

# Tablelands Regional Council



## Asset Management Plan TRANSPORT 2022 - 2031



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## **1.0 EXECUTIVE SUMMARY**

### **1.1 The Purpose of the Plan**

Asset management planning is a comprehensive process ensuring delivery of services from infrastructure is financially sustainable.

This Transport Asset Management Plan (AMP) details information about infrastructure assets with actions required to deliver the level of service outlined in this plan in the most cost-effective manner while outlining associated risks. The plan defines the services to be provided, how the services are provided as outlined in the improvement plan table 8.2 and what funds are required to provide over the 2022/23 – 2030/31 year planning period. The Asset Management Plan will link to the 10 Year Capital and long-term financial plan.

This AMP covers the infrastructure assets that provide Road, Kerb & Channel, Footpath and Car Parking services for Tablelands Regional Council (TRC).

### **1.2 Asset Description**

The Transport network comprises:

- Roads (1,884 km)
- Footpaths (74 km)
- Kerb & Channel (295 km)
- Car Parking (19,643 m<sup>2</sup>)

The above infrastructure assets have significant total renewal value estimated at \$308 million.

### **1.3 Levels of Service**

This AMP includes recommended levels of funding for desired service levels.

An acceptable level of service in asset management aims to ensure the asset is fit-for-purpose and maintained within available resources in an economic and cost-effective manner.

Based on current Desired Levels of Service as defined by the Transport Strategy there are approximately 285 kilometres of formed gravel road that should be a natural surface road and there are 170 kilometres of natural surface roads that require upgrade to a formed gravel standard.

Based on current information, our present funding levels are insufficient (in particularly maintenance funding). The continued insufficient funding will lead to an increase in deterioration resulting in additional closures and increased reactive maintenance costs.

### **1.4 Future Demand**

The main demands for new services are created by:

- New housing sub-divisions

These demands will be approached using a combination of managing existing assets, upgrading of existing assets and providing new assets to meet demand. Demand management practices may also include a combination of non-asset solutions, insuring against risks and managing failures.

- Ensuring new assets are constructed in accordance with standards contained within the FNQROC Development Manual
- Ensuring existing assets are renewed/upgraded as defined in TRC's adopted Transport Strategy

## 1.5 Lifecycle Management Plan

### 1.5.1 What does it Cost?

The forecast lifecycle costs necessary to provide the services covered by this AMP includes operation, maintenance, renewal, acquisition, and disposal of assets. Although the AMP may be prepared for a range of time periods, it typically informs the 10 Year Capital Plan. Therefore, a summary output from the AMP is the forecast of 10-year total outlays, which for the Transport Assets is estimated as \$206,735,652 or \$20,673,865 on average per year.

## 1.6 Financial Summary

### 1.6.1 Plan Moving Forward:

Estimated available funding for the 10-year period is \$138,768,113 or \$13,876,811 on average per year as per the Draft 10 Year Capital Budget.

**Note:** It is expected that the above funding ratio would improve following the completion of a comprehensive collection of sealed road condition data programmed to be undertaken during the 2022-23 financial year. This project will allow Council staff to develop detailed multi-year renewal programs for Bitumen Reseals, Rehabilitation, etc. linked to the Star Rating of roads as defined by the Transport Strategy.

The infrastructure reality is that only what is funded in the long-term financial plan can be provided. Informed decision making depends on the AMP emphasising the consequences of Planned Budgets on the service levels provided and risks.

The anticipated Planned Budget for Transport Assets leaves a shortfall of \$718,137 on average per year of the forecast lifecycle costs required to provide services in the AMP compared with the Planned Budget currently included in the Long-Term Financial Plan. This is shown in the figure below.

*Forecast Lifecycle Costs and Planned Budgets*

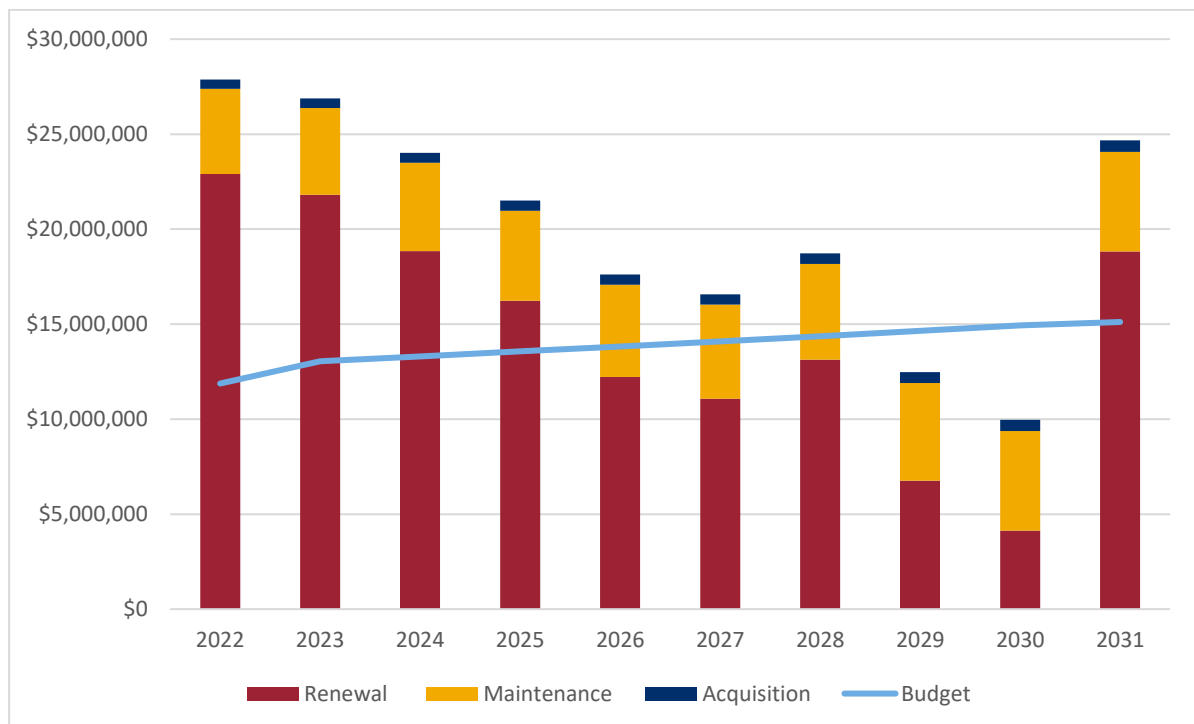


Figure Values are in current dollars.

We plan to provide Transport services for the following:

- Operation, maintenance, renewal and upgrade of Transport Assets to meet service levels set in annual budgets.

### **1.6.2 What we can improve**

We currently do not allocate enough budget to sustain these services at the proposed standard or to provide new services being sought. Works and services that cannot be provided sufficiently under present funding levels are:

- Bitumen Resealing
- Gravel Re-Sheeting

### **1.6.3 Managing the Risks**

The outputs from asset management programs can be compared with the outputs from other asset management programs, such as pavement management programs, to give the asset manager the necessary information to make informed choices when setting priorities for managing the whole road network asset.

The main risk consequences are deterioration to assets to a lower standard:

- Sealed Roads to Gravel Roads
- Gravel Roads to Natural Roads
- Footpaths resulting in an increased risk of pedestrians tripping and being injured
- Kerb & Channel resulting in increased risk of property being flooded

We will endeavour to manage these risks within available funding by:

- Developing Renewal Programs based on Overall Risk Score which is a combination of Star Rating and Condition as defined within the TRC Transport Strategy

## **1.7 Asset Management Practices**

Our systems to manage assets include:

- Technology One
- Pitney Bowes CONFIRM history
- Pitney Bowes MapInfo

Assets requiring renewal have been identified by the following approach:

- Financial Asset Register data is used to forecast the renewal costs, using the acquisition year and the useful life
- Operational Asset Register uses an estimate of renewal lifecycle costs, which is projected from internal defect assessments, data from Asset Management System and expert knowledge.

A combination of data from the Financial Asset Register and the Operational Asset Register was used to forecast the renewal life cycle costs for this Asset Management Plan.

## **1.8 Monitoring and Improvement Program**

The next steps resulting from this AMP to improve asset management practices are:

- Development of Desired Service Levels
- Development of Renewal Programs in line with Service Standards and available budgets
- Re-Valuation of Transport Assets to align Unit Rates and Useful Lives
- Desired Levels of Service for Maintenance to be included in TRC's Road Maintenance Management Plan

- Development of Capital Works program to upgrade Transport Assets to Desired Standard as per TRC Transport Strategy



## 2.0 Introduction

### 2.1 Background

This AMP communicates the requirements for the sustainable delivery of services through management of assets, compliance with regulatory requirements, and required funding to provide the appropriate levels of service over the long term planning period.

The AMP follows the format for Asset Management Plan recommended in Section 4.2.6 of the International Infrastructure Management Manual<sup>1</sup>.

The AMP is to be read with the following associated planning documents:

- [Corporate Plan 2021-2026](#)
- [Operational Plan 202223.pdf](#)
- [TRC Planning Scheme](#)
- [Asset Management Policy](#)
- [Strategic Asset Management Plan](#)
- International Infrastructure Management Manual 2011
- [Transport Strategy 2019-24](#)
- 10 Year Capital Plan
- IPWEA Practice Note 1 – Footpaths & Cycleways
- IPWEA Practice Note 2 – Kerb & Channel
- IPWEA Practice Note 9 – Road Pavements

The infrastructure assets covered by this AMP include Roads, Footpaths, Kerb & Channel and Car Parking. For a detailed summary of the assets covered in this AMP refer to Table 5.1.1 in Section 5.

These assets are used to provide safe and reliable transport services within the Tablelands Regional Council (TRC) Local Government area.

The infrastructure assets included in this plan have a total estimated replacement value of \$308,000,000.

Key stakeholders in the preparation and implementation of this AMP are shown in Table 2.1.

