Asset Management Plan

Plant and equipment

Maitland City Council

8 June 2022

The Power of Commitment

Executive summary

Maitland City Council's (MCC) asset portfolio has an estimated financial value of over $1.7B (in 2022$) across seven asset classes. These asset classes are:

- **Roads and Road Inventory** (all road types, kerb and gutter, paths, signs and traffic equipment)
- **Drainage** (trunk drains, culverts and conduits, floodgates and detention basins)
- **Bridges and Major Structures** (road bridges, pedestrian bridges, retaining walls, lookouts and wharfs)
- **Recreation** (parks, buildings, sporting facilities, buildings and open spaces)
- **Buildings** (all MCC owned and operated buildings)
- **Aquatic Centres** (Maitland and East Maitland Aquatic Centres)
- **Plant and Equipment** (plant and equipment used to maintain all MCC asset such as excavators and mowers)

Asset Management Plans (AM Plans) have been developed for each of these asset classes to demonstrate responsible management of assets and associated services, compliance with regulatory requirements, and communicate the level of funding necessary to provide the required levels of service for each asset class.

This AM Plan is for **Plant and Equipment assets** which provide maintenance, operational and construction support for all asset classes**.** The AM Plan outlines requirements to deliver expected services to the community including Levels of Service; Future Demand and Lifecycle Management activities, informing specific asset investment decisions. This plan has been prepared by GHD in close consultation with MCC staff.

What council provides

MCC is expected to provide plant and equipment to support the maintenance of all assets that are:

- Safe and functional
- Of appropriate quality
- Reliable
- Compliant with relevant legislation
- Delivered in a cost efficient and sustainable manner

To operate, maintain and construct assets included in the above asset classes, MCC own and operate a diverse fleet of plant and equipment inclusive of items such as civil plant (excavators, backhoes, front end loaders, graders), trucks, mowers, utes, trailers, passenger vehicles and ancillary equipment (such as various handheld tools). In total there are approximately 270 individual pieces of plant and equipment with a replacement value in 2022$ of $22.3 M. This is summarised as follows (sorted from highest replacement cost to lowest.

Table E.1 Asset inventory summary

Description	Total Qty (estimated)	$ Cost breakdown (millions)	% Cost total
Trucks	68	$10,531,762	48%
Utes	64	$2,476,237	11%
Waste Compactor	1	$1,331,183	6%
Graders	3	$1,279,766	6%
Front End Loaders	4	$843,744	4%
Tractors	8	$687,413	3%
Mowers	19	$668,486	3%
Trailers	26	$563,468	3%

Description	Total Qty (estimated)	$ Cost breakdown (millions)	% Cost total
Track Loader	1	$528,601	2%
Rollers	4	$465,995	2%
Small plant	29	$432,950	2%
Backhoes	2	$422,858	2%
Caravans	6	$362,021	2%
Slashers	12	$295,602	1%
Excavators	2	$282,672	1%
Ancillary Equipment	3	$219,327	1%
Skid Steer	1	$211,436	1%
Woodchipper	1	$148,261	1%
EWP	3	$104,282	<1%
Turf Equipment	2	$73,405	<1%
Forklifts	2	$71,583	<1%
ATV / UTVs	2	$69,644	<1%
Stump Grinders	2	$61,762	<1%
VMS	2	$58,715	<1%
Portable Traffic Lights	1	$29,617	<1%
Boat and Trailer	1	$26,529	<1%
Confined S/Trailer	1	$16,738	<1%
Tamper	1	$14,041	<1%
TOTAL	**271**	**$22,278,084**	**100%**

Current asset status

Not every asset is of equal importance or presents the same failure risk. It is therefore important to know which assets are most critical to service delivery. Understanding which assets are critical, and why, helps to focus investment decisions.

Critical assets are those assets that have high **consequences or impacts** if they fail and a high **probability or likelihood** of failing. Based on this risk methodology no MCC plant and equipment assets are a "**very high**" business risk, with 21% of plant and equipment assets being a "**high**" business risk due to the age/condition of the asset and the consequence of the asset not being available to provide its intended function. These high risk assets are regarded as a high priority for ongoing management and investment, with a financial replacement estimate (in 2022$) of ~4.6 M. High priority plant and equipment assets are:

– Waste trucks
– Ride on and quad steer mowers
– Select Utility vehicles

Future demand

The Maitland Local Government Area is in a period of extraordinary population growth. Most recent population estimates from the Australian Bureau of Statistics for 2020/21 shows the population grew by 3.5%. These accelerated growth rates are predicted to continue for the next five to ten years, with Maitland's population expected to exceed 104,700 by 2041.

Our current growth rate is the fifth highest in NSW and the highest outside of Greater Sydney.
To accommodate this continued growing population, the majority (>90%) are expected to live in new greenfield developments, all of which require new MCC owned and operated assets (such as roads, drainage, paths, recreation etc). New greenfield developments have conservatively been estimated at around 700 new lots per year for the next 10 years.

New infrastructure planned for construction due to the region's growth will require maintenance provided by a variety of plant and equipment assets, therefore it is expected that additional plant and equipment will be required in addition to what is currently owned by MCC. To assist in maintaining the growing asset base across the region, it is anticipated new plant and equipment items will be purchased in the short to medium term.

Sustaining the asset portfolio

The estimated cost over time to renew or replace MCC's plant and equipment assets to the maintain the target condition and level of service is shown in Figure E.1 below. As indicated by the horizontal line, the theoretical average annual cost to sustain this asset class (based on long term replacement cycles, asset age/condition and estimated growth) is estimated to be in the order of **$3.1 M** in 2022 dollars.

This information now provides a target for short term assessments – particularly with regards to priority assets identified and those that have reached the end of their estimated life. Risk exposure can be further reduced through applying appropriate risk reduction measures or obtaining more accurate condition data that confirms extending asset life is practical.

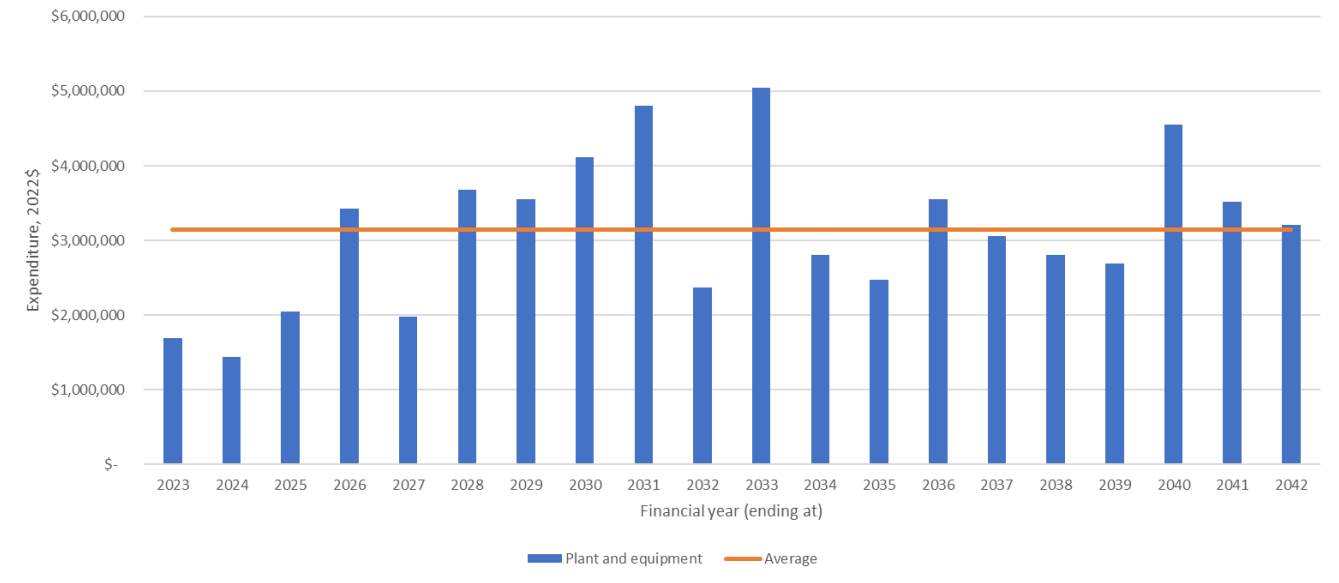

Figure E.1 Financial projection – Total

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1. Introduction

1.1 Asset portfolio

Maitland City Council's (MCC) asset portfolio has an estimated financial value of over $1.7B (in 2022$) across seven asset classes. These asset classes are:

- **Roads and Road Inventory** (all road types, kerb and gutter, paths, signs and traffic equipment).
- **Drainage** (trunk drains, culverts and conduits, floodgates and detention basins).
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- **Aquatic Centres** (Maitland and East Maitland Aquatic Centres).
- **Plant and Equipment** (plant and equipment used to maintain all MCC asset such as excavators and mowers).

