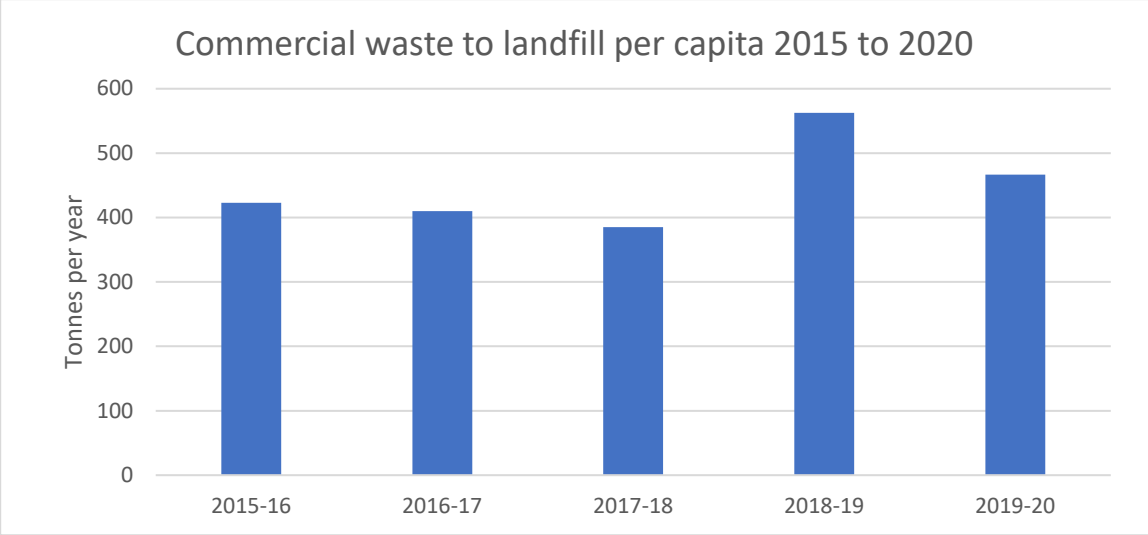


Figure 8 Commercial waste (divided per capita) for comparison with Figure 6

As Nelson's population increases, the total tonnes of waste can also be expected to increase in proportion to the population growth. However, the per capita figure should not be increasing as Council aims to reduce the amount of waste being generated by each person by at least 10% by 2030.

Refuse disposal and the waste levy

National and local data shows that households are generating more waste. Both refuse and recycling volumes are increasing. In an effort to reverse this trend, central government is increasing the waste levy.

The waste levy is charged for all waste (excluding coverfill) which is disposed of to landfill. This is collected by the Ministry for the Environment and the funds distributed to support

waste minimisation activities. The present split of the funds is that approximately 50% of the money is returned to the region (based on a population formula). In 2020 this will return approximately $200k to Nelson, to be used in waste minimisation activities. Tasman District Council received a similar amount towards their activities.

In 2020 the waste levy is $10 per tonne but the Ministry for the Environment (MFE) has indicated that it will be set at $50-60 by 2023 and raised further after that date.

The currently proposed NTRLBU increase in charges will raise the average cost of disposal to residents, adding $40 to a skip and at least $0.45 to a kerbside bag. This price increase is unlikely to significantly influence residential disposal but may influence commercial diversion.

A higher waste levy will make diversion more economically attractive and improve outcomes for focus areas such as construction and deconstruction. Many councils will use the increase in funding to promote the use of the waste hierarchy and to encourage people to avoid waste at point of purchase and/or design. In addition, products will be more likely to be designed to be reused, in order to avoid the increased cost of product disposal.

The levy increase will increase costs for the streetlitter activity, as well as disposing of contaminants from recycling, parks litter disposal, and any deconstruction or demolition carried out by Council. While these projects will all be completed under contract, the costs will be passed back to Council in the tender price.

6.2. Focus Area 2: Supporting the community to avoid the creation of waste

The primary focus of this activity is Goal 1 of the JWMMP — avoid the creation of waste, which also includes an aspiration that our community's culture makes waste avoidance and reduction the actions of choice, and that members of our community work together collaboratively to avoid the creation of waste.

To achieve these outcomes, the waste management role of Council now has an increased focus on community engagement in waste avoidance and reduction. The key point to consider is how can we reduce the need for waste management? Many of the decisions which will achieve this sit outside of Council's direct control and for that reason there is a recognised need to collaborate with the community.

The waste minimisation work programme will address several key areas:

- Leadership — Council walking the talk
- Community — enable a culture where people choose to reduce or avoid waste and support the development of a circular economy
- Individual priority waste streams identified on an annual basis based on data and strategic priorities — for example, food waste, single use plastics, textile waste and construction and demolition waste.

Activity	Examples of actions	Objectives
Collaborating with community including industry, business, education sectors, iwi, groups and individuals	• Joint action plan to deliver JWMMP with TDC • Use of a range of platforms to engage with different sectors of community • Iwi	• Reduction of regional greenhouse gas emissions • Reduction of waste per capita to landfill

	• Advocacy and engagement with local and central government, as well as industry bodies and other relevant organisations	• Council strategic direction both influences and is influenced by all voices in the community, as well as legislation and other drivers
Council walking the talk	• Building waste minimisation into the delivery of Council projects • Reviewing how Council facilities and events avoid the creation of waste • Building waste avoidance into organisational culture	• Reduce Council's operational greenhouse gas emissions • Reduction of volumes of Council waste to landfill
Enabling a culture where people choose to avoid or reduce waste	• Creating resources and messaging to tell the story and inspire change • Using tools such as grants, community social marketing and education to enable new choices	• Reduction of regional greenhouse gas emissions • Reduction of waste to landfill
Supporting the development of a circular economy	• Working with different sectors, local and central government, industry bodies and waste reduction advocates to build waste minimisation into planning and design of projects	• Reduction of regional greenhouse gas emissions • Reduction of waste per capita to landfill
Targeting avoidance or reduction of specific waste streams	• Use of SWAP analysis data and other data sources to identify waste stream priorities. Example waste streams include organic waste such as kitchen waste reduction supported through kerbside collection trial, promotion of home composting and Love Food Hate Waste, and C&D waste reduction through workshops with building industry and developing resources to support new behaviours	• Reduction of regional greenhouse gas emissions • Reduction of waste per capita to landfill
Improving collection of data to evaluate programme effectiveness and how objectives are achieved	• Use surveys more consistently to establish baseline • Review LTP performance measures • Introduce new platforms such as Shape Nelson to increase data on waste minimisation and behaviour change	• Consistent baseline data established • Reduction of regional greenhouse gas emissions • Reduction of waste per capita to landfill

Table 17: Waste minimisation activities

Demand

A growing percentage of residents are likely to choose to actively divert waste or reduce consumption due to education, engagement, a wider range of available disposal options and the increase in disposal costs. The waste minimisation component of this AMP focuses on providing the tools to support this. This area will also actively contribute to the reduction of regional greenhouse gas emissions.

Council will work towards making waste avoidance the norm. Methods to do this include using of subsidies and grants to encourage new behaviours and support community-led programmes, and providing education and engagement through a range of channels including school programmes and Council media.

As with many behavioural change programmes, the benefits of the increased expenditure will also only be recognised over time. Unlike with the introduction of a new service, behavioural change produces a progressive improvement, but has long term benefits. It is also recognised that when an individual changes one aspect of their behaviour they become more receptive to other changes in behaviour, providing a 'snowballing' effect of improvements in their waste disposal behaviour.

The waste minimisation engagement programme is currently under-resourced to meet the expectations of the community. Whilst the programme benefits from a full time staff role to support it, the funding does not allow sufficient coverage of the broad ranging topics encompassed by waste minimisation activities. Significant funding increases are proposed to enable programmes to be extended.

Risk

It is important to recognise that individual waste minimisation decisions are made in the community rather than by Council. Waste minimisation engagement programmes are critical to enable this change to occur, but the methods used should be reviewed and used in tandem with other measures such as compliance and provision of infrastructure to ensure the best results. In order for waste minimisation activities to achieve intended outcomes, the programme design will follow best practice methods and include the principles of investigation, trial, deliver and evaluation.

6.3. Focus Area 3: Recycling

Collecting and processing recyclables

Collecting and processing recyclable materials is not recycling in itself. The processor who produces a new product from the collected material (and which can be reprocessed at a future time) is the recycler.

Council provides a kerbside collection service to enable recycling, but it does not supply a complete recycling service. In recognition of the importance of the other aspects of the recycling process, Council resolved in December 2019 to only collect materials for which there is a New Zealand processor.

The ultimate outcome would be for a recycling service to no longer be necessary. This could only eventuate following significant changes in how products are designed and sold. Until then, recycling will continue to be the largest single area of expenditure for the Solid Waste activity with the costs of this activity offset by the environmental and social benefits.

Recycling background

A wheelie bin based kerbside collection service for recycling was introduced in 2016. Prior to this time, recycling was left kerbside in a blue crate (or associated bundles and bags) and collected with glass and recyclables on alternate weeks. The same crate was used for kerbside glass collection.

The recycling materials were hand sorted (at Pascoe St) with a fine weather recovery of approximately 60% (annual average was approximately 40% contamination) and a wet weather recovery of approximately 35%. Materials were baled and sold to exporters.

In October 2016 the introduction of wheelie bins and use of the Materials Recovery Facility (MRF) in Richmond raised the overall tonnage of plastic and fibre to more than 2,000 tonnes per year with a recovery rate of over 85% (wet or dry weather) with the remaining 15% being rejected due to general contamination.

The future demand for recycling

Currently, Council's estimates of future demand is based on existing processes, and the current value of recyclables. However, national strategies could influence these projections.

Due to the recent fluctuations in prices for recyclables, and a worldwide oversupply of low grade recyclables, there is significant political enthusiasm to produce a national standard for both recycling and the collection method. The Ministry for the Environment and Wasteminz are seeking to produce pure waste streams at the point of collection rather than relying on post collection sorting. This would improve the recovery rate from kerbside collections, and better service the recycling industry. However, it would place significantly more work and expense onto the point of collection. This would also increase the time spent on the task, the number of trucks required for the services, and the emissions generated.

The suggested timing of any change would produce an increase in kerbside collection costs at the same time as an increase in volumes occurred. The volumes would be largely driven by the increase in charges for reuse disposal due to the Waste Disposal Levy (WDL) increase. The timeframe of the volume increase would also align with the introduction of the product stewardship scheme, which is likely to divert higher value materials from the kerbside service. These factors would combine to create higher costs for recycling of higher volumes of recyclables with lower financial value.

The modelling for future demand for recycling has three components:

- the selection of materials to be collected
- the amount of material that residents intend to recycle
- the collection bins and service.