**Table 2.1: Key Stakeholders in the AMP**

Key Stakeholder	Role in Asset Management Plan
Councillors	<ul style="list-style-type: none"> <li>■ Represent needs of the whole of community/shareholders through strategies and policy not representation of individual community members in relation to individual customer requests.</li> <li>■ Approve resources i.e. budget to meet planning objectives in providing services while managing risks</li> <li>■ Ensure organisation is financial sustainable</li> </ul>

<sup>1</sup> IPWEA, 2011, Sec 4.2.6, Example of an Asset Management Plan Structure, pp 4|24 – 27

Key Stakeholder	Role in Asset Management Plan
	<ul style="list-style-type: none"> <li>Endorse asset management policy and plan</li> </ul>
Executive Leadership Team	<ul style="list-style-type: none"> <li>Ensure compliance and delivery</li> </ul>
Council Officers	<ul style="list-style-type: none"> <li>Operate and maintain assets in accordance with the AMP</li> <li>Compilation and verification of data</li> <li>Ensure plan represent the desired service levels</li> <li>Review AMPs</li> </ul>
Institute of Public Works Engineering Australia	<ul style="list-style-type: none"> <li>Development and Maintaining of Condition Assessment &amp; Asset Performance Guidelines (Practice Notes)</li> </ul>

## 2.2 Goals and Objectives of Asset Ownership

Our goal in managing infrastructure assets is to meet the desired level of service as defined within TRC's Transport Strategy in the most cost effective manner for present and future consumers. The key elements of infrastructure asset management are:

- Providing a defined level of service and monitoring performance
- Managing the impact of growth through demand management and infrastructure investment
- Taking a lifecycle approach to developing cost-effective management strategies for the long-term that meet the defined level of service
- Identifying, assessing and appropriately controlling risks
- Linking to a 10 Year Capital Plan which identifies required, affordable forecast costs and how it will be allocated.

Key elements of the planning framework are:

- Levels of service – specifies the services and levels of service to be provided
- Future demand – how this will impact on future service delivery and how this is to be met
- Lifecycle management – how to manage its existing and future assets to provide defined levels of service
- Financial summary – what funds are required to provide the defined services
- Asset management practices – how we manage provision of the services
- Monitoring – how the plan will be monitored to ensure objectives are met
- Asset management improvement plan – how we increase asset management maturity.

Other references to the benefits, fundamentals principles and objectives of asset management are:

- International Infrastructure Management Manual 2015 <sup>2</sup>
- ISO 55000<sup>3</sup>

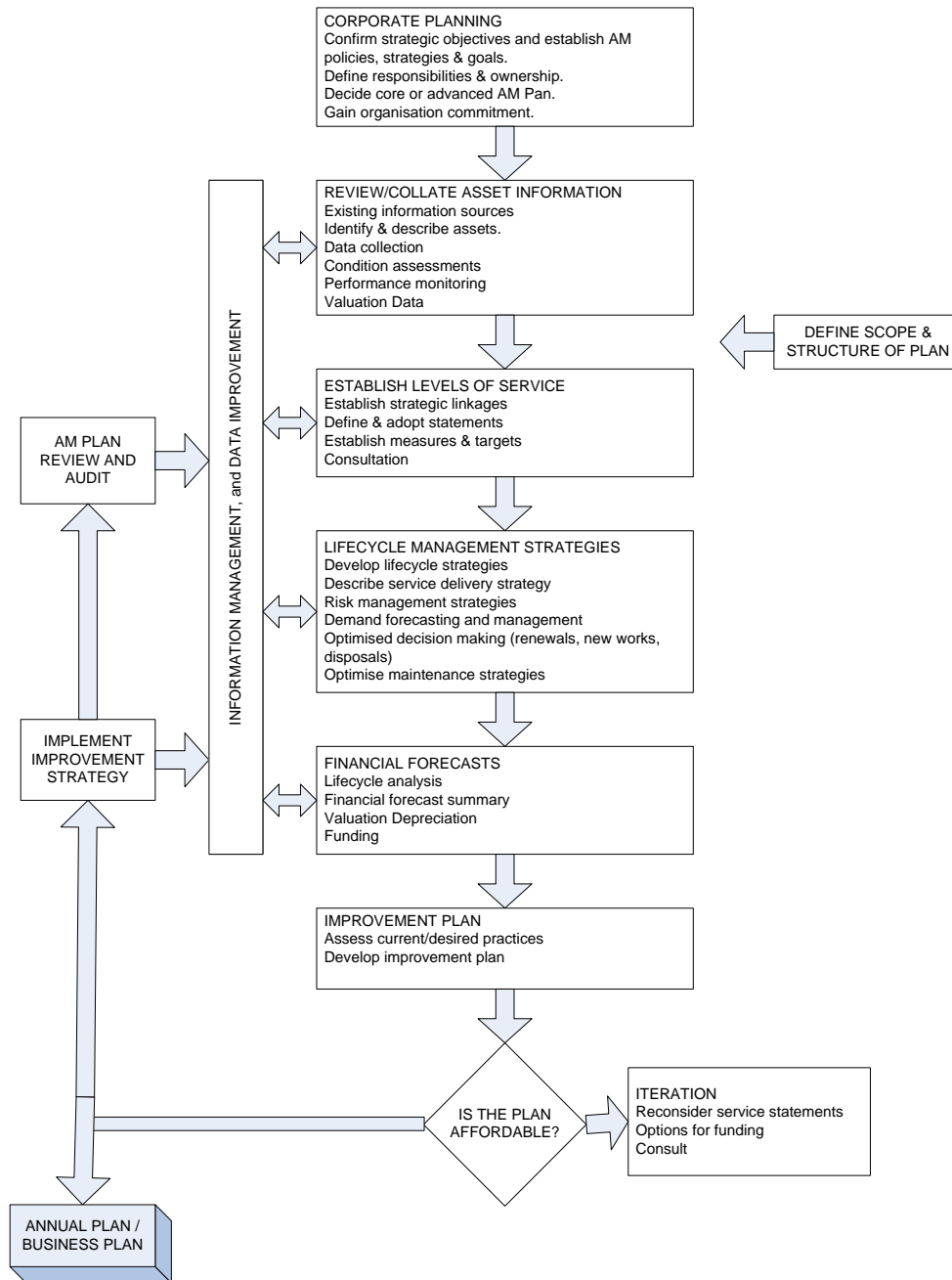
<sup>2</sup> Based on IPWEA 2015 IIMM, Sec 2.1.3, p 2 | 13

<sup>3</sup> ISO 55000 Overview, principles and terminology

A road map for preparing an Asset Management Plan is shown below.

**Road Map for preparing an Asset Management Plan**

Source: IPWEA, 2006, IIMM, Fig 1.5.1, p 1.11



### 3.0 LEVELS OF SERVICE

#### 3.1 Customer Research and Expectations

Market research was conducted between 20 September and 13 October 2019 to measure community perceptions of Council services and in particular satisfaction with those services provided by Council. The representative sample is 4% of the population (668 respondents). Outcomes from the survey are as follows:

- The overall satisfaction with roads (including bridges and major culverts) and drainage services scored 2.5 (rating level mixed) across all of TRC. This is relatively low when compared with 6 other Councils (a mix of Regional and Metro Councils from across Australia), which have an average score of 3.0.
- Council's perceived reliability in delivering core services is 3.1, which compares to an average score of 3.4 measured across 6 other Councils (a mix of Regional and Metro Councils from across Australia).

#### 3.2 Strategic and Corporate Goals

This AMP is prepared under the direction of the Strategic Asset Management Plan.

As adopted by Council. TRC Corporate Plan provides the following Strategic Theme.

*"Our infrastructure is well planned, integrated and fit-for-purpose"*

TRC Transport Strategy provides the following vision.

*"To provide residents, businesses and visitors access to integrated fit for purpose infrastructure, that makes for safe, efficient and sustainable transport within the region."*

TRC Transport Strategy provides the following mission:

*"TRC aims to ensure the road network sustainably provides a level of service that addresses the needs and expectations of the TRC community and its visitors."*

#### 3.3 Legislative Requirements

Legislative requirements that impact the delivery of the TRC transport assets are outlined in the Transport Strategy (2019-2024).

#### 3.4 Customer Levels of Service

Service levels are defined in two ways, customer levels of service and technical levels of service.

The Customer Levels of Service are considered in terms of:

**Quality** How good is the service ... what is the condition or quality of the service?

**Function** Is it suitable for its intended purpose .... Is it the right service?

**Capacity/Use** Is the service over or under used ... do we need more or less of these assets?

In Table 3.4 under each of the service measures types (Quality, Function, Capacity/Use) there is a summary of the performance measure being used, the current performance, and the expected performance based on the current funding level.

These are measures of fact related to the service delivery outcome e.g. number of occasions when service is not available, condition percentage's of Very Poor, Poor/Average/Good and Very Good and provide a balance in comparison to the customer perception.

**Table 3.4: Customer Level of Service Measures**

Type of Measure	Level of Service	Performance Measure	Current Performance	Performance Target
<b>Condition</b>	Roads are structurally sound and 'Fit for Purpose'	% of Roads in Good condition or better as indicated with IRI measuring.	60%	80%
	<b>Confidence levels</b>		Low (Professional judgement supported by a small amount data sampling)	High (Professional Judgement supported by extensive data)
<b>Function</b>	Service Level indicator.	The percentage of roads constructed to the desired service level.	82%	80% as per Transport Strategy
	<b>Confidence levels</b>		High (100% of network has been reviewed)	High (100% of network has been reviewed)
<b>Safety</b>	Safety Indicator	The number of vehicle incidents per 100 lane km of road.	2015 – 0.93 2016 – 1.04 2017 – 1.26 2018 – 1.04 2019 – 0.98	1.0/100 lane km of road.
	<b>Confidence levels</b>		High. (Based on data supplied by Qld Government for Blackspot Funding proposals)	High (Based on data supplied by Qld Government for Blackspot Funding proposals)

This is subject to change as condition assessment are completed across the road network.

### 3.5 Technical Levels of Service

**Technical Levels of Service** – To deliver the customer values, and impact the achieved Customer Levels of Service, are operational or technical measures of performance. These technical measures relate to the activities and allocation of resources to best achieve the desired customer outcomes and demonstrate effective performance.