Asset Management Plans (AM Plans) have been developed for each of these asset classes to demonstrate responsible management of assets and associated services, compliance with regulatory requirements, and communicate the level of funding necessary to provide the required levels of service for each asset class.

The AM Plans provide a rational framework to enable systematic and repeatable processes to manage costs, risks and levels of service. They attempt to identify expected future costs and assist in predicting future barriers to efficient and effective service delivery.

1.2 Content of this Asset Management Plan

This AM Plan is for **Plant and Equipment.** To operate, maintain and construct assets included in the above asset classes, MCC own and operate a diverse fleet of plant and equipment inclusive of items such as civil plant (excavators, backhoes, front end loaders, graders), trucks, mowers, utes, trailers, passenger vehicles and ancillary equipment (such as various handheld tools). In total there are approximately 270 individual pieces of plant and equipment with a replacement value in 2022$ of $22.3 M.

The AM Plan outlines the general approach and methodology taken in preparing the Plan as well as discussing key outputs used in managing the assets within this asset class. The specific sections included in the AM Plan are as follows:

- ***Levels of service*** – Specifies the services and levels of service to be provided by MCC.
- ***Future demand*** – How the growth of the Maitland region will impact on future service delivery and how this growth is to be met.
- ***Lifecycle management*** – How MCC are/will manage its existing and future assets to provide the required services.
- ***Financial summary*** – What funds are required to provide the required services.
- ***Improvement and monitoring plan*** – Next steps required to enable continuous improvement of AM Planning outputs.

1.3 Asset management framework

MCC's asset management policy, plans, strategies, tactics, and activities are part of an integrated, overarching *Asset Management Framework*. This framework defines the relationship between key asset management plans and business processes, and how they interact with MCC's broader corporate plans and activities to deliver the Community Strategic Plan and its service outcomes. The key elements of MCC's Asset Management Framework, and their inter-relationships, are shown in Figure 1.1.

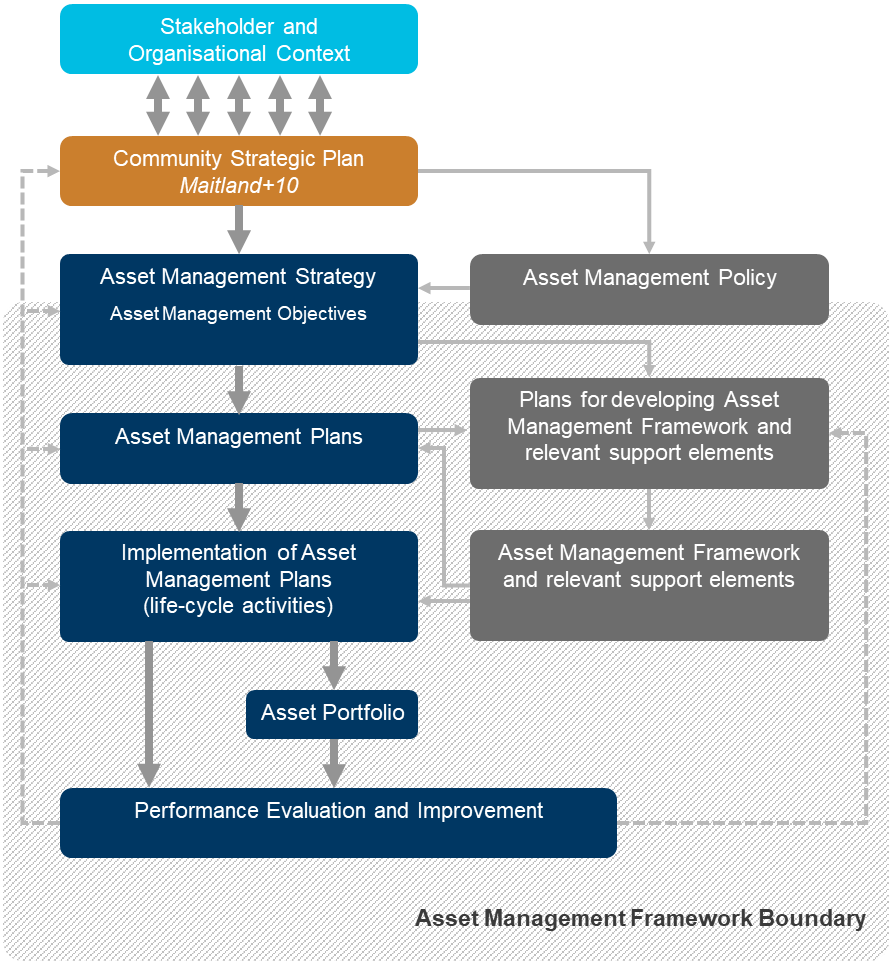

Figure 1.1 Asset management framework

AM Plans are a key element of this framework being a crucial link between city wide strategic asset management goals through to the implementation of tactical service delivery requirements. How the AM Plans relate to other MCC documents and planning outputs is illustrated in the figure below. The AM Plans are a central piece to the Asset Management Framework by consolidating (for each asset class) asset portfolio, master planning and lifecycle information to inform asset status and long term financial reporting.

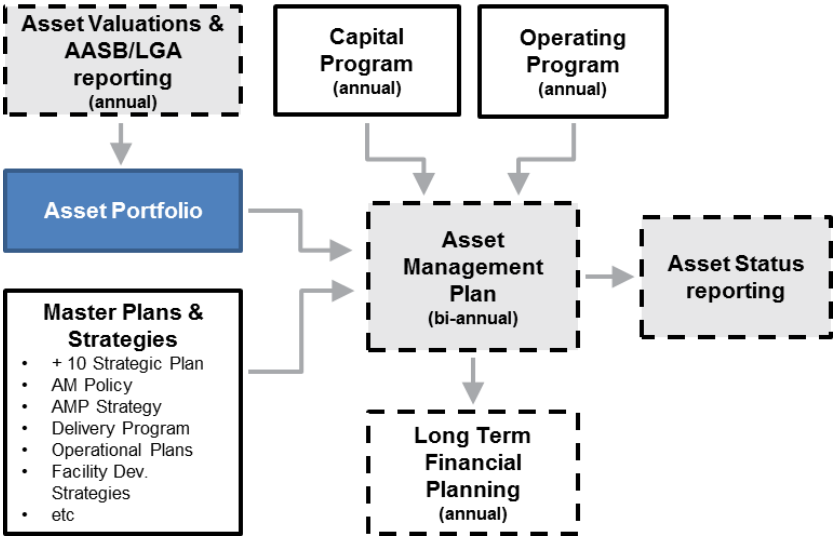

Figure 1.2 AM Plan Relationship to other Maitland City Council Documents

1.4 Asset management objectives

MCC is responsible for providing services relating to road pavement and road inventory to the community within the broader portfolio of Council assets. To support the inherent goal of meeting levels of service, MCC has adopted key infrastructure Asset Management Objectives and corresponding Tactics, all of which are relevant to this asset class. These objectives are:

- **Objective 1, Health and Safety:** To be a local government leader in how we effectively manage the health and safety risks related to how we use, operate and maintain our assets.
- **Objective 2, Community Focus:** Our asset portfolio supports the Maitland community's growing and changing demand for connectivity, recreational, sporting and community infrastructure and services.
- **Objective 3, Value for Money**: The life cycle management of our assets is sustainable, prioritised and optimised to deliver the right balance of cost, risk and service level outcomes.
- **Objective 4, Empowered and Engaged People**: Our people understand their role in delivering service outcomes and are empowered to consider their decisions and actions from a customer service perspective.
- **Objective 5, Growing Maintenance Maturity:** The maturing knowledge and understanding of our assets supports effective application of our condition and risk-based maintenance approach.
- **Objective 6, Project Delivery:** Our project delivery capability and capacity enable us to consistently meet the expectations and timeframes of our stakeholders.
- **Objective 7, Balanced Growth:** Our city retains its unique balance of heritage, urban, rural, natural character, amenity, lifestyle and physical assets while accommodating growth.
- **Objective 8, Economic Prosperity:** Our infrastructure and asset management practices support and enable the economic prosperity of our City.

1.5 Plant and equipment service delivery program

To meet these objectives, assets are rated in terms of risk and criticality. Criticality assists lifecycle management decision making by defining which assets are most important to the service delivery program. To inform the MCC's service delivery needs, this AM Plan provides:

- Details of the community expectations (where available) and legislative/regulatory requirements, as they relate to plant and equipment assets.
- A discussion on the asset management implications from the growth of the Maitland region.
- Lifecycle management strategy recommendations (capital rehabilitation, replacement projects and/or maintenance works) commensurate with asset data available.
- Indications of long-term sustainable funding amounts for maintaining adequate services.

1.6 Asset Management data model

All asset management data reporting in this AM Plan is documented in an Excel based Asset Management Planning data model, provided separately to this AM Plan. The logic in this model is based on lifecycle processes, asset condition data and assumptions documented in this AM Plan. Key data inputs and assumptions have been provided by MCC staff.