The selection of materials

Recycling of most materials is expensive, time consuming, and has a high energy demand. When compared against the cost of virgin plastics, paper pulp and glass, it looks like a poor economic model. As noted earlier, recycling has environmental and employment benefits. For these reasons it will continue to be subsidised at a central government and at a local council level. However, economics cannot be ignored and the financial value of recyclables is based on supply and demand. International decisions on the importation and exporting of materials for recycling have recently led to a glut of material and a collapse of the value of recycling commodities. This has also identified

that much of the material was never being recycled and was being disposed of irresponsibly.

As outlined in section 5.2, the introduction of China's National Sword Policy and the growing awareness of overseas recycling systems, their labour conditions and their environmental record, changed exporting rules. In 2019 New Zealand ratified the amendment to the 1994 Convention, which in effect eliminated exports of 'mixed plastic' recycling.

In December 2019 Council resolved to only collect glass and materials for which there was New Zealand processing, resulting in collection of 1, 2 and 5 plastics and fibre.

- Plastic 1 is PETE, commonly referred to as PET. This is Polyethylene terephthalate. It is commonly visually clear and used in soft drink bottles.
- Plastic 2 is HDPE or high density polyethylene. It is commonly opaque and is used in milk bottles and detergents.
- Plastic 5 is PP or Polypropylene. It is used in some food containers, car parts and toys.

The plastics that Council decided not to continue collecting include: PVC (polyvinyl chloride), LDPE (low density polyethylene), PS (compressed polystyrene) and other plastics including acrylic, polycarbonate, polylactic fibres and nylon, and PLA (polylactic acid).

This will reduce total recovered tonnes by 90 t/yr, with any of these collected materials that are sorted at the MRF being disposed to landfill as contamination.

Fibre is the other main group of recyclable materials collected in Nelson. Fibre is any paper and cardboard, which is both recycled in New Zealand and exported. While New Zealand may have adequate demand for the fibre, it does not have sufficient capacity to process all of it. In addition, as each time paper or card is recycled, the fibres (which hold the material together) get shorter, so it is essential that new material is constantly added to the recycled fibre. A 100% circular use of fibre would result in all fibre in New Zealand becoming unrecyclable after 3-4 cycles. Therefore, New Zealand is dependent on its ability to export a proportion of its fibre and to utilise virgin material in conjunction with the recycled material when processed locally. If the fibre was not exported it would be landfilled which, being organic, would produce unwanted landfill emissions.

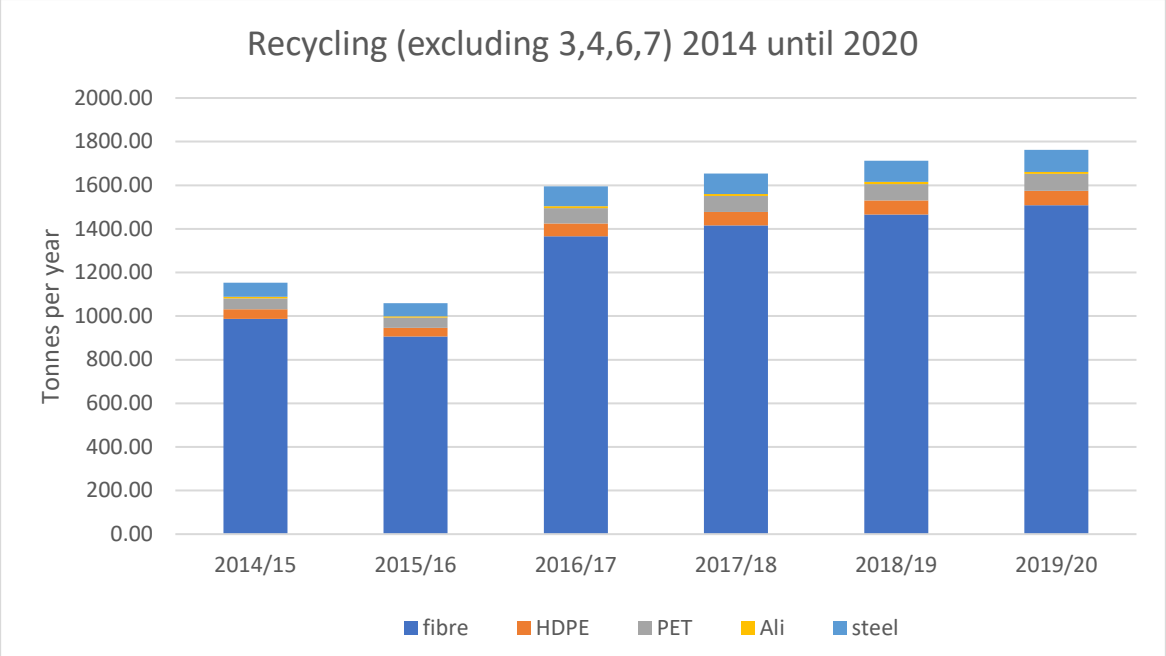


Fig 9: This demonstrates the growth in recycling following the introduction of wheelie bins (in October 2016) as well as the composition of the non-glass recyclables. Fibre, which is a mixture of all paper and cardboard, accounts for at least 70% of non-glass recyclables. Although 3, 4, 6 & 7 plastics were collected during this time, they have been removed from these figures to enable ongoing comparisons.

The quantity of materials to be recycled

As of April 2020, there are 22,260 residential recycle bins in service which are used to collect over 2000 tonnes of fibre, plastic, and tins and aluminium annually. This volume is expected to increase in line with the population growth by approximately 1% per year. For the duration of the present contract (which expires in June 2023) this increase will be absorbed by the present number of collection vehicles resulting in no unplanned increase in costs to Council or in emissions.

The collected materials are sorted in the Materials Recovery Facility (MRF) in Richmond. The sorting plant utilises machinery and staff and also incorporates up to date technology such as an artificial intelligence optical sorting machine. As the MRF has invested in contemporary technology the facility is unlikely to undergo any further significant technology upgrades within the term of the AMP.

Future demand modelling also takes into account changes from central government. The introduction of a product stewardship scheme (detailed in Focus Area 6.10) may create competition for high value commodities. Where a plastic type such a PET1 (carbonated drink bottles) is given a minimum value, it becomes a potential source of funding. Consequently, community groups or schools may become collection depots, bypassing the kerbside service and leaving the kerbside service with only low commodity value items.

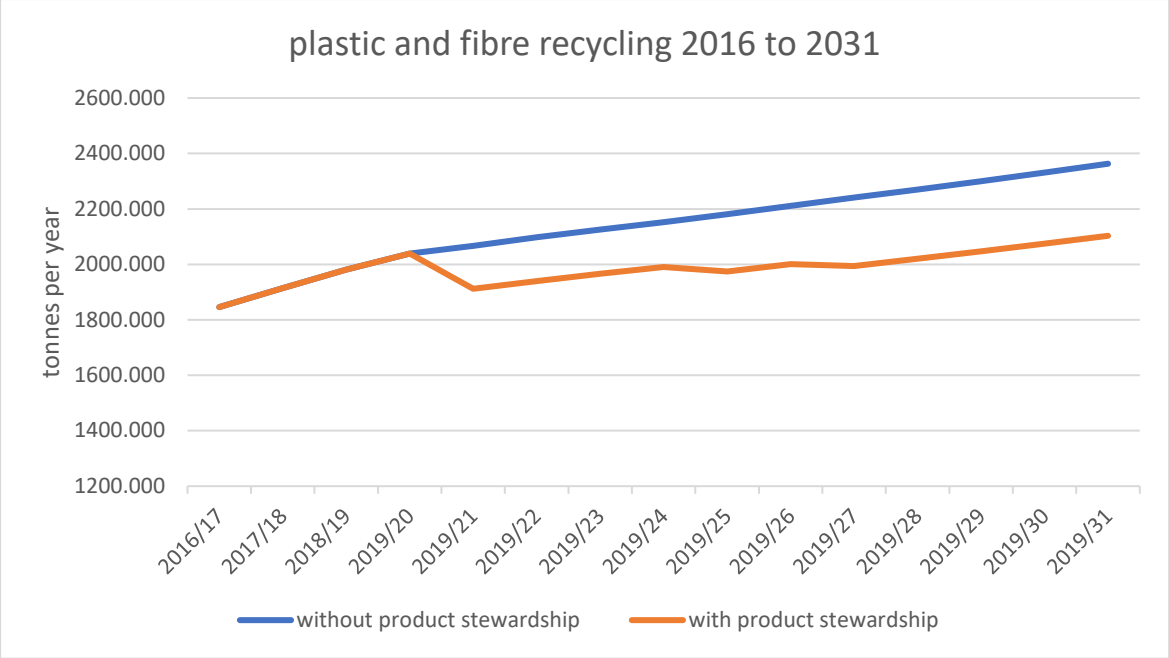


Fig 10 demonstrates the potential changes to recycling volumes after a product stewardship scheme is introduced.

The bins and kerbside collection service

The 19,475 240 litre and 2,785 120 litre wheelie bins were first distributed in August 2016. At that time they were expected to have an operational life expectancy of 10 years. In the past 12 months, 270 bins have been replaced for 'fair wear and tear' damage. The frequency with which bins are placed on the kerbside has a significant effect on their life expectancy. A replacement schedule can be calculated based on the present collection technology and factors such as UV and weather-induced deterioration. The cost of bin replacement is growing 20% per year until 2027/28. In that year a single year expenditure of up to $870k may be required to replace most of the outstanding bins. All bins will need to be replaced by 2030.

The Future Development Strategy outlines council's intent to increase inner city living. This may lead to a variation in the current approach to the inner city residential recycling (and possibly refuse) collection services.

Comparison with national collection rates.

When predicting future demand, consideration should also be given to local recycling practice rather than deriving information solely based on nationally produced data.

Table:1 demonstrates the difference between Nelson and a Wastminz report[1]. This demonstrates that while Nelson produces less material overall, the quality of the recycling is better than average.

[1] The Truth about Plastic Recycling in Aotearoa New Zealand in 2020)

	tonnes	Kg per Nelson household	Wastminz report	difference
Fibre	1466	72.36	74.00	-1.64
Plastic containers	233.81	11.54	22.60	-11.06
Metal packaging	107	5.28	11.30	-6.02
Glass	1519	74.98	94.80	-19.82
All other	174.37	8.61	32.40	-23.79
	3500.18	172.76	235.10	-62.34

Table 18: Nelson recycling compared with national recycling rates.

Demand impacts on assets

As identified in section 4.1 the recycling service is collecting approximately 30% of the capacity of the collection bins and at approximately 75% of the capacity of the present collection service. The restricting factor is the quantity of collection trucks and the time required for the collections. The decrease in the collection service from not accepting some plastics has negligible effect on these calculations.

It can be calculated that the required amount to be collected will not be exceeded by either bin capacity or collection capacity within the term of the AMP.

Demand Management Plan

The contract for the recyclables collection service is a total cost contract and does not contain any allowance for changes to volumes or participation. In effect it means that no matter how well or poorly the service is patronised, the costs to Council are consistent.

