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ROAD ASSET MANAGEMENT PLAN

Version 1

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ABBREVIATIONS

AAAC	Average Annual Asset Consumption
AASB	Australian Accounting Standards Board
AMP	Asset Management Plan
CRC	Current Replacement Cost
DA	Depreciable Amount
EF	Earthworks Formation
FY	Financial Year
HDM4	Highway Development Maintenance Management System
HV	Software Heavy Vehicle
IRMP	Infrastructure Risk Management Plan
KPI	Key Performance Indicator
LCC	Life Cycle cost
LCE	Life Cycle Expenditure
LOS	Level of Service
LRRS	Local Roads of Regional Significant
LTFF	Long Term Financial Forecast
LV	Light Vehicle
MATM	Mackay Area Transport modelling
MGAM	Mackay Growth Allocation Model
MMS	Maintenance Management system
MRC	Mackay Regional Council
NTRO	National Transportation Research Organisation
PCI	Pavement Condition Index
PMS	Pavement Management System
RV	Residual Value
RAMP	Road Asset Management Plan
SOI	Statement of Intent
SLPT	Strategy, Leadership and Performance Team
TAZ	Traffic Analysis Zone
TIDS	Transport Infrastructure Development Scheme
VPH	Vehicles Per Hour

GLOSSARY

Annual service cost (ASC)

An estimate of the cost that would be tendered, per annum, if tenders were called for the supply of a service to a performance specification for a fixed term. The Annual Service Cost includes operating, maintenance, depreciation, finance/ opportunity and disposal costs, less revenue.

Asset class

Grouping of assets of a similar nature and use in an entity's operations (AASB 166.37).

Asset condition assessment

The process of continuous or periodic inspection, assessment, measurement and interpretation of the resultant data to indicate the condition of a specific asset to determine the need for some preventative or remedial action.

Asset management

The combination of management, financial, economic, and engineering and other practices applied to physical assets with the objective of providing the required level of service in the most cost-effective manner.

Assets

Future economic benefits controlled by the entity because of past transactions or other past events (AAS27.12).

Property, plant and equipment including infrastructure and other assets (such as furniture and fittings) with benefits expected to last more than 12 months.

Average annual asset consumption (AAAC)*

The amount of a local government's asset base consumed during a year. This may be calculated by dividing the Depreciable Amount (DA) by the Useful Life and totalled for each asset OR by dividing the Fair Value (Depreciated Replacement Cost) by the Remaining Life and totalled for each asset in an asset category or class.

Brownfield asset values**

Asset (re)valuation values based on the cost to replace the asset including demolition and restoration costs.

Capital expansion expenditure

Expenditure that extends an existing asset, at the same standard as is currently enjoyed by residents, to a new group of users. It is discretionary expenditure, which increases future operating, and maintenance costs, because it increases council's asset base, but may be associated with additional

revenue from the new user group, e.g., extending a drainage or road network, the provision of an oval or park in a new suburb for new residents.

Capital expenditure

Relatively large (material) expenditure, which has benefits, expected to last for more than 12 months. Capital expenditure includes renewal, expansion and upgrade. Where capital projects involve a combination of renewal, expansion and/or upgrade expenditures, the total project cost needs to be allocated accordingly.

Capital funding

Funding to pay for capital expenditure.

Capital grants

Monies received generally tied to the specific projects for which they are granted, which are often upgrade and/or expansion or new investment proposals.

Capital investment expenditure

See capital expenditure definition

Capital new expenditure

Expenditure which creates a new asset providing a new service to the community that did not exist beforehand. As it increases service potential it may impact revenue and will increase future operating and maintenance expenditure.

Capital renewal expenditure

Expenditure on an existing asset, which returns the service potential or the life of the asset up to that which it had originally. It is periodically required expenditure, relatively large (material) in value compared with the value of the components or sub-components of the asset being renewed. As it reinstates existing service potential, it has no impact on revenue, but may reduce future operating and maintenance expenditure if completed at the optimum time, e.g., resurfacing or resheeting a material part of a road network, replacing a material section of a drainage network with pipes of the same capacity, resurfacing an oval. Where capital projects involve a combination of renewal, expansion and/or upgrade expenditures, the total project cost needs to be allocated accordingly.

Capital upgrade expenditure

Expenditure, which enhances an existing asset to provide a higher level of service or expenditure that, will increase the life of the asset beyond that which it had originally. Upgrade expenditure is discretionary and often does not result in additional revenue unless direct user charges apply. It will increase

operating and maintenance expenditure in the future because of the increase in the council's asset base, e.g., widening the sealed area of an existing road, replacing drainage pipes with pipes of a greater capacity, enlarging a grandstand at a sporting facility. Where capital projects involve a combination of renewal, expansion and/or upgrade expenditures, the total project cost needs to be allocated accordingly.

Carrying amount

The amount at which an asset is recognised after deducting any accumulated depreciation / amortisation and accumulated impairment losses thereon.

Class of assets

See asset class definition

Component

An individual part of an asset which contributes to the composition of the whole and can be separated from or attached to an asset or a system.

Cost of an asset

The amount of cash or cash equivalents paid, or the fair value of the consideration given to acquire an asset at the time of its acquisition or construction, plus any costs necessary to place the asset into service. This includes one-off design and project management costs.

Current replacement cost (CRC)

The cost the entity would incur to acquire the asset on the reporting date. The cost is measured by reference to the lowest cost at which the gross future economic benefits could be obtained in the normal course of business or the minimum it would cost, to replace the existing asset with a technologically modern equivalent new asset (not a second hand one) with the same economic benefits (gross service potential) allowing for any differences in the quantity and quality of output and in operating costs.

Current replacement cost "As New" (CRC)

The current cost of replacing the original service potential of an existing asset, with a similar modern equivalent asset, i.e., the total cost of replacing an existing asset with an as NEW or similar asset expressed in current dollar values.

Cyclic Maintenance**

Replacement of higher value components/sub-components of assets that is undertaken on a regular cycle including repainting, building roof replacement, cycle, replacement of air conditioning equipment, etc. This work generally falls below the capital/ maintenance threshold and needs to be

identified in a specific maintenance budget allocation.

Depreciable amount

The cost of an asset, or other amount substituted for its cost, less its residual value (AASB 116.6)

Depreciated replacement cost (DRC)

The current replacement cost (CRC) of an asset less, where applicable, accumulated depreciation calculated based on such cost to reflect the already consumed or expired future economic benefits of the asset

Depreciation / amortisation

The systematic allocation of the depreciable amount (service potential) of an asset over its useful life.

Economic life

See useful life definition.

Expenditure

The spending of money on goods and services. Expenditure includes recurrent and capital.

Fair value

The amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties, in an arm's length transaction.

Greenfield asset values **

Asset (re)valuation values based on the cost to initially acquire the asset.

Heritage asset

An asset with historic, artistic, scientific, technological, geographical or environmental qualities that is held and maintained principally for its contribution to knowledge and culture and this purpose is central to the objectives of the entity holding it.

Impairment Loss

The amount by which the carrying amount of an asset exceeds its recoverable amount.

Infrastructure assets

Physical assets of the entity or of another entity that contribute to meeting the public's need for access to major economic and social facilities and services, e.g., roads, drainage, footpaths and cycleways. These are typically large, interconnected networks or portfolios of composite assets. The components of these assets may be separately maintained, renewed or replaced individually so that the required level and standard of service from the network of assets is continuously sustained. Generally, the components and hence the assets

have long lives. They are fixed in place and are often have no market value.

Investment property

Property held to earn rentals or for capital appreciation or both, rather than for:

- (a) use in the production or supply of goods or services or for administrative purposes; or
- (b) sale in the ordinary course of business (AASB 140.5)

Level of service

Is defined as a qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and or passengers. The LOS definition usually describes these conditions in terms of factors such as speed and travel time, freedom to manoeuvre, traffic interruptions, comfort and convenience and safety. In general, there are six levels of service, designated A to F, ranging from free flow conditions to forced or break-down flow.

Life Cycle Cost **

The life cycle cost (LCC) is average cost to provide the service over the longest asset life cycle. It comprises annual maintenance and asset consumption expense, represented by depreciation expense. The Life Cycle Cost does not indicate the funds required to provide the service in a particular year.

Life Cycle Expenditure **

The Life Cycle Expenditure (LCE) is the actual or planned annual maintenance and capital renewal expenditure incurred in providing the service in a particular year. Life Cycle Expenditure may be compared to Life Cycle Expenditure to give an initial indicator of life cycle sustainability.

Loans / borrowings

Loans result in funds being received which are then repaid over a period with interest (an additional cost). Their primary benefit is in 'spreading the burden' of capital expenditure over time. Although loans enable works to be completed sooner, they are only ultimately cost effective where the capital works funded (generally renewals) result in operating and maintenance cost savings, which are greater than the cost of the loan (interest and charges).

Maintenance and renewal gap

Difference between estimated budgets and projected expenditures for maintenance and renewal of assets, totalled over a defined time (e.g., 5, 10 and 15 years).

Maintenance and renewal sustainability index

Ratio of estimated budget to projected expenditure for maintenance and renewal of assets over a defined time (e.g., 5, 10 and 15 years).

Maintenance expenditure

Recurrent expenditure, which is periodically or regularly required as part of the anticipated schedule of works required to ensure that the asset achieves its useful life and provides the required level of service. It is expenditure, which was anticipated in determining the asset's useful life.

Materiality

An item is material if its omission or misstatement could influence the economic decisions of users taken based on the financial report. Materiality depends on the size and nature of the omission or misstatement judged in the surrounding circumstances.

Modern equivalent asset.

A structure like an existing structure and having the equivalent productive capacity, which could be built using modern materials, techniques and design. Replacement cost is the basis used to estimate the cost of constructing a modern equivalent asset.

Non-revenue generating investments

Investments for the provision of goods and services to sustain or improve services to the community that are not expected to generate any savings or revenue to the Council, e.g., parks and playgrounds, footpaths, roads and bridges, libraries, etc.

Operating expenditure

Recurrent expenditure, which is continuously required excluding maintenance and depreciation, e.g., power, fuel, staff, plant equipment, on-costs and overheads.

Pavement management system

A systematic process for measuring and predicting the condition of road pavements and wearing surfaces over time and recommending corrective actions.

Planned Maintenance**

Repair work that is identified and managed through a maintenance management system (MMS). MMS activities include inspection, assessing the condition against failure/breakdown criteria/experience, prioritising scheduling, actioning the work and reporting what was done to develop a maintenance history and improve maintenance and service delivery performance.

PMS Score

A measure of condition of a road segment determined from a Pavement Management System.

Rate of annual asset consumption*

A measure of average annual consumption of assets (AAAC) expressed as a percentage of the depreciable amount (AAAC/DA). Depreciation may be used for AAAC.

Rate of annual asset renewal*

A measure of the rate at which assets are being renewed per annum expressed as a percentage of depreciable amount (capital renewal expenditure/DA).

Rate of annual asset upgrade*

A measure of the rate at which assets are being upgraded and expanded per annum expressed as a percentage of depreciable amount (capital upgrade/expansion expenditure/DA).

Reactive maintenance

Unplanned repair work that carried out in response to service requests and management/supervisory directions.

Recoverable amount

The higher of an asset's fair value, less costs to sell and its value in use.

Recurrent expenditure

Relatively small (immaterial) expenditure or that which has benefits expected to last less than 12 months. Recurrent expenditure includes operating and maintenance expenditure.

Recurrent funding

Funding to pay for recurrent expenditure.

Rehabilitation

See capital renewal expenditure definition above.

Remaining life

The time remaining until an asset cease to provide the required service level or economic usefulness. Age plus remaining life is economic life.

Renewal

See capital renewal expenditure definition above.

Residual value

The net amount which an entity expects to obtain for an asset at the end of its useful life after deducting the expected costs of disposal.

Revenue generating investments

Investments for the provision of goods and services to sustain or improve services to the community that are expected to generate some savings or revenue to offset operating costs, e.g., public halls and theatres, childcare centres, sporting and recreation facilities, tourist information centres, etc.

Risk management

The application of a formal process to the range of possible values relating to key factors associated with a risk to determine the resultant ranges of outcomes and their probability of occurrence.

Section or segment

A self-contained part or piece of an infrastructure asset.

Service potential

The capacity to provide goods and services in accordance with the entity's objectives, whether those objectives are the generation of net cash inflows or the provision of goods and services of a volume and quantity to the beneficiaries thereof.

Service potential remaining*

A measure of the remaining life of assets expressed as a percentage of economic life. It is also a measure of the percentage of the asset's potential to provide services that are still available for use in providing services (DRC/DA).

Strategic Management Plan (SA)**

Documents Council objectives for a specified period (3-5 yrs.), the principal activities to achieve the objectives, how that will be carried out, estimated income and expenditure, measures to assess performance and how rating policy relates to the Council's objectives and activities.

Sub-component

Smaller individual parts that make up a component part.

Useful life

Either:

- (a) the period over which an asset is expected to be available for use by an entity, or
- (b) the number of production or similar units expected to be obtained from the asset by the entity.

It is estimated or expected time between placing the asset into service and removing it from service, or the estimated period over which the future economic benefits embodied in a depreciable asset, are expected to be consumed by the council. It is the same as the economic life.

Value in Use

The present value of estimated future cash flows expected to arise from the continuing use of an asset and from its disposal at the end of its useful life. It is deemed to be depreciated replacement cost (DRC) for those assets whose future economic benefits are not primarily dependent on the asset's ability to generate new cash flows, where if deprived of the asset its future economic benefits would be replaced.

Source: DVC 2006, Glossary

Note: Items shown * modified to use DA instead of CRC

Additional glossary items shown **

1 EXECUTIVE SUMMARY

1.1 What Council Provides

Council provides a Road network in partnership with the Community to enable planning, delivering and managing community services and facilities in a sustainable manner.

This Asset Management Plan covers the following infrastructure assets from within the 2,429.72 kilometre road network:

- Sealed and unsealed pavements and formation within the road reserve dedicated to Council for traffic movement;
- Bridges within the road network owned and operated by Council;
- Kerb and channel within the road network;
- Footpaths, Bus Shelters and Bicycle Paths within the road reserve, and
- Traffic management facilities within the road network such as roundabout, median islands, Guardrail, retaining walls and traffic control devices

1.2 What does it Cost?

There are two key indicators of cost to provide the Road Assets.