2. Levels of service

2.1 Introduction

One of the basic cornerstones of sound asset management is to provide the level of service that current and future communities want and are prepared to pay for. To achieve this, MCC needs to plan for the provision of desired service levels, for a sustainable cost, over the life span of its assets. Establishing levels of service requires knowledge of customers and stakeholders, and an understanding of their expectations and requirements in terms of the assets and outcomes that plant and equipment assets are required to support.

This section of the AM Plan covers the following:

– Customer research and expectations
– Strategic and corporate goals relevant to levels of service
– Legislative requirements
– Current Levels of Service
– Desired (Target) Levels of Service

2.2 Customer expectations

Understanding of customer's expectations is a key input into levels of service and prioritising works across multiple asset types. This understanding will be balanced against legislative requirements and the customers' ability/willingness to pay.

The specific community levels of service expectations are captured in the current Community Strategic Plan. The following table summarises the typical customer expectations that are considered in determining the level of service.

Table 2.1 Typical customer expectations for assets

Service Criteria	Technical measures may relate to
Safety	Be able to perform their function effectively and safely and without causing risk or harm to operators, other people or property either during or after their use.
Quality and quantity	Have the capacity and capability to achieve their intended function in a way that achieves both the quality and quantity of outcomes sought.
Reliability	Be available to perform their function when required and to operate and perform with an acceptable level of reliability.
Environmental	Cause no harm to the environment and operate in an efficient way with respect to fuel and energy use, emissions and other environmental factors.
Cost Efficiency	Plant and equipment are cost-effective to manage from a life cycle cost perspective, are standardised to the extent reasonable, and managed effectively and efficiently to deliver services within known budget constraints.
Legislative Compliance	Compliance with all applicable legislation.
Sustainability	Are managed under long term plans that are prepared and implemented to ensure services are delivered for future generations in an environmentally, financially, and socially sustainable way.

2.3 Asset Management Challenges

Within this and other strategic themes of the Community Strategic Plan are a number of challenges that must be confronted in order to achieve the desired community outcomes. These challenges, consistent with the Asset Management Strategy, are summarised as follows and influence outcomes of this AM Plan.

- **Growing and changing demand:** MCC is facing a significant population growth over the coming decades, with an estimated cumulative population growth of 35% over the next 20 years.
- **Aging infrastructure:** Many of MCC's existing assets are approaching the end of the expected lives. As such, their physical condition has deteriorated and will continue to deteriorate at an accelerated pace in the coming years.
- **Legislative Landscape:** The current legislative environment emphasises a need for local government to recognise the equitable recovery of costs from owning and operating infrastructure over the full lifecycle of assets.
- **Heritage Assets:** MCC has a significant number of heritage buildings and infrastructure dating from the early 1800's which present additional challenges and costs for the preservation and maintenance of our unique past.
- **Preserving and restoring natural assets:** The natural environment and unique character of the Hunter River floodplain are an important part of the Maitland's appeal to residents and visitors. In dealing with population growth and urban expansion it is essential that we not only preserve but increase our areas of natural vegetation and green open space.

  Resilience and sustainability: While the natural and riverine assets of our city are among its most appealing attributes, they bring with them risks including potential vulnerability to bushfires and floods. Our asset management decision making must be cognizant of these risks and seek to improve the resilience of our flood mitigation facilities and infrastructure in a sustainable way.
- **Improving delivery capability:** Across both our capital project and maintenance service delivery processes we have the opportunity to significantly improve our asset information, tools, business processes and skills, and in doing so increase our productivity, efficiency and the value for money of our services.

2.4 Legislative requirements

MCC has to meet many legislative requirements including Australian and State legislation and State regulations in day to day service delivery tasks. For plant and equipment, key legislation requirements in the context of support other asset classes are:

Table 2.2 Legislative requirements

Legislation	Objective/Intent
Local Government Act	Sets out roles, purpose, responsibilities and powers of local governments including the preparation of a long term financial plans supported by asset management plans for sustainable service delivery.
Manual of Engineering Standards (MoE's)	Manual of Engineering Standards are the engineering guidelines and drawings for major subdivision design and construction, and for individual development sites in the Maitland Local Government area.
Environmental Legislation	Responsible measures to protect environmental issues.
Roads Transport Act 2013	Consolidation of existing statutory provisions concerning road users, road transport and the improvement of road safety.
Roads Act 1993, including supplementary road regulations	Sets out role, purpose, responsibilities and powers with respect to roads.
Transport Administration act 1988	Sets out role, purpose, responsibilities and powers with respect to transport services.

Legislation	Objective/Intent
Road Transport (Mass Loading and Access) Regulation 2005	To make provision with respect of: – The mass and loading of vehicles and combinations. – The conditions for access to roads of vehicles and combinations that are too large or too heavy to be allowed general road access. – The conditions under which oversize or over mass vehicles and combinations exempted from normal dimension or mass limits may travel on roads and road related areas. – The use of intelligent transport systems to monitor compliance with conditions of concessions under this Regulation or the Act (Road Transport (General) Act 2005).
Occupational Health and Safety Act 2000 Occupational Health and Safety Regulation 2001 Work Health and Safety Act 2011	Defines responsibilities of employers and workers to ensure safety is maintained.
National Heavy Vehicle Regulator, Chain of Responsibility	The Chain of Responsibility (CoR) law ensures everyone who works with heavy vehicles – from the business that employs a driver to the place where goods are delivered – is accountable for safety.

2.5 Levels of service

2.5.1 Common levels of service

Assets within this asset class have levels of service defined as either “Functional” or “Not Functional”, meaning the asset in its current state does or does not achieve the original intent of the asset inclusive of function, compliance and safety. Achieving this intent, or not, is based on one of the core failure modes defined in Section 4.1 of this plan (capacity, condition, financial efficiency, reliability) including safety and regulatory requirements specific to an asset.

2.5.2 Target levels of service

To assist in prioritizing asset management activities the following target level of services categories have been defined by MCC and applied to the plant and equipment asset hierarchy. Target condition ratings have also been allocated, in accordance with MCC's condition assessment process defined (with "1" being excellent condition and "5" being unserviceable).

These allocations were defined and agreed with applicable Council staff and managers. As indicated from this table, plant and equipment can have a relatively standard or low condition expectation as long as it achieves its intended function safely and is compliant with relevant regulatory requirements (for example all road plant must meet NSW government registration requirements).

Table 2.3 Target levels of service

Plant/Equipment Type	Description	Target level of service	Target condition
Backhoe		Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required
Grader		Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required
Excavators	2-5 tonne	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required
	6-10 tonne	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required
	>11 tonne	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required
Excavator Attachments		Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required
Front End Loader Attachments		Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required
Forklift		Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required
Front End Loader		Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required
Roller		Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required
Skid Steer		Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required
Tractor		Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required
Trucks	>12t Tipper	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required
	>12t Flat top	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required
	<12t Tipper	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required
	<12t other	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required
	Tanker - Diesel	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required
	Tanker - Water	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required
	Sweeper	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required
	Waste Trucks - Side Loader	Achieves intended function (inc. safety and compliance)	2 – Minor maintenance required plus planned maintenance

Plant/Equipment Type	Description	Target level of service	Target condition
	Waste Trucks - Rear Loader	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required
Trailer - Heavy (>4.5t)	Dog and Plant	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required
Mowers	Zero Turn	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required
	Reel Mower	Achieves intended function (inc. safety and compliance)	2 - Minor maintenance required plus planned maintenance
	Speciality Mowers	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required
Track Loader		Achieves intended function (inc. safety and compliance)	2 - Minor maintenance required plus planned maintenance
Waste Compactor		Achieves intended function (inc. safety and compliance)	2 - Minor maintenance required plus planned maintenance
Elevated Work Platform		Achieves intended function (inc. safety and compliance)	2 - Minor maintenance required plus planned maintenance
Portable Traffic Lights		Achieves intended function (inc. safety and compliance)	4 - Significant renewal/upgrade required
Slashers	Mulcher / rotary heavy / Rotary fine	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required
Stump Grinder		Achieves intended function (inc. safety and compliance)	2 - Minor maintenance required plus planned maintenance
Turf Equipment	Aerator / Cutter / Scarifier	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required
Variable Message Sign		Achieves intended function (inc. safety and compliance)	4 - Significant renewal/upgrade required
Woodchipper		Achieves intended function (inc. safety and compliance)	2 - Minor maintenance required plus planned maintenance
ATV / UTV		Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required
Boat		Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required
Boat and Trailer		Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required
Caravan Amenities		Achieves intended function (inc. safety and compliance)	2 - Minor maintenance required plus planned maintenance
Trailer - Light (<4.5t)		Achieves intended function (inc. safety and compliance)	4 - Significant renewal/upgrade required
Utes	Single Cab / Dual Cab / Extra Cab	Achieves intended function (inc. safety and compliance)	2 - Minor maintenance required plus planned maintenance

Plant/Equipment Type	Description	Target level of service	Target condition
Small Plant (<10k purchase value)	Chainsaw Chemical Spray Unit Compactor Compressor Demolition saws Drills Edger GPS Hoists Kerbmaker Lifting Equipment Linemarker Pressure Washer Pallet Lifter Plasma Cutter Push mowers Safety equipment Two-way radios Welders Whipper snipper	Achieves intended function (inc. safety and compliance)	4 - Significant renewal/upgrade required
Equipment - Ancillary	Fixed Compressors	Achieves intended function (inc. safety and compliance)	4 - Significant renewal/upgrade required
	Fuel storage systems	Achieves intended function (inc. safety and compliance)	2 - Minor maintenance required plus planned maintenance
	Survey Equipment	Achieves intended function (inc. safety and compliance)	2 - Minor maintenance required plus planned maintenance

2.6 Asset condition

In understanding levels of service as well as asset performance, MCC use a 1 to 5 condition rating scale (1 = excellent condition, 5 = poor condition) to set target levels of service, manage asset condition against this target as well as inform risk assessments in probability of failure estimates (discussed in section 4.6). These condition targets not only represent expected asset condition, but also the type and level of maintenance strategy to be applied.