Emissions

The emissions from the vehicles used in the recycling service are not assigned to Council. As the service is performed under contract, the emissions are assigned to the contractor. However, Council takes a holistic view and is actively seeking to reduce emissions created as a result of its services. Prior to any collection contract being awarded after 2023, consideration will be given as whether the collection service could be completed with EV trucks. Where it would be appropriate, the use of EV vehicles could be used in the non-price attributes for the contract assessment.

This approach will be included for the recyclable and glass service, streetlitter collection, and any other Solid Waste activity that requires significant truck usage.

Future demand for glass

Glass is collected from the kerbside in blue crates. The way that glass has been collected and processed over the last three years has changed. Until 2016 mixed colour glass was collected in rear loading vehicles and crushed for mixture into road base material by

Fulton Hogan. Since 2017 glass has been colour sorted at the kerbside and the colour separation is maintained in the vehicle. The glass can then be sent for recycling and, as it does not require optical sorting, it has a commodity value. This offsets the extra costs of collection. Since 2020, approximately 98% of glass has been fully recycled (only 30 out of 1594 tonnes goes to landfill).

It is likely that the use of glass will continue to increase so future collection contracts will require strict limits on how it is sorted.

As Council collects, colour sorts, and transports glass for recycling it is unlikely that there would be any changes to this methodology if central government introduces a standardised recyclables collection methodology.

Fig 11: Annual glass tonnes

Emissions

At present Council only takes responsibility for emissions from the glass collection vehicles. Once disposed to the depot, the transport emissions belong to the transporter. There are three main collection vehicles of differing sizes, covering a total approximately of 80,000 kms per year and producing over 300 tonnes of CO_2.

As glass collection vehicles do not travel over the same road multiple times in the same collection there are few opportunities to reduce vehicular movement or emissions when collecting glass. Therefore (as above), introducing EV vehicles into the next contract could be considered.

6.4. Focus Area 3: Streetlitter

The present streetlitter bins have been installed and sited with the intention of providing an assumed, but undefined, clean street service. Installation and assessment of service is complaints-driven rather than planned. It is difficult to predict future street litter demand. The 166 bins are emptied a total of 47,000 times per year, averaging 7.8 Kg per empty or on average 2.2 tonne/bin/yr.

With the proposed increase in inner city living, increases in the use of public transport and bus stops, and more social inner city activity, the same number of bins utilising the same technology are likely to have a 10-15% increase in annual weight over the term of the AMP. This could be absorbed within the existing bin capacity (section 4) but as the contractor has to cover the cost, the extra vehicle time and the cost of disposal, this increase is likely to lead to higher contract costs.

Demand Impact on Assets

For the purposes of the AMP 'streetlitter' refers to infrastructure bins (not rubbish bins in parks).

Streetlitter comprises of 166 bins for casual pedestrian refuse disposal. They are sited in the CBD (92) and various sites around Nelson including dairies, bus stops, and car parks. The collection contract (2974) started in 2006 and has rolled over three times. The contract includes a set price for the collection schedule. This contract has a value of over $200k/yr. Disposal of collected material is a cost to the contracted service provider, so an increase in volume does not result in an increase in costs for Council.

There are 80 cast iron bins which were selected for their Victorian aesthetic. The metal liners require replacement every 2-3 years. The bins are difficult to empty because the collector has to lift the liner (full of refuse) for the entire height of the bin to remove it for emptying. There is evidence that some of the collectors performing this role have developed shoulder damage after a few years. This has been identified as a Health and Safety risk by the contractor. In 2018/19, following complaints of seagulls feeding from open-top bins, a hinged metal lid (at a total cost of $90k) was added to 49 of the bins. While this keeps the seagulls from the refuse, it has not addressed the core safety issues with the bins.

Supplementing the collection contract is the 'Tidytown' Variation which came into effect when Kahurangi Trust ceased trading. Tidytown started in 2014, and includes water blasting of the painted blue pavement lines in Bridge Street, water blasting of the white 'stone' street furniture, cleaning of drinking fountains, and clearance of illegal refuse disposal (fly-tipping). This variation has a value to the contractor of approximately $63k/yr.

There are no immediate plans to remove the blue lines, and maintenance of the lines is a responsibility of the transport business unit so it is expected that the cleaning contract will continue in a similar form for the duration of the AMP.

The present streetlitter bins have a total value of $336k, this being a total of $65k of cast iron bins, $183k of cast iron bins with seagull proof lids, $77k of tilt bins and $2.5k of plastic bins. Over the last two years, 19 plastic bins have been replaced with tilt bins. By 2023 there will not be any plastic bins remaining.

In 2019/20 streetlitter disposed of 169 tonnes of refuse from both streetlitter and parks collections. This is up by 7% on 2018/19. However, this does not demonstrate more pedestrian use because while streetlitter bins are for the purpose of litter disposal by pedestrians, approximately 30% of material appears to be shop, commercial, or dumped

residential refuse. This inappropriate use of bins costs Council approximately $5-7k per year in disposal. Some of the materials placed in the bins are recyclable but there is no ability at present to separate this material from other refuse.

Management

The contract, variations, and service requests relating to this task is managed by the Solid Waste supervisor.

Levels of service

The bins are emptied according to a contractual schedule, with a higher rate of weekly service in summer (1,426 empties per week) than in winter (889 empties per week). Service Requests are monitored to determine the efficacy of the collection schedule.

The following is a proposed timetable for the implementation of the solar compacting bins.

	Present plan	options
21/22		All plastic bins replaced
22/23	RFT New contract	RFT New Contract
23/24		EV collection vehicles Solar compacting bins introduced
24/25		Solar compactor bins Retired bins absorbed by Parks
25/26	Roll over	
26/27		
27/28		
28/29	Roll over	
29/30		
30/31		

Table 19 proposed timeframe for streetlitter bin changes

Compacting bins and the reduction of collections

While the cast iron bins may have a significant life expectancy, this should not prevent consideration of alternative streetlitter options that may be more efficient. One option is to have fewer, larger bins.

Solar powered compacting bins are seagull-proof boxes that contain a wheelie bin. When they reach a certain volume of material, a compacting plunger squashes the contents, ensuring more capacity. Once they have been compacted enough, a text message is sent to the collection vehicle.

Figure 12 solar powered compacting bins in use by waste management.

Solar powered bins have been trialled by Council's Parks business unit, and by Nelmac, and are used by other councils. As a significant portion of what is placed in a street litter bin is compactable (such as food wrappers etc.), and as each compacting bin contains a 120 litre wheelie bin (with an effective 300 litre capacity), it means that collections could be reduced to once every 2–3 days rather than (at present in summer) twice per day. While the total tonnage collected would be the same, it would reduce vehicle movements, therefore reducing traffic congestion in the CBD, and carbon emissions. As compactor bins send a text message when they require emptying, this would also ensure that a vehicle is only stopping when required, which would minimise traffic disruption.

Replacing the 94 cast iron bins in the CBD with 75 solar compactor bins would cost over $675k. However, as per the financial summary, they are also available on a lease or lease to own basis which would allow this to be considered as an opex cost over the first years of operation.

As the bins are larger 'boxes' there is also potential to utilise the sides for environmental or waste disposal education.

A collection of three times per week would remove 6,000 kms of collection vehicle use per year. This is an immediate reduction of over 25 tonnes of CO_2.

Apart from the environmental and economic considerations, the bins are consistent with the vision of the 'Smart Little City' and move the city away from a Victorian aesthetic. During the bin selection process, Solid Waste will work closely with the City Development team to ensure that any proposed bin aligns with the city centre spatial plan and the renewal palette.

Low emission collections

A significant energy requirement in a collection vehicle is the compacter in the truck. Approximately 30% of fuel consumption is used for compacting. Where the material is already pre-compacted the collection truck can be of a much simpler design. This allows for the introduction of electric collection vehicles (EVs). Similar vehicles are used by other councils in New Zealand, and these vehicles would reduce the carbon footprint of street litter collection by up to 45 tonnes of CO_2/yr.

6.5. Focus Area 5: CBD Recycling

Council has four stainless steel recycle bins which were supplied for the Rugby World Cup in 2011. Each bin has two disposal slots, each going to one of the two 120 litre wheelie bins inside. These bins were sited at Millers Acre, BNZ Trafalgar Street, Tahunanui sportsgrounds, and Saxton netball courts. The bins are in reasonable condition and have a useful life of more than another 10 years.

Fig 13 stainless steel recycle bins in the CBD

The bins have been ineffective as recycling collection vessels. They are generally heavily contaminated with unrecyclable materials. Contamination recovered from the bins has included bags of household rubbish, commercial glass, gas bottles, camping equipment and even furniture and a mattress. They also attract fly tipping with stacks of household rubbish left against or around the bins. Following a cost of $2k in six months for rubbish removal from the Millers Acre bin, this one was removed.

Cages were added to the mouth of the bins to restrict the maximum size of any item to 150mm wide. This stopped some of the larger contamination but did not eliminate the problem. Recycling bins that have a refuse bin two metres away are still full of rubbish. This indicates that rubbish disposal in the recycling bins is behavioural.

While many residents liked the idea of the recycling bins, the bins are ineffective at collecting recyclable material. As the bins were provided by an external sponsor, their

location, use, or need was not planned and they have become a cost without fulfilling their intended purpose.

Alternative utilisation

The cast iron bins would be re-purposed in line with Council asset management procedures and the waste hierarchy.

	Present plan	options	
21/22			
22/23		Reverse vending machines	
23/24	Solar recycling bins	Some of the solar compacting bins could be recycling bins.	
24/25		Container deposit scheme Reverse vending machines	
25/26			
26/27			
27/28			
28/29			
29/30			
30/31			

Table 20: Timetable for recycling in the CBD

Reverse Vending Machines

Enabling recycling of material by pedestrians is consistent with the goals of the JWMMP. While the existing stainless steel recycle bins have not been effective, other options are available that reduce the risk of contamination. One method is the introduction of reverse vending machines. The machines 'read' the recycling and only allow recyclable materials to be deposited into them. They also provide accurate information on weight and content so that efficacy and need can be quantified.

Figure 14 A reverse vending machine in action.

As the appropriate bottle or container is disposed of into the machine, the barcode is read and the 'refund' is paid onto a mobile phone account or automatically diverted to a selected charity. The bulk container within the machine is then collected and the contents are added to the recycling.

Following the introduction of a container deposit scheme (expected to be in place in approximately 2023/24) Council could place reverse vending machines in various locations in the CBD. However, Council could introduce the technology ahead of the container deposit scheme. While an early introduction would be an additional cost, it would also have educational and city perception benefits. This technology is now commonplace around the world.

6.6. Focus Area 6: Greenwaste

The projected increase in population and households in Nelson is unlikely to increase the total quantity of greenwaste. There will be an increase in inner city living which does not produce greenwaste. New subdivisions tend to have smaller shrubs and trees, and lower maintenance gardens. These factors, combined with infill-housing, will produce less greenwaste per capita, but due to the overall population growth, there will probably be a similar overall volume of greenwaste to the present. However, the manner of disposal of that greenwaste may change.