- The life cycle cost being the average cost over the life cycle of the asset, and
- The total maintenance and capital renewal expenditure required to deliver existing service levels in the period covered by Council's long term financial plan.

The life cycle cost of the road assets has not been quantified and is one of the major improvement proposals detailed in the improvement plan section of this report. Council has recently completed a major data cleanse of the road network; however, this is an ongoing exercise to maintain the most accurate asset cycle cost at the current snapshot in time.

The total capital expenditure recorded on the LTFF in the next 10 years is estimated at \$650,332,302.71 of which \$331,811,217.00 is estimated to be utilised for asset renewal while depreciation assessments total \$ 344,433,760.22 (Asset depreciation value is based on utilising the current annual depreciation figure for future years)

The current financial statements and the adopted long term financial plan currently use the asset class Roads, Bridges and Drainage network. Currently all financial costs are collected and modelled on this assumption. Changes to Council's accounting procedures and transitions from the DeltaS system to the current corporate MMS Assetic system, Council can now accurately separate and report Roads vs Drainage costs. This allows Council to attain a more detailed cost breakdown of expenditure and therefore will assist with future LTFF funding allocations.

Further refinement of the system and assessment of maintenance costs and triggers for intervention levels will need to be improved via "Condition Assessments" or other measure. This will need to be reviewed and considered as part of outcomes from this plan.

1.3 Plans for the Future

Council plans to operate and maintain the road network to achieve the following strategic objectives.

1. Ensure the road network is maintained at a safe and functional standard as set out in this Asset Management Plan and at the level of service adopted by Council;
2. Demonstrate asset management of the road's, footpaths, kerb & channel, bridges and other subclass in the most cost effective and sustainable manner;
3. Communicate and justify funding requirements;
4. Comply with regulatory requirements;
5. Utilise technical and financial techniques over the lifecycle of the asset to provide pre-determined levels of service.
6. Identify, establish and support planning decisions relating to the asset's lifecycle.
7. Provide a detailed improvement plan for the enhancement of road asset management.
8. Develop an Integrated Road Asset Management System.

1.4 Measuring our Performance

Quality

Road assets will be maintained in a serviceable condition based on the level of service adopted by Council. Details of the maintenance response service levels and the details of defect prioritisation and response time are included within the Plan.

Function

Council's intent is that an appropriate road network is maintained in partnership with other levels of government and stakeholders to meet the levels of service adopted by Council and requested by the Community.

Road asset attributes will be maintained at a serviceable level as needed to ensure public safety. Council needs to ensure the following key functional objectives are met:

- Demonstrate asset management of the road's asset class in the most cost effective and sustainable manner;
- Communicate and justify funding requirements;
- Comply with regulatory requirements;
- Utilise technical and financial techniques over the lifecycle of the asset to provide pre-determined levels of service; and
- Identify, establish and support planning decisions relating to the asset's lifecycle.

The Next Steps

To achieve the required outcomes significant improvements are required detailed in table 8.1 of this report, a summary of some of the key items are noted below;

- As part of community consultation process research community expectations and cost resulting level of service based on community expectations.
- Quantify community expectations for level of service and forecast costs to achieve level of service.
- Based on community expectation develop and submit for approval by Council a level of service to form the basis for rehabilitation and renewal plans.
- Condition Assessments to be completed for all asset classes and updated as per the business rules.
- Develop renewal programs for all assets based on their condition rating and input into future revisions and Long-Term Financial Strategy.
- Develop and remodel existing procedures and systems to reflect requirements to report against KPI's.
- Review process of maintenance delivery to assess intervention levels and unit costs to meet these levels.
- Improve formal Maintenance Management system linking to both the corporate financial system and Asset Management

system so that a link between the maintenance and renewal cost and overall life cycle costs of assets can be made.

- Establish Transport Infrastructure Management System to review traffic flows and network capacity and schedule future road upgrades to address traffic flow requirements.
- Establish Demand Management procedures to limit effect of future traffic flow increases particularly related to increased public transport usage, multiple passenger requirements and parking manage.
- Undertake an assessment of future donated assets to be received by Council and its subsequent effects on maintenance and renewal expenditure requirements.
- Institute a Bridge Management System to improve the existing bridge management plan with the ability to review and record inspection, maintenance and renewal priorities and timing for all bridge assets.
- Review Long Term Financial strategy based on assessed levels of services and future maintenance and renewal costs for the asset class including assessment of life cycle gap and sustainability index.
- Undertake formal Enterprise Risk Management assessment for all road class assets.
- Undertake corridor studies on identified arterial routes for upgrades.

2 INTRODUCTION

2.1 Background

The purpose of the Asset Management Plan is to demonstrate responsive asset management and services provided from assets, compliance with regulatory requirements, and to communicate funding requirements detailing the required levels of service from customer feedback and standard engineering practices.

The purpose of the Road Asset Management Plan is to:

- Demonstrate asset management of the road's asset class in the most cost effective and sustainable manner;
- Communicate and justify funding requirements;
- Comply with regulatory requirements;
- Utilise technical and financial techniques over the lifecycle of the asset to provide pre-determined levels of service;
- Identify, establish and support planning decisions relating to the asset's lifecycle; and
- Provide a detailed improvement plan for the enhancement of road asset management in the future.

The outcome of this Asset Management Plan is to create or compile data, information and plans to effectively undertake Asset Lifecycle Management and in turn identify future funding and service delivery requirements.

The Asset Management Plan is to be read in conjunction with the following associated planning documents:

- Mackay Regional Council Corporate Plan 2022-2027. The direction and focus for the undertaking of this Asset Management Plan stems from the vision, mission, priorities, objectives and strategies contained within the Corporate Plan and in particular "Ensure that asset management aligns to council's strategic direction and that effective asset management practices are in place to optimise the use of council's assets required to deliver services to the community."
- Council will have robust strategic asset management practices to optimise the planning, delivery and maintenance of public assets. Mackay Regional Council 2023/24 Operational Plan supports the Corporate Plan and identified project initiatives and services which will be delivered with the ultimate aim at achieving the long-term objectives of the Corporate Plan. The included action items are extracted from the Infrastructure and Transport – Better Roads, Operation Plan specifically related to Asset Management issues.

This Asset Management Plan covers 2,429.71 kilometre of road network including the following infrastructure assets:

- Sealed and unsealed pavements and formation within the road reserve dedicated to Council for traffic movement;
- Bridges within the road network owned and operated by Council;
- Kerb and channel within the road network;
- Footpaths, Bus Shelters and Bicycle Paths within the road reserve;
- Traffic management facilities within the road network such as roundabout, median islands, barriers, retaining walls, signs, traffic signals and traffic control devices; and
- Carparks

In this Asset Management Plan these asset classes will be referred to as “road assets”.

Table 2-1: Assets covered by this Plan (as of 30/06/2023)

Asset Category	Financial Replacement Value
Road - Formation	\$ 102,316,782.00
Road – Pavement Base	\$ 591,920,124.00
Road – Pavement Subbase	\$ 230,165,873.00
Road - Surface	\$ 318,302,447.00
Unsealed Roads	\$ 156,100,114.30
Kerb and Channel	\$ 130,182,732.00
Traffic Management Facilities <i>(Inclusive of signs, signals, road barriers and traffic control devices)</i>	\$ 54,430,781.74
Footpaths	\$ 148,240,502.00
Bridges	\$ 148,720,000.00
Carparks	\$ 13,957,767.16
Public Transport Shelters and Stops	\$ 12,095,000.00
Grand Total	\$1,906,432,123.20

Key stakeholders during the preparation and implementation of this Asset Management Plan are:

- Councillors;
- Staff of Mackay Regional Council;
- Community;
- Visitors to Mackay Region;
- State and Federal Governments;
- Utility providers;
- Developers;
- Contractors/consultants, and
- Insurers.

The Corporate Structure of Council attached as Appendix A sets out the activities within the areas of responsibility within Council and their association with Council assets.

2.2 Goals and Objectives of Asset Management

The purpose of a Council is to provide services to its community. Some of these services are provided by infrastructure assets such as roads and bridges. Council can acquire infrastructure assets by purchase, contract, construction by Council staff and donation of assets from developers, State Government, or private entities. Council's goal in managing infrastructure assets is to meet the required level of service in the most cost-effective manner for present and future consumers. The key elements of infrastructure asset management are:

- Taking a life cycle approach;
- Develop long term cost-effective management strategies;
- Providing a defined level of service and monitoring performance;
- Understanding and meeting the demands of growth through demand management and infrastructure investment;
- Managing risks associated with asset failures;
- Sustainable use of physical resources and
- Continuous improvement in asset management practices.

This Asset Management Plan is prepared under the direction of Council's vision, mission, goals and objectives. Council's vision is identified in the Corporate Plan 2022-2027 as follows:

- Attract new business and events;
- Advocate for the community's interests and investments from the Queensland and Australian governments A strong regional identity;
- Facilitate future growth by working with the community and development industry;
- Partner with adjoining jurisdictions and organisations;
- Deliver community services by providing a range of services to the community, such as planning regulations and development, public health, local roads and footpaths, parks and playing fields, libraries, local environmental issues, waste management, water, sewerage, transport and drainage, and other community services and
- Collaborate with the private sector and community organisations, creating mutually beneficial partnerships to deliver diverse initiatives.

Other relevant Council objectives and strategies and how these are addressed in this Asset Management Plan are detailed in Table 2-2 below.

Table 2-2: Council Strategic Priorities, Objectives & Strategies and how these are addressed in this Plan (Source: Mackay Regional Council – Corporate Plan 2023-2024)

Corporate Plan Strategy	Action	Evaluation	Responsibility
Use of a consistent Asset Management Plan (AMP) template for all asset classes and confidence of the data outputs is high	AMPs for all asset classes are complete by June 2024	Review and complete in readiness for budget considerations	Asset Management
Strengthen working relationships with key stakeholders	Levels of service with internal stakeholders implemented and monitored	Update AMP with findings	Asset Management
Strengthen working relationships with key stakeholders	Levels of service with external stakeholders defined	Update AMP with findings	Asset Management

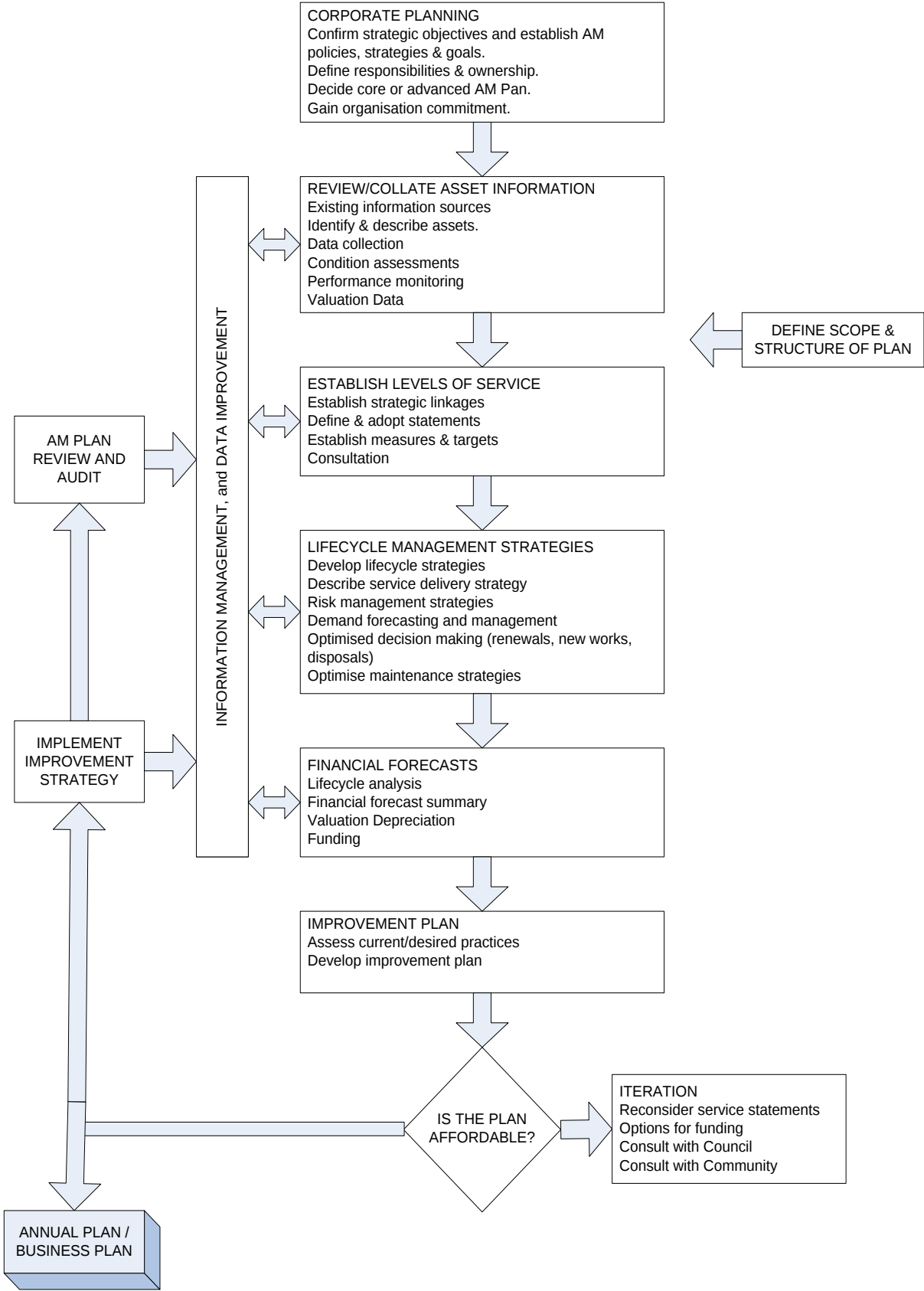
2.3 Plan Framework

Key elements of the plan are:

- Levels of service – specifies the services and levels of service to be provided by Council;
- Future demand – how this will impact on future service delivery and how this is to be met;
- Life cycle management – how Council will manage its existing and future assets to provide the required services;
- Financial summary – what funds are required to provide the required services;
- Asset management practices;
- Monitoring – how the plan will be monitored to ensure it is meeting Council's objectives;
- Asset management improvement plan and

A road map for preparing an asset management plan is shown below.