Understanding the application of these conditional ratings as defined in this AM Plan can be complex and are primarily for the use of MCC's asset professionals to inform decision making. The following table aims to articulate how asset condition ratings/targeted are interpreted.

Table 2.4 Asset condition explained

Condition Rating	Maintenance Strategy	Maintenance Principles and Intervention level
1	Predictive Maintenance (Proactive)	– Proactive maintenance approach that uses condition monitoring and high frequency inspections during operation to detect possible failures and fixes them before it fails. – Higher cost of maintenance – Low level of failures or defects and complaints expected from the community – High frequency of inspections, condition monitoring and planned preventative maintenance Only tolerate normal preventative and planned maintenance interventions – Maitland Park, Art Gallery, No.1 Sportsground, Arterial Roads
2	Preventative / Planned Maintenance	– Type of proactive maintenance that keeps assets in good working order and reduces the need for major repairs – Aims to limit failures to minor corrective maintenance levels only before intervention – Lower cost than predictive maintenance – Reduces high consequence failures – Frequency of inspections lower than predictive, including monitoring condition and intervening when failures are still minor in nature (eg potholes) – Assets remain safe but we will tolerate a time frame to allow a defect to be repaired – Distributor or Arterial Roads, Library, Road and Pedestrian bridges
3 and 4	Corrective Maintenance	– Maintenance is carried out following a detection of a failure or defect. This is where we make conscious decisions to allow 'safe' failures to occur and the cost for downtime and repair is known to be lower than a preventative or predictive maintenance program – Lower cost than preventative maintenance – Assessment made to let fail then fix within a nominated time frame – Condition rating 3 - tolerate some major corrective maintenance before intervening – Condition rating 4 – intentionally delay intervention to a point where major corrective maintenance needs to occur – Plant and Equipment, Local roads, non critical drainage assets
5	Run to Failure (Breakdown Maintenance)	– Simplest maintenance strategy where assets are allowed to operate until they essential break or fail to operate as designed – Asset receives little to no maintenance until failure or unsafe – Strategy used mostly where asset failure has low safety or financial consequence – Lowest cost intervention – Other than basic maintenance like cleaning and visual inspection, nothing is done until the asset is not functional – Bike racks, streetlights, garbage bins

2.7 Known service deficiencies

Known and/or perceived service deficiencies affect the current and future performance of assets. For plant and equipment, these service deficiencies are likely to impact other asset classes. For the purpose of this assessment, MCC staff have confirmed the current level of service and condition for each asset either through available asset data and/or a qualitative judgement based on knowledge of the asset.

From data available to make this comparison MCC regard more than 93% of plant and equipment assets as meeting their condition targets. Of the remaining 7% that do not meet condition targets, it is generally accepted by MCC that the assets meet their "functional" level of service and require only standard operations and maintenance interventions. Should they not be deemed safe or compliant by operators they are removed from service and repaired, disposed of, or replaced.

3. Future Demand

3.1 Introduction

Future demand is a measure of how much customers will consume the services provided by the assets as well as additional (new) assets required to meet predicted population growth. Understanding and predicting demands enable asset managers to plan and identify the best way to meet future conditions.

MCC are currently in a period of extraordinary population growth, with 2020/21 growth rates estimated by the Australian Bureau of Statistics of 3.5% - a rate that is estimated as being maintained for the next five to ten years. This growth will see Maitland's population grow to more than 104,700 by 2041. This growth rate is the fifth highest in NSW and the highest outside of Greater Sydney. To house this continued growing population, the majority (>90%) are expected to live in new greenfield developments, all of which require new MCC owned and operated assets. New greenfield developments have conservatively been estimated at around 700 new lots per year for the next 10 years.

In addition to new assets, this growth will place a greater demand on parts of the existing asset base, potentially requiring additional (or different) maintenance strategies to be applied.

3.2 Demand forecasts

3.2.1 Forecast methodology

To enable proactive planning, development and management of additional demand on assets created by this growth, MCC have estimated growth projections for roads and road related assets based on the average growth rates experienced between the periods of 2017 and 2021. Combined with published growth rates available in annual reports as well as the estimated lot quantities defined in the development capacity survey completed by MCC's Planning and Environment group, annual asset growth rates were estimated and projected for a period of 10 years (2022 to 2032). This enabled the estimation of asset quantities and costs such as roads, kerb and gutter, footpaths, drainage structures etc, required to service the estimated greenfield lots as well as enhancements to existing assets.

3.2.2 New assets from growth

These new assets all will require maintenance provided by a variety of plant and equipment assets, therefore it is expected that additional plant and equipment will be required over and above what is currently owned by MCC commensurate with this growth.

Acquiring these new assets will commit council to fund ongoing operations and maintenance costs for the period that the service provided from the assets is required. These future costs are identified and considered in developing forecasts of future operating and maintenance costs.

3.3 Demand management

Consideration of the future growth and impact on services drives the planning and demand management strategies. Strategies to be implemented in this current cycle of asset management planning include resource management and maintenance.

Whilst direct capital and maintenance costs for plant are discussed in this (and other sections) of the AM Plan, operations and maintenance costs for plant and equipment are generated and managed through internal hire rates that are charged directly to a specific project or maintenance activity of relevant asset classes (inclusive of capital costs for the replacement of existing plant). There are no actual direct cost allocations from MCC for the operations and maintenance of plant and equipment.

Additional funds, however, are required should additional plant/equipment be purchased due to asset growth requirements. Therefore, funding gaps relating to plant and equipment identified in this AM Plan generally cater for the purchase of new plant/equipment required for the construction and maintenance of new assets from growth. Note that specific plant and equipment required has not been identified as part of this AM Plan.

3.3.1 Resources

To manage the surge in capital development over the next ten years, additional resources will be required. It is anticipated these additional resource requirements will be procured from both new MCC recruits as well as external resources such as design consultants, contract staff and third-party construction contractors.

3.3.2 Maintenance

From these new assets will come additional operations and maintenance requirements on top of the existing asset base. Consistent with the tactics included in the Asset Management Strategy, maintenance tactics will be applied as defined in the Lifecycle management section of this AM Plan.

3.3.3 Financial Impacts: Capital

Based on the above demands, additional capital expenditure will be required for new plant and equipment purchases. These have not yet been estimated by MCC. Future iterations of this AM Plan will include these estimates.

3.3.4 Financial Impacts: Maintenance

Based on the above demands, additional maintenance expenditure will be required. As estimated by MCC, recent historical maintenance expenditure on plant and equipment assets is approximately **$1.131 M**, disbursed across all plant and equipment asset types. To cater for the additional asset base growth that will require additional plant and equipment for maintenance purposes, an annual growth factor of **5%** has been added to this O&M expenditure until 2032.

4. Lifecycle Management

4.1 Introduction

This section defines assets owned (including future new assets from growth) and broad plans required to manage and operate the assets at the agreed levels of service (defined in Section 2) while optimising life cycle costs. This section includes:

– Asset Details and Age Profiles
– Maintenance and Renewal Planning
– Asset Lifecycle Activities and Cost Data
– Asset Failure Modes and Consumption Estimates
– Asset Risk Data and Risk Exposure Estimates
– Lifecycle Management Plans

Lifecycle management strategies and tactics, consistent with MCC's AM Strategy are also highlighted throughout this section.

4.2 Background data

4.2.1 Asset hierarchy

Asset information is needed to support decision making. The asset hierarchy provides the framework to assist with lifecycle planning and management. The asset hierarchy used for this AM Plan is shown below. This hierarchy is "rolled down" to additional levels in supporting data. Due to the diverse range of plant and equipment owned by MCC, this asset hierarchy is intentionally "flat".