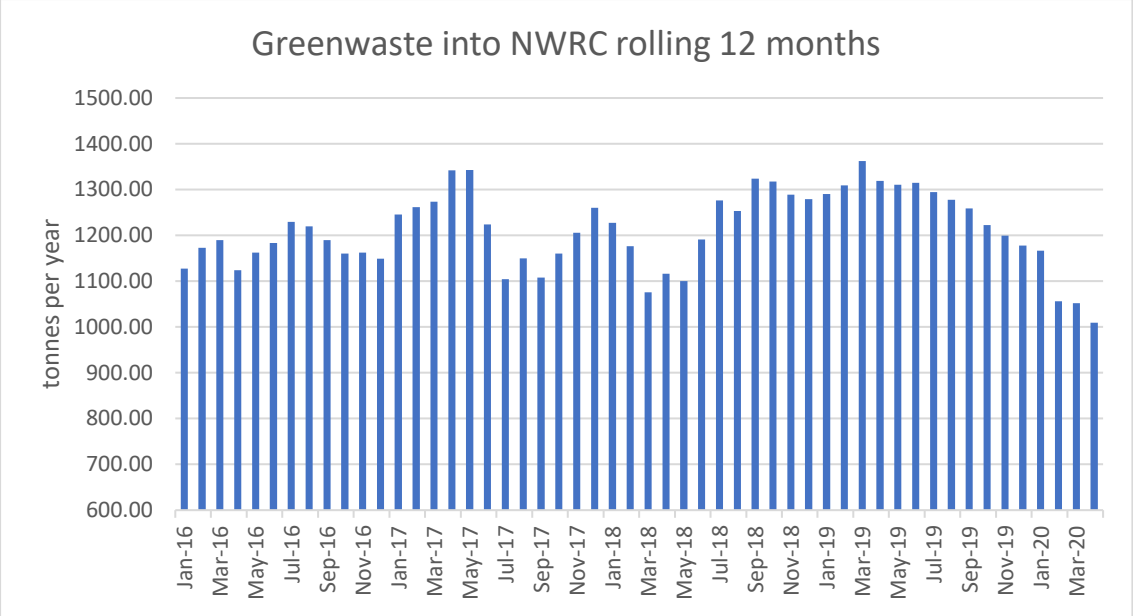


Figure 15: Greenwaste disposed of to the NWRC. A rolling 12 months has been used to minimise the seasonal variances.

Greenwaste tonnes from the NWRC indicates a decrease in disposal tonnes. However, this is a behavioural change rather than a decrease in demand. Two companies currently offer a greenwaste bin service and while one is reasonably constant at 8 tonnes per month. The other is an increasing service which is already at over 15 tonnes per month. The 200 tonnes decline in the greenwaste received at the NWRC last year is indicative of the growth of the user-pays service.

This indicates that while significant amounts of greenwaste disposal will continue to be received at the NWRC, the convenience and reliability of the user pays services will reduce the use of the Council provided service. In effect, the total amount of greenwaste being diverted form landfill is reasonable constant, it is only the method of this waste reaching the composter that has changed.

Regardless of who collects or accepts the greenwaste, the material is being processed and hence diverted from landfill, so the overarching intent of the JWMMP is being maintained. For this reason, this AMP does not propose removing material from the private contractors and will instead monitor the tonnes to ensure that greenwaste is still being diverted to processing and composting. Note: greenwaste that is being collected kerbside will not be included in the diverted tonnes and will not be reflected in the JWMMP Waste Reduction Indicators.

Greenwaste is being effectively diverted from landfill. While some councils offer a greenwaste kerbside service, there is no indication that a kerbside service would divert more greenwaste from landfill. The AMP does however include actions to encourage increased separation of greenwaste from refuse at the NWRC and to promote home composting.

Risk

Council's policy is to prevent residential greenwaste entering York Valley Landfill and is dependent on private operators to process greenwaste. Without private service delivery, it is likely that residents would expect Council to provide that service. Presently there is enough volume of greenwaste being disposed to the windrow composters to ensure ongoing commercial viability. If the greenwaste volume drops by 30% it is unlikely that

a composting company would be sustainable, and Council would then need to consider subsides to ensure an operation or a suitable alternative disposal option.

A close and ongoing relationship between Council and commercial greenwaste collectors and composters will ensure effective greenwaste diversion continues.

This AMP aims to achieve the maximum diversion from landfill of greenwaste. However, not all greenwaste diversion is quantifiable. While resident surveys have indicated that up to 65% of residents perform some kind of composting it is difficult to determine how much material is home composted.

Some greenwaste that is disposed of into the NRWC refuse hoppers because it is mixed with refuse, but the lower gate rate for greenwaste minimises this risk. For this reason, the difference in the gate fee between refuse and greenwaste should be maintained or expanded.

The landfill weighbridge has a code for vegetation. However this code is only used for loads consisting totally of vegetation and is generally comprised of material that is unsuitable for windrow processing.

The SWAP determined that 15% of general refuse is greenwaste, with a similar percentage in skips. Private skip companies provide 'green only' skips which are diverted to composting operations but mixed loads continue to be disposed of at York Valley Landfill.

6.7. Focus Area 7: Kitchenwaste

Section 6.1 of the AMP highlighted the importance of organic material diversion in order to achieve the 10% reduction per capita target of the JWMMP. A large contributor to the desired diversion is kitchenwaste, which will achieve a reduction of tonnes to landfill and a reduction in greenhouse emissions.

The use of the term 'kitchenwaste', rather than the generic 'foodwaste', relates to the acceptance criteria. If it is sourced from the kitchen it won't include lawn clippings or weeds, animal waste or other undesirable items. Kitchenwaste includes vegetable matter, food scraps, dairy, meat, bones and bread. Any collection and processing option would have to be able to accept any materials that would reasonably come from a kitchen.

In Nelson there are several programs which divert commercially produced foodwaste to foodbanks, kai rescue, or to pig farms. This AMP is focused on developing a solution for residentially produced kitchenwaste.

It is estimated, and supported by the NTRLBU SWAP, that annually in Nelson between 4,000–6,000 tonnes of residential meat, dairy, bread, and vegetable matter is being disposed to York Valley Landfill. This is producing at least 9,000 tonnes of CO_2. Diversion of this would achieve 75% of the JWMMP per capita diversion target. Residential kitchenwaste is usually disposed of through home composting, livestock or chickens at home, an existing foodwaste collection service, or in the vast majority of cases, included in general refuse collection services.

While it is difficult to quantify the exact volumes composted at home, it is estimated that vegetable matter is composted in 65% of households (based on the interim residents' survey results in 2020). However, it is difficult to determine what percentage of the residents' total kitchenwaste is actually composted. Council provides a subsidy

on compost bins which has seen consistent levels of uptake, and maintains composting videos on the Council website. Any resulting organic material is generally used on the property on which it is composted.

There are very few people keeping livestock on their properties and with intensification this activity is likely to further decrease. The existing foodwaste collection service has a small number of clients and a very limited range of acceptance criteria.

As mentioned above, most kitchenwaste is currently added to the bag or bin refuse collection service and present estimates are that 20% of all refuse is some form of foodwaste.

Foodwaste or kitchenwaste cannot be processed at the greenwaste open windrow processors or included in the user-pays greenwaste kerbside collection services.

As both of the above systems only process vegetable matter, other compostable kitchenwaste such as meat, dairy and bread etc. is generally included in the kerbside refuse collection.

Kerbside collection of kitchenwaste is under consideration by Council. A Council managed weekly kerbside collection service of a 23 litre wheelie bin to 22,000 (+/-1000) households has a projected 80% uptake of bins being placed kerbside for 90% of the collection days. The weight per household is estimated at 6-6.5Kg per week, with seasonal fluctuations) resulting in 5000 tonnes per year of landfill diversion.

This will require a collector agreement and a processing agreement. It is not suggested that Council have any ownership in either collection vehicles or in a processing plant.

Whatever technique for processing is selected there will be an output. While compost is one option, it is not always the most efficient way to process food waste and greenwaste. The primary goal of this AMP is to reduce waste. The recommendations will be the most cost-effective option that manages the most waste for the least cost, emissions, and environmental impact.

The 2020–21 kitchenwaste trial

The 2020-21 kitchenwaste trial was included in the 2020/21 Annual Plan and was funded from the Climate Change Reserve Fund. Prior to any Council commitment to providing a full service, this local trial will provide reliable data on which a full proposal can be based. Council has an expectation that any trial material would have to be processed to compost rather than landfilled which has directed the operational methodology of the trial.

The trial is expected to run until 2021/22 and then a report will be brought back to Council to decide whether to proceed with a full kerbside service. This has cost implications similar to recycling, and so provisional figures have been included in this AMP.

Emissions from a kitchenwaste kerbside service

Based on collection services from other cities, an average of 6Kg/household/week has been suggested. Therefore, a kerbside collection service would recover approximately 6000 tonnes of material (which in a landfill would produce equivalent of 9000 tonnes CO_2) and require 60,000 kms of truck movements producing a further 200 tonnes CO_2.

Collection Emissions

On the assumption that Council does introduce a kerbside kitchenwaste collection service the following information is provided.

To reduce the collection emissions it is expected that any post 2023 collection service would be either low emission, hybrid or electric collection vehicle. A significant (20% on average) weight and engineering component of a collection vehicle is the compacting system. Kitchenwaste does not require compacting so the engineering is lighter and less complicated. This makes electric vehicles which are already available suitable for kitchenwaste collection. It would be expected that any EV vehicle would utilise carbon neutral electricity. If the chosen processing technique for the kitchenwaste is anaerobic digestion with 100% gas capture, the electricity for the vehicle could be wholly or significantly provided by the digester. This would make the collection a low to negative emission. If the kitchenwaste collection service was performed with diesel vehicles they would produce more than 200 tonnes of CO_2 per year.

Potential processing methods

There are various options available for the processing of kitchenwaste. Some of the options already available 'off the shelf' include:

- Open windrow composting
- Aerobic in-vessel composting
- Anaerobic digesters (with gas capture)
- Insect farming (protein production)
- Plasma incinerators (produce hydrogen as a by-product)

Should Council decide to proceed with a kitchenwaste kerbside service, the expression of interest should be open to any processing method (not only composting). The criteria for evaluation would include environmental, social, and cultural benefits as well as compliance with national and international regulations and standards

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6.8. Focus Area 8: Nelson Waste Recovery Centre

The refuse disposal at the Nelson waste recovery centre over the past four years has been reasonably consistent at 5,900 (+/-100) tonnes per year. Residential waste to landfill has increased by 20% over the past six years, which indicates more use of skips and potentially the kerbside collection service, rather than increased use of the transfer station. There are a number of actions such as waste levy increases and education which will influence the residents' disposal options in future, but as residents do not have direct access to a landfill, there will always be an expectation of a publicly accessible transfer station.