Technical service measures are linked to the activities and annual budgets covering:

- **Operation** – the regular activities to provide services (e.g., opening hours of Council Customer Services, mowing grass, asset inspections, etc.)
- **Maintenance** – the activities necessary to retain an asset as near as practicable to an appropriate service condition. Maintenance activities enable an asset to provide service for its planned life (e.g. road patching, unsealed road grading, building and structure repairs)
- **Renewal** – the activities that return the service capability of an asset up to that which it had originally provided (e.g. road resurfacing and pavement reconstruction, pipeline replacement and building component replacement)
- **Upgrade/New** – the activities to provide a higher level of service (e.g. widening a road, sealing an unsealed road, replacing a pipeline with a larger size) or a new service that did not exist previously (e.g. a new road).

Council Infrastructure Officers plan, implement and control technical service levels to influence the service outcomes.<sup>4</sup>

Table 3.5 shows the activities expected to be provided under the current Planned Budget allocation, and the Forecast activity requirements being recommended in this AMP.

**Table 3.5: Technical Levels of Service**

Lifecycle Activity	Purpose of Activity	Activity Measure	Current Performance*	Recommended Performance **
<b>Operation</b>	Defect Management	The number of defects logged per km of the road	3415/1884 = 1.81	1.5
<b>Maintenance</b>	Road Maintenance	The percentage of roads maintained below intervention level.	TBD in future versions of Maintenance Management Plan. Currently intervention levels based on budget availability.	80%
<b>Renewal</b>	Smooth travel exposure indicator	The percentage of roads meeting roughness criteria (Condition Score 3 or Lower)	84.5% Note. Only 124.42 km of roads have had roughness testing.	80%
<b>Renewal</b>	Renewal Indicator	The percentage of roads with a surface age younger than its optimal target age. <b>Bitumen 12yrs</b> <b>Asphalt 25yrs</b> <b>Formed Gravel 8yrs</b>	Bitumen – 56.03% Asphalt – 100% Formed Gravel – 41.82%	80%
<b>Upgrade/New</b>	Upgrade/New road projects will be constructed as per the Replacement Program and in line with Desired Standards within Transport Strategy	The percentage of roads constructed to the desired service standard.	90%	80%

Note: \* Current activities related to Planned Budget.

\*\* Forecast required performance related to forecast lifecycle costs.

It is important to monitor the service levels provided regularly as these will change. The current performance is influenced by work efficiencies and technology, and customer priorities will change over time.

<sup>4</sup> IPWEA, 2015, IIMM, p 2|28.

## 4.0 FUTURE DEMAND

### 4.1 Demand Factors

Drivers affecting demand include things such as population change, regulations, changes in demographics, seasonal factors, vehicle ownership rates, consumer preferences and expectations, technological changes, economic factors, agricultural practices, environmental awareness, etc.

### 4.2 Demand Forecasts

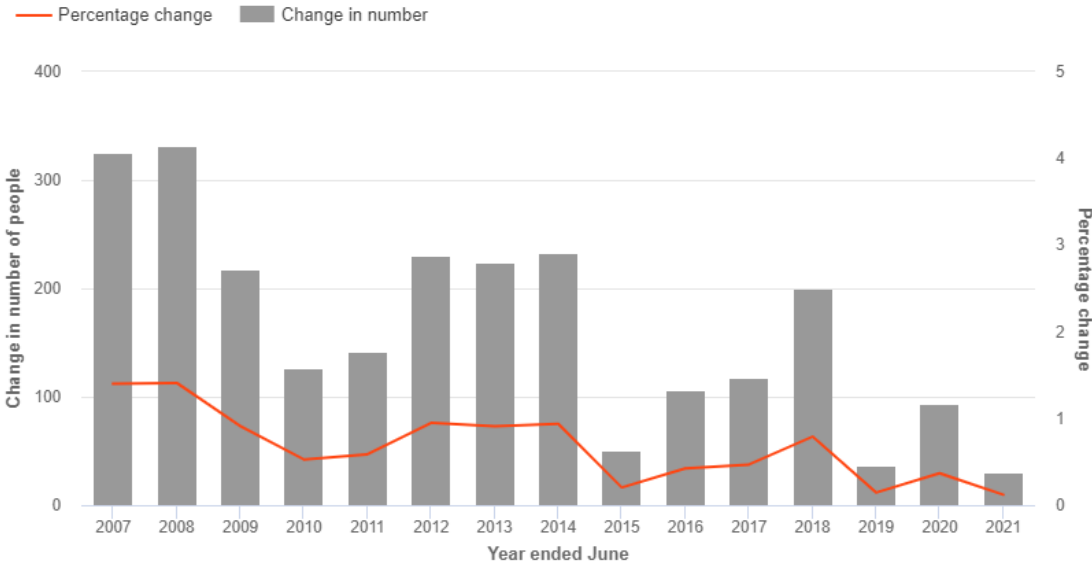
The present position and projections for demand drivers that may impact future service delivery and use of assets have been identified and documented. These drivers include:

- Population growth
- Demographics
- Development – Greenfield and in-fill
- Increased demand for asset rehabilitation and maintenance
- Increased risk of failure in ageing infrastructure
- Level of employment
- Changes in recreation and leisure trends
- Change in community expectations

The official population of Tablelands Regional Council area as of the 30th June 2022, is 26,244 with an average household size of 2.3.

### Annual change in Estimated Resident Population (ERP)

Tablelands Regional Council



Source: Australian Bureau of Statistics, Regional Population Growth, Australia (3218.0). Compiled and presented by id (informed decisions)

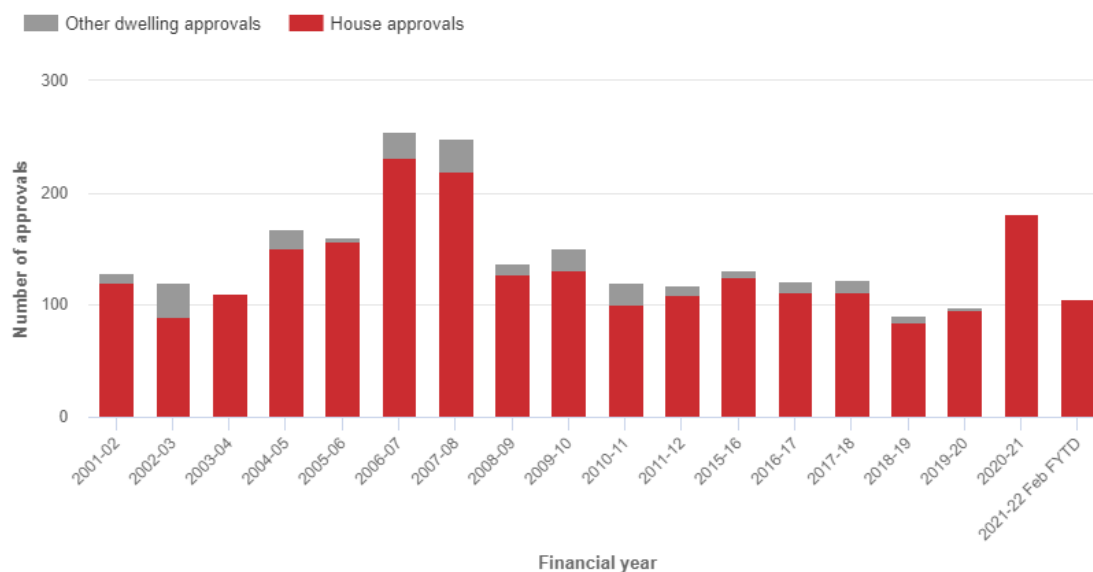
It is noted that the population projection will be somewhat similar to the current trend therefore the impact of population on services will be relatively insignificant.

The figure below shows the downward trend of building approvals from 232 houses and 23 other dwelling approvals in 2006-07 down to 96 houses and 2 other dwelling approvals in 2019-20. The 2020-21 building approvals shows a larger rate of growth than predicted with 181 housing approvals, it is unknown at this stage if this trend will continue to grow or return to previous housing approval rates of approximately 100 houses per

year.

## Residential building approvals

Tablelands Regional Council



Source: Australian Bureau of Statistics, Building Approvals, Australia (8731.0). Compiled and presented by id (informed decisions).

### 4.3 Demand Impact and Demand Management Plan

The impact of demand drivers that may affect future service delivery and use of assets are shown in Table 4.3.

Demand for change of service level i.e. request for B-Double vehicle approval, changes to rural land use (creation of new blueberry farms) will be managed through one of the following methodologies: managing existing assets, upgrading of existing assets and providing new assets to meet demand and demand management. Demand management practices can include non-asset solutions, insuring against risks and managing failures.

Opportunities identified to date for demand management are shown in Table 4.3. Further opportunities will be developed in future revisions of this AMP.

**Table 4.3: Demand Management Plan**

Demand driver	Current position	Projection	Impact on services	Demand Management Plan
Population growth to urban consolidation and Expansion	25,667 (30/06/2020)	Growth of 0.37%	An increase in population may result in higher maintenance, renewal, upgrade/acquisition costs	Optimise maintenance, renewal and upgrade works against Road Star Rating (Asset Criticality).
Demographics	Aging Population	Percentage of population over 60 will continue to increase	Increase usage of footpaths for mobility access. Requirement to widen footpaths & provide DDA compliant access ramps.	Continue to review and develop service levels and asset management plans to ensure accessibility to all community members in line with changing needs.



Tree Change	Popularity of Rural Residential living has continued within Council area.	Continued demand for Rural Residential Developments	Expectation of 'urban' quality services in Rural Residential developments.	Use of developer contributions to upgrade trunk infrastructure linked to developments. Clearly communicate service levels standards to the community.
Agricultural Practices	General access for vehicles used to transport goods from farms	Increased demand for restricted access vehicles (B-Doubles) to service farms	Requirement for freight routes and upgrade of roads. Change in freight routes/land use resulting in change of Road Star Rating and Service Level.	Use of B-Double permit system to monitor movement of vehicles. Deployment of traffic counters to measure usage. Maintain/update Road Star Rating as required.

#### 4.4 Asset Programs to meet Demand

The new assets required to meet demand may be acquired, donated or constructed. Additional assets are discussed in Section 5.4.

#### 4.5 Climate Change and Adaption

Climate change can have a significant impact on the assets we manage and the services they provide. In the context of the Asset Management Planning process climate change can be considered as both a future demand and a risk.

How climate change will impact on assets can vary significantly depending on the location and the type of services provided, as will the way in which we respond and manage those impacts.

As a minimum we should consider both how to manage our existing assets given the potential climate change impacts, and then also how to create resilience to climate change in any new works or acquisitions.