Figure 2-1: Road Map for preparing an Asset Management Plan
(Source: IIMM Fig 1.5.1, p 1.11)



2.4 Core and Advanced Asset Management

This Asset Management Plan is prepared as a 'core' asset management plan in accordance with the International Infrastructure Management Manual. It is prepared to meet minimum legislative and organisational requirements for sustainable service delivery and long-term financial planning and reporting. The core asset management is a 'top down' approach where analysis is applied at the 'system' or 'network' level.

Future revisions of this Asset Management Plan will move towards 'advanced' asset management using a 'bottom up' approach for gathering asset information for individual assets to support the optimisation of activities and programs to meet agreed service levels. several sub asset management plans have been completed and will be utilised to improve the accuracy of this Roads AMP. The Following sub-AMPs will be utilised to initiate the bottom up approach;

- Sealed Roads
- Pathways
- Kerb and Channel
- Bridges
- Bus Stop Infrastructure

The remaining sub-AMPs that are not completed are; Traffic Management Devices, Car Parks and Traffic Signals.

3 LEVELS OF SERVICE

The level of service an asset provides to the community is a function of its fitness for purpose, both perceived and real. The fitness for purpose is a function of:

- The completeness - rate of completion and ongoing perceived need for the asset
- The applicability of the original design; and
- The effectiveness of maintenance carried out over the life of the asset.

In this Asset Management Plan, maintenance is defined as the ongoing expenditure to ensure the asset realises its useful life. Rehabilitation is the expenditure for maintaining the current level of service by reinstating the original life of the asset.

3.1 Customer Research and Expectations

Council has not carried out any specific research on customer expectations. This will be investigated for future updates of the Asset Management Plan.

However, as part of the 2018 Mackay Regional Council Community Survey, non-specific ratings of the importance of individual assets and services, customer satisfaction and community priorities were assessed and reported. These results are located in Appendix B of this report.

The survey highlights the level of importance the community places on maintenance and construction of sealed, unsealed roads together with satisfaction ratings which highlight a significant gap between customer satisfaction ratings and expectations regarding the level of maintenance provided.

Similarly, the survey has highlighted that the community believes that Council should rate road maintenance as a higher priority within its operational activities.

Future research in the operation and maintenance of road assets will combine specific community expectation and satisfaction survey information, results of customer service request system outputs together with Council management of its infrastructure via a blend of currently formally programmed maintenance and rehabilitation from inspections and outputs from its pavement management system and reactive maintenance to improve overall system management.

Council proposes to use this data in developing the Corporate and Operational Plans and in allocation of resources in budgets to fund agreed levels of service for maintenance, rehabilitation and future construction works.

3.2 Legislative Requirements

Council is required to meet many legislative requirements including Australian and State legislation and State regulations and are drivers affecting the level of service for roads assets.

Table 3-1: Legislative Requirements

Requirement	Legislation
Work in Road Reserves	• Local Government Act 2009 • Transport Infrastructure Act 1994 • Transport Operations (Road Use) Management Act 1995 • Manual of Uniform Traffic Control Devices
Safety	• Local Government Act 2009
Accessibility	• Disability Discrimination Act 1992 • Disability Standards for Accessible Public Transport 2002

3.3 Current Levels of Service

Current Level of Service is defined by the following criteria:

Community Levels of Service relate to how the community receives the service in terms of safety, quality, connectivity, reliability, responsiveness, cost efficiency and legislative compliance. At this stage no, specific levels of service have been determined and these will be subject to a determination in the future as part of the Community Survey process. A target LOS is detailed in each individual sub-asset management plan, however these are either driven by ELT or a based on assumptions.

Supporting the community service levels are operational and technical measures of performance developed to ensure that the minimum community levels of service are met.

Given that there are many drivers for level of service Council have implemented several methods to manage these criteria. It is a blend of informal programmed maintenance, reactive maintenance based on Customer Service Request and Supervisor Programmed Inspections managed through a Maintenance Management system called "Delta S" which has transferred to the corporate MMS "Assetic" as of 28 October 2019.

It should be noted that one of the major future developments under this plan is to implement a whole of Council integrated management system which would be proactive in its approach and include field inspections, tracking of work orders through to practical completion and integrating outputs from pavement condition inspections and generated rehabilitation projects as well as being linked to Council's finance and Asset Management systems.

After a period of utilising such a maintenance and pavement management system levels of service could be reassessed and along with unit rates to undertake maintenance and rehabilitation could be used to predict life cycle costs of the assets and to predict financial impacts on council for modifications to level of service.

3.4 Desired Levels of Service

At present, indications of desired levels of service are only obtained from the Mackay Regional Council Community 2018 Survey which contain residents' feedback to Councillors and staff, service requests and correspondence. Council has yet to quantify desired levels of service in conjunction with current LTFF. This will be completed in future revisions of this Asset Management Plan along with highlighting budgetary impact of such decisions.

There has been no formal assessment of customer levels of service undertaken at this stage and is a matter for future consideration as part of the improvement plan identified in Section 8 of this document. Perceived customer levels of service are detailed in each sub-asset management plan.

4 FUTURE DEMAND

4.1 Demand Forecast

MRC has carried out recent updates to the Mackay Growth Allocation Model (MGAM), which has the capability to forecast both population and employment detail. The MGAM provides population and land use information at the “Lot Level”. The first step is to utilise the data from the lot level to review the Traffic Analysis Zone (TAZ) levels in reference to the geographical boundaries in Mackay Area Traffic Model (MATM).

The Mackay Region continues to be one of the fastest growing regions in Australia. Population predictions indicated expected growth of 2.1% annually from estimated figures of 110,000 in 2008 to 160,000 in 2026. Growth of this nature is being fuelled by the mining boom in the hinterland and will provide a challenge in delivering and maintaining adequate infrastructure and services to support such growth. Factors affecting demand include population change, changes in demographics, seasonal factors, vehicle ownership and running costs, public transport usage, consumer preferences and expectations, economic factors, tourism growth, agricultural practices, environmental awareness and increased alternative transport modes.

Passenger transport improvement are a key issue which will need to be address to relief peak traffic congestions and improve liveability standards. Increased passenger transport mode share and the viability of alternative modal options is a key issue where further improvement are required to address increased demands.

4.2 Trip Generation Data

Traffic count data has been assessed from actual measurements and from the Mackay Area Integrated Traffic Model 2017 which generated the following traffic growth assessments.

Table 4-1 details 2021 Base Case for total daily vehicle demands on light vehicles (LV) and heavy vehicles (HV) by reporting sectors as trip origins. This is references to the 2011 demand model to compare the results. The overall modelled vehicle demand has a compounding growth of 0.4% per annum from 2011 to 2021. This is in line with the combined effect of 0.9% annual population growth with -0.5% annum job growth between 2011 and 2021.

At the detailed sector level, the model indicates a reduction of traffic in the Mackay CBD due to significant job reductions in this area. On the other hand, the increase of traffic counts in Rural View and Ooralea represents an increase of population, jobs or both in these areas.

Table 4-1: 2011 and 2021 Daily Total Vehicle Demand by Report Sector

Sector ID	Report Sector	2011	2021 BC
		Origin Totals	Origin Totals
1	Rural View	20,463	32,639
2	Regional - Northwest	12,943	12,594
3	North Mackay	91,821	93,571
4	Rosella	3,469	2,794
5	Port	7,077	7,169
6	Paget	24,424	26,181
7	Regional - Southwest	18,253	22,464
8	Regional - South Mackay	23,614	24,951
9	Ooralea	5,297	9,658
10	Mackay CBD	101,955	89,298
	Total	309,316	321,320

Table 4-2 shows the estimated total population and job growth in MATM from 2011 to 2036. The growth rates starts from 2011 increments of 5years thereafter to 2036. It details the overall population has a slower growth to begin with in earlier years with growth under 1% per annum until 2021. The total number of jobs decline from 2011 – 2016 then increases on a steady growth. The results indicate that both population and jobs are forecast to increase from 2026 onwards, this is a healthy sign of a fast growing region.

Table 4-2: 2011 - 2036 Population and Employment Growth

	2011	2016	2021	2026	2031	2036
Total Resident Population	117,151	118,294	128,023	138,769	150,709	165,127
Growth (from 2011 per annum)		0.2%	0.9%	1.1%	1.3%	1.4%
Total Jobs	55,292	48,471	52,793	55,836	59,489	66,123
Growth (from 2011 per annum)		-2.6%	-0.5%	0.1%	0.4%	0.7%

Table 4-3 highlights the total daily vehicle demands for report sectors, this was tabulated from the above demographic, land use inputs and the growth rate estimate from the table above.

Table 4-3: 2011 - 2036 Daily Total Vehicle Demand by Report Sector

Sector ID	Report Sector	2011	2021	2026	2031	2036
		Origin Totals	Origin Totals	Origin Totals	Origin Totals	Origin Totals
1	Rural View (include Shoal Point Bucasia)	20,463	32,639	38,710	44,650	51,702
2	Regional - Northwest	12,943	12,594	12,926	13,335	13,661
3	North Mackay	91,821	93,571	99,424	105,348	110,010
4	Rosella	3,469	2,794	3,117	3,245	3,379
5	Port	7,077	7,169	7,319	7,803	8,635
6	Paget	24,424	26,181	26,678	28,244	32,604
7	Regional - Southwest	18,253	22,464	23,661	25,126	26,511
8	Regional - South Mackay	23,614	24,951	26,111	28,817	31,069
9	Ooralea	5,297	9,658	13,168	18,564	21,160
10	Mackay CBD	101,955	89,298	94,153	101,023	109,515
	Total	309,316	321,320	345,268	376,153	408,247
	Growth (from 2011 per annum)		0.4%	0.7%	1.0%	1.1%

In reviewing Table 4-3 it indicates a significant traffic growth from 2011- 2036 for Rural View and Ooralea sectors. Rural View and Ooralea daily traffic will increase 150% and 300% respectively. The majority of the growth in Ooralea will take place between 2021 and 2031 where the daily traffic movement will almost double and increase 92% to reach an estimated daily traffic movement of 18,564. The growth in Rural View will be boom from 2011 – 2021 at 60% before a steady 3.4% annual growth from 2021 – 2036 reach a final daily vehicle demand of 51,702 vehicles.

North Mackay will also have a steady growth of 0.8% per annum from 2011- 2036 with a total increase of 18,189 daily vehicle demand. However, given the report sector is already well established, the increased growth may not cause any major concerns. However, ongoing monitoring of traffic growth and transportation needs will be undertaken and used as inputs to determine future capital works programmes to provide increased road capacity to service existing populations and proposed development.

It is proposed to extend the Traffic Model to form the basis of an assessment model to schedule road asset upgrades to meet traffic generation demands for future capital works programmes. Projects currently scheduled in the Long-Term Financial Forecast have been mitigated using outputs from the MATM, this schedules projects at network macro levels and establishes timing for trunk road upgrades. Detailed level investigations and traffic studies will need to be investigated as traffic volumes approach trigger values, this will become more crucial as traffic congestions increases as the exact timing of project delivery will need to be forecasted to assist with funding allocations. Establishment of a Transportation Infrastructure Management System to integrate the above items and model current and future traffic data would:

- Enable best whole of life returns on investments;
- Document the rationale for investment decisions;
- Provide the tools to achieve excellence in all phases of asset creation and maintenance;
- Enable preservation and optimum use of knowledge assets such as data, information, and human capital and
- Provide an effective and efficient learning tool.

4.2 Changes in Technology

Technological advances will increase the effectiveness and efficiency of asset inspection and recording by better data management and improvements in processing and recording of inspection and pavement records. This information includes asset physical parameters, defective issues and condition rating which is utilised to create maintenance programs and assist with LTFF. Future advances in road surfacing and pavement technology may also improve “fitness for purpose” pavement and surface options which may provide economies in both road maintenance and construction outcomes. Similarly, automation of information gathering processes may reduce the physical inspection processes required in the ongoing monitoring of the road assets.

4.3 Demand Management Plan

Demand for new services will be managed through a combination of managing existing assets, upgrading of existing assets and providing new assets to meet demand and demand management. Demand management practices include non-asset solutions, insuring against risks and managing failures. Council has some direct ability to exert influence on transport modes and the number of trips through land use planning. This planning is used to encourage public transport oriented development in appropriate areas.

This process in combination with Council initiatives for provision of pedestrian and cycleway assets may assist in some level of demand management. However, the larger driver in demand management may be the establishment of a viable and efficient public transport system to service the expanding region. While Council may be able to provide some input to this proposal ultimately the power to institute such a process lies with TMR and the State Government. Further progression and implementation of TransLink’s foreshadowed public transport network improvements will assist in this regard.

4.4 New Assets from Growth

New assets are constructed to accommodate for network growth and to service increased traffic volumes. A large percentage of acquisitions are predominately acquired from subdivision. In 2021/22 FY 5,255m of new roads assets was constructed and in 2022/23 FY 3,288m of new roads asset was constructed. This equates to network growth of 0.135% from the previous financial year.

The roads network is currently undergoing an asset revaluation in 2023/24FY. This will result to movement within the roads asset class caused by completion of open works ordered assigned to the roads asset and ongoing data cleanse projects to improve asset integrity and accuracy.

Currently Infrastructure Planning and Asset Management are working on cleansing the sealed and unsealed roads network. During the annual road inspections, inaccurate data would commonly occur at the transition point where the roads network would change from sealed to unsealed. Therefore, a project was raised to address this issue with the aim to complete this project prior to the road's revaluation.

Acquiring these new assets will commit Council to fund ongoing operations and maintenance costs for the remaining asset life of the new asset. These future costs will be required to be identified and considered in developing forecast of future operating and maintenance costs.

At this stage limited ability exists to predict the future growth of assets, however, as part of the Strategic Planning and Local Area Planning processes for growth precincts within the City it is expected some level of determination may be made of donated assets which can be utilised as part of future financial modelling to determine financial impacts because of the presence of the assets.

5 LIFECYCLE MANAGEMENT PLAN

5.1 Background Data

The lifecycle management plan details how Council plans to manage and operate the assets at the agreed levels of service (defined in section 3) while optimising life cycle costs.

Table 5-1: Summary of Council's Road Asset Data

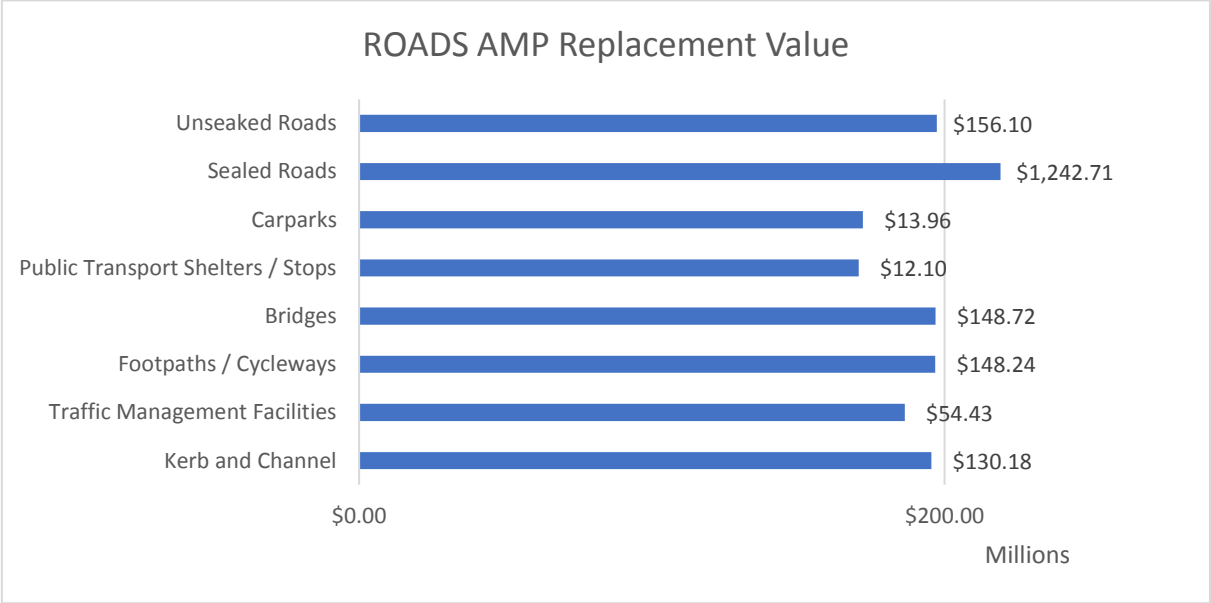
Road Category	Length (km)	Replacement Value
Sealed Access Place	130.28	\$ 101,855,376.20
Sealed Access Street	661.75	\$ 453,377,690.37
Sealed Laneway	4.40	\$ 7,282,855.79
Sealed Minor Collector	395.38	\$ 300,866,531.22
Sealed Major Collector	49.6	\$ 53,022,776.27
Sealed Controlled Distributor	32.25	\$ 55,035,869.95
Sealed Traffic Distributor	224.48	\$ 173,048,331.06
Sealed Arterial	68.36	\$ 97,142,562.08
Sealed Highway	1.18	\$ 1,073,233.07
Unsealed Access Place	4.25	\$ 728,014.44
Unsealed Access Street	737.34	\$ 124,837,798.04
Unsealed Laneway	0.04	\$ 3,293.95
Unsealed Minor Collector	98.47	\$ 26,717,759.33
Unsealed Major Collector	0.43	\$ 50,585.68
Unsealed Traffic Distributor	21.50	\$ 3,762,662.86
Grand Total	2,429.71 km	\$ 1,398,805,340.30

Table 5-2: Other Asset Data Groups

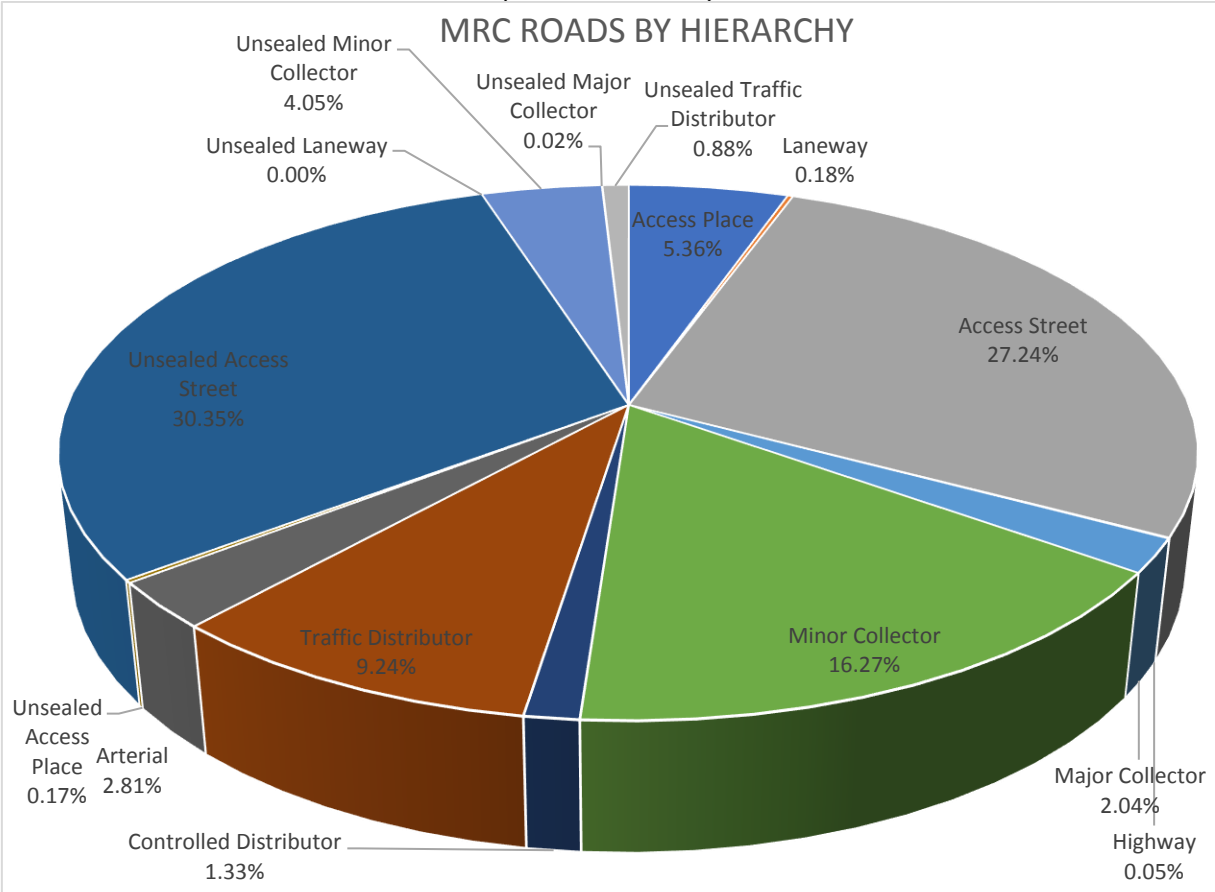
Asset Category	Unit	Replacement Value
Kerb and Channel	1,178.85 km	\$ 130,182,732.00
Traffic Management Facilities	5494 qty	\$ 54,430,781.74
Footpaths / Cycleways	321.72 km	\$ 148,240,502.00
Bridges	126 Qty	\$ 148,720,000.00
Public Transport Shelters / Stops	509 qty	\$ 12,095,000.00
Carparks	964 qty	\$ 13,957,767.16
Grand Total		\$ 507,626,782.90

Total Replacement Value for all asset classes in this AMP is \$1,906,432,123.20

Graph 5-1a: Summary of Council Assets
(Source – Assetic)



Graph 5-2b: MRC Roads by Hierarchy
(Source – Assetic)



5.1.1 Physical Parameters

The physical geometry parameters for the road assets are recorded including details of seal type and pavement treatments and age.

The age profile of road surface and pavement categories of Council’s road assets are shown in Appendix C. Other assets are based on condition assessments only so have not at this stage been included.

While the network, on average, appears in reasonable condition, future challenges exist for both maintenance and rehabilitation based on aging pavement and surfacing within the road network. Significant investment would be required to maintain the increasing demands for improved LOS. A condition survey of the roads network is completed on a three yearly basis to align with the rules and regulations driven by NDRRA recovery arrangements. The last roads condition survey was completed in 2022 the results are uploaded in the pavement management system and will be utilised to output future work programs.

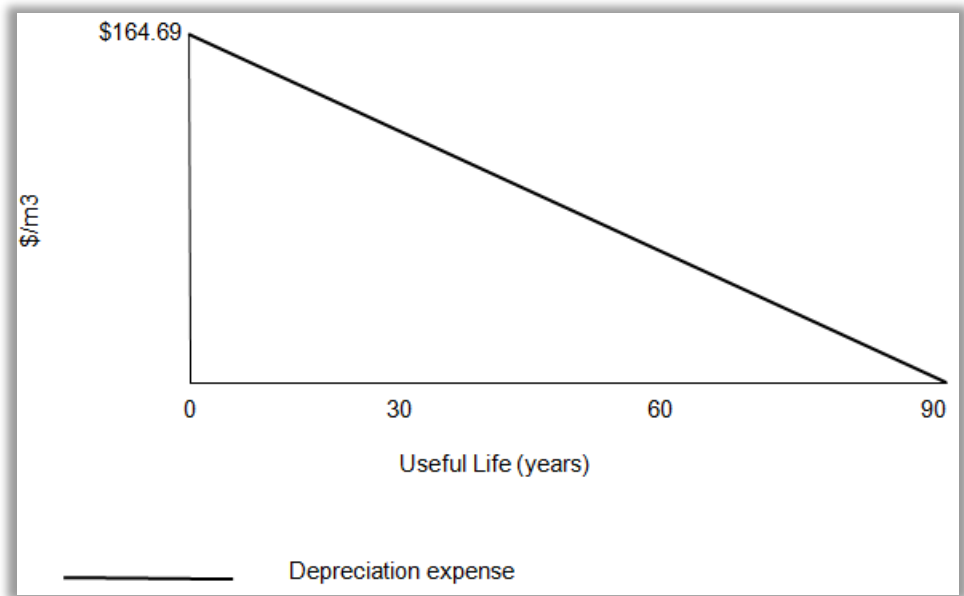
5.1.2 Asset Useful Life

Council currently records depreciation for all assets by the straight-line method. However, it is noted that Council is review this model and is exploring the complexities of converting to a condition based depreciation model. Refer to the example below for the current linear depreciation model of a road pavement.

Example 1.0:

Sub Pavement (Fine Crushed Rock FCR2): 100 cubic metres
Cost: \$164.69 per cubic metre
Asset Value: \$16,469
Useful life: 90 years
Depreciation: Entire Asset Value depreciated over 90 years
Annual Depreciation: ($\$16,469/90$) = \$184.95 per year

Graph 5-3: Example 1.0 of Straight Line Pavement Depreciation



The useful life of an asset is defined as the period over which the depreciable asset is expected to be fully utilised, however, this period can be significantly impacted on by maintenance practices. When an asset requires repairs or rejuvenation, the capital expenditure will increase the asset value and extend the asset life. This is reflected in example 2.0 below.

Example 2.0:

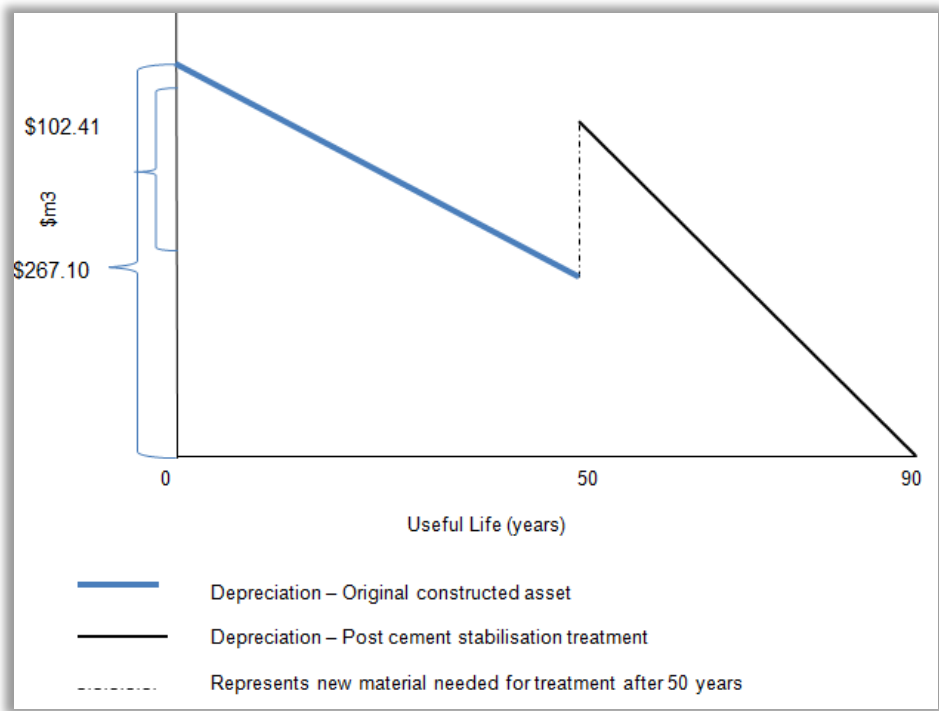
a) Upon construction
Pavement (Cement Stabilised Crushed Rock): 100 cubic metres
Cost: \$267.10 per cubic metre
Asset Value: \$26,710
Useful life: 90 years
Depreciation: Entire Asset Value depreciated over 90 years
Annual Depreciation: $\$26,710/90 = \296.78 per year

b) Upon reconditioning
Cement stabilised costs: \$102.41 per cubic metre
Value added: \$10,241.00.
Depreciation to date: $\$296.78 \times 50 = \$14,839$.
Depreciated replacement cost to date; $\$26,710 - \$14,839 = \$11,871$

c) New Pavement Value
Pavement Value: $\$11,871 + \$10,241 = \$22,112$
Remaining useful life: $90 - 50 = 40$ years
Depreciation: entire asset value depreciated over 40 years
Annual depreciation: $\$22,112/40 = \552.80

Therefore, it is reasonable to conclude the total asset will be fully depreciated over 90 years at two different rates over the course of its 90 year life.

Graph 5-4: Example 2.0 of Straight Line Pavement Depreciation with Maintenance



The table below identifies the useful lives currently adopted by Council for road network assets.

Table 5-3: Asset Useful Life and Residual Values
(Source: MRC Finance Policy)

Asset	Asset Class	Useful Life (Years)	Residual Value (%)
Roads – Sealed & Car Parks	Surfacing – Spray Seal	50	0%
	Surfacing – Asphalt	50	0%
	Pavement – Flexible	90	0%
	Pavement – Concrete	90	0%
	Formation	100 / Indefinite life	100 %
	Resurfacing – Spray Seals	12	0%
	Resurfacing – Asphalt	18	0%
Roads – Unsealed	Gravel Surface	100 / Indefinite life	100%
	Formation	100 / Indefinite life	100%
Kerb and Channels	All	100	0%
Traffic Facilities	Street Lights	40	0%
	Traffic Signals	35	0%
	Roundabouts (concrete)	100	0%
	Median and other islands	100	0%
	Concrete Barrier / Guard Rail	100	0%
Footpaths	Asphalt	50	0%
	Spray Seal	50	0%
	Brick Pavers	50	0%
	Concrete	100	0%
	Gravel	50	0%
	Earth	100	100%
Bridges	Wooden	100	0%
	Steel, Concrete	100	0%
Bus Shelters	Public Transport Shelters	40	0%
	Public Transport Stops	100	0%

5.1.3 Asset Capacity and Performance

Council's assets and services are designed to meet the standards as indicated in the Engineering Design Guidelines, Council's road hierarchy plans and standard drawings at the time of constructions.

Large sections of the network are highly underutilised and hence the network is believed to have not reached its traffic capacity. No computer modelling, or statistical analysis has been used to calculate future capacity of the network to date, however as noted on Table 8-1, future improvement plans have been noted to ascertain better asset capacity and performance.

Given that no traffic model is available for the local road network and only anecdotal information of network capacity problems are available. As per section 4.0 of this report, it is proposed to establish a Transportation

Infrastructure Management System to integrate current known traffic volumes, future and modelled traffic data measurements which would:

- Enable best whole of life returns on investments;
- Document the rationale for investment decisions;
- Provide the tools to achieve excellence in all phases of asset creation and maintenance;
- Enable preservation and optimum use of knowledge assets such as data, information, and human capital and
- Provide an effective and efficient learning tool.

This action is proposed as an outcome of the Asset Management Plan

5.1.4 Asset Condition

Council operates and maintains a pavement management system (PMS) designed and supported by the National Transport Research Organisation (NTRO)

The NTRO PMS is an engineering tool that forecast pavement deterioration from input data such as;

- Physical asset geometry and characteristics;
- Condition inspection data;
- Traffic loading and volumes; and
- Weather conditions.

And models each unique section of sealed flexible road pavement, using the HDM4 deterioration model. This can be performed both historically and in the future. The system will output estimates of timing for reseal, rehabilitation or reconstruction. The system has provision to generate works programmes based on set condition requirements or alternatively create work programmes based on budget allocations.

The output generated from the pavement management system, coupled with onsite inspections and verification by experienced field staff, is used to form the basis of the capital works programmes.

As a control function, the pavement management system has the ability to use pavement condition indices to set the required 'level of service' this rule base will therefore set a precedence on the road network and create a works program to maintain the required compliance level.

Council currently has indicated a preferred pavement condition indices level of 7 for urban sealed road and 5.5 for rural sealed roads. In the appended information an "average" compliance level of 6.25 has been used for comparison purposes and for easy display.

The NTRO Pavement Condition Index (PCI) was formulated several years before the AUSTROADS PCIs were available and has been retained to give a degree of consistency between the current version and earlier versions of the software.

The NTRO PCI rating system is defined by the following: ranking of 10 for a road without defects (perfect condition) and deducts points from this ranking depending on the level and types of distresses present in the pavement. In general terms the PCI value is interpreted as shown in the

Table 5-4 below.

Table 5-4: NTRO PCI Rating

PCI	Road Condition
10 to 8.5	Excellent
7.0 to 8.5	Very good
5.5 to 7.0	Good
4.0 to 5.5	Fair
2.5 to 4.0	Poor
1.0 to 2.5	Very poor
< 1.0	Failed

Based on the use of the PCI a breakdown of the current road network condition against the “average” pavement condition index is included in Appendix D, where the data is tabulated in a table graph and road sections are recorded against the PCI rating.

The current rural and urban average network PCI levels are above the targeted PCI of 5.5 and 7 respectively. It should be highlighted that a number of individual segments may be less than the target PCI but the assessment of the network average currently available supports the premise that the network condition is currently sitting above the targeted average.

Once the works program is obtained from the NTRO PMS, these roads will be interrogated following site inspections to generate prioritised listings for action. Management Principles and selection criteria objectives will be reflected in the “NTRO PMS Business Rule”. This document is under review and will be made available in the near future. The purpose of this document is to highlight the process and step by step produce taken to prioritise selected roads for Resealing, Rehabilitation or Reconstruction.

Road Network Maintenance Management System

The road network is operating on an internal system called DeltaS to manage the RMPC Program. Council has also transitioned to Assetic on the 28th of October 2019. This asset software is the point of truth for all of council's assets and is also linked to the financial systems and the pavement management system.

An integrated maintenance management system as described above will enable Council to determine the following outcomes:

- Target funds to areas of most need;
- Determine what assets would be cost effective to rehabilitate;
- Minimise Council's exposure to risk (public liability);
- Determine whether maintenance is being appropriately funded;
- Determine the maintenance liability over time for donated and Council built assets;
- Enable the consideration of maintenance costs at the development approval stage when proposals are being assessed, and
- Provide Council with accurate unit rates for maintenance activities.

Currently, programmed and reactive maintenance on the sealed road network and associated infrastructure is actioned in accordance with procedures as specified in procedures under the Integrated Management System which can be access via the links in the Table 5-5 below.

Table 5-5: Links to Integrated Management System

Standard Operating Procedure	Hyperlink
Maintenance Management Procedure	Click Here
Pavement Repairs and failures	Click Here
Routine Servicing for Bridges	Click Here
Bus Shelter Erection and/or maintenance	Click Here
Concrete Footpath Repairs	Click Here
Paved Footpath Repairs	Click Here

Data from road inspections and Customer Requests are manually assessed in accordance with the MRC procedures. This data together with information from cost centres, job numbers, plant sheets, time sheets, material purchase orders, stores requisitions and sub-contractor agreements are manually processed which makes it difficult to produce an adequately integrated picture of overall sealed road maintenance.

Intervention levels for both programmed and reactive maintenance are recorded and identified in the table below.

Table 5-6: Inspection Maintenance Forms

Maintenance Forms	Hyperlink
Pavement Assessment Defects	Click Here
Defect Summary and Intervention Levels	Click Here

An integration has been completed between Council's Asset Management Software "Assetic" with the pavement management software "NTRO". This has eliminated the need of double entry; entering the same data in twice, once in Assetic and again in NTRO. The database can be harmonised automatically, where the database can be copied from the point of truth in Assetic to the NTRO database.

The unsealed road network is managed similarly by procedures for inspection and defect classification from the Integrated Management System which is identified in the links located in the Table 5-7 below.

Table 5-7: Unsealed Road Integrated Management system

Standard Operating Procedure	Hyperlink
Gravel Road Assessment and Rectification	Click Here

Gravel Road Defect Assessment	Click Here

Inspection and maintenance types and levels for the unsealed road network are controlled by the Shepherd Maintenance Management System. Details of the system are appended.

The Shepherd System has created a specific unsealed roads hierarchy like the Austroads hierarchy to group roads of a similar nature to reflect differing maintenance needs. These are shown below:

Table 5-8: Unsealed Road Networks – Shepherd System Road Hierarchy

Hierarchy Number	Description	Traffic Count (VPD)	Network Length (km)	% of Total Network
1	Arterial Roads	>150	84.44	9.39%
2	Major Collector Roads	100 - 150	30.53	3.40%
3	Minor Collector Roads	75 - 100	190.95	21.24%
4	Local Access Roads (10-15 residences or properties)	30 - 75	124.88	13.89%
5	Minor Local Access Roads (5 - 10 residences or properties)	5 – 30	438.13	48.74%
6	Service Tracks (< 5 residences or properties)	< 5	30.01	3.34%

Service levels based on surface and pavement condition as well as perceived safety have been applied and are as follow:

Table 5-9: Unsealed Roads – Service Levels

Service Level	Performance Measure	Measurement Method	Activities used to Provide Service
Surface Condition	Average Visual Condition Score > 15 prior to maintenance grading	Standard Assessment guidelines	Heavy and Medium Formation grading and frequency of grading
Pavement Condition	% length of gravel pavement maintained by road class Average > 40 %	Budget determines service level. Works programmed by visual assessment	Re-sheeting and Gravel Patching

		and measured as m3/year/road class	
Safety	High Risk defects repaired	Visual Assessment	Temporary Repairs, Signage and Full grades

This system has allowed modification of the grading frequency to be achieved on unsealed roads to reflect the assessed service level. Similar systems operate to generate a gravel loss model and visual assessment to program resheeting and patching activities.

In summary the overall condition of the unsealed network averages about 6 to 8 at any time noting that the intervention level for action is 15.

Community expectation of road condition has at this stage not been tested and the technical level of service currently in place may be modified following this action. The merging of levels of service and subsequent budgetary impact will be the subject of future Asset Management Plans.

In the short term an assessment of predicted unsealed maintenance needs has been undertaken based on predicted gravel loss and the level of gravel coverage to be maintained over the road network and the unsealed road hierarchy. The information as per below has been presented to Council and approval granted for the continuation of maintenance levels to maintain the current level of gravel coverage and maintenance intervention. [Mackay Regional Council's Unsealed Roads Pavement Preservation](#) Needs Assessment was reviewed in 2017 by Shepherd Services and the assessed financial impacts and the assessment document is available in the link above.

An updated review the these figures and requirements will be completed by Civil Operations in future updates of this Asset management plan.

Table 5-10: Unsealed Roads, Gravel Preservation Needs

Option	Description	Gravel Preservation Needs (per year)		Additional Funds	
		Years 1 to 10	Full Lifecycle	Years 1 to 10	Full Lifecycle
1	Maintain Existing Coverage	\$3.5M	\$4.4M	+ \$1.0M	+ \$1.9M
2	100% Coverage	\$3.9M	\$4.7M	+ \$1.4M	+ \$2.2M
3	Lower Level Coverage to Match Existing	\$2.5M	\$3.3M	-	+ \$0.8M

Bridge Management System

The Bridge Infrastructure Asset Management Plan (AMP) was developed in 2016 and has annual reviews and updates. This AMP details information about bridge infrastructure assets with actions required to provide an agreed level of service in the most cost-effective manner while outlining associated risks. The plan defines the services to be provided, how the services are provided and what funds are required to provide over the 20 year planning period. The AMP will link to a Long-Term Financial Plan which typically considers a 20-year planning period.

The bridge network comprises:

- Concrete Bridges
- Timber Bridges
- Steel Bridges
- Pedestrian Bridges
- Fishing Piers
- Overpasses

however, excludes other structural assets covered. Additional AMP's include:

- Major Culverts and Minor Culverts
- Causeways and Floodway
- Barriers and Guardrails

Technical Levels of Service follow the guidelines set out in the Department of Transport and Main Roads Structures Inspection Manual and includes.

Customer Levels of Service are not specifically researched in the "Community Perceptions Survey", however respondents were asked an open-ended question asking them to record what they thought should be Council's top priority for the region over the next three years. Roads/ bridges were perceived by 32% of residents as the top priority for Council and mentioned most frequently by far.

The management of Bridge Infrastructure predominantly follows the following activities:

1. Bridge Operations
 - a. Level 1 Routine Maintenance/surveillance inspections (Defect Inspections)
 - b. Level 2 Condition Inspections
 - c. Level 3 Structural Engineering / Special Inspection
2. Bridge Operational Maintenance
 - a. Bridge Regular Maintenance
 - b. Bridge Routine Maintenance
3. Bridge Capital Maintenance
 - a. Bridge Rehabilitation
4. Bridge Capital Replacement

- a. Bridge Asset Decommissioning
- b. Bridge Asset Replacement
- c. Bridge Asset Upgrade

The activities involved in the management of Bridge Infrastructure are specialised and require specific certification, special skills and technical abilities. Human and material resources can be difficult to source but are essential for minimising risk of these potentially high risk but essential assets.

5.1.5 Asset Valuations

The value of assets as of June 2023 covered by this asset management plan is summarised below. Assets are revalued annually and at actual replacement costs.

Table 5-11: Asset Valuations

Asset Category	Replacement Value (\$)	Accrued Depreciation (\$)	Written Down Replacement Value (\$)
Roads - Formation	\$102,316,782.00	\$0.00	\$102,316,782.00
Roads - Pavement	\$822,085,997.00	\$237,394,263.71	\$584,691,733.29
Roads - Surface	\$318,302,447.00	\$89,571,336.02	\$228,731,110.98
Roads – Unsealed	\$156,100,114.30	\$0.00	\$156,100,114.30
Kerb and Channel	\$130,182,732.00	\$65,537,883.37	\$64,644,848.63
Traffic Management Facilities	\$54,430,781.74	\$10,616,702.14	\$43,814,079.61
Footpaths / Cycleways	\$148,240,502.00	\$54,270,680.42	\$93,969,821.58
Bridges	\$148,720,000.00	\$51,788,497.56	\$96,931,502.44
Carparks – Formation	\$1,208,571.05	\$0.00	\$1,208,571.05
Carparks – Pavement	\$7,499,774.42	\$1,022,065.71	\$6,477,708.70
Carparks – Surface	\$5,249,421.70	\$1,204,406.20	\$4,045,015.50
Public Transport Shelter / Stops	\$12,095,000.00	\$4,214,139.45	\$7,880,860.55
Grand TOTAL	\$1,906,432,123.00	\$515,619,974.57	\$1,390,812,148.63

5.2 Risk Management Plan

Mackay Regional Council recognises that Enterprise Risk Management is an integral part of sound asset management practices. Risk is described as an effect of uncertainty on objectives and whilst it is acknowledged

that it is not possible to have a totally risk-free environment, it is possible to manage risk by avoiding, reducing, transferring or accepting the risk.

A comprehensive process of risk identification has yet to be carried out within each service unit. When this occurs, Council will adopt a systematic, holistic approach to managing risk, based on the process outlined in AS/NZS ISO 31000:2018 Risk Management - Guidelines. Council's Enterprise Risk Management framework consists of:

- Enterprise Risk Management framework;
- Enterprise Risk Management Policy
- Operational Risk Register
- Strategic Risk Register

The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, develops a risk rating, evaluates the risk and develops a risk treatment plan for non-acceptable risks.

Senior Management meets on a regular basis and reviews the performance of Mackay Regional Council's risk management practices.

For a detailed risk assessment, please refer to Council's Engineering Operational Risk Register. One of the major risks assessed as part of the risk register is generated by bridge failure particularly those routes with no alternate access provision. These are shown on route assessments also attached in Appendix E.

5.3 Routine Maintenance Plan

Routine maintenance is the regular on-going work that is necessary to keep assets operating, including instances where portions of the asset fail and need immediate repair to make the asset operational again.

5.3.1 Maintenance Plan

This plan will outline the strategies and actions for the operation and maintenance of the road assets. Operational expenditure on an asset includes the investment in the day to day activities of business operations as well as the investment for its ongoing upkeep to meet its design life.

Maintenance includes reactive, programmed and cyclic maintenance work activities.

Reactive maintenance is unplanned repair work carried out in response to service requests and management/supervisory directions.

Programmed maintenance is repair and maintenance work that is identified and managed through a maintenance management system (MMS). MMS 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.

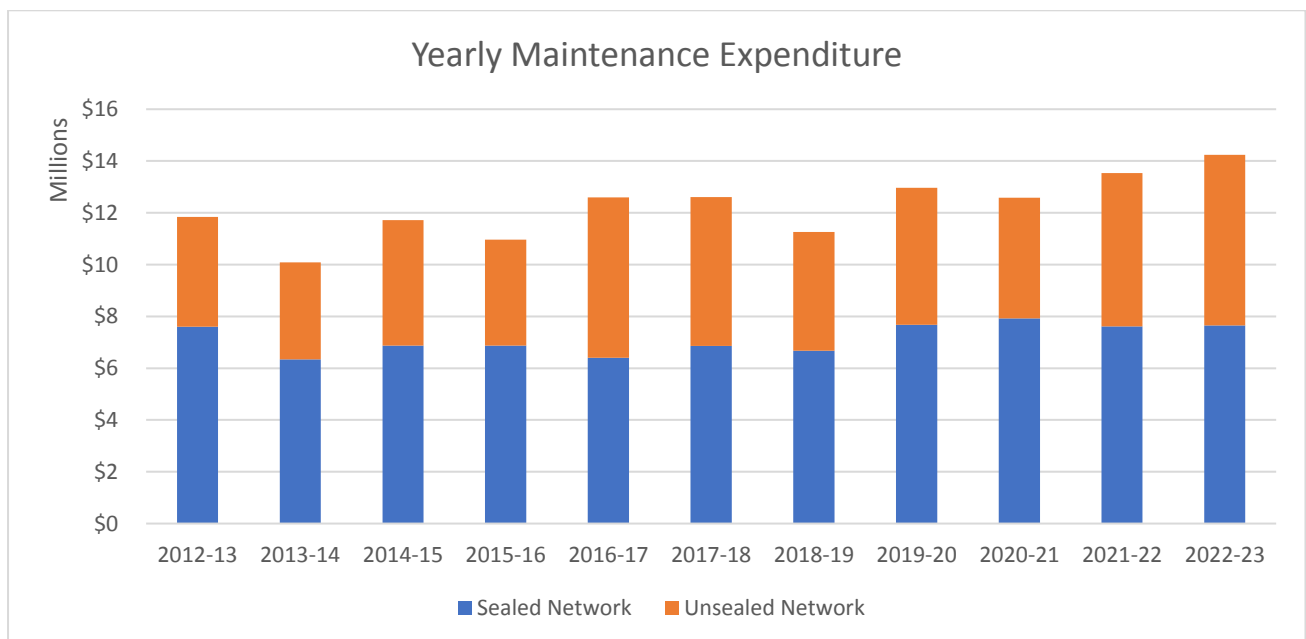
Cyclic maintenance is replacement of higher value components/sub-components of assets that is undertaken on a regular cycle including resurfacing, rehabilitation, etc. This work generally falls below the capital/maintenance threshold.

Operational maintenance is the care and minor maintenance of the road assets including tasks such as inspections, street sweeping and mowing.

Maintenance expenditure trends are shown in the Table 5-12 below:

Table 5-12: Maintenance Expenditure Trends (excl Depreciation)

Year	Maintenance Expenditure			
	Sealed Network	Unsealed network	Yearly Total Expenditure	% Movement
2012-13	\$7,595,505	\$4,242,638	\$11,838,143	
2013-14	\$6,335,500	\$3,744,141	\$10,079,641	-14.85%
2014-15	\$6,873,073	\$4,843,072	\$11,716,145	16.24%
2015-16	\$6,872,273	\$4,094,842	\$10,967,115	-6.39%
2016-17	\$6,400,618	\$6,197,481	\$12,598,099	14.87%
2017-18	\$6,862,476	\$5,741,088	\$12,603,564	0.04%
2018-19	\$6,668,666	\$4,591,187	\$11,259,853	-10.66%
2019-20	\$7,677,809	\$5,282,549	\$12,960,358	15.10%
2020-21	\$7,921,276	\$4,657,397	\$12,578,673	-2.95%
2021-22	\$7,612,194	\$5,923,072	\$13,348,060	6.12%
2022-23	\$7,651,725	\$6,581,138	\$14,232,863	6.63%

Graph 5.3: Maintenance Expenditure Trends (excl Depreciation)

It should be stated that the maintenance costs quoted above may be skewed by non-standard events as follows:

- Flooding and Disaster events during 2011 & 2012 with expenditure on restoration works being completed by June 2014 with associated impacts on maintenance expenditures.

Currently no separation of costs associated with reactive, planned or cyclic maintenance expenditures on the sealed road network occurs and similarly individual work order recording to assess activity unit rates and costs is not specifically undertaken. Future improvements to the maintenance management system will allow individual activity costing and be able to model the effect of changes in the level of service because of community expectations or changes in required technical levels of service.

Maintenance expenditure levels are inadequate to meet the service levels desired by residents. Future revision of this asset management plan will include linking required maintenance expenditures with required service levels.

Maintenance is skewed towards being reactive being generated by programmed inspections or via customer requests.

Reactive maintenance is carried out in accordance with response levels of service detailed in Appendix F.

Based on the Shepherd Management system assessment of the unsealed road network assessments of future maintenance expenditures together with the need for future capital resheeting expenditures have been assessed and have been appended under Section 5.1.4. The assessed annual cost to maintain existing gravel coverage is estimated at \$8.6M per annual for the next ten years. This is based on an annual average maintenance cost of \$4.2M and \$4.4M gravel replenishment as referenced in table 5.12 and 5.10 respectively. Planning for ongoing maintenance of the unsealed road network is based on the results obtained from inspections and predicted gravel loss for programmed maintenance.

5.3.2 Maintenance Issues

Issues that affect maintenance include:

- Adequate resourcing for a Skilled and experienced workforce to meet activity requirements;
- Access to adequate plant to carry out maintenance efficiently;
- Increased traffic speeds and volumes increasing traffic control costs and overtime for non – peak hour operations;
- Weather. Most road pavements are constructed from granular materials which require sealing to achieve its design life. Sealing provides a waterproof membrane and protects the pavement, offers skid resistance and ensures a durable, wear resistant surface. As such one of the major challenges in both renewal and maintenance is to strive to ensure surfacing provides the waterproofing etc to maintain the flexible pavements design life. In addition, the seasonal impact of operating in a tropical environment also provides pressures to ensure road maintenance and roadside drainage maintenance works are undertaken to cater for the seasonal rainfall effects;
- Reduced Impact. There is an increasing trend to carry out road maintenance with less impact on residents and road users, which may lead to an increased need to have such work carried out at nights and on weekends;
- Upgrading the Road Assets. There is an increasing trend to request that unsealed roads be sealed. This is an increase in the level of service to the residents which will result in increased maintenance costs. Current SOI and LOS investigations are based on providing an assessment of needs to address issues impacting residents in this area of concern.;
- Private Land Impact. There is an expectation that Council will maintain its land assets so there is no impact on private land amenity or land usage e.g., Road off alignment issues in rural areas and weed control, and
- Vegetation Management. There is an increasing need to treat weeds in areas that could be slashed and probably have been previously.

In addition, the growth that has been experienced has resulted in a significant volume of roads and road network infrastructure donated by developers. These donated assets have an immediate impact on ongoing operational and maintenance expenditures.

5.3.3 Standards and Specifications

Maintenance work is carried out in accordance with the following Standards and Specifications:

- Council policies and procedures;
- Council's Design and Construction Specifications and industry Standards;
- TMR Standard Specifications;
- TMR RMPC Work Procedures;
- Australian Standards;
- Austroads Standards and Guidelines and
- Non-specified materials and standards developed to support local conditions.

5.3.4 Summary of Future Maintenance Expenditures

The existing MMS records a backlog of works from inspections and customer requests but is not quantified financially. An indicative cost for the backlog works is provided from rates incorporated into the MMS. Indicative maintenance expenditure trends are therefore only available, and the MMS recording system is in its infancy and not expanded to all asset classes. Currently estimates of future donated asset levels are not available and this further complicates the ability for the prediction of future maintenance costs.

Future maintenance expenditure is forecast to trend in line with the value of the asset stock. Reductions in rehabilitation and renewal investment and so a reduction in asset value will increase maintenance expenditure needs.

Deferred maintenance, i.e., works that are identified for maintenance and unable to be funded, is to be included in the risk assessment process in the infrastructure risk management plan.

Maintenance is funded from Council's operating budget and grants where available. This is further discussed in Section 6.2.

5.4 Renewal/Replacement Plan

Renewal expenditure is defined as work which does not increase the asset's design capacity but restores, rehabilitates, replaces or renews an existing asset to its original service potential. Work over and above restoring an asset to original service potential is upgrade/expansion or new works expenditure.

Renewal works program are detailed in each individual sub asset management plan where specific business rules are utilised to create annual renewal works program for consideration in the LTFF.

5.4.1 Rehabilitation and Renewal Issues

Issues that affect rehabilitation and renewal include:

- Whether an asset achieves its potential life depends on the effectiveness of the maintenance regime during its life;
- Postponement of rehabilitation increases the cost of maintaining the asset and results in a lower level of service;
- Rehabilitation of an asset group may be required due to poor maintenance of a different asset group e.g.; poor surface and drainage affects pavements;
- Changes in design standards need to be balanced against a 'fit for purpose' design;

- Renewal is typically cyclical and therefore requires substantial amounts of funding after a time interval equal to the useful life;
- Improvement in technology can have significant effects on the cost of rehabilitation; and
- Community expectations may require the use of more expensive methods of rehabilitation to minimise the impact of inconvenience to the community.

5.4.2 Renewal Plan

Assets on the sealed road network requiring treatments are identified from the Pavement Management System (PMS) based on the economic analysis undertaken by the PMS based on a 'best for network' assessment. Funding figures and allocations of funds in rural and urban areas are possible input functions which are controlled to output a realistic works program for the organisation. The PMS will select treatments based on trigger values in the treatment matrix and condition data of each road segment.

The Pavement management system will assess the most economically treatment to be funded based on a benefit cost ratio and will select from the available options in resurfacing, rehabilitation or reconstruction. Following the completion of each works program, field verification is undertaken to confirm that the proposed treatment is appropriate.

Renewal will be undertaken using 'low-cost' renewal methods where practical. The aim of 'low-cost' renewals is to restore the service potential or future economic benefits of the asset by renewing the assets at a cost less than replacement cost.

Following generation of works program and field verification the approved projects are included within the Capital Works Programme for funding approval by Council. The basis of the assessment and the various treatments and cost are shown in the NTRO Treatment Matrix in Appendix F.

Renewal expenditures proposed for the unsealed network are based on condition inspections and predictions of gravel loss based on actual gravel depth and coverage assessments from the Shepherd System with documentation included in section 5.1.4.

5.4.3 Renewal Standards

Renewal and Rehabilitation works are carried out in accordance with the following Standards and Specifications:

- Council policies and procedures;
- Council's Design and Construction Specifications and industry Standards;
- DTMR Specifications and Work Procedures;
- Australian Standards;
- Austroads Standards and Guidelines and
- Non- specified materials and standards developed to support local conditions.

5.4.4 Summary of Future Renewal Expenditure

Projected future renewal expenditures are forecast to increase over time as the age of the asset continue to increase and the projects are delayed due to budgetary limitations.

Renewals are to be funded from Council's capital works program and grants where available. As part of the improvement plan significant improvements are required to the base asset data and condition assessment as

well as deterioration modelling to improve data accuracy and in turn improve prediction of future maintenance and renewal expenditures. This is further discussed in Section 6.2.

Renewal expenditures on the unsealed road network have been predicated from the Shepherd System based on gravel loss assessments and are included in Section 5.1.4.

5.5 Creation/Acquisition/Upgrade Plan

Acquisitions is defined when new asset is created when it did not previously exist or when assets are upgraded or improved beyond its current capacity. This may result from growth, social or environmental needs. Assets may also be acquired at no cost to the Council from land development, donated and transferred from the state department. These assets from growth are considered in Section 4.4.

5.5.1 New Capital Assets Issues

Issues that affect new capital include:

- That the creation of the road network assets from Council's major projects and developments will continue to increase at a higher rate than previously;
- Continued expectations exist to increase road network capacity to cater of population increase and reduce congestion and road user delay;
- Council will be required to fund increasing levels of operational, maintenance, renewal and rehabilitation expenditures based on the acquisition of these new assets; and
- The expectation that road network assets will increase due to the Local Government Infrastructure Plan requirements and ongoing growth within the Region.

5.5.2 Selection Criteria

New assets and upgrade/expansion of existing assets are identified from various sources such as Councillor or community requests, proposals identified by strategic plans or partnerships with other organisations. Of note are assets generated from development proposals where trunk conversion or Infrastructure Agreement requirements dictate the need to provide or contribute to trunk asset creation.

Candidate proposals are inspected to verify need and to develop a preliminary renewal estimate. Verified proposals are ranked by priority and available funds and scheduled in future capital works programmes following approval by Council. No specific funding level is approved for this category of asset but forms part of the overall capital works program allocation.

5.5.3 Summary of Future Upgrade/New Assets Expenditure

Following adoption of the long term financial plan a generated plan for new assets will be produced for assessment of the effect on the life cycle costs of the assets. However, at this stage given the difficulties and lack of specific information that currently exist it will not currently be possible to either assess lifecycle costs or future renewal, rehabilitation or upgrade costs.

New assets and services are to be funded from Council's capital works program and grants where available. This is further discussed in Section 6.2.

5.6 Disposal Plan

Council disposes of unused sections of road reserve when requested either as road licences or permanent closures subject to these areas being of no use to Council in the foreseeable future and that do not provide legal access to other landholders. It is rare that any constructed road would be disposed of while still in use and serving residents.

Council is continuously reviewing and updating Council Assets to achieve the best representation of Council's asset at the current snapshot in time. This is an ongoing task as assets are added and disposed on a regular basis. In the recent financial year, Council has removed a large majority of the overlapping sealed road network at each intersection. The change is to ensure that the asset is captured from the tangent point of the kerb rather

than the start of the road chainage. This has eliminated a large amount of overlapping assets with similar projects being delivered on a yearly basis.

These updates and changes are also evident across the entire asset network, when comparing the figures from 2018 to 2019, there are significant changes to the network asset length for; kerb and channel, traffic management facilities, footpaths / cycleways and bridges, as council improves upon asset management systems and controls.

5.6.1 Disposal Issues

Disposals of road assets rarely occur as these assets have a high asset life, concrete pathways and K&C asset have an asset life of 100 years and is only disposed when the asset fails and is unserviceable for the community. Disposal cost of the asset is not captured separately, as the work activity will occur in the same package with the construction of the new asset.

6 FINANCIAL SUMMARY

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 future asset performance.

6.1 Financial Statements and Projections

The financial projections shown are drawn from the Long Term Financial Strategy of Council. The values shown have been developed at an elevated level and primarily reflect the affordability levels of Council at this point in time. As more detailed information is gathered around these assets through the asset management process more detailed and meaningful projections will be developed.

The following values reflect future expectations of expenditures for planned operating (operations and maintenance) and capital expenditure (renewal and upgrade/expansion/new assets). These values are generated from the Long Term Financial Strategy but are based on estimated requirements only and will require future revision. Details of future operational and capital expenditures are shown as follows.

Table 6-1: Financial Forecast Summary

	2023/24 FY	2024/25 FY	2025/26 FY	2026/27 FY	2027/28 FY	2028/29 FY	2029/30 FY	2030/31 FY	2031/32 FY	2032/33 FY
Network Depreciation Value	\$ 31,312,160.02	\$ 31,312,160.02	\$ 31,312,160.02	\$ 31,312,160.02	\$ 31,312,160.02	\$ 31,312,160.02	\$ 31,312,160.02	\$ 31,312,160.02	\$ 31,312,160.02	\$ 31,312,160.02
5.01 Operational Cost	\$ -									
5.02 Operational Cost	\$ 84,862.28									
5.03 Operational Cost	-\$ 851,416.23									
5.04 Operational Cost	\$ 17,359,229.69									
Total Operational Cost	\$ 16,592,675.74	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Capital Expenditure										
LTFF Allocations (Roads)	\$ 30,186,046.28	\$ 321,450,147.59	\$ 26,504,612.10	\$ 62,118,131.77	\$ 58,054,607.66	\$ 73,951,179.14	\$ 81,819,613.40	\$ 98,183,568.19	\$ 62,951,072.12	\$ 52,922,706.72
Renewal Capital expenditure (Roads)	\$ 22,557,930.53	\$ 25,329,834.68	\$ 20,638,805.52	\$ 40,517,748.53	\$ 33,639,209.41	\$ 42,200,720.27	\$ 29,466,728.60	\$ 34,915,945.83	\$ 28,668,037.38	\$ 24,101,004.39
Asset Sustainability Ratio	72%	81%	66%	129%	107%	135%	94%	112%	92%	77%

6.1.1.1 Sustainability of Service Delivery

There are two key indicators for financial sustainability that have been considered in the analysis of the services provided by this asset category, these being the asset sustainability ratio and medium-term life cycle costs over the 10-year financial planning period.

Medium Term – 10-Year Financial Planning Period

This asset management plan identifies the estimated maintenance and capital expenditures required to provide an agreed level of service to the community over a 20-year period from input figures in the sub-asset management plans.

Providing services in a sustainable manner will require an understanding of the target LOS for the community, identifying the current LOS of each asset class and determining the capital expenditure required to deliver the target LOS based on the renewal cost of current assets that requires maintenance and renewal.

A gap between projected asset renewals, planned asset renewals and funding indicates that further work is required to manage required service levels and funding to eliminate any funding gap.

Based on current capital expenditure figures and future forecast figures, there are insufficient funds to maintain the current level of service the roads asset class. Required capital expenditure for each asset class is detailed in the sub-asset management plans.

Asset Renewal Funding Ratio

The asset renewal funding ratio is the most important indicator and indicates that over the next ten years of the forecasting it is expected to have the following percent of funds required for the optimal renewal and replacement of assets excluding upgrade/new assets. Asset sustainability ratio is calculated by dividing the capital expenditure on renewals by

Table 6-2: Asset Renewal Funding Ratio

<u>Year</u>	<u>Asset Sustainability Ratio</u>
2023/24 FY	72%
2024/25 FY	81%
2025/26 FY	66%
2026/27 FY	129%
2027/28 FY	107%
2028/29 FY	135%
2029/30 FY	94%
2030/31 FY	112%
2031/32 FY	92%
2032/33 FY	77%
2033/34 FY	95%

Providing services for infrastructure in a sustainable manner requires managing, service levels, risks and expenditure with the aim to achieve a financial indicator (asset sustainability ratio) of 100%. The asset sustainability ratio is calculated by dividing capital renewal expenditure over the asset depreciation value. When the result equates to 100%, this represents optimum capture expenditure. Where this figure is less than 100% it equates to under spend and over 100% equates to overspend. The depreciation value is driven from the remaining asset life and the aim of the organisation is to spend this figure in capital renewal so that we ensure that the current LOS is being maintained.

6.2 Funding Strategy

Projected expenditure identified in Section 6.1 is to be funded from Council’s operating and capital budgets. The funding strategy is detailed in the Council’s long term financial plan. It is anticipated that existing funding sources shall continue to fund road asset management Activities. Funding sources include:

- Council Rate Revenue;
- Transport Network Contributions and Subdivider External Works contributions;
- Loan funds;
- State Government Grants (LRRS, TIDS etc.), and
- Federal Government Grants (Roads to Recovery, Blackspot etc.)

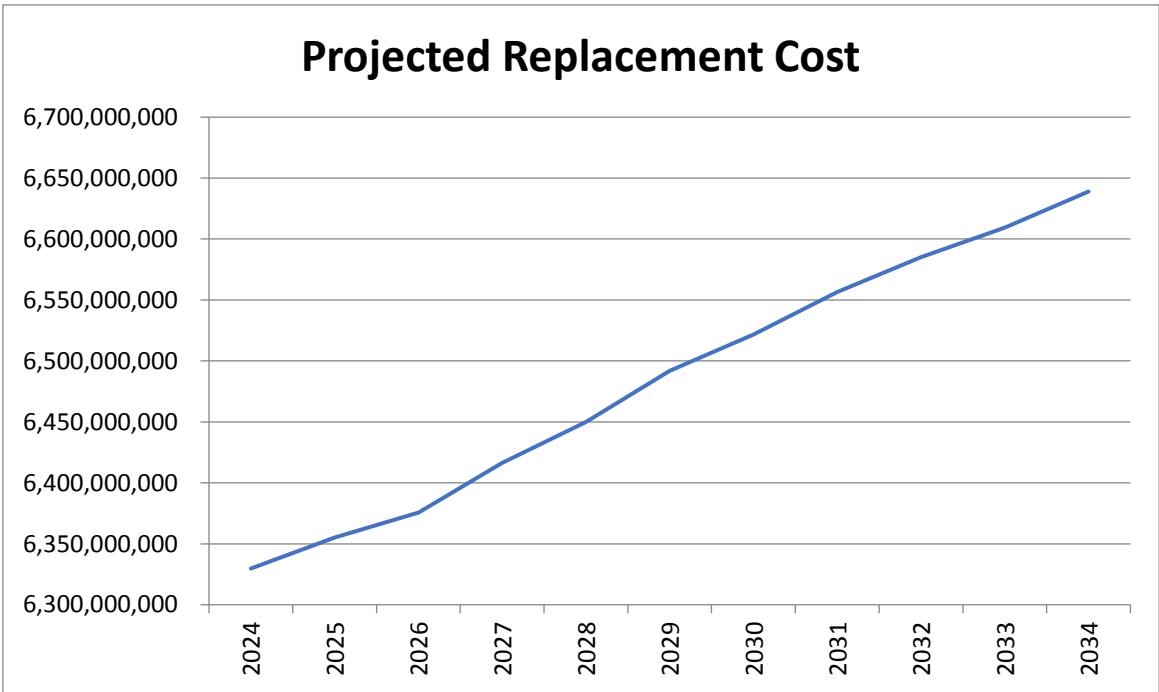
Achieving the financial strategy will require either Council to review its road policy in line with current funded service delivery levels resulting in a lowering of the deliverable level of service or allocating significant increases in funding allocations. Demands on current levels of funding to cater for development growth experienced in the recent past and projected in the future together with resulting increases required in existing network capacity significantly impact on Council’s ability to meet the asset management requirements at the expected level of service for the road network.

6.3 Valuation Forecasts

Asset values are forecast to increase in line with acquisition figures detailed in the sub-asset management plans. Council acquires new assets annually, this can be obtained from construction or donated by developers, state department and other stakeholders. Fair value asset accounting requires Council to value and consequently depreciate its assets using a method that accurately reflects the consumption of the asset.

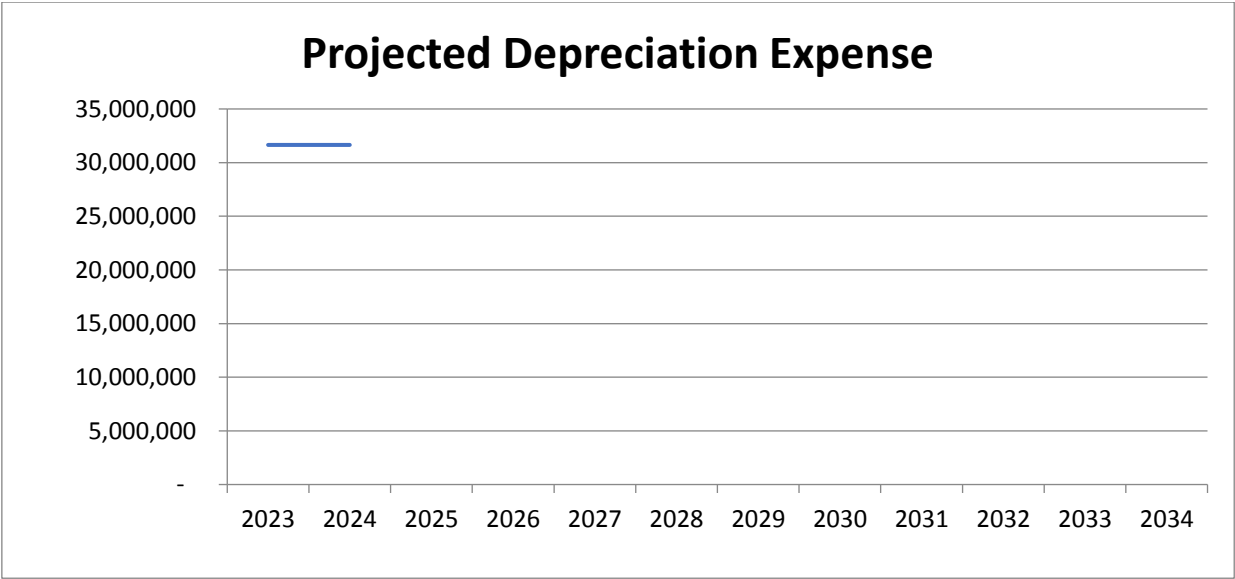
Graph 6-1 shows the projected replacement cost asset values at this point in time over the planning period.

Graph 6-1: Projected Asset Values



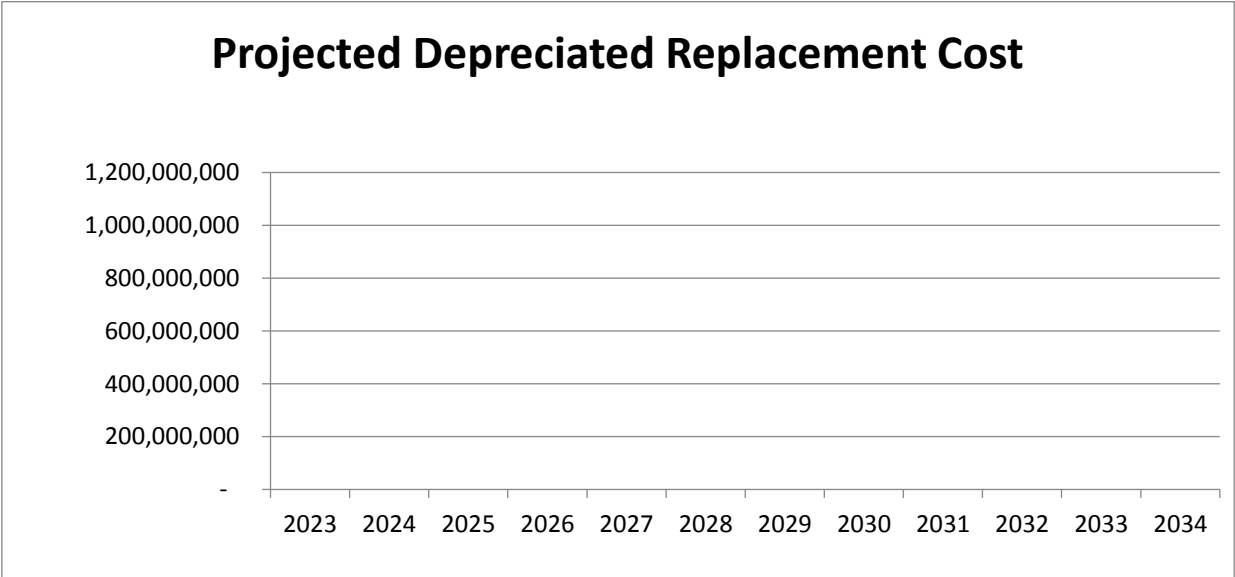
Depreciation expense values at this point in time are forecast in line with asset values as shown in Graph 6-2

Graph 6-2: Projected Depreciation Expense



* Projected depreciation expense graph will be updated in future AMP's

Graph 6-3: Projected Depreciated Replacement Cost



* Projected depreciation replacement cost graph will be updated in future AMP's

6.4 Key Assumptions made in Financial Forecasts

This section details the key assumptions made in presenting the information contained in this asset management plan and in preparing forecasts of required operating and capital expenditure and asset values, depreciation expense and carrying amount estimates. It is presented to enable readers to gain an understanding of the levels of confidence in the data behind the financial forecasts.

Key assumptions made in this asset management plan are:

- The effect of any further Natural Disasters is excluded on the basis that funding to return any assets affected is provided to return the asset to its condition prior to the Natural disaster occurring.
- Valuation and depreciation of assets is adjusted only by proposed capital expenditure at this point in time.

Accuracy of future financial forecasts may be improved in future revisions of this asset management plan by the following actions:

- Further review of unit rates, depreciation patterns, and asset useful lives and residual values.
- Inclusion of annual or periodic adjustments for asset revaluations
- Review of prescribed service delivery levels in conjunction with community expectations and financial sustainability.

Forecast expenditure and valuations projections in this AM Plan are based on best available data. Currency and accuracy of data is critical to effective asset and financial management. Data confidence is classified on a 5 level scale in accordance with Table 6-3 below.

Table 6-3: Data Confidence Grading System

Confidence Grade	Description
A - Highly reliable	Data based on sound records, procedures, investigations and analysis, documented properly and agreed as the best method of assessment. Dataset is complete and estimated to be accurate $\pm 2\%$
B - Reliable	Data based on sound records, procedures, investigations and analysis, documented properly but has minor shortcomings, for example some of the data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or some extrapolation. Dataset is complete and estimated to be accurate $\pm 10\%$
C - Uncertain	Data based on sound records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which grade A or B data are available. Dataset is substantially complete but up to 50% is extrapolated data and accuracy estimated $\pm 25\%$
D - Very Uncertain	Data is based on unconfirmed verbal reports and/or cursory inspections and analysis. Dataset may not be fully complete, and most data is estimated or extrapolated. Accuracy $\pm 40\%$
E - Unknown	None or very little data held.

The estimated confidence level for and reliability of data used in this AM Plan is considered to be uncertain. Efforts to improve the confidence level in the AMP will be addressed in the Improvement Plan.

7 ASSET MANAGEMENT PRACTICES

7.1 Accounting/Financial Systems

Mackay Regional Council uses the Finance 1 computerised accounting system which is a product of Technology 1.

The Financial Services program is primarily responsible for Finance 1.

AASB116 Property, Plant and Equipment is the primary relevant accounting standard.

Mackay Regional Council has adopted an asset threshold of \$5,000 for all asset classes except for Land which has a threshold of \$1.

7.2 Asset Management Systems

The asset management systems used by Mackay Regional Council for roads are Assetic and NTRO.

The Assets program is primarily responsible for Assetic in conjunction with the individual asset owners.

7.3 Information Flow Requirements and Processes

The key information flows *into* this asset management plan are:

- The asset register data on size, age, value, remaining life of the network;
- The unit rates for categories of work/material;
- The adopted service levels;
- Projections of a range of factors affecting future demand for services;
- Correlations between maintenance and renewal, including deterioration models;
- Data on new assets acquired by council.

The key information flows *from* this asset management plan are:

- The assumed Works Program and trends;
- The resulting budget, valuation and depreciation projections;
- The useful life analysis.

These will impact the Long Term Financial Plan, Strategic Business Plan, annual budget and departmental business plans and budgets.

Asset recognition and capitalisation is covered under Mackay Regional Council policy number 042.

7.4 Standards and Guidelines

Key standards and attributes that influence Asset Management attributes include:

- AASB 116;
- Council policies and procedures;
- Council's Design and Construction Specifications and industry Standards;
- TMR Specifications and Work Procedures;
- Australian Standards;
- Austroads Standards and Guidelines and

- Non-specified materials and standards developed to support local conditions.

8 PLAN IMPROVEMENT AND MONITORING

8.1 Performance Measures

The effectiveness of the Asset Management Plan can be measured in the following criteria:

- Degree of confidence in and accuracy of the base data collected and maintained;
- Generate condition rating of the assets;
- The degree to which the required cash flows identified in this Asset Management Plan are incorporated into Council's long term financial plan and Corporate Management Plan;
- The degree to which detailed works programs, budgets, business plans and organisational structures consider the 'global' works program trends provided by the Asset Management Plan;

8.2 Improvement Plan

The asset management improvement plan generated from this asset management plan is shown in Table 8-1

Table 8-1: Improvement Plan

Task No	Task	Responsibility	Resources Required	Timeline
1.	Update and revise SAMP and AMP to new format. Including renewal works program for each asset class and action items on the improvement plans.	Asset Management/Asset Owner	Internal Resources	01/07/2024
2.	Complete Street Lighting data cleanse and spatial mapping of the asset	Asset Management/GIS	Internal Resources	31/12/2024
3.	Complete Traffic Management Device data cleanse and spatial mapping of the asset	Asset Management/GIS	Internal Resources	31/12/2024
4	Complete Traffic Signal data cleanse and spatial mapping of the asset	Asset Management/GIS	Internal Resources	31/12/2024
5.	Develop and remodel existing procedures and systems to reflect requirements to report against KPI's	Asset Management	Assume existing resources	01/07/2025
6.	Institute Bridge Management System to review and record inspection, maintenance and renewal priorities and timing for all bridge assets	Asset Management / Asset Owner	Consultant plus existing resources	01/07/2025
7.	Formalise a process for project prioritisation to apply a cost benefit analysis to proposed projects to quantify overall project benefits	Asset Owner	Consultant plus existing resources	01/07/2025
8.	Establish Council wide maintenance management system linking to the corporate financial system and asset management system to further establish the relationship between maintenance cost, renewal cost and overall life cycle costs of assets.	Asset Management/ IT/ Civil Operations	Assume existing resources	01/07/2026

9.	Research community expectations and adjust LOS based on these expectations. This will then allow the Asset Owner to Establish LOS based on best engineering practice as well as outputs from SOI review of road standards and hierarchy outputs	Corporate Communication s /Asset Management	Assume existing resources	01/07/2025
10.	Model alternative renewal strategies to generate most cost effective renewal options using the NTRO PMS	Asset Owner	Internal Resources	Ongoing
11.	Condition Assessments – Collect condition data against all high-risk asset classes on an approved iteration period.	Asset Management/Asset Owner	Consultant plus existing resources	Ongoing
12.	Review Long Term Financial strategy based on assessed levels of services and future maintenance and renewal costs for the asset class including assessment of life cycle gap and sustainability index.	Finance	Assume existing resources	Ongoing
13.	Undertake corridor studies on identified arterial routes for future upgrade	Strategic Planning	Assume existing resources	Ongoing
14.	Develop yearly renewal programs for all assets based on their condition and input into future revisions of the plan and Long Term Financial Strategy	Asset Management/ Finance / Asset Owner	Internal resources	Ongoing
15.	Ongoing collection and review of asset data to improve data accuracy with emphasis on high risk assets	Asset Management/Asset Owner	Consultant plus existing resources	Ongoing
16.	Update Transport Infrastructure Management System to review traffic flows and network capacity and schedule future road upgrades to address traffic flow requirements	Strategic Planning	Assume existing resources	Ongoing
17.	Update Demand Management Procedures to limit effect of future traffic flow increases particularly related to increased public transport usage, multiple passenger requirements and parking management requirements.	Strategic Planning	Assume existing resources	Ongoing
18.	Review and assess future donated assets to be received by Council and its subsequent effects on maintenance and renewal expenditure requirements	Development Services / Strategic Planning	Assume existing resources	Ongoing
19.	Undertake formal Enterprise Risk Management assessment for all road class assets.	Governance	Assume existing resources	Ongoing

8.3 Monitoring and Review Procedures

8.3.1 Monitoring

The effectiveness of the Asset Management Plan can be measured in the following ways:

- The degree to which the required cash flows identified in the plan are incorporated into Council's long term financial plan and Strategic Management Plan;
- The degree to which detailed maintenance and capital programs, budgets, business and organisational structures consider processes and principles outlined in the Asset Management Plan;
- The level of user satisfaction based on comparative surveys from year to year.

8.3.2 Review

This Asset Management Plan will be reviewed during annual budget preparation and amended to recognise any changes in service levels and/or resources available to provide those services because of the budget decision process.

The Plan has a life of five (5) years and is due for revision annually and updating within two (2) years of each Council election to reflect performance requirements of changing Council expectations.

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10 APPENDICES

Appendix A Extracts - Mackay Regional Council Community Survey 2018

1.4 Council’s Top Priorities

Respondents were asked what should be Council’s top priority for the region over the next three years. 904 responses were collected. These responses have been classified into 38 themes and topics [see Figure 1.4]. Open-ended reponses have been provided to Council in a separate report.

Figure 1.4 Council’s Top Priorities

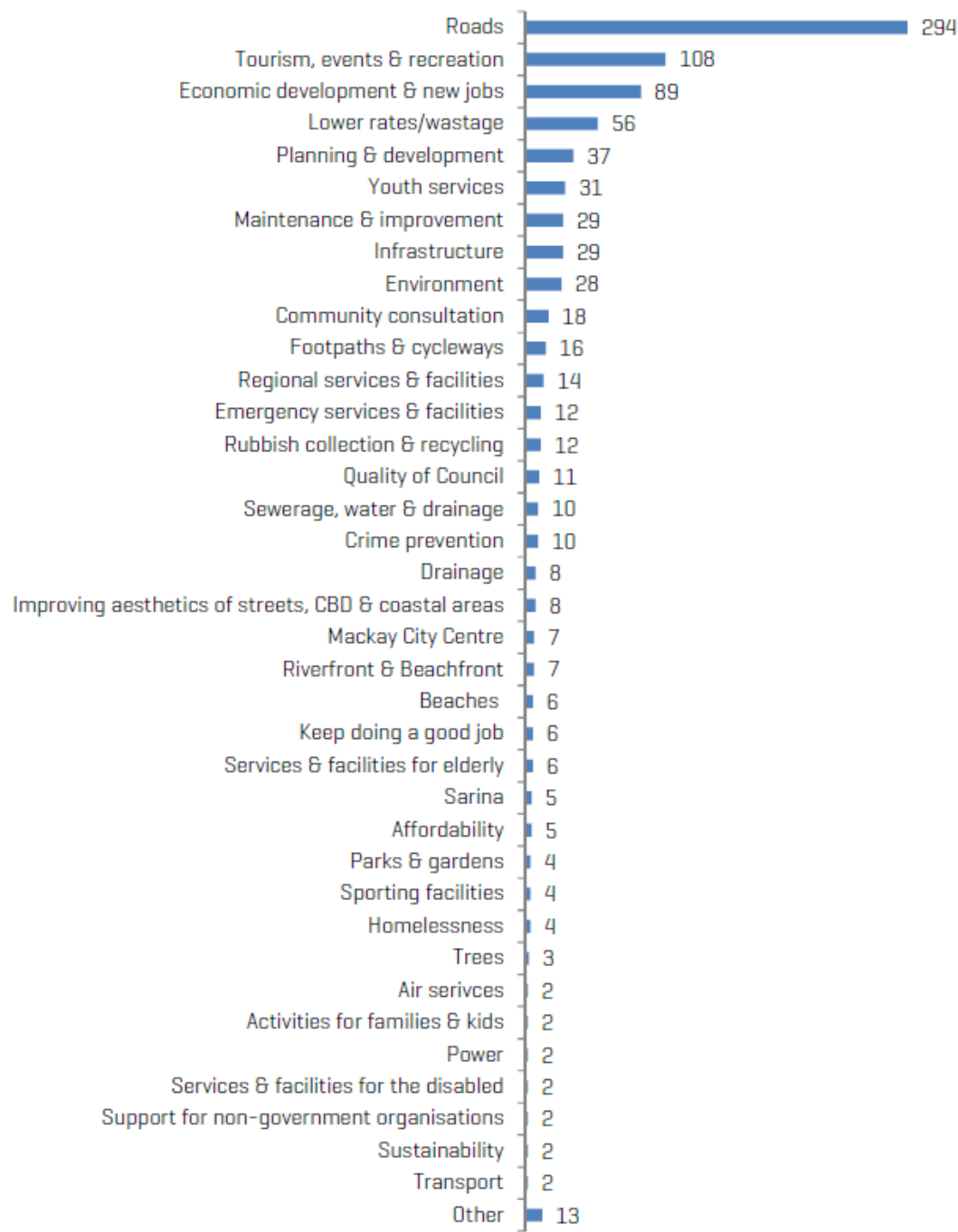


Figure 2.1 Infrastructure & Basic Services – Satisfaction