The transfer station provides an opportunity to implement the waste hierarchy and maximise the diversion and reuse of waste materials. Much of the material brought to the site for refuse disposal will instead be diverted into a reuse or recycling waste stream. This will require the availability of services at the NWRC to match the required diversion. While there is already a public free-of-charge drop off and a reuse shop, in order to improve the diversion services for construction waste, e-waste and other materials, the acceptance services have to be available at the same site.

The Nelson Waste Recovery Centre will be a centralised location for waste diversion, and be a conduit rather than a processing site. The aim is to accept materials and ensure that they are sorted and distributed in accordance with the waste hierarchy.

There is public enthusiasm for a one-stop-shop approach to waste diversion and the existing waste recovery centre has the potential to provide this through a cooperative approach by all site participants.

The free of charge public drop off for recyclables at the Vivian Street end of the NWRC is operated by Nelmac as part of Contract 2906 (which expires in 2023). This allows any material which could have been put into a kerbside bin to be disposed of for recycling. It is primarily a residential service which is also utilised by some light commercial operators.

Within the recycle site are two Council buildings which are used by Council for storage and Solid Waste activities and which are not included in the Nelmac contract.

The next Council building is leased (as of 2020) to the Nelson Environment Centre (NEC) for the purposes of operating a reuse shop. Reusable household items can be donated to the reuse shop, which sells the items either directly to the public or via their other sites.

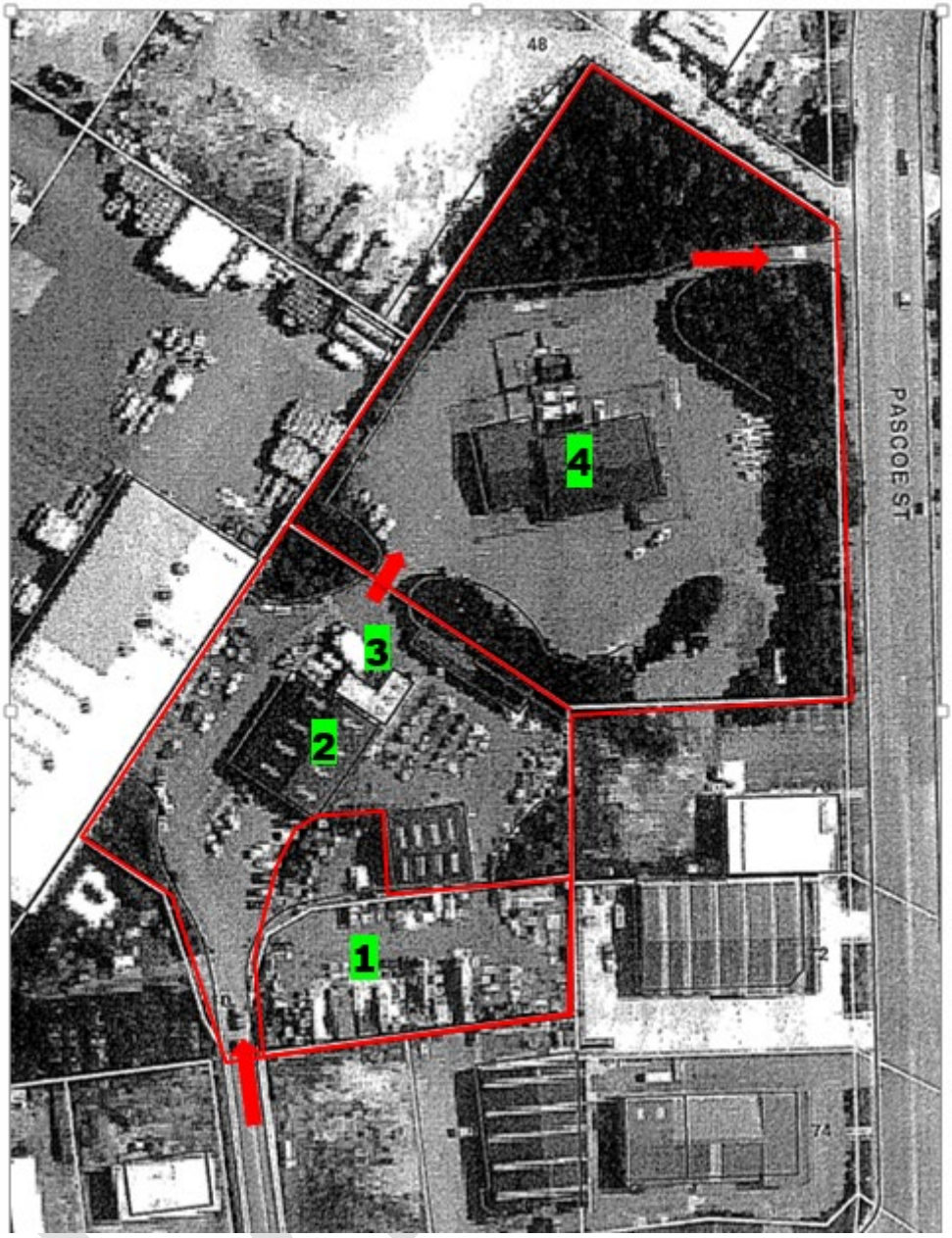


Figure16: Aerial view of the Nelson Waste Recovery Centre

1) Recycle yard
2) NEC reuse shop
3) Kiosk
4) Transfer Station Hoppers

NWRC hazardous waste disposal

Residential quantities of hazardous materials are accepted free of charge at the NWRC. After 1 November 2020, the hazardous material handling and storage will be performed by Fulton Hogan under Contract 4018. This material was previously managed by the ticket office operator.

Materials accepted include used oil, flares, ammunition, agrichemicals, batteries, fluorescent tubes and gas bottles. There is an ongoing collection service for hazardous materials which will be formalised into an agreement.

NWRC ticket office (kiosk)

The kiosk is also a Council asset. A Council staff member provides customer service, including advice, and completes the payment transactions for disposal to the hoppers etc, with input from Council's Solid Waste Manager. Prior to October 2020 the customer service role was performed by Nelmac.

Greenwaste and refuse are user-pays disposal although greenwaste is heavily subsidised to ensure a lower disposal price.

Tyres and white ware can be disposed of for a charge and tyres are cut before landfilling and fridges are de-gassed prior to recycling.

The future disposal options will include e-waste which will be reconditioned, repaired, or deconstructed for recycling. This will be an NEC operation on a user pays basis. The site will also include disposal and re-sale for deconstructed building materials and materials recovered from the construction sector.

NWRC Hoppers

"The hoppers" is a generic term which includes the building at the Pascoe Street end of the NWRC. It is a predominantly below ground structure into which people can tip their waste. The actual hoppers are metal lined below-ground bins, usually operated as one for refuse and one for greenwaste. The material from each hopper is compacted utilising a large hydraulic ram into a 30 cubic metre cartage container. The containers are then loaded by a gantry crane onto the cartage vehicles. The hoppers, crane, and transport are operated under Contract 4018.

The hopper complex is a Council asset which has been depreciated, with financial allowance made for replacement when required. There has been little development in hopper technology in the last 20 years and it is likely that at point of replacement like-for-like hoppers would be installed.

A new contract was signed in August 2020 to operate the hoppers and to carry out related tasks. The term is five years with a Council option of two years followed by a further Council option of two years.

Within Contract 4018, management, hopper operation, and cartage are separately charged so a reduction in waste to the hoppers and a reduction of waste to cartage would result in a lower cost to Council.

6.9. Focus Area 9: E-waste

In Nelson e-waste is primarily recycled by NEC, which follows the waste hierarchy by promoting repair and reuse before recycling.

During 2020 NEC will operate its e-waste recycling from 6 Vivian Place (outside of the NWRC, and on its associated site) but the intention is to move the service within the NWRC boundaries. This will require a sub-let from Nelmac for the unutilised area behind the public recycle drop off and potentially the lease of one of Council's buildings which is presently used for storage.

6.10. Focus Area 10: Product stewardship

In 2019 Nelson City Council submitted on the Ministry for the Environment's proposals for the introduction of a Product Stewardship scheme for New Zealand. While there is not an exact date for the introduction, it is likely that product stewardship will be introduced for products including packaging, tyres and e-waste by 2023.

One of the immediately influential components of product stewardship is the container deposit scheme. Similar schemes are in place around the world and a container deposit scheme is proven to achieve a higher return rate of Pet 1 & 2 (water and soft drink bottles) and HDPE (milk bottles). It has also been indicated that the recovery rate is higher where the return process is the most convenient, rather than when the value of the return is highest. Placing a value on this material will influence what people leave in their wheelie bins for kerbside recycling.

While the immediate assumption is that people will store at home and then 'cash in', similar schemes in Australia have indicated that diverting from kerbside bin service is primarily for local community groups, NGOs or schools, and that there is no noticeable increase in 'bin diving'.

The impact of product stewardship and materials having a cash value will potentially mean that the post 2023 recycling contract will require a different model. Presently the sorting costs are covered by the commodity value. Following the introduction of a product stewardship scheme, the volume (which is predominantly paper and cardboard) will continue but the higher value materials which offset the low value paper and cardboard may not be put in the bin. There is a risk that if a significant amount of the most valuable plastics are removed from the recycling service it may create a financial imbalance where the recycling kerbside is little more than a cardboard collection. This would change the cost of the contract and potentially the collection methodology.

In the event of recycling becoming little more than a cardboard service, Council may determine that sorting is not justified and that alternative processing options should be explored. This could then reduce the contract to a collection only service which would be approximately half of the present contract price.

Tyres

It is estimated that Nelson disposes of approximately 40,000 tyres per year. The end of life disposal for many of these tyres will be the York Valley Landfill. Other tyres may be reused on farms. Tyres being disposed of via transfer stations into York Valley are cut or shredded. This reduces how much space they take up and ensures an effective revenue per metre of landfill airspace. Tyres which are disposed of in mixed loads or general refuse such as skips are not usually cut or shredded. These tyres fill more landfill airspace and also create air-pockets in the landfill. As tyres do not compact more or decompose over time, they continue to take up significant space in the landfill. This means they only return 40% of the usual disposal fee per tonne.

The NWRC accepts 1,200 tyres per year, and has a limit of 50 uncut tyres on site at any time.

The product stewardship scheme proposes that tyres will require a purchase deposit as well as a payment for recycling. While this may create an effective tyre returns scheme, the professionalism of the operators needs to be reviewed prior to starting operations.

Some regions have fallen victim to the economical tyre 'recycling' businesses which accept a payment for taking possession of the tyres and do not have an effective disposal option, often 'skipping town' and leaving the tyre mountains abandoned. Such tyre mountains are

a fire, environmental, and health risk. Nelson does not have any tyre mountains but may need to ensure that one cannot be established. The increase in the waste disposal levy will at least double the price of tyre disposal and increase the likelihood of a 'tyre recycler' establishing.

Product stewardship will require the recycling of tyres or potentially the use of the Golden Bay Cement tyre incineration plant. Golden Bay Cement has an operational plant in Northland and has received $13M from central government for a South Island plant.