Table 4.1 Asset hierarchy

Level 1	Level 2	Level 3	Level 4
Plant and equipment	Backhoe		Type / Ref
	Grader		Type / Ref
	Excavators	Size (2-5 tonne, 6-10 tonne, >11 tonne)	Type / Ref
	Excavator Attachments		Type / Ref
	Front End Loader Attachments		Type / Ref
	Forklift		Type / Ref
	Front End Loader		Type / Ref
	Roller		Type / Ref
	Skid Steer		Type / Ref
	Tractor		Type / Ref
	Trucks	>12t Tipper	Type / Ref
		>12t Flat top	Type / Ref
		<12t Tipper	Type / Ref
		<12t other	Type / Ref
		Tanker - Diesel	Type / Ref
		Tanker - Water	Type / Ref
		Sweeper	Type / Ref
		Waste Trucks - Side Loader	Type / Ref
		Waste Trucks - Rear Loader	Type / Ref

Level 1	Level 2	Level 3	Level 4
	Trailer - Heavy (>4.5t)	Dog	Type / Ref
		Plant	Type / Ref
	Mowers	Zero Turn	Type / Ref
		Reel Mower	Type / Ref
		Speciality Mowers	Type / Ref
	Track Loader		Type / Ref
	Waste Compactor		Type / Ref
	EWP		Type / Ref
	Portable Traffic Lights		Type / Ref
	Slashers	Mulcher	Type / Ref
		Rotary heavy	Type / Ref
		Rotary fine	Type / Ref
	Stump Grinder		Type / Ref
	Turf Equipment	Aerator	Type / Ref
		Turf Cutter	Type / Ref
		Scarifier	Type / Ref
	Variable Message Sign		Type / Ref
	Woodchipper		Type / Ref
	ATV / UTV		Type / Ref
	Boat		Type / Ref
	Boat and Trailer		Type / Ref
	Caravan Amenities		Type / Ref
	Trailer - Light (<4.5t)		Type / Ref
	Utes	Single Cab	Type / Ref
		Dual Cab	Type / Ref
		Extra Cab	Type / Ref
	Small Plant (<10k purchase value)	Chainsaw Chemical Spray Unit Compactor Compressor Demolition saws Drills Edger GPS Hoists Kerbmaker Lifting Equipment Linemarker Pressure Washer Pallet Lifter Plasma Cutter Push mowers Safety equipment Two-way radios Welders Whipper snipper	Type / Ref
	Equipment - Ancillary	Fixed Compressors	
		Fuel storage systems	
		Survey Equipment	

4.2.2 Asset information and targets

At an appropriate level of the hierarchy, asset information and targets are assigned. This assists in deriving the Maximum Potential Life of an asset and the subsequent Effective Remaining Life. The Maximum Potential Life (MPL) is the time from installation to replacement, with typical maintenance and refurbishment activities taking place during this time frame.

Within the asset hierarchy, the following is allocated in addition to MPL:

– Target level of service (LOS) (between “A and F” as defined in Section 2.5).
– Target condition (between “1 and 5” as defined in Section 2.5 and Table 4.2).
– Consequence of failure (CoF) (between “C1 and C5” as defined in Section 4.5 and Table 4.29).

MPL, level of service, condition and consequence of failure figures assigned to assets are aligned to industry experience and are agreed/confirmed with MCC staff and managers. Where required, MCC staff have provided judgement (or exception) figures that override these targets. These are summarised in the following table:

Table 4.2 Asset lifecycle information

Plant/Equipment Type	Description	MPL (years)	Target level of service	Target condition	CoF
Backhoe		10	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required	2
Grader		10	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required	2
Excavators	2-5 tonne	7	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required	2
	6-10 tonne	8	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required	2
	>11 tonne	8	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required	2
Excavator Attachments		15	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required	2
Front End Loader Attachments		15	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required	2
Forklift		7	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required	2
Front End Loader		10	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required	2
Roller		10	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required	2
Skid Steer		8	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required	2
Tractor		7	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required	3

Plant/Equipment Type	Description	MPL (years)	Target level of service	Target condition	CoF
Trucks	>12t Tipper	8	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required	2
	>12t Flat top	8	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required	2
	<12t Tipper	7	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required	2
	<12t other	7	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required	2
	Tanker - Diesel	12	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required	2
	Tanker - Water	12	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required	2
	Sweeper	7	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required	2
	Waste Trucks - Side Loader	6	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required	4
	Waste Trucks - Rear Loader	6	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required	4
Trailer - Heavy (>4.5t)	Dog and Plant	10	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required	2
Mowers	Zero Turn	10	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required	2
	Reel Mower	7	Achieves intended function (inc. safety and compliance)	2 - Minor maintenance required plus planned maintenance	1
	Speciality Mowers	7	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required	3
Track Loader		7	Achieves intended function (inc. safety and compliance)	2 - Minor maintenance required plus planned maintenance	2
Waste Compactor		10	Achieves intended function (inc. safety and compliance)	2 - Minor maintenance required plus planned maintenance	4
Elevated Work Platform		6	Achieves intended function (inc. safety and compliance)	2 - Minor maintenance required plus planned maintenance	4
Portable Traffic Lights		10	Achieves intended function (inc. safety and compliance)	4 - Significant renewal/upgrade required	1
Slashers	Mulcher / rotary heavy / Rotary fine	10	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required	1

Plant/Equipment Type	Description	MPL (years)	Target level of service	Target condition	CoF
Stump Grinder		7	Achieves intended function (inc. safety and compliance)	2 - Minor maintenance required plus planned maintenance	2
Turf Equipment	Aerator / Cutter / Scarifier	7	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required	2
Variable Message Sign		7	Achieves intended function (inc. safety and compliance)	4 - Significant renewal/upgrade required	2
Woodchipper		12	Achieves intended function (inc. safety and compliance)	2 - Minor maintenance required plus planned maintenance	1
ATV / UTV		10	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required	1
Boat		10	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required	1
Boat and Trailer		10	Achieves intended function (inc. safety and compliance)	3 - Significant maintenance required	1
Caravan Amenities		10	Achieves intended function (inc. safety and compliance)	2 - Minor maintenance required plus planned maintenance	1
Trailer - Light (<4.5t)		8	Achieves intended function (inc. safety and compliance)	4 - Significant renewal/upgrade required	1
Utes	Single Cab / Dual Cab / Extra Cab	5	Achieves intended function (inc. safety and compliance)	1 - Only planned maintenance required	1
Small Plant (<10k purchase value)	Chainsaw Chemical Spray Unit Compactor Compressor Demolition saws Drills Edger GPS Hoists Kerb maker Lifting Equipment Line marker Pressure Washer Pallet Lifter Plasma Cutter Push mowers Safety equipment Two-way radios Welders Whipper snipper	5 - 10	Achieves intended function (inc. safety and compliance)	4 - Significant renewal/upgrade required	1

Plant/Equipment Type	Description	MPL (years)	Target level of service	Target condition	CoF
Equipment - Ancillary	Fixed Compressors	5	Achieves intended function (inc. safety and compliance)	4 - Significant renewal/upgrade required	1
	Fuel storage systems	10	Achieves intended function (inc. safety and compliance)	2 - Minor maintenance required plus planned maintenance	4
	Survey Equipment	10	Achieves intended function (inc. safety and compliance)	2 - Minor maintenance required plus planned maintenance	1

4.3 Asset profiles

4.3.1 Asset inventory and replacement costs

To focus need for investments, it is helpful to understand the number of assets and replacement value of assets against the hierarchy. MCC currently manage around **270 individual plant and equipment assets** with a total 2022 replacement value of $22.3 M**.** This is summarised as follows (sorted from highest replacement cost to lowest.

Table 4.3 Asset inventory summary

Description	Total Qty (estimated)	$ Cost breakdown (millions)	% Cost total
Trucks	68	$10,531,762	48%
Utes	64	$2,476,237	11%
Waste Compactor	1	$1,331,183	6%
Graders	3	$1,279,766	6%
Front End Loaders	4	$843,744	4%
Tractors	8	$687,413	3%
Mowers	19	$668,486	3%
Trailers	26	$563,468	3%
Track Loader	1	$528,601	2%
Rollers	4	$465,995	2%
Small plant	29	$432,950	2%
Backhoes	2	$422,858	2%
Caravans	6	$362,021	2%
Slashers	12	$295,602	1%
Excavators	2	$282,672	1%
Ancillary Equipment	3	$219,327	1%
Skid Steer	1	$211,436	1%
Woodchipper	1	$148,261	1%
EWP	3	$104,282	<1%
Turf Equipment	2	$73,405	<1%
Forklifts	2	$71,583	<1%
ATV / UTVs	2	$69,644	<1%

Description	Total Qty (estimated)	$ Cost breakdown (millions)	% Cost total
Stump Grinders	2	$61,762	<1%
VMS	2	$58,715	<1%
Portable Traffic Lights	1	$29,617	<1%
Boat and Trailer	1	$26,529	<1%
Confined S/Trailer	1	$16,738	<1%
Tamper	1	$14,041	<1%
TOTAL	**271**	**$22,278,084**	**100%**

4.3.2 Installation profile of assets

To assist MCC with asset management decision making including future funding needs analysis, it is helpful to understand the installation profile of the asset portfolio, that is, the purchase date (age) of plant and equipment. The following graphs show the replacement value of the assets by year of installation/purchase, in 2022 dollar value. This indicates the majority of plant and equipment assets being purchased within the last ten years which illustrates the relatively short lifecycle of this asset class.