Opportunities identified to date for management of climate change impacts on existing assets are shown in Table 4.5.1

**Table 4.5.1 Managing the Impact of Climate Change on Assets**

Climate Change Description	Projected Change	Potential Impact on Assets and Services	Management
Climate Change	Trending toward increased seasonal extreme weather events.	Increasing levels of maintenance & renewal works to maintain current standard of the transport network. Transport networks will experience an increase in flood damage, increased structural and foundation damage through increased geotechnical effects and more generally an accelerated degradation of materials and structures through increased temperature and solar radiation.	Continue to monitor developments in this space such that the projected climate change and effects on infrastructure may be estimated. Appropriate measures may then be taken to account for these effects in asset management practices, infrastructure planning and material and design standards.

Additionally, the way in which we construct new assets should recognise that there is opportunity to build in resilience to climate change impacts. Buildings resilience will have benefits:

- Assets will withstand the impacts of climate change
- Services can be sustained
- Assets that can endure may potentially lower the lifecycle cost and reduce their carbon footprint.

Table 4.5.2 summarises some asset climate change resilience opportunities.

**Table 4.5.2 Building Asset Resilience to Climate Change**

New Asset Description	Climate Change impact These assets?	Build Resilience in New Works
Kerb & Channel	More extreme weather events and heavier rainfall	Any new kerb and channel works needs to accommodate increased flow from storm surges.  New Kerb and channel to be designed to an increased flood immunity.
Road Pavement (inc carparks)	More extreme weather events and heavier rainfall causing water over roads if it cannot get away	Consider permeable pavement designs.
	Degradation of pavements due to hot weather	Material types considered for reducing the fatigue rates of pavements  Modify pavement design and improve design standards/guidelines for road pavements
Road Surfaces	Higher temperatures, hotter and more frequent hot days	Resealing program. Select different products (polymer modified bitumen). Need more info on trend over time in temps and maintenance costs. Evidence of impact on ground.
Signs	Severe storm damage can displace signs	Selecting products for new signs that have a higher strength rating (better footing, better strength in the poles etc.) and are therefore, better resistant to handling extreme weather events like storms, cyclones etc.

The impact of climate change on assets is a new and complex discussion and further opportunities will be developed in future revisions of this AMP.

## 5.0 LIFECYCLE MANAGEMENT PLAN

The lifecycle management plan details how the Council plans to manage and operate the assets at the agreed levels of service (Refer to Section 3) while managing life cycle costs.

### 5.1 Background Data

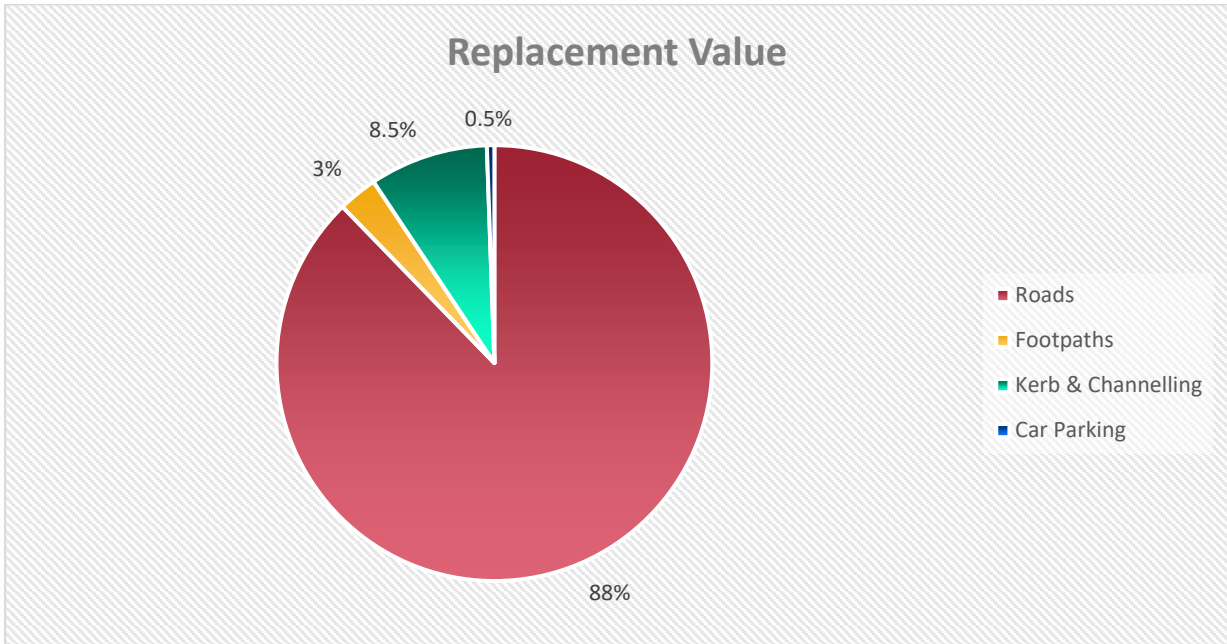
#### 5.1.1 Physical parameters

The assets covered by this Asset Management Plan and their estimated replacement cost are shown in Table 5.1.1.

**Table 5.1.1: Assets covered by this Plan**

Asset Type	Asset Sub-Type	Quantity	Replacement Value
Roads	Asphalt	97.7 km	\$40,403,568
	Bitumen	689.8 km	\$178,630,687
	Concrete	0.65 km	\$1,115,909
	Gravel	655.9 km	\$49,848,149
	Natural Surface	440.1 km	\$0
Footpaths	Concrete	43.0 km	\$6,695,343
	Paved	4.1 km	\$1,199,126
	Other	24.0 km	\$1,074,132
Kerb & Channelling	Concrete	288.9 km	\$27,092,045
Car Parking	Asphalt	380 m <sup>2</sup>	\$32,863
	Bitumen	15,678 m <sup>2</sup>	\$1,356,679
	Composite	1,410 m <sup>2</sup>	\$122,051
	Concrete	1,926 m <sup>2</sup>	\$166,640
	Gravel	249 m <sup>2</sup>	\$21,507
<b>TOTAL</b>			<b>\$307,758,699</b>

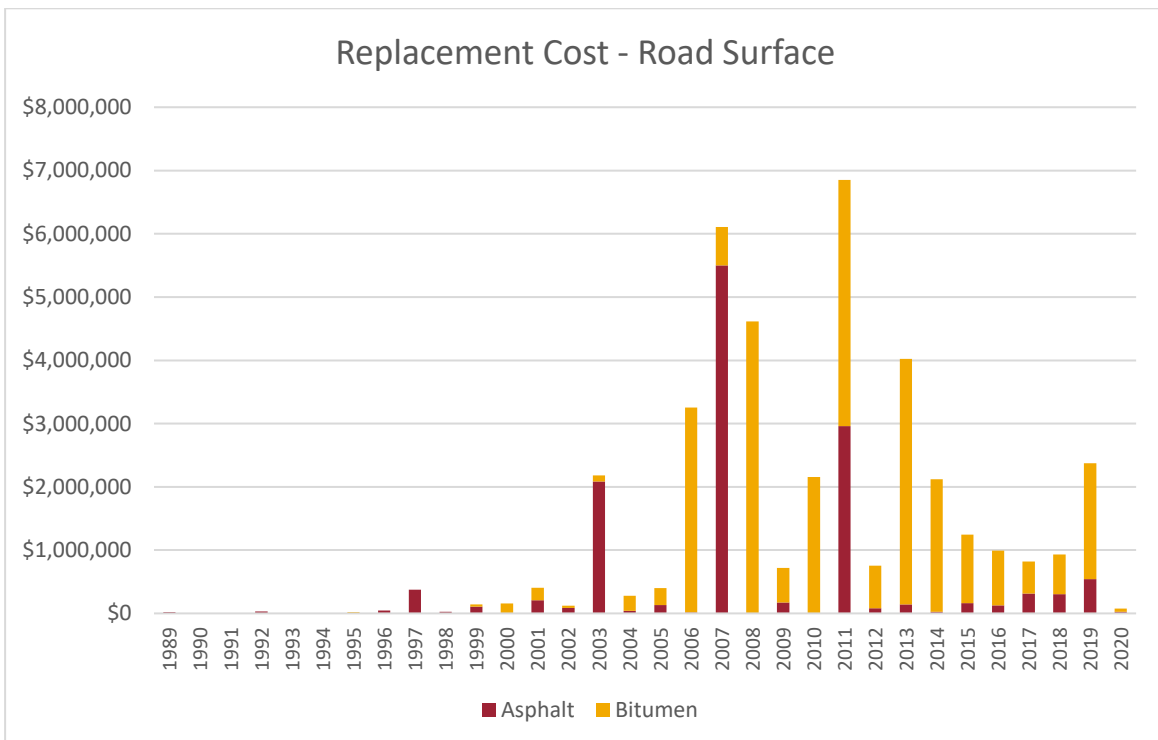
**Figure 5.1: Replacement Value shown as Percentage**



**Note:** The Replacement Values presented above are from the Financial Asset register which is based on renewing roads on a like for like basis and no consideration for upgrading (i.e. upgrade from bitumen to asphalt surface) to meet desired standards as defined with the Transport Strategy.

The Construction year profile of the assets included in this AMP are shown in Figures 5.1.1. & 5.1.6.