6.11. Focus Area 11: Refuse

Council does not provide a residential kerbside collection service but there are at least three companies that do. The estimated total volume of kerbside is approximately 9,000 tonnes per annum.

As Council does not manage or own the collection service, it has minimal influence over how the service is delivered. Whereas a council may (as Taupo District Council does) provide a 120 litre bin on a fortnightly collection, thus restricting the waste volume, Council cannot control the size or quantity of bins provided by a waste business. Maximising waste is the basis for their business so they have no incentive to promote waste diversion or minimisation.

In effect Nelson's waste minimisation is now in direct competition with private businesses. i.e. the diversion of foodwaste from the refuse bag or bin will reduce the commercial revenue stream.

6.12. Focus Area 12: Atawhai Landfill

The Atawhai Landfill is a Nelson City Council asset. It is not part of the Nelson Tasman Regional Landfill Business Unit (NTRLBU), so post-closure management is managed by Council's Solid Waste business unit. At present the post-closure management consists of six monthly monitoring of leachate and gas composition, and to ensuring a process is in place to manage unexpected gas levels.

Atawhai Landfill operated as the primary disposal site for Nelson prior to 1947 until 1987. As each stage was completed it was capped in varying degrees of thickness and the land area then used for parks, reserves, Founders Heritage Park, Whakatū Marae, and housing developments.

Although the landfill was closed in 1987, the area continues to produce landfill gas which is released to the air through a combination of mechanical vents and natural seepage through the capping. Atawhai closed landfill will continue to produce decreasing amounts of landfill gas for another 20–30 years.

Council monitors the surface gas as well as the below-ground gas. Landfill gas is mainly composed of methane, carbon dioxide, and oxygen, and some small amounts of other gases such as hydrogen sulphide. When on the surface, landfill gas is naturally mixed with air which dilutes the landfill gas, so the standards for an acceptable limit for a gas are far lower.

The surface gas is professionally monitored fortnightly in one area, and every six months at a number of mapped locations where the surface may be disrupted, such as by tree roots or buildings. Disruption of the surface increases the chance of gas reaching the surface.

There are several passive vents to relieve pressure from the landfill and these are monitored for gas levels and mechanical condition.

The concentrations of methane detected by the surface testing are consistently below the criteria of requiring any action or notification to any business or residents. These levels are also checked against the workplace exposure standards for both short and long term exposure.

In May 2017, 10 wells were established in the landfill so that below ground gas can be measured and monitored. These are not vents and no gas is released from them on a daily basis. Testing is carried out in the wells every six months to measure the composition of the landfill gas at about six metres below the ground. This testing measures landfill gas only (not mixed with air) so produces a reliable picture of underground activity. The results are in line with expectations and will continue to be managed through ongoing monitoring.

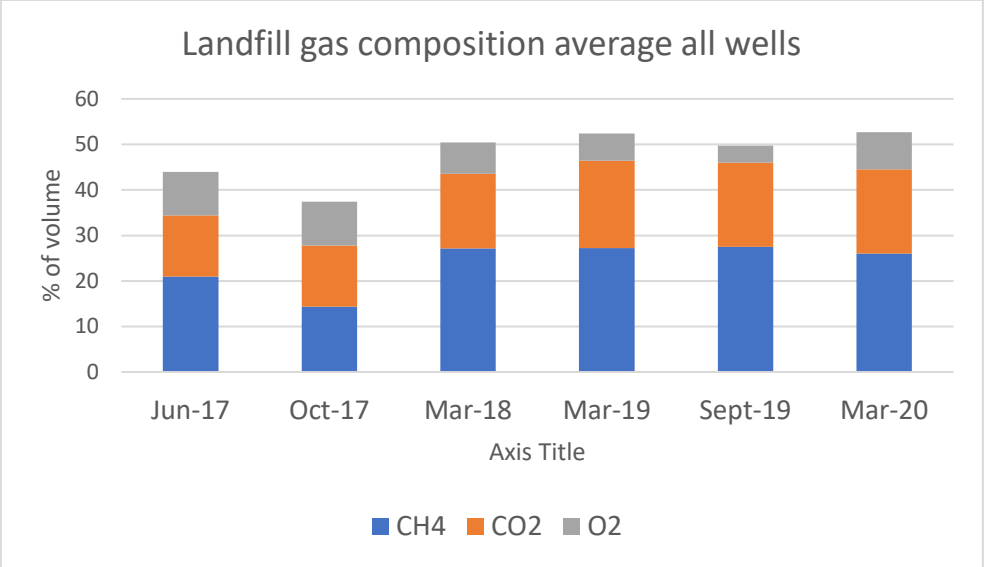


Figure 17. Composition of landfill gas at the Atawhai landfill. This indicates that the gas composition is in line with expectations and the MFE guide to management of closed landfills (2001).

As no new material is being added the production of the landfill gas will continue to decrease but the site will require gas management until at least 2050. The site will therefore require budgeting of site and gas management costs (without any associated revenue) until that time. As the ETS is calculated from tonnes at the time of disposal, the production of this gas does not incur any ETS costs.

Sea level rise in coastal environments

As the Atawhai Landfill is coastal, the site should be reviewed within the term of the AMP to validate structural integrity and to assess the likelihood of inundation during storms, floods, or through general sea level rise. There is no indication that this will occur within the term of the AMP.

The gas composition and leachate composition is presently monitored twice a year which provides a snapshot of the status of the landfill and this assists in any risk assessments. If this monitoring is continued it will continue to prove valuable data on which decisions relating to the landfill can be made.

7. Financial Summary (what it will cost and how we pay for it)

Solid Waste activities operate in a 'closed account' with revenue streams which are retained within the activity, in effect making the activity financially independent of Council rates. The cost of all Solid Waste projects are compiled and the revenue from the waste disposal levy and the gate takings at the NWRC are deducted. The balance is the amount of revenue required from the local disposal landfill levy. If this amount is obtained from the landfill business unit the Solid Waste budget balances without any further revenue being required. Where the landfill revenue is less than expected, Solid Waste activities are adjusted to match ensuring an independently balanced budget.

7.1. Financial Statements and Projections

Account	2018/19 Est	2019/20 Est	2020/21 AMP	2021/22 AMP	2022/23 AMP	2023/24 AMP	2024/25 AMP	2025/26 AMP	2026/27 AMP	2027/28 AMP
Grand Total										
Predicted LDL required			**2700**	**2700**	**3100**	**3000**	**3000**	**3000**	**3100**	**3100**
Total of all solid waste expenses (excluding capex)			**3985**	**4565**	**5404**	**5224**	**5294**	**5294**	**5419**	**5419**
Total of all Solid waste Income (excluding LDL)			**1240**	**2095**	**2495**	**2495**	**2495**	**2495**	**2495**	**2495**
60100510 Fees transfer station			850	860	860	860	860	860	860	860
60100530 Sundry income (scrap steel etc)			10	10	10	10	10	10	10	10
60050153 Waste Disposal Levy			198	850	1250	1250	1250	1250	1250	1250
551026270800 Moved to solid waste. Street litter collection			172	225	225	225	225	225	225	225
6005 Waste Minimisation			**359**	**359**	**359**	**359**	**359**	**359**	**359**	**359**
Expenses										
Programmed Expenses										
60054310 Resources			**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**
1061000543421643 Minimisation at Council facilities			20	20	20	20	20	20	20	20
20600543421646 Minimisation at events			30	30	30	30	30	30	30	30
600543421645 Community engagement			168	168	168	168	168	168	168	168
60054312 E-waste subsidy			20	20	20	20	20	20	20	20
20600543421644 Compost subsidy			20	20	20	20	20	20	20	20
600543421644 Compost education			25	25	25	25	25	25	25	25
600543421641 Schools			40	40	40	40	40	40	40	40
40600543721583 JWMMP			15	15	15	15	15	15	15	15
600543722018 SWAP			11	11	11	11	11	11	11	11

6010 Transfer Station			**1620**	**1625**	**1625**	**1625**	**1625**	**1625**	**1625**	**1625**
Base expenditure			1382	1382	1382	1382	1382	1382	1382	1382
Unprogrammed expenses			28	28	28	28	28	28	28	28
Programmed expenses			61	61	61	61	61	61	61	61
Reserves			148	148	148	148	148	148	148	148
Capital Expenditure										
Hopper walls relining						100		150		400
Cartage containers rebuilds						50		100		100
6030 Greenwaste			**126**	**126**	**145**	**145**	**160**	**160**	**160**	**160**
Base Expenses			126	126	145	145	160	160	160	160
6035 Recycling			**1430**	**1430**	**1700**	**1700**	**1700**	**1700**	**1700**	**1700**
Base Expenses										
Capital Expenditure										
Wheelie bins						370	370			
5510 Streetlitter			**250**	**225**	**225**	**100**	**100**	**100**	**225**	**225**
XXXX Kitchenwaste			**200**	**800**	**1300**	**1300**	**1350**	**1350**	**1350**	**1350**

Table 21: Financials for all activities

7.2. Funding Strategy

The funding of solid waste is dependent on the following factors:

1. That the NWRC gate rate will maintain a price parity with the cost of disposal and cartage of both refuse and greenwaste.
2. That the central government Waste Disposal Levy will continue to be collected and distributed to the regions in line with the current process
3. That Nelson receives from the NTRLBU the Landfill Local Disposal Levy (LDL) that the budget indicates it should request
4. That any new services or changes to services that are not in the current budgets and forecasts are only instigated if there is supplementary revenue.

Solid Waste revenue is derived from the Waste Disposal Levy from central government, the 'gate revenue', and from Nelson's share of the LDL from the NTRLBU. In summary:

1. The Waste Disposal Levy (WDL) is a fee charged by central government for waste to landfill. While presently $10 per tonne it will be $60 per tonne, by 2023. A share (approximately 50% based on population) is returned to the region to fund waste activities.
2. The 'gate' is the revenue derived from the NWRC when residents pay for the disposal of refuse and greenwaste.
3. The Landfill Disposal levy (LDL) is the share Nelson receives from the NTRLBU.

7.3. Valuation Forecasts

Physical assets are monitored as per a schedule, and in line with table 22. The monitoring process validates the condition of the asset and at each monitoring frequency each asset can be assigned a new valuation. The valuation assumes a remaining life expectancy but this may not align with previous life expectancy projections.

Asset	Quantity	Total remaining value
Cast iron bins	25 bins	$65k
Cast iron bins with seagull lids	49 bins	$183k
Tilt bins	43 bins	$77k
Plastic bins	34 bins	$2.5k
Stainless recycle bins	4	No book value
240 litre recycle bins in service	19475 wheelie bins	$470k
120 litre recycle bins in service	2785 wheelie bins	$54k
Unused 240 litre wheelie bins	130 wheelie bins	$8k
Unused 120 litre wheelie bins	620 wheelie bins	$30k
Cartage containers for refuse and greenwaste	7 x 30M^3 bins	$105k

Table 22: Valuation of assets in 2020

Remaining value has been calculated by reviewing the total replacement value, divided by the expected lifespan of the asset, multiplied by the years remaining. The remaining life of an asset has a number of variables and valuations may move up or down with each review, according to the condition of the asset.