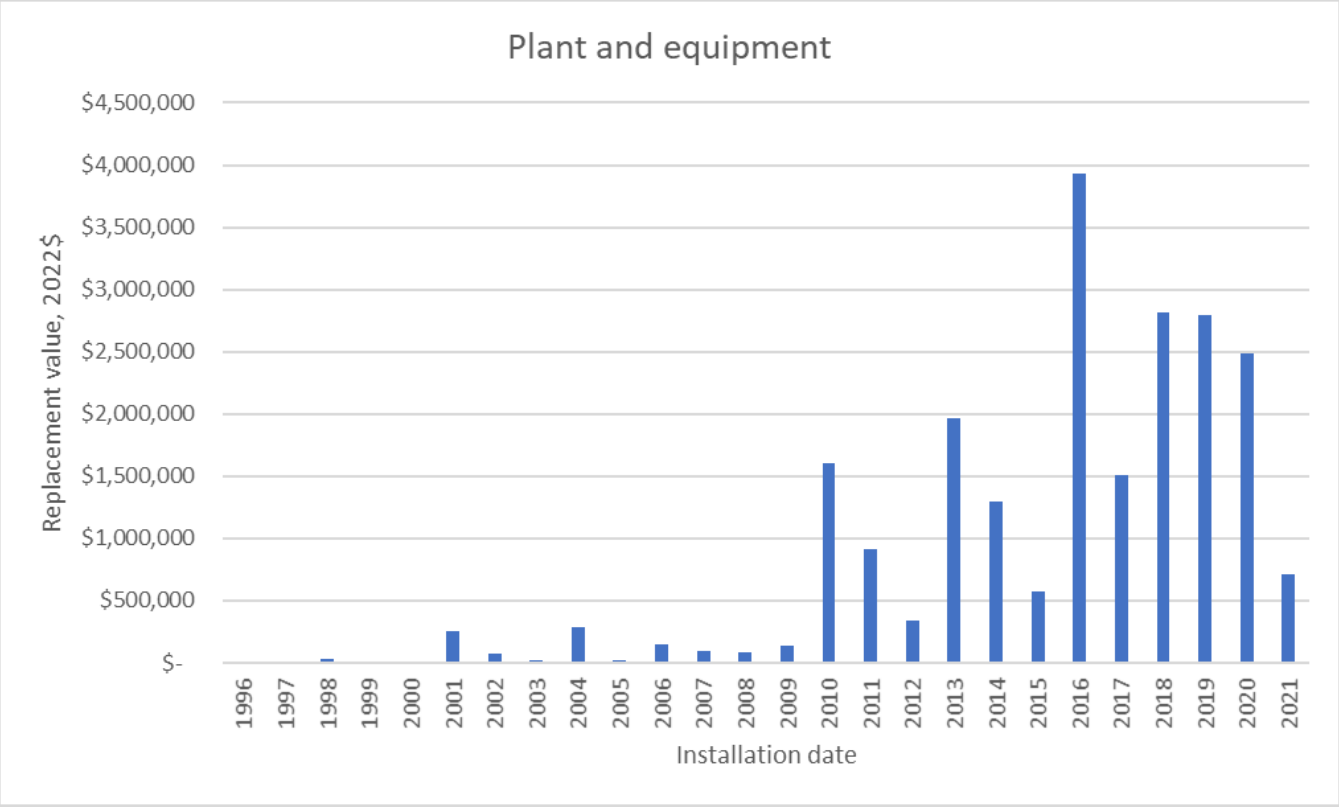

Figure 4.1 Asset installation

4.4 Asset lifecycle activities

Lifecycle activities can be categorized into the following main areas:

- ***Create or Acquire:*** Activities that provide new or donated/gifted assets that increase service potential, performance capability or capacity.
- ***Operate***: The active process of using an asset which may consume resources such as manpower, energy, chemicals, and materials.
- ***Maintain:*** Activities necessary to retain an asset as near as practicable in its original condition but excluding refurbishment / rehabilitation or replacement.
- ***Refurbish or Rehabilitate:*** Activities to sustain the original service potential or substantially extend the life of existing assets by replacing component systems or assemblies without increasing service potential, performance capability or capacity.
- ***Enhance:*** Activities that augment or upgrade existing assets to increase service potential, performance capability or capacity.
- ***Replace:*** Activities that replace existing assets with assets of equivalent service potential, performance capability or capacity.
- ***Dispose:*** Work that permanently removes assets from service.

The lifecycle activities and associated costs for the MCC owned roads and road furniture are further described in the following sections.

4.4.1 Maintenance expenditure/budgets

As defined in Section 3.3.4 operations and maintenance expenditure for plant and equipment is based on the annualised historic costs (of $1.131 M) plus a 5% growth factor to cater for the growing asset base.

4.4.2 Maintenance and renewal planning

MCC currently carries out maintenance activities that are necessary to plant and equipment assets in safe and reliable condition and fit for purpose. .Maintenance includes reactive, planned and cyclic maintenance work activities.

- ***Reactive maintenance*** is unplanned repair work carried out in response to service requests and management/supervisory directions.
- ***Planned maintenance*** activities include inspection, assessing the condition against failure/breakdown experience, prioritising, scheduling, actioning the work and reporting what was done to develop a maintenance history and improve maintenance and service delivery performance.
- ***Cyclic maintenance*** is replacement of higher value components/sub-components of assets that is undertaken on a regular cycle. This work generally falls below the capital/maintenance threshold.

4.4.3 Standards and specification

Maintenance works on plant and equipment are carried out in accordance with manufacture standards and recommendations, as well as relevant MCC, NSW and Federal Government requirements.

4.4.4 Capital works (new plant and equipment assets)

Consistent with the AM Strategy, specific capital works strategies and tactics to be implemented by MCC staff in the management of this asset class.

4.5 Asset failure modes and consumption estimates

4.5.1 Failure modes

There are several different ways that an asset can fail to provide its required level of service. These are known as the failure modes of an asset. Each of these failure modes could have a different probability or consequence of failure. Most asset failures can be classified under one of the following four failure modes.

- **Utilisation (capacity):** The demand exceeds the capacity of the existing asset or network of assets, or vice versa in some cases (e.g. usage of a building maybe greater than design capacity due to population increase).
- **Physical Mortality (condition):** The condition of the asset (or one of its components) is such that it has reached the end of its effective life (e.g. failure of a hydraulic hose).
- **Financial Efficiency (cost):** The asset is not being maintained at the lowest lifecycle cost, that is, the cost to execute the current maintenance strategies over time exceed that of the replacement cost.
- **Level of Service:** The asset no longer performs reliably, does not meet the agreed target level of service or does not meet mandatory regulatory requirements (e.g. pool water quality does not meet health targets).

Decisions about the refurbishment and replacement of an asset and the timing of these activities should be based on a sound determination of its predominant or critical failure mode (the failure mode with the highest consequence and probability of occurrence).

4.5.2 Remaining life and asset consumption

For assets within this AM Plan, remaining life and asset consumption was determined at an appropriate level in the hierarchy simply as follows:

– Install year + estimated MPL – current year (2022).
– Applying a ***remaining life factor*** (which is a reduction factor based on the asset condition rating and current level of service). A good condition correlates to a high residual life factor, and a poor condition correlates to a low residual life factor as illustrated below.

If the result of this method did not appear appropriate based on what is inherently known about the asset, a judgement regarding residual life was applied which overrides the above.

These elements are described as follows:

– ***Install Year:*** The year an asset was first installed or replaced.
– ***Estimated MPL:*** As per Section 4.42.2.
– ***Condition Rating:*** A condition rating was applied to each asset based on available condition data or judgment of MCC staff as per Section 2.6.

The “remaining life factor” was applied based on combined performance rating of condition and level of service is as follows:

Table 4.4 Remaining life factor

Combined Performance	Residual life factor
1	0.99
2	0.90
3	0.66
4	0.325
5	0.075

Based on the remaining life predictions, the consumption of each asset in the hierarchy has been calculated on a least remaining life basis. The Asset Consumption Distribution graphs shown in the following figures illustrate the value of assets that are new (0% consumed) through to assets that have reached their maximum potential life (100% consumed).

This graph provides a good indication of which assets are at the end or nearing the end of their life and require replacing or a significant maintenance intervention. The plant and equipment age/condition data highlight that the majority of assets are within the first two thirds of their lifecycle, which reflects the maintenance strategies and interventions currently applied to these assets by MCC.