**Figure 5.1.1: Construction Year Profile (Road Surface)**

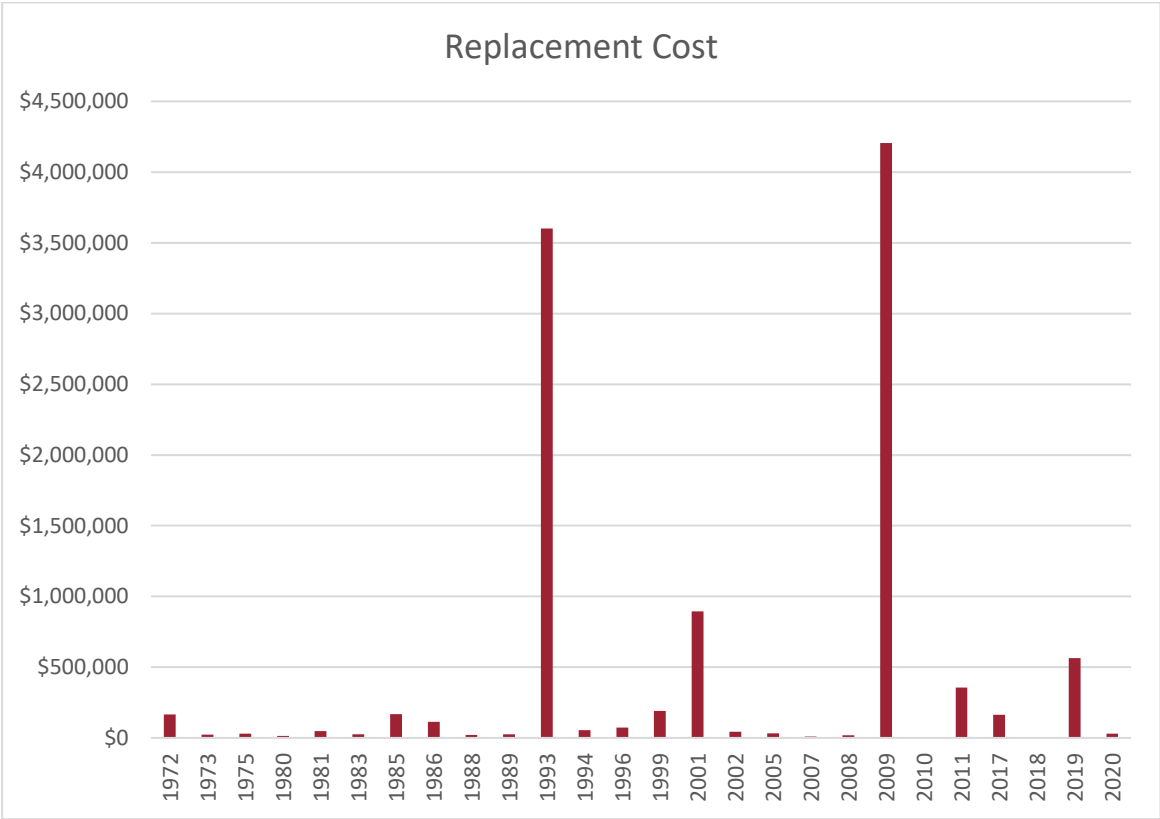


Figures represent up to 2020. This chart and figures will continue to be updated.

The constructed year profile shown in Figure 5.1.1 indicates that a significant amount (>\$5.0M) of Road Surfaces are reaching or have reached the end of their useful life (i.e. Sealed Year earlier than 2007)

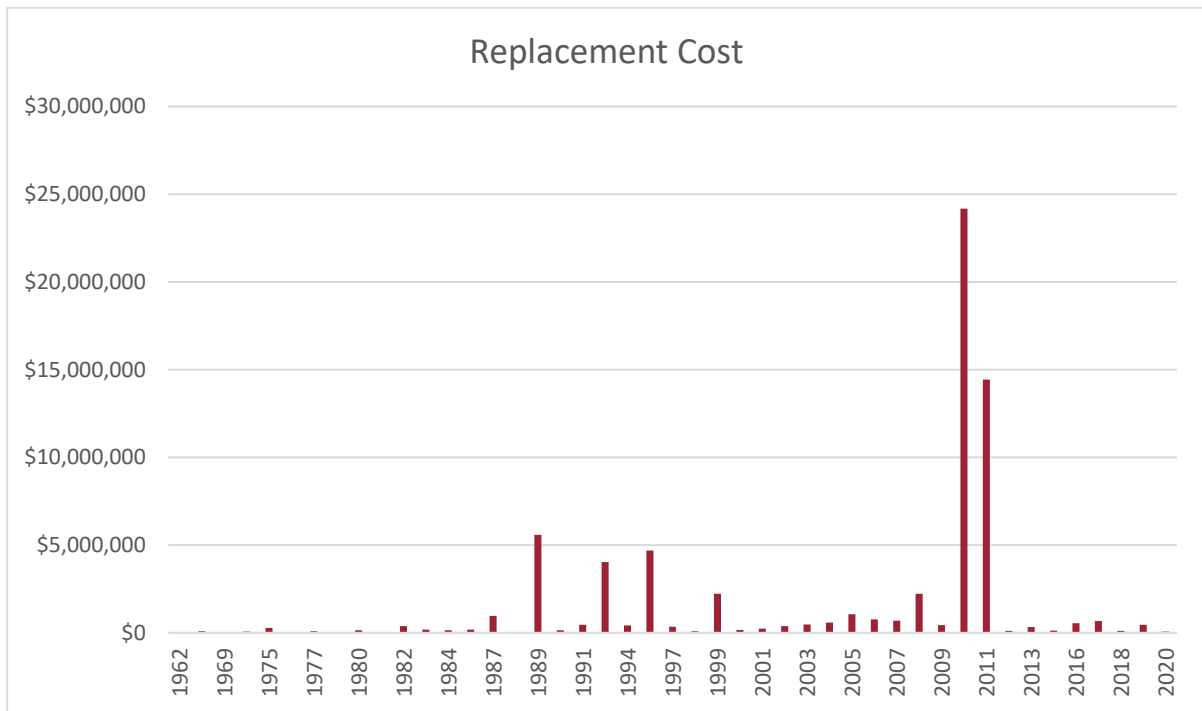
The useful life for roads is covered in 5.3.

**Figure 5.1.2: Construction Year Profile (Pavement - Asphalt Surface)**



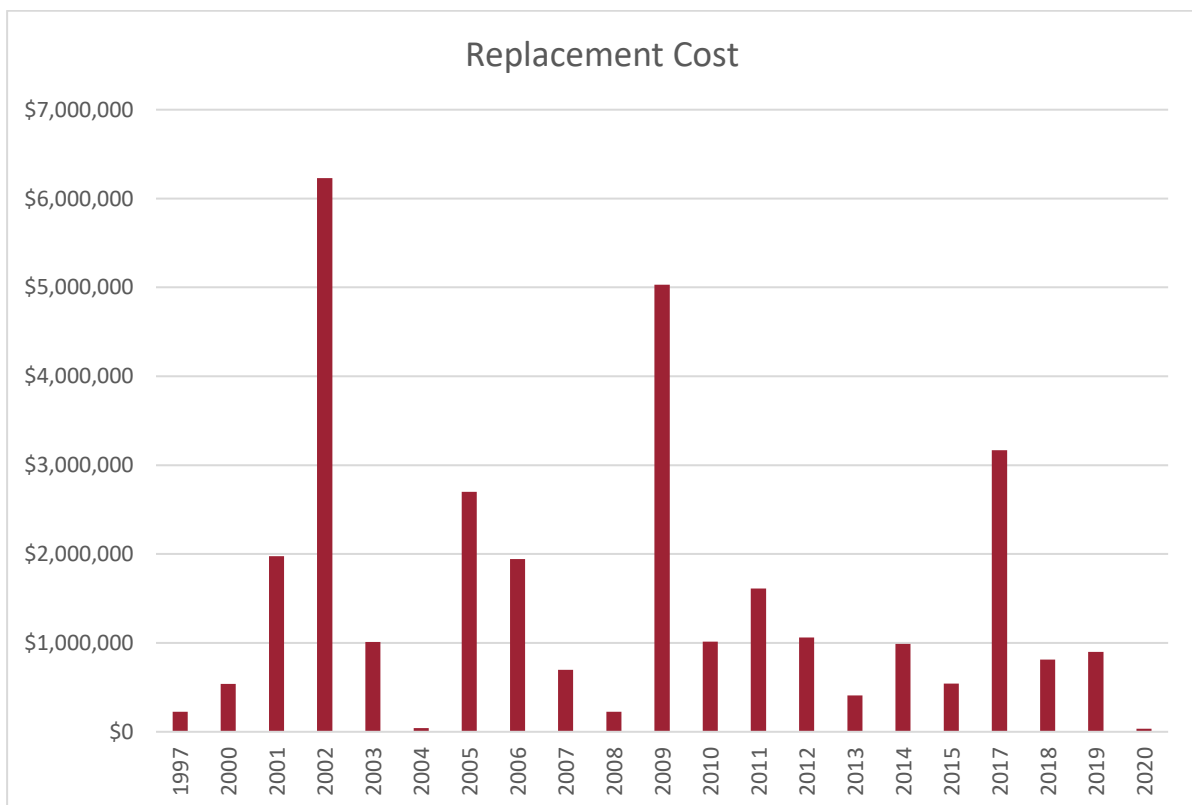
The constructed year profile shown in Figure 5.1.2 shows that there are 2 two distinct peaks in 1993 and 2009. This would indicate there are potential errors with the lack of data. These will develop as the improvement plan is established and conditions are known.