Assets relating to the NWRC including the Hoppers, gantry crane, and buildings are actively depreciated on behalf of solid waste. This ensures funds are available, if required, following an unforeseen event. This would include events such as a complete failure of the hopper machinery and the need for an unplanned significant repair or replacement. The likelihood of this, which would affect the amount that should be depreciated, is monitored through engineering inspections and a maintenance plan which is part of contract 4018.

The following table forecasts the depreciation of the physical assets. As there is not an existing baseline for asset condition, assets have been reviewed and lifespan estimates have been applied.

Asset	Quantity	Total remaining value	Estimated value 2025	Estimated value 2028	Estimated value 2031
Cast iron bins	25 bins	$65k	$50k	$30k	$20k
Cast iron bins with seagull lids	49 bins	$183k	$100k	$75	$40k
Tilt bins	43 bins	$77k	$60	$20	$0
Plastic bins	34 bins	$2.5k	$0	$0	$0
Stainless recycle bins	4	No book value	No book value	No book value	No book value
240 litre recycle bins in service	19475 wheelie bins	$470k	$300	$50k	$0
120 litre recycle bins in service	2785 wheelie bins	$54k	$45k	$15k	$0
Unused 240 litre wheelie bins	130 wheelie bins	$8k	$8k	$8k	$8k
Unused 120 litre wheelie bins	620 wheelie bins	$30k	$30	$30	$30
Cartage containers for refuse and greenwaste	7 x $30M^3$ bins	$105k	$80	$50k	$0

Fig 23: forecast of physical asset depreciation. NWRC assets are separately depreciated on behalf of solid waste.

7.4. Key assumptions made in Financial Forecasts

The key assumptions made in the financial forecasts are:

1. Where there is insufficient revenue within the closed Solid Waste account, activities will be slowed, stopped, or modified until they can be afforded.

2. That the proposed increase to the Waste Disposal Levy (WDL) shall be instigated in the timeframe that was suggested in the information provided by the Ministry for the Environment. Due to COVID-19 there have been parliamentary delays and if the act is not passed into law within the proposed timeframe this revenue stream will be delayed. The WDL line also assumes that the current method for distribution of the fund will continue.

3. That the current kitchenwaste trial will yield the expected results and that council progress with a residential kerbside kitchenwaste service. If the WDL fund does not eventuate it is unlikely that a residential kitchenwaste service could be instigated.

4. That the current user-pays refuse and green waste companies in the Nelson/Tasman region will continue to be available to residents and Council. Council is dependent on private companies to achieve greenwaste diversion.

7.5. Forecast Reliability and Confidence

Waste minimisation expenditure can be planned with a high degree of confidence, and these activities will be undertaken in accordance with the available revenue. The activities are adaptable, and where there is a surplus or a saving in one line it will be applied to another activity.

Activity lines in which there could significant variation are the residential kitchenwaste service and the solar compacting bins.

One of the activity lines with the largest expenditure is the proposed kerbside kitchenwaste service. The benefits of the proposal are discussed in section 6.7. However, if in the 2020/21 trial the actual volumes of material do not meet expectations, or far exceed expectations, the project would need to be reviewed prior to committing to this level of expenditure. The costs have been calculated using national data and local knowledge, and have also benefited from Council's familiarity with the current recycling service and the costs of collections. These calculations are a 'best estimate' and it will not be until years 2–3 of the AMP that a completely reliable costing could be achieved. The largest variable in the kitchenwaste service is the price paid to the processor of the material. While indicative numbers have been supplied by companies that presently process this type of material the exact process that will be used has not yet been determined. The price of landfill disposal (which is less than almost any form of composting) has been used to model costs.

The forecast for the solar compacting bins is based on a lease or lease to own scenario. If Council does not want to pursue this option, procurement of bins could be a capex item with purchases made in line with the identified costs. However, this approach

would negate the benefit of the bin change until all of the bins had been exchanged which would be in years 6–7 of this AMP.

8. Asset Management Practices

The goal of infrastructure asset management is to:

"Deliver the required level of service to existing and future customers in a sustainable and cost effective manner."

A formal approach to the management of assets is essential in order to provide services in the most cost-effective manner, and to demonstrate this to customers and other stakeholders. The benefits of improved asset management are:

- Improved governance and accountability
- Enhanced service management and customer satisfaction
- Improved risk management
- Improved financial efficiency
- More sustainable decision

8.1. AM leadership and structure

The structure of solid waste leadership has been diagrammatically represented in Figure 2 (p:31), however solid waste operates with minimal staff and so does not form teams to progress projects. Whether solid waste or waste minimisation, the development of projects is significantly managed by the staff member who will supervise the project. Guidance and management is supplied by the Transport and Solid waste Unit Manager and the Group Manager of Infrastructure.

8.2. Management Systems

Management strategies

The following table demonstrates the interactions within the organisation which are required to deliver the objectives of the AMP.

Strategy	Objective/ Description
Strategic Planning	
Human Resources	Develop the professional skills of the staff through adequate training and experience Personal Development Plans will be agreed with staff each year and a register maintained to record training history. Staff are encouraged to belong to appropriate professional bodies and to attend appropriate conferences, seminars and training courses.
Strategic Alignment	This Activity Management Plan will support the achievement of relevant Community Outcomes for Nelson City Council, as set out in the Long Term Plan. The intended contribution of the Nelson City Council solid waste service and the contribution of waste minimisation to the achievement of Community Outcomes is shown in Table 3 of this Activity Management Plan.
Service Levels	A clear statement of the solid waste services provided and standards to be achieved that support the stated community outcomes are shown in table 3 of this Activity Management Plan.
Sustainable Management	Ensures all planning for the solid waste activity activity is compatible with sustainable management principles.

Strategy	Objective/ Description
	Nelson City Council will pursue ways of limiting the use of natural resources including energy, valued landscapes (and other natural heritage) and adverse effects on waterways.
Data Management and Utilization	
Data Collection	Data collection programmes (condition, performance, asset registers) closely aligned with business needs will be operated in accordance with documented quality processes Data collection, maintenance and analysis are expensive and it is important that programmes and techniques are cost effective and consistent with business needs. Systematic processes will be introduced for the collection and upgrading of essential data based on asset criticality including: - Asset attribute information - Asset performance data - Asset condition data. - Service efficacy such as energy / emissions per collection - Social engagement outcomes
Geographical Information System Data	Geographical information system data will be the subject of defined quality assurance processes. Nelson City Council has quality processes to ensure that all data entered to the Geographical information system meets defined quality standards and supports Asset Management through connectivity with the asset register and Asset Management data storage. GIS systems and similar technology is utilised for collection services, asset locations, and service provision.
Business Processes	
Activity Management Plan Updates	This Activity Management Plan remains a strategic 'living' document and will be updated as required and reviewed at three yearly intervals to coincide with the Long Term Plan. The scope of the review will be influenced by changes in Community Outcomes for Nelson City Council, service standards, improved knowledge of assets, corporate strategy/ policy and process.
Risk Management	Risk Management is an essential part of Asset Management. Implementing a Risk Register including risk controls for the solid waste activities will assist in maintaining risk exposure at agreed levels. Risk controls include maintaining appropriate insurance cover, emergency response planning, condition monitoring of critical assets, preventative maintenance, operations manuals, review of standards and physical works programmes.
Infrastructure Asset valuation	Perform valuations in a manner that is consistent with national guidelines and Nelson City Council corporate policy for valuation cycles which are carried out every 1-3 years to reflect international financial activity and align with the Long Term Plan requirements. Asset valuations are the basis for several key asset management processes including asset renewal modelling and financial risk assessments. Valuations of the solid waste assets will be carried out based on data from the Asset Management System to ensure audit ability and alignment with other processes.
Monitoring	
Level of Service Standards	Continue with the monitoring procedures to ensure the activity is contributing to the community outcomes as stated and that internal controls (service requests, operational contract requirements) are also monitored and managed
Asset Performance	The performance of assets are monitored as an input to asset renewal and asset development programmes. The Monitoring includes: Customer service requests Asset failure records Asset Maintenance records Compliance with Resource Consents Critical asset audits

Strategy	Objective/ Description
	Supervisory Control and Data Acquisition Legislative compliance.
Financial Management	
Budgeting	Expenditure programmes for solid waste activities are budgeted with a 10 year projection. The Activity Management Plan is intended to provide sufficient detail to provide the basis for those 10 year projections. 30 year budget projections are also undertaken for the Infrastructure Strategy.
Financial management	Manage the activity budget in accordance with statutes and corporate policy. This involves: Economic appraisal of all capital expenditure Annual review of Activity Management Plan financial programmes Recording of significant maintenance and asset renewals Continuous monitoring of expenditure against budget.
Sustainable Funding	The financial requirements for the provision of the Solid Waste activity, which are sustainable and to acceptable standards over the long term will be identified and provided for in the budgets. These financial requirements include: • management of the Solid Waste activity • operation and maintenance of the Solid Waste services • asset replacement Asset development to ensure that the ability of the Solid Waste activity to deliver an acceptable level of service is not degraded by population growth in Nelson. That all changes to services or new assets are introduced and maintained within the 'closed account' solid waste financial structure.

Table 24: procedures and interactions within the organisation which will progress the delivery of the objectives of the AMP

8.3. Information Systems and Tools

Solid Waste utilises several computer based operating systems. These include Council-generic administrative systems such as Objective and Magiq. Information relevant to the collection services (such as closed streets or new streets) is provided by other Council officers using RAMM and similar 'street information' systems. During development of various activity lines Solid Waste also makes significant use of N-Map.

Touchway

Touchway is the York Valley weighbridge activity software. While this is primarily utilised by the NTRLBU for general accounting, there is a vast amount of information relating to solid waste activities that can be extrapolated from the weighbridge activity. Currently this data is being used in conjunction with MFE reporting and the SWAP report to calculate waste composition and volumes.

'Editor' Recycling service software

Currently the recyclables kerbside service and the kitchenwaste trial utilise a unique layer in N-map (provided by GIS) which reads each residential property, their

recyclables bin serial number, and associated service requests. This ensures there is only one bin per household, that replacement bins are tracked so it is clear whether someone should pay for their replacement or not. The system is also used to identify recovered 'lost' bins.

In the event of Council replacing or supplying new blue glass crates, the crates would have a unique serial number and would, like the wheelie bins, be assigned to each property and tracked in the same system.

In the event of a residential kitchenwaste service being instigated the same system would be used for the kitchenwaste bins.

This would allow most Solid Waste services to be included and monitored within an existing software which, as it is already in use, would require minimal expenditure.

GIS

Streetlitter bins were mapped in GIS in 2016 and the location of all bins was audited in 2020. When solar bins are introduced this information will be updated.