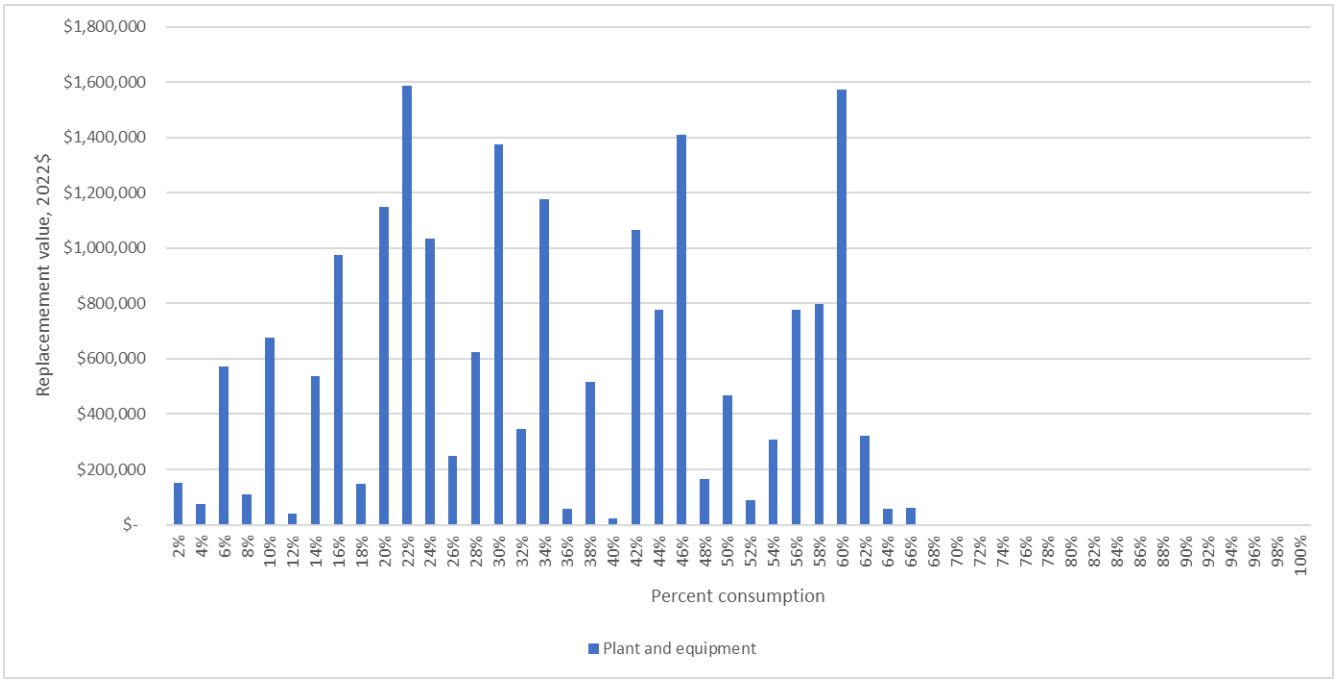

Figure 4.2 Asset consumption: Plant and equipment

4.6 Asset risk data and risk exposure estimates

4.6.1 Overview

Not every asset is of equal importance or presents the same failure risk. Understanding which assets are critical and how they might fail helps focus lifecycle management strategies on what is most important. Critical plant and equipment assets are those that have major consequences or impacts if they fail and a high probability or likelihood of failing.

The asset consumptions determined in the preceding section provides an insight into the likelihood or probability of assets failing. To determine which of these assets are critical the consequence of failure must also be assessed and included in the analysis.

To determine the risk exposure of the assets, the following simple calculation is applied:

Risk Exposure = Probability of Failure (Pof) x Consequence of Failure (CoF).

The basis of determining the relative priority for each asset is the calculation of a Business Risk Exposure (BRE) rating index. The BRE is a probability-consequence risk matrix determination, using MCCs risk matrix structure as shown below:

Probability of Failure						
P5	Almost Certain	7	14	17	23	25
P4	Likeley	6	9	16	19	24
P3	Possible	3	8	15	18	22
P2	Unlikely	2	5	11	13	21
P1	Rare	1	4	10	12	20
		Insignificant	Minor	Moderate	Major	Catastrophic
		C1	C2	C3	C4	C5
		Consequence of Failure				

Figure 4.3 Risk matrix

4.6.2 Probability of failure

The probability of failure was derived by using the asset consumption defined in the previous section and MCC's likelihood scale (included in the MCC's Risk Management process), as illustrated in the following table.

Assets that are reaching the end of their estimated life (i.e. high% asset consumption) have a high probability of failure. Assets that are at the start of their estimated life (i.e. low % consumption) have a low probability of failure.

Table 4.5 Probability of failure

% Life consumed	Level	Probability / likelihood	Descriptor	Probability of occurrence
0% to 20%	P1	Rare	May occur only in exceptional circumstances	More than 20 years
21% to 40%	P2	Unlikely	Could occur at some time	Within 10-20 years
41% to 60%	P3	Possible	Might occur at some time	Within 3-5 years
60% to 80%	P4	Likely	Will probably occur in most circumstances	Within 2 years
80% to 100%	P5	Almost certain	Expected to occur in most circumstances	Within 1 year

4.6.3 Consequence of failure

Consequence of Failure was determined in a workshop with MCC staff using the following consequence ratings. These ratings are based on the ratings included the MCC's corporate Risk management process. Consequence of Failure ratings applied for each asset is defined in Table 4.6.

Table 4.6 Consequence of failure

Level	Consequence	Operational & Technical	Financial	Social	Environmental
C1	Insignificant	None or negligible service disruptions	Financial loss < $10K	No injuries No litigation exposure No media interest	None or negligible environmental impacts
C2	Minor	Isolated disruption to non-essential services	Financial loss between $10K and $50K	First Aid treatment Acceptable exposure to litigation Local media coverage	On-site environmental impact immediately contained
C3	Moderate	Isolated disruption to essential services Wide disruption to non-essential services	Financial loss between $50K and $200K	Medical treatment required Moderate exposure to litigation Regional media coverage	On-site environmental impact contained with outside assistance
C4	Major	Wide disruption to essential services Some non-essential services unavailable	Financial loss between $200K and $1M	Extensive (multiple) injuries Some state/national media coverage Major exposure to litigation	Off-site environmental impact with no detrimental effects
C5	Catastrophic	Essential and non-essential services unavailable	Financial loss >$1M	Loss of life Extensive state/national media coverage Unacceptable exposure to litigation	Toxic release off-site

4.6.4 Asset risk exposure estimate

The following section includes risk maps showing the total replacement value of assets for Risk Exposure by asset type, based on the risk methodology and criteria described above. The risk maps have enabled the identification and prioritisation of higher risk assets that need to become candidates for closer inspection (to verify if they truly are high risk), renewal or replacement.

The determination of the BRE is a function of the selected PoF and CoF figures for each individual asset. Using the Risk Matrix shown in Figure 4.3, a ranking was determined (Very High, High, Medium or Low) for each asset included in the hierarchy.

In summary none of the plant and equipment assets are rated as a "**very high**" business risk based on PoF and CoF. However approximately 21% of assets are rated as being a "**high**" business risk with due to the age/condition of the asset and the consequence of the asset not being available to provide its intended function. This equates to a financial replacement estimate (in 2022$) of $4.6 M.

A breakdown of the risk profile by asset category is as follows:

Probability of Failure						
	P5	Almost Certain	$ -	$ 1,435,155	$ -	$ -	$ -
	P4	Likeley	$ -	$ 1,565,482	$ -	$ 481,775	$ -
	P3	Possible	$ -	$ 4,637,969	$ 71,609	$ 2,660,209	$ -
	P2	Unlikely	$ -	$ 5,327,712	$ -	$ 2,061,526	$ -
	P1	Rare	$ -	$ 3,572,229	$ -	$ 147,717	$ -
			Insignificant	Minor	Moderate	Major	Catastrophic
			1	2	3	4	5

Consequence of Failure

Figure 4.4 Asset risk matrix: Replacement value

Probability of Failure						
	P5	Almost Certain	0%	6%	0%	0%	0%
	P4	Likeley	0%	7%	0%	2%	0%
	P3	Possible	0%	21%	<1%	12%	0%
	P2	Unlikely	0%	24%	0%	9%	0%
	P1	Rare	0%	16%	0%	1%	0%
			Insignificant	Minor	Moderate	Major	Catastrophic
			1	2	3	4	5

Consequence of Failure

Figure 4.5 Asset risk matrix: Percentage

4.6.5 High priority assets

Based on the outputs of this risk assessment, high priority assets are summarised as follows. The following assets should be prioritised in future capital, operations and maintenance planning and delivery:

– Waste trucks
– Ride on and quad steer mowers
– Select Utility vehicles

These are further listed in Appendix B. Note that whilst this plan identified these as high-risk assets, it does not necessarily mean a high-cost intervention is required.

4.7 Renewal and enhancement plan

Short term renewal and enhancement plans are defined through MCC's annual capital and maintenance planning processes. Current renewal and enhancement plans incorporate high priority assets identified within this AM Plan consistent with the cost estimates included in the Capital Works Program. Renewal and enhancement of ageing assets over a longer period of time from this AM Plan are also consistent with the current Long Term Financial Plan.

Note that within the wider Hunter Region, there is a significant amount of major construction work scheduled over the next five years (and beyond) for NSW government entities such as Transport for NSW. This is expected to have an impact on the availability of plant, both in purchasing and hiring. Whilst this impact is not directly included in this AM Plan, regional plant (and resource) availability is an ongoing consideration for MCC in supporting the construction of new assets and the maintenance of the existing asset base.

4.8 Creation/acquisition/upgrade plan

All new plant and equipment assets will be planned, scheduled and delivered on an annual basis as per MCC's capital programming and project delivery processes and within the limits of the Council endorsed four-year capital works budget.

4.9 Disposal plan

Disposal includes any activity associated with disposal of a decommissioned asset including sale, disposal or relocation. Rationalisation of plant and equipment assets and the services they provide will be considered in future development of this plan.

5. Financial Summary

5.1 Overview

This section contains the financial requirements resulting from all the information presented in the previous sections of this asset management plan. The financial projections will be improved as further information becomes available on desired levels of service and current and projected asset performance.

5.2 Financial projections for asset renewal

The estimated cost over time to renew or replace MCC's plant and equipment assets to achieve the target condition and level of service is shown in Figure 5.1 below. As indicated by the horizontal line, the theoretical average annual cost to sustain this asset class (based on long term replacement cycles, asset age/condition and estimated growth) is estimated to be in the order of **$3.1 M** in 2022 dollars.

This information now provides a target for short term assessments – particularly with regards to priority assets identified and those that have reach the end of their estimated life. Risk exposure can be further reduced through applying appropriate risk reduction measures or obtaining more accurate condition data that confirms extending asset life is practical.

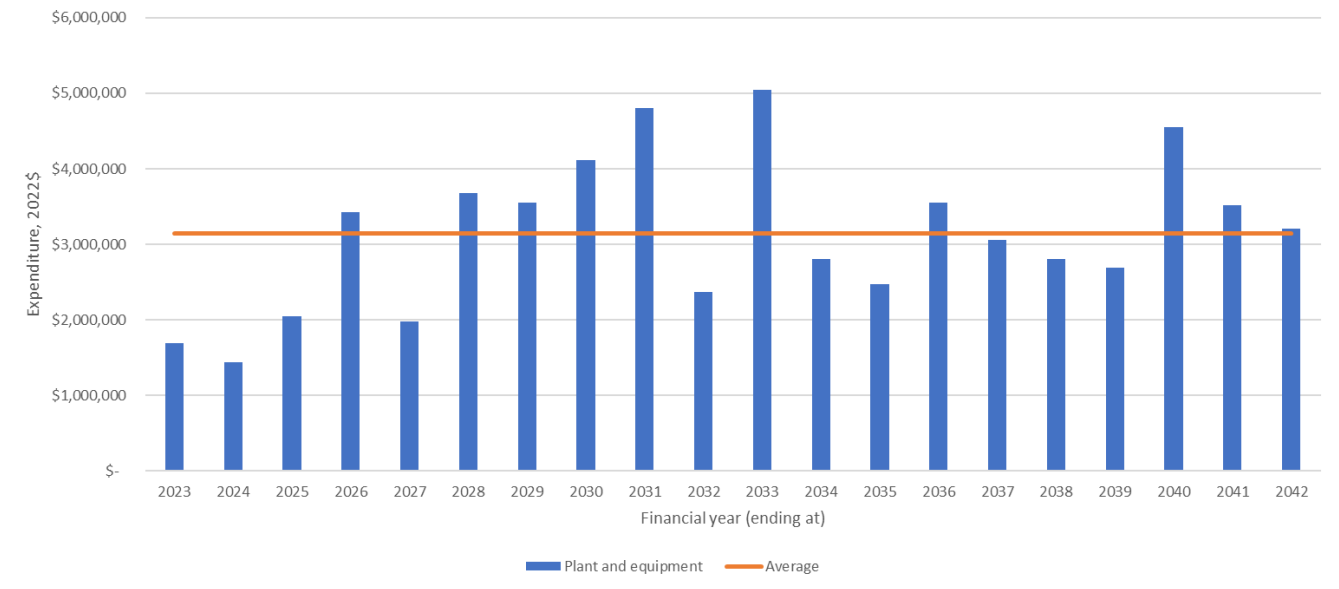

Figure 5.1 Financial projection – Total

5.3 Long term funding mechanisms

Long term funding mechanisms will be addressed Council's resourcing strategy and associated rate rises. These are currently being realised in the current capital/maintenance works program and the 2022 Long Term Financial Plan which was endorsed by Council in early 2022.

Appendices

Appendix A

Limitations and assumptions

Limitations

This report has been prepared by GHD for Maitland City Council and may only be used and relied on by Maitland City Council for the purpose agreed between GHD and Maitland City Council. GHD otherwise disclaims responsibility to any person other than Maitland City Council arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

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GHD has prepared this report on the basis of information provided by Maitland City Council which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

GHD has prepared financial information set out in this report ("Cost Estimate") using information reasonably available to the GHD employee(s) who prepared this report; and based on assumptions and judgments made by GHD and using information provided by Maitland City Council The Cost Estimate has been prepared for the purpose of asset management planning and must not be used for any other purpose.

The Cost Estimate is a preliminary estimate only. Actual prices, costs and other variables may be different to those used to prepare the Cost Estimate and may change. Unless as otherwise specified in this report, no detailed quotation has been obtained for actions identified in this report. GHD does not represent, warrant or guarantee that the [works/project] can or will be undertaken at a cost which is the same or less than the Cost Estimate.

Where estimates of potential costs are provided with an indicated level of confidence, notwithstanding the conservatism of the level of confidence selected as the planning level, there remains a chance that the cost will be greater than the planning estimate, and any funding would not be adequate. The confidence level considered to be most appropriate for planning purposes will vary depending on the conservatism of the user and the nature of the project. The user should therefore select appropriate confidence levels to suit their particular risk profile.

Assumptions

- All data outcomes presented are commensurate with the data provided by MCC. Data provided is generally high level.
- Maintenance, capital and replacement costs are as per provided by MCC.
- When the condition of the asset is reflected by the age of the asset, the age of the asset is used to calculate the residual life. Conversely, when the condition of the asset is not reflected by the age of the asset, the condition of the asset is used to calculate the residual life. To determine whether the condition of the asset is reflected by the age of the asset, the residual life based on condition must be between $\frac{3}{4} \times$ residual life based on age and $\frac{4}{3} \times$ residual life based on age.
- % consumed has been rounded to the nearest multiple of 5.

Appendix B

High priority assets

Table B.1 High priority plant and equipment

Level 2	Level 3
Truck - Waste	Dennis Eagle Dual Control Truck with Superior Pak Body 24500kg GVM
Truck - Waste	Iveco Acco F2350G with Superior Pak Body 24500kg GVM
Truck - Waste	Iveco Acco F2350G with Superior Pak Body 24500kg GVM
Truck - Waste	Iveco Acco F2350G with Superior Pak Body 24500kg GVM
Waste Compactor	Bomag BC772RB-2
Two-way radios	Motorola
Confined S/Trailer	Confined Space Trailer
Mower	Ride On John Deere LX277 (Gaol)
Mower	Ride On John Deere X320 (East Maitland Pool)
Mower	Toro GM360 Quad Steer Mower
Mower	Toro Reelmaster 5510 Cylinder Mower (5495) Retain for new sportsground
Pallet Lifter	Crown WP2320 Walkie
Slasher	Muthing MU-L220 2.2m Flail Mulcher
Trailer	7'x4'6" box Trailer with cage
Truck	Tabletop Isuzu FRR 500 Long (Crane) Bridge Truck 10400kg GVM
Truck	Tipper UD MK6 (Canopy) Wood chip truck (6396) 10400kg GVM 14900kg GCM
Truck	Hino Tipper 300 Series 616 Medium 2T 5500kg GVM
Truck-Water/Fuel Cart	Water Tanker Mitsubishi FV51 25400kg GVM Waste facility
Ute	Holden Colorado Single Cab 4x4 Ute (6505) Irrigation
Ute	Holden Colorado Single Cab 4x4 Utility (6364)
Ute	Mazda BT-50 DX Space Cab 4x2 Tipper Ute (6498)
Ute	Isuzu D-Max SX Space Cab 4x4 Ute (6580)
Ute	Holden Colorado LX Space Cab 4x4 Ute (6395) New Steamer with 2200mm tray

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