**Figure 5.1.3: Construction Year Profile (Pavement - Bitumen Surface)**



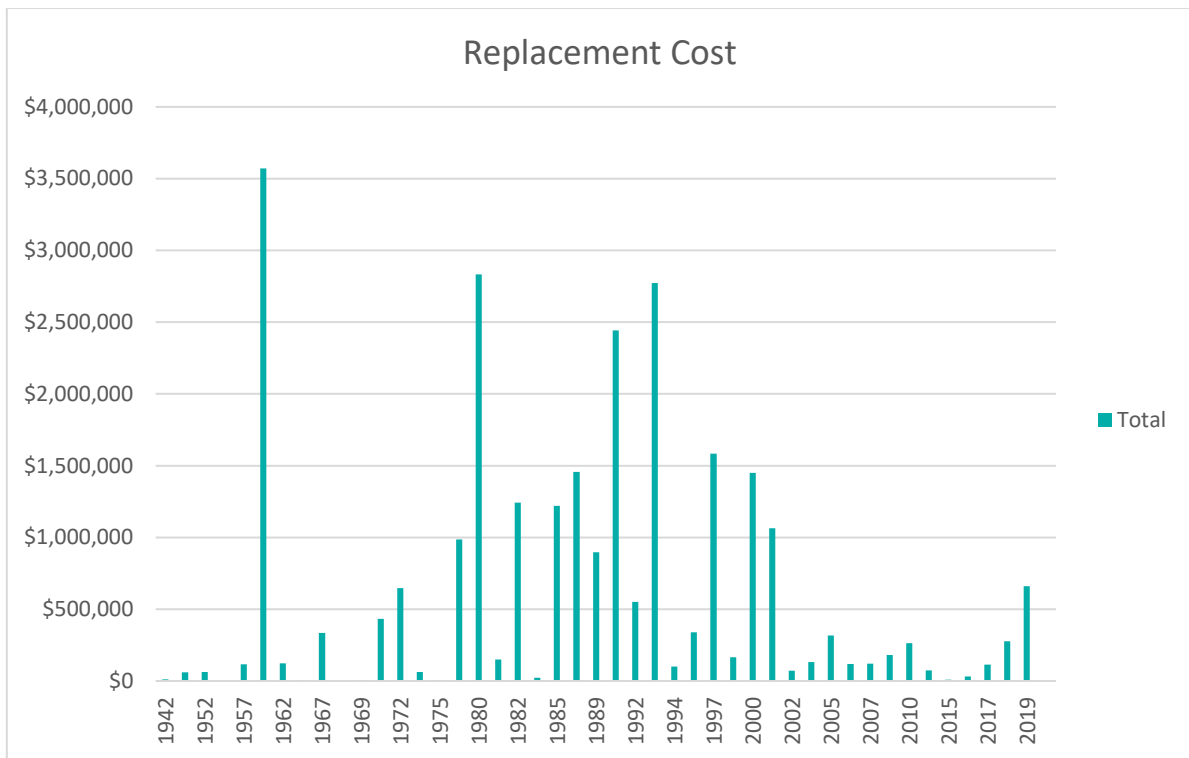
The constructed year profile shown in Figure 5.1.3 shows that there are 2 two distinct peaks in 2010 and 2011. This would indicate there are potential errors with the data which require further investigation.

**Figure 5.1.4: Construction Year Profile (Pavement - Gravel Surface)**



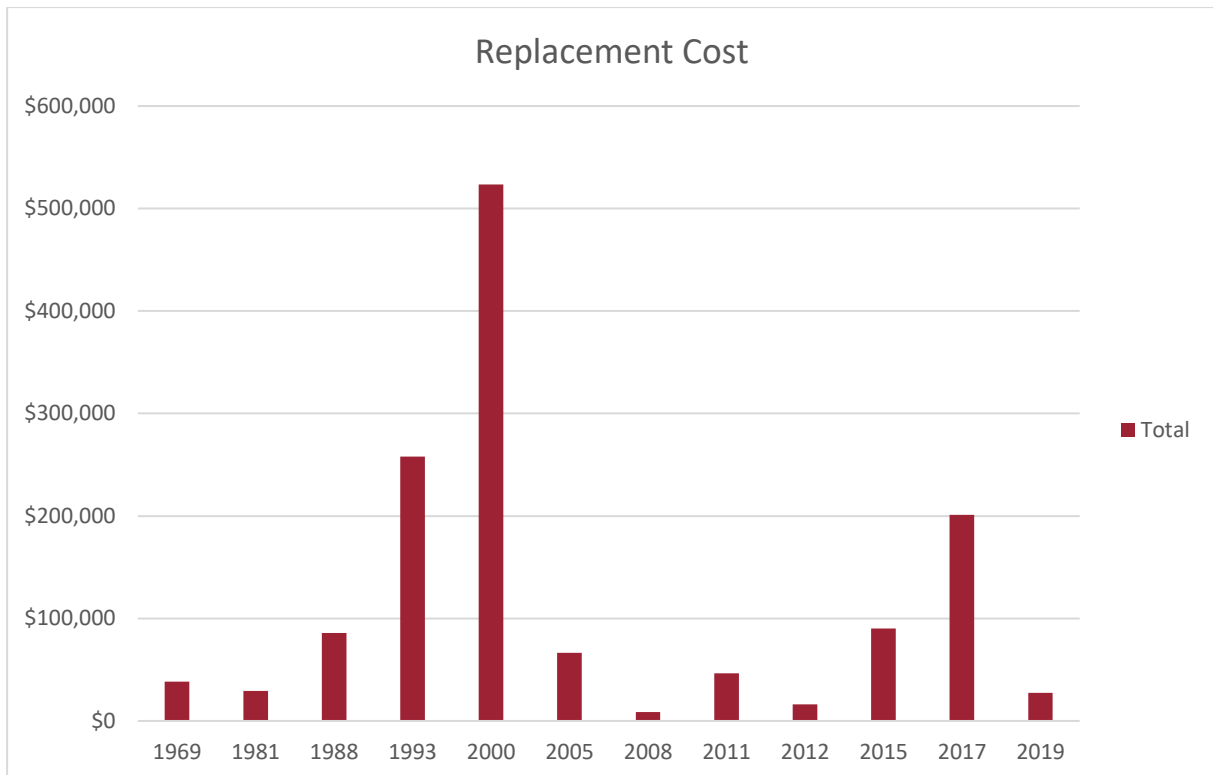
The constructed year profile shown in Figure 5.1.4 indicates that a significant amount (>\$10.0M) of Gravel roads are reaching or have reached the end of their useful life (i.e. Re-Sheet Year earlier than 2010)

**Figure 5.1.5: Construction Year Profile (Kerb & Channel)**



The constructed year profile shown in Figure 5.1.5 indicates that are no Kerb and Channel assets nearing or have reached their useful life. These figures will change as asset conditions are recorded.

**Figure 5.1.6: Construction Year Profile (Car Parking)**



### **5.1.2 Asset capacity and performance**

Assets are generally provided to meet design standards where these are available. Tablelands Regional Council has developed a Transport Strategy which has defined the Desired Design Standards for both Rural and Urban Roads. These standards are detailed in the following tables.

It should be noted that Footpaths & Kerb & Channel Star Rating is linked to the applicable Road Segment Star Rating.



**Table 1: Desired design standards for rural roads**

Star Rating	Design Element											
	Width [m]			Flood Immunity	Wearing Course	Design Life (maximum) [yr]		Reserve Width** [m]	Desirable Speed Environment (maximum) [km/h]	Design Speed Environment (minimum) [km/h]	Bridges***	
	Formation	Pavement	Lane			Pavement	Seal				Load Limit [t]	Lane Configuration
4.6 - 5.0	10	9	7	Q5	Seal	50	12	30(+)	100	80	S1600	Dual
4.1 - 4.5	10	9	7	Q5	Seal	50	12	30(+)	100	80	S1600	Dual
3.6 - 4.0	9	8	7	Q5	Seal	50	12	30(+)	100	80	44	Dual
3.1 - 3.5	7.5	6.5	3.5-6.5*	Q2	Seal	50	12	20 - 30	80	60	44	Dual
2.6 - 3.0	7.5	6.5	3.5-6.5*	Q2	Seal	50	12	20 - 30	80	60	44	Single
2.1 - 2.5	5.5	4.5	4.5	Q2	Gravel	8	N/A	20 - 30	60	40	44	Single
1.6 - 2.0	5.5	4.5	4.5	Q2	Gravel	8	N/A	20 - 30	60	40	44	Single
1.1 - 1.5	4.5	3.5	3.5	Q2	Natural	Infinite	N/A	20	40	N/A	N/A	N/A
0.0 - 1.0	NA	NA	NA	NA	Natural	Infinite	N/A	20	40	N/A	N/A	N/A
* Seal width depending on environmental considerations (weather) and whole of life costing												
** Reserve width depending on environmental considerations (terrain) or as existing												
*** Bridge Load Limit depending on alternate access or Traffic Count >20 VPD												

Note: It is recommended that sections of gravel roads will be considered for an upgrade to bitumen seal standard where there are occupied dwellings on the prevailing downwind side within 100m of the centreline of the road carriageway. Officers will apply discretion on project scope (i.e. length of the section proposed to be sealed) based on the number of and distance between dwellings on the road. This does not apply to formed natural material roads.

**Table 2: Desired design standards for urban roads**

Star Rating	Design Element																		
	Width [m]			Flood Immunity	Wearing Course	Design Life (Maximum) [yr]			Reserve Width** [m]	Desirable Speed (maximum) [km/h]	Bridges***		Drainage			Footpaths (formed)		Cycle path	Lighting
	Formation	Pavement*	Lane			Pavement	Seal	Line marking			Load Limit [t]	Lane Configuration	Kerb and Channel	Under Ground Stormwater	Drainage Easements	Location	Width	Location	Type
4.6 - 5.0	16	16	16	Q5	Asphalt	50	25	Yes	25	40-60	44	Dual	Yes	Yes	As Applicable	Both sides	Unlimited	Yes	V3
4.1 - 4.5	11	11	11	Q5	Asphalt	50	25	Yes	25	40-60	44	Dual	Yes	Yes	As Applicable	Both sides	Unlimited	Yes	V3
3.6 - 4.0	11	11	11	Q5	Asphalt	50	25	Yes	25	40-60	44	Dual	Yes	Yes	As Applicable	Both sides	2m	Yes	B1
3.1 - 3.5	7.5	7.5	7.5	Q5	Asphalt	50	25	Intersection and Curves	20	40-50	44	Dual	Yes	Yes	As Applicable	Both sides	2m	Yes	B1
2.6 - 3.0	7.5	7.5	7.5	Q5	Asphalt	50	25	Intersection and Curves	20	40-50	44	Dual	Yes	Yes	As Applicable	One side	2m	Yes	B1
2.1 - 2.5	6.5	6.5	6.5	Q2	Asphalt	50	25	Intersection and Curves	20	40-50	44	Single	Yes	Yes	As Applicable	N/A	N/A	N/A	B1
1.6 - 2.0	6.5	6.5	6.5	Q2	Asphalt	50	25	No	16	40-50	44	Single	Yes	N/A	As Applicable	N/A	N/A	N/A	B1
1.1 - 1.5	5.5	5.5	5.5	Q2	Bitumen	50	12	No	16	40-50	44	Single	N/A	N/A	As Applicable	N/A	N/A	N/A	B2
0.0 - 1.0	5.5	5.5	5.5	NA	Bitumen	50	12	No	16	40-50	44	Single	N/A	N/A	As Applicable	N/A	N/A	N/A	B2

\* Seal width depending on environmental considerations (weather) and whole of life costing

\*\* Reserve width depending on environmental considerations (terrain) or as existing

\*\*\* Bridge Load Limit depending on alternate access or Traffic Count >20 VPD

However, there is insufficient resources to address all known deficiencies. Locations where deficiencies in service performance are known are detailed in Table 5.1.2.

**Table 5.1.2: Known Service Performance Deficiencies**

Service Deficiency	Upgrade Works Required	Approximate Dollar Value and Quantity of Upgrade Works
Various TRC roads are currently at a standard below the Desired Design Standard based on current Star Rating.	Upgrade to Asphalt Surface	\$6.7M – 250,000m <sup>2</sup>
	Upgrade to Formed Gravel	\$12.8M – 750,000m <sup>2</sup>
	Upgrade to Bitumen Surface	\$32.3M – 460,000m <sup>2</sup>
	Footpath Works	\$5.0M – 29,500m <sup>2</sup>
	Kerb & Channel Works	\$1.3M – 7700m
	Widen & Seal Works	\$6.6M – 47,000m <sup>2</sup>

The above service deficiencies were identified from a gap analysis undertaken on the TRC Road Network.

### 5.1.3 Asset condition

Condition is measured using a 1 – 5 grading system<sup>5</sup> as detailed in Table 5.1.3. It is important that consistent condition grades be used in reporting various assets across an organisation. This supports effective communication. At the detailed level assets may be measured utilising different condition scales, however, for reporting in the AMP they are all translated to the 1 – 5 grading scale.

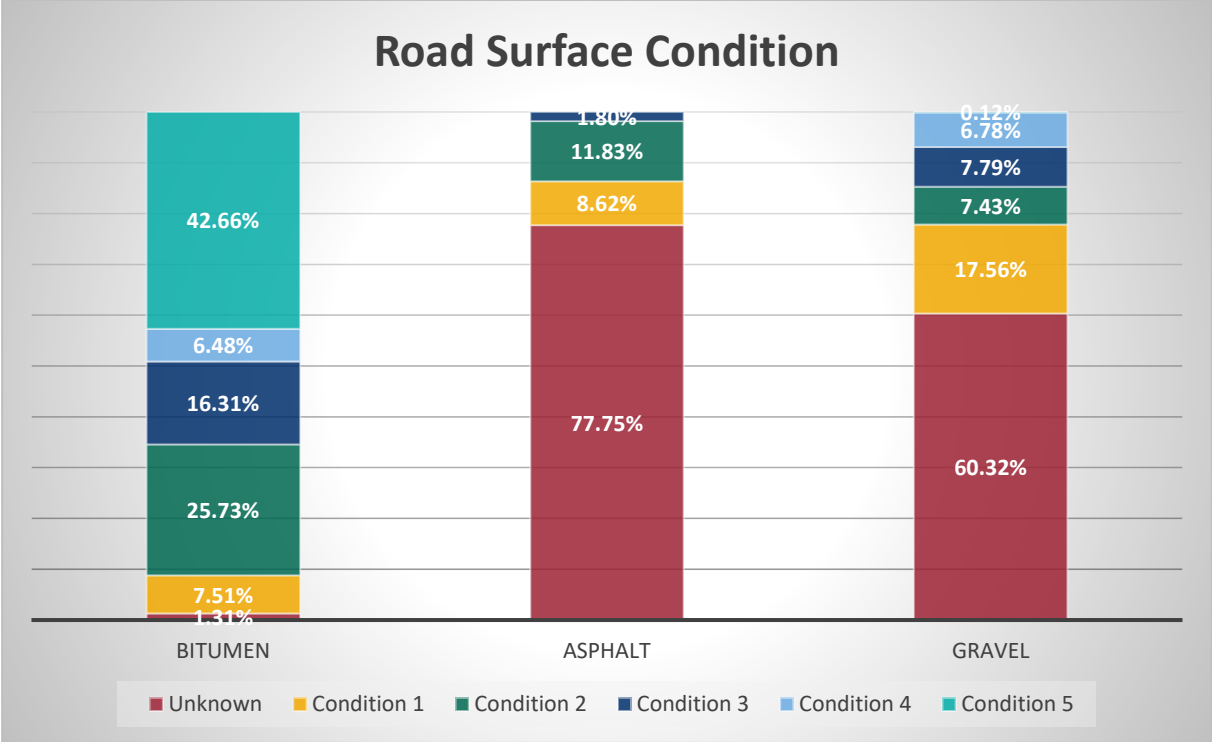
**Table 5.1.3: Simple Condition Grading Model**

Condition Grading	Description of Condition
1	<b>Good “as new”:</b> Free of defects with little or no deterioration evident.
2	<b>Fair:</b> Free of defects affecting structural performance, integrity and durability. Deterioration of a minor nature in the protective coating and/or parent material is evident.
3	<b>Poor:</b> Defects affecting the durability/serviceability which may require monitoring and/or remedial action or inspection by a structural engineer. Component or element shows marked and advancing deterioration including loss of protective coating and minor loss of section from the parent material is evident. Intervention is normally required.
4	<b>Very Poor:</b> Defects affecting the performance and structural integrity which require immediate intervention including an inspection by a structural engineer, if principal components are affected. Component or element shows advanced deterioration, loss of section from the parent material, signs of overstressing or evidence that it is acting differently to its intended design mode or function.
5	<b>Unsafe:</b> This state is only intended to apply to the overall structural integrity. Structural integrity is severely compromised and the structure must be taken out of service until a structural engineer has inspected the structure and recommended the required remedial action.

<sup>5</sup> IPWEA, 2015, IIMM, Sec 2.5.4, p 2 | 80.

The condition profile of our assets is shown in Figure 5.1.3 – 5.1.5.

**Figure 5.1.3: Road Surface Condition Profile (Based on Age)**



**Figure 5.1.4: Footpath Condition Profile**

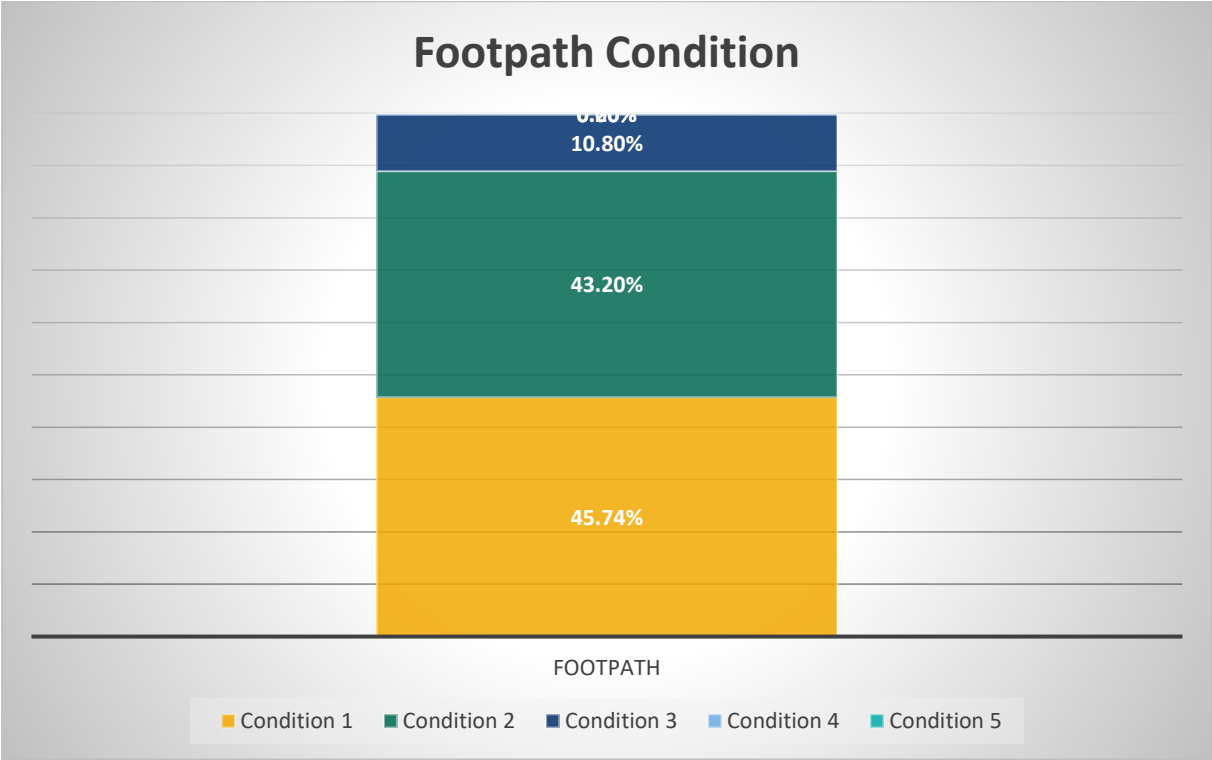
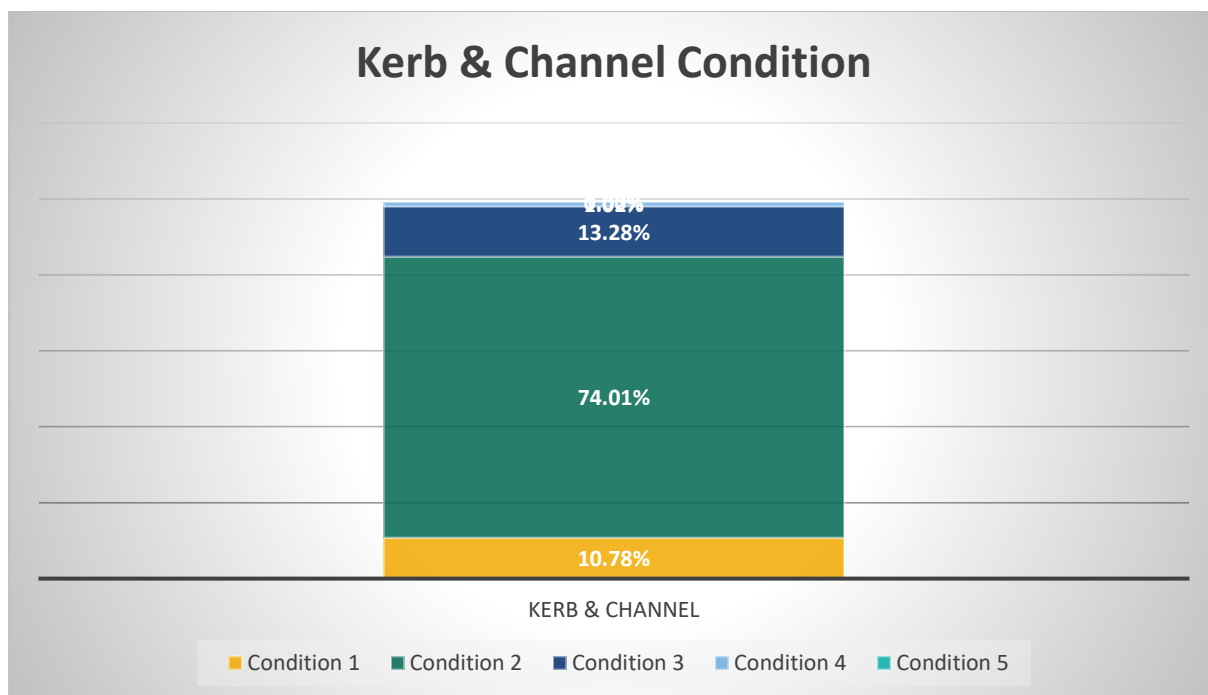


Figure 5.1.5: Kerb & Channel Condition Profile



## 5.2 Operations and Maintenance Plan

Operations include regular activities to provide services. Examples of typical operational activities include cleaning road furniture, road inspection, and vegetation maintenance.

Maintenance includes reactive, planned and specific maintenance work activities.

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

- pothole patching
- debris removal
- tree removal

Planned maintenance is repair work that is identified and managed through a maintenance management plan (MMP). MMP 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. Activities include:

- sealed pavement and surface repairs
- roadside drains, pipes and culvert cleaning and repair
- signage/guide post cleaning, repair and/or replacement

Specific maintenance is replacement of higher value components/sub-components of assets that is undertaken at regular intervals to ensure the road is kept in safe and serviceable condition. Activities include:

- unsealed road grading
- roadside grass and verge maintenance operations
- repainting road markings and sign cleaning

This work generally falls below the capital/maintenance threshold but may require a specific budget allocation. The trend in maintenance budgets are shown in Table 5.2.1.

**Table 5.2.1: Maintenance Budget Trends**

Year	Maintenance Budget \$
2019/20	\$4,131,728
2020/21	\$4,095,258
2021/22	\$4,388,055

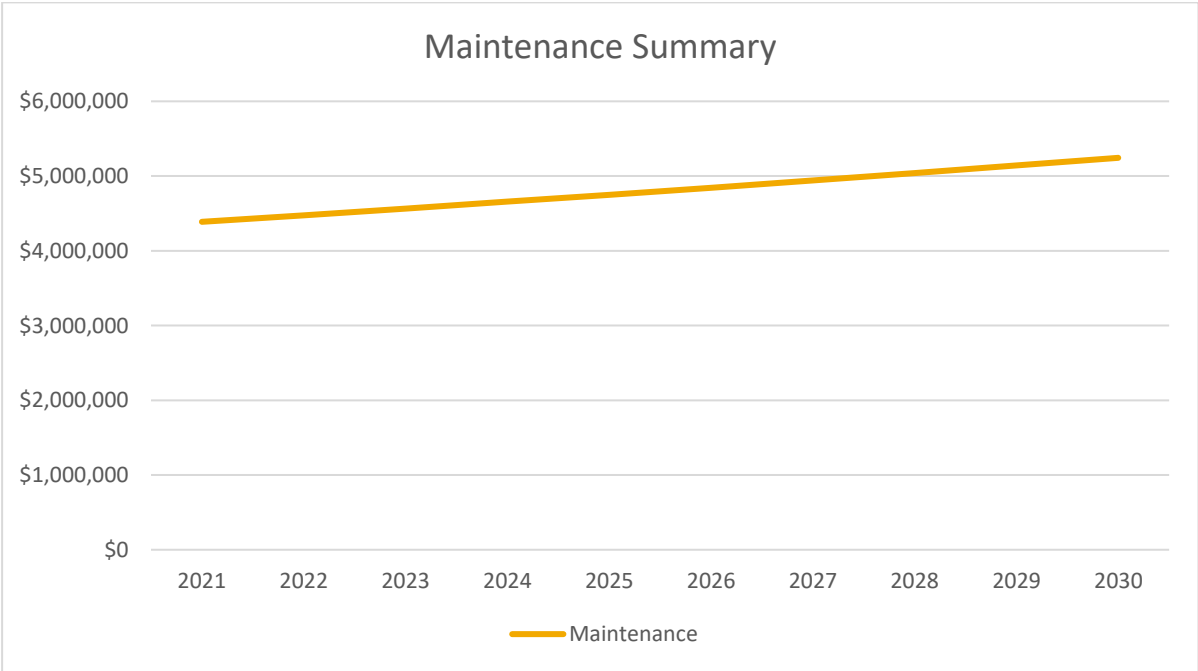
Maintenance budget levels are considered to be adequate to meet risk levels, which may be less than or equal to desired service levels. Where maintenance budget allocations are such that they will result in a lesser level of service, this will require further analysis by Council officer to identify service risk and consequences.

Reactive maintenance is carried out in accordance with intervention levels detailed in the Roads Maintenance Management Plan and Road Star Rating as outlined in the TRC Transport Strategy.

**Summary of forecast operations and maintenance costs**

Forecast operations and maintenance costs are expected to vary in relation to the total value of the asset stock. If additional assets are acquired, the future operations and maintenance costs are forecast to increase. If assets are disposed of the forecast operation and maintenance costs are expected to decrease. Figure 5.2 shows the forecast operations and maintenance costs relative to the proposed operations and maintenance Planned Budget.

**Figure 5.2: Operations and Maintenance Summary (All Classes)**



All figure values are shown in current day dollars.

An annual increase of 2.0% has been applied to the 2021/22 Maintenance Budget to allow for increases in costs to deliver maintenance activities.

**Asset hierarchy**

An asset hierarchy provides a framework for structuring data in an information system to assist in collection of data, reporting information and making decisions. The hierarchy includes the asset class and component used for asset planning and financial reporting and service level hierarchy used for service planning and delivery. This is included in the Transport Strategy where the service level is linked to the Star Rating of the Road Network segment.

The service hierarchy is shown in Table 5.2.2.

**Table 5.2.2: Asset Service Hierarchy**

**Urban Roads**

STAR RATING CRITERIA FOR URBAN ROADS											
Speed Limit			Terrain			Traffic Count			Use		
Value	Score	Weight	Value	Score	Weight	Value	Score	Weight	Value	Score	Weight
		5%			5%	Vehicles per day (v/pd)		50%			40%
Speed - 100 km/h	0	0	Mountainous	10	0.5	>1000	10	5	CBD / Commercial / Tourism	2.5	1
Speed - 90 km/h	0	0	Rolling	5	0.25	600-1000	10	5	Public Transport	2	0.8
Speed - 80 km/h	0	0	Level	2	0.1	300-599	8	4	Essential Public Infrastructure Access	2	0.8
Speed - 70 km/h	10	0.5	Not Applicable	0	0	150-299	6	3	Recreational Access	1.5	0.6
Speed - 60 km/h	9	0.45				75-149	4.5	2.25	Industrial Zone	1.5	0.6
Speed - 50 km/h	6	0.3				20-74	2	1	Cycling	0.5	0.2
Speed - 40 km/h	2	0.1				0-19	1	0.5	Not Applicable	0	0
Not Applicable	0	0				Not Applicable	0	0			



Rural Roads

STAR RATING CRITERIA FOR RURAL ROADS														
Desired Speed Limit*			Terrain			Traffic Count			Use			Access		
Value	Score	Weight 5%	Value	Score	Weight 5%	Value	Score	Weight 50%	Value	Score	Weight 30%	Value	Score	Weight 10%
						Vehicles per day (v/pd)								
Speed - 100 km/h	10	0.5	Mountainous	10	0.5	>1000	10	5	Primary Production (High Value Crops)	2.7	0.81	No Alternative Access	10	1
Speed - 90 km/h	0	0	Rolling	5	0.25	600-1000	10	5	Primary Production (Broad Acre Crops)	2	0.6	Limited Alternative Access	8	0.8
Speed - 80 km/h	5	0.25	Level	2	0.1	300-599	8	4	Tourism	1	0.3	Some Alternative Access	6	0.6
Speed - 70 km/h	0	0	Not Applicable	0	0	150-299	6.5	3.25	Essential public infrastructure Access	2	0.6	Moderate Alternative Access	4	0.4
Speed - 60 km/h	2	0.1				75-149	4.5	2.25	B Double (NHVR)	1.5	0.45	Good Alternative Access	2	0.2
Speed - 50 km/h	0	0				20-74	2	1	Public Transport	2.5	0.75	Not Applicable	0	0
Speed - 40 km/h	0	0				0-19	1	0.5	Cycling	0.3	0.09			
Not Applicable	0	0				Not Applicable	0	0	Not Applicable	0	0			

The following two examples show how the star rating of each rural road can be calculated using the information provided in the Transport Strategy.

<b>RURAL ROAD X</b>				
<b>Criterion</b>	<b>Value</b>	<b>Score</b>	<b>Weight</b>	<b>Weighted Score</b>
Desired speed limit	100 km/hr	10	5%	0.50
Terrain	Level	2	5%	0.10
Traffic Count	52 v/pd	2	50%	1.00
Use	Primary Production	2.7	30%	0.81
Use	Tourism	2.2	30%	0.66
Access	Some	6	10%	0.60
<b>Total Weighted Score</b>				<b>3.67</b>
<b>Star Rating</b>	<b>(=total score divided by 2)</b>			<b>1.84</b>
Rural road X is a 2 star road				

<b>URBAN ROAD Y</b>				
<b>Criterion</b>	<b>Value</b>	<b>Score</b>	<b>Weight</b>	<b>Weighted Score</b>
Desired speed limit	60 km/hr	9	5%	0.45
Terrain	Level	2	5%	0.10
Traffic Count	320 v/pd	8	50%	4.00
Use	Cycling	0.5	40%	0.20
Use	Tourism	2.5	40%	1.00
<b>Total Weighted Score</b>				<b>5.75</b>
<b>Star rating</b>	<b>(=total score divided by 2)</b>			<b>2.88</b>
Urban road Y is a 3 star road				

### 5.3 Renewal