Wastedge

Wastedge is a GPS based truck tracking system which can be used to review the location of any vehicle carrying a transponder. The operator can view either 'live', a daily track, or historically up to approximately 12 months. Each of the recycle trucks can be individually tracked. One operator licence is provided by the recyclable collection contractor (who leases the software) so that Solid Waste can review the collection vehicles to validate collection times, the location of a vehicle, or even whether a collection occurred in a street. This is also used for investigations into complaints and health and safety incidents. Access to this system is available at no cost to Council. Currently this system is not a permanent feature in streetlitter collection vehicles but due to the value to Council, it would be beneficial if this or a similar system was a requirement of any future collection contracts, including kitchenwaste, streetlitter and recyclables.

Service Delivery Models

Maintenance contracts have been reviewed and grouped to provide a good balance between price and quality, and use either prequalification or price/quality supplier selection methods. The methods used to procure capital projects will differ depending on the size of the project, but will be either lowest price or price/quality.

Council maintains an in-house professional services capability balanced with external consultants as required to achieve best value for money. Additional professional services are sometimes required.

9. Plan Improvement and Monitoring (what we're doing to improve)

Table 22 identifies the current monitoring and auditing procedures. These are the baseline from which improvements can be developed.

Each activity is monitored. Information is collated from audits and used to both guide operational decisions and new projects.

Activity	Monitoring methodology	Frequency
Recyclable collection	Monitoring using wastedge for collection service	As required or at least weekly
	Review of service requests relating to recycling to identify areas that require improvement	As required or at least monthly
	Auditing of bins left kerbside for recyclables composition	10 bins per week
	Audits of 3 days of collection using the MRF	3 monthly
	Analysis of collection data including per capita and trends	Monthly
Streetlitter	Monitoring of service requests relating to bin service	
	Audits of bins locations and conditions	3 monthly
NWRC		
Hoppers	Engineer's inspection of hopper condition including metal wall thickness and wear rates	Every 2 years
	Engineer's inspection of compactor	Every 2 years
	Engineer's inspection of gantry crane	Annually
	Certification for gantry crane	Annually
Recycling shed	Building warrant of fitness	Annually
Reuse shop	Building warrant of fitness	Annually
York Valley Landfill	Monitoring of weighbridge information	Monthly
	Per capita and diversion calculations	Monthly
Waste Minimisation	Ongoing monitoring of each project	

Table 25 The method and timeframe of monitoring for physical assets and services

9.1. Improvement Programme

AMP monitoring and review procedures

This AMP is a regularly revised and evolving document. It will be reviewed annually and updated at least every three years to coincide with the Annual and Long Term Plans and to incorporate improved decision making techniques, updated asset information, and Nelson City Council policy changes that may impact on the levels of service.

The AMP will be improved throughout its lifecycle as further information about the assets is collected in terms of condition, performance and service delivery. Council is committed to advanced data collection and management systems that will allow for a greater appreciation of the performance and condition of the Council assets.

The three yearly review of the JWMMP will also guide operational and financial decisions and form part of the review of the AMP.

Nelson City Council will report variations in the adopted annual plan budgets against the original asset management plan forecasts and explain the level of service implications of budget variations.

Internal Audits

Internal audits will be taken every three years to assess the effectiveness of the AMP in achieving its objectives. The internal audit will also assess the adequacy of the asset management processes, systems and data.

Statutory Audits

The Local Government Act requires an independent, annual audit of Council's operations.

Improving accuracy and confidence in the AMP

Accuracy and confidence in the plan will be enhanced through monitoring, data collection, and using that information in an integrated manner to determine whether activities are achieving their desired trajectories. Improvements in accuracy will be achieved through inter-technology communication.

Technology systems for asset improvement

Solid waste assets include both physical assets and services. For both of these information relating to waste disposal is the single most effective tool when assessing the efficacy of services, the suitability of a physical asset, or the future demand for waste services.

The implementation of a Solid Waste activity, or the targeting of a specific material for diversion, requires time to be established. For this reason Solid Waste collates information from 'now' and is always looking several years ahead.

Solid Waste utilises several computer based systems for monitoring, reviewing asset and service provision, and for future planning. This includes tonnes disposed, volumes collected and distances travelled. The present lack of integration of these systems isolates some activity lines from their related services. For example, Wastedge cannot 'talk' to GIS, and Touchway cannot 'talk' to Magiq. This results in data being manually extracted from one software and then re-entered into another.

A significant improvement in data collation and management will be achieved though improvements in synchronous software. In future Council guide the choice of tracking software used by the collection vehicles. The NTRLBU future software should communicate with Magiq.

These improvements would not require supplementary funding so are not itemised in the financial summary.

9.2. Monitoring and Review Procedures

The Activity Management Plan will be reviewed annually and updated at least every three years to coincide with the Annual and Long Term Plans and to support improved decision making, updated asset information, and policy changes that may impact on the levels of service. The Plan will be improved throughout its life cycle as further information about solid waste assets and services are collected including condition, performance and service delivery data. Changes to expectations and technologies will influence the reviews of the plan and ensure that the plan continues to be action focussed and appropriate to contemporary political, social and environmental expectations.

Nelson City Council is committed to advanced data collection and management systems that will allow for a greater appreciation of the performance and condition of the Nelson City Council assets and service achievements. Nelson City Council will report variations in the adopted annual plan budgets against the original activity management plan forecasts and explain the level of service implications of budget variations.

Internal Review

Internal reviews will be taken every three years to assess the effectiveness of the plan in achieving its objectives.

Statutory Audit

The Local Government Act requires that an independent, annual audit of the operations of the Nelson City Council be carried out.

9.3. Performance Measures

How the effectiveness of this AMP will be measured

The effectiveness of this Plan will be monitored by the following procedures:

- The achieving of the performance targets outlined in Table 3, levels of service.
- Financial expenditure projections being in line with budgets
- Resource consent monitoring for sites operations.

- Operations and Maintenance reports.
- A recognised process of succession for all services and contrcats

The continued monitoring of these procedures and ongoing analysis of results will result in:

- Optimisation of expenditure through the asset lifecycle
- Service levels actively monitored and reported on
- Management of risk and control of failures

10. Appendices

10.1 Appendix 1 : Glossary

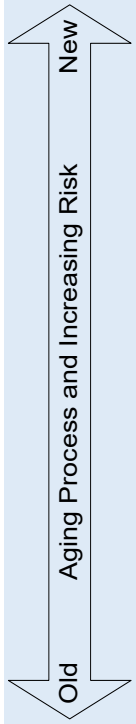
AMP	Activity Management plan
Contamination	Any material that is not the primary aim of the collection or acceptance service. This may include non-recyclables in the recyclable wheelie bin or foodwaste or animal waste in the greenwaste.
Coverfill	Non-hazardous soil (not from a HAIL site) which can be used at the York Valley landfill to cover refuse on a daily basis or to build embankments.
Deconstruction	The controlled demolition or dismantling of a building or structure to maximise the recovery of materials — potentially for resale.
Demolition	The clearing of a building or structure without any attempt to recover materials for reuse.
Diversion	The interruption of a waste stream so that materials are handled in a manner more conducive to (or higher up) the waste hierarchy.
EOI	Expression of Interest
Fly-tipping	Illegal dumping of refuse without consideration for the safety of the environment or other people.
Food waste	Wasted food.
Foodwaste	Any food material that could be diverted for food rescue, pig farms or be used for composting. This does not usually include meat and animal by-products.
Greenwaste	Garden material including weeds and trees under 200mm in diameter. This does not usually include flax or bamboo.
HAIL	Soil which through previous land use is contaminated beyond the safe acceptance levels for coverfill but which can still be accepted at York Valley Landfill as hazardous soil.
Kitchenwaste	Any food or food material that would reasonably be expected to be used in a kitchen. This will include meat, dairy, bread, bones fish waste as well as general foodwaste.
MRF	Materials Recycling Facility (or sometimes a municipal recycling facility). A site at which materials are sorted and re-packaged for transportation to the recycler.
NEC	Nelson Environment centre. A local community group which operates a reuse shop and e-waste recycling within the NWRC.
NGO	Non-government organisation
NWRC	Nelson Waste Recovery Centre. Previously referred to as 'Pascoe street" or the 'Nelson transfer station'.
NTRLBU	Nelson-Tasman Regional Landfill Business Unit
RFT	Request for Tender
Recyclables	Any material that is on the list of acceptable materials to put in the yellow topped kerbside recyclable bin. Any other material is a contaminant.
Streetlitter	A street based bin service such as in Contract 2974.
Street litter	Litter in the street that is not contained in a bin.

Skip	A fixed volume refuse container usually 3-9 M^3 delivered by truck and filled by the resident.
SWAMP	Solid Waste Activity Management Plan
Tidytown	A variation to the 2974 streetlitter contract in which extra tasks were included in the contract. These included water blasting of the blue lines.
Tidy town	One of the goals of Solid Waste.
Windrow	An open air row of compostable material that is 'turned' for aeration.

10.2 Appendix 2 : Asset lifecycle management plan

Asset Lifecycle

Assets have a lifecycle as they move through from the initial concept to final disposal. Depending on the type of asset, its lifecycle may vary from 10 years to over 50 years. Key stages in the asset lifecycle are:



Asset planning	When the new asset is designed - decisions made at this time influence the cost of operating the asset and the lifespan of the asset. Alternative, non-asset solutions, must also be considered.
Asset creation or acquisition	When the asset is purchased — constructed or vested in the Council. Capital cost, design and construction standards, commissioning the asset, and guarantees by suppliers influence the cost of operating the asset and the lifespan of the asset.
Asset operations and maintenance	When the asset is operated and maintained — operation relates to a number of elements including efficiency, power costs and throughput. Maintenance relates to preventative maintenance where minor work is carried out to prevent more expensive work in the future and reactive maintenance where a failure is fixed.
Asset condition and performance monitoring	When the asset is examined and checked to ascertain the remaining life of the asset — what corrective action is required including maintenance, rehabilitation or renewal and within what timescale.
Asset rehabilitation and renewal	When the asset is restored or replaced to ensure that the required level of service can continue to be delivered.
Asset disposal and rationalisation	Where a failed or redundant asset is sold off, put to another use, or abandoned.

Asset Failure Modes

Generally it is assumed that physical failure is the critical failure mode for many assets. However, the asset management process recognises that other modes of failure exist. The range of failure modes includes:

Structural	Where the physical condition of the asset is the measure of deterioration, service potential and remaining life.
Capacity	Where the level of under or over capacity of the asset is measured against the required level of service to establish the remaining life.
Level of Service Failure	Where reliability of the asset or performance targets are not achieved.
Obsolescence	Where technical change or lack of replacement parts can render assets uneconomic to operate or maintain.
Cost or Economic Impact	Where the cost to maintain or operate an asset is greater than the economic return.
Operator Error	Where the available skill level to operate an asset could impact on asset performance and service delivery.

The Lifecycle Management Programmes cover the four key categories of work necessary to achieve the required outcomes for the Solid Waste activity. These programmes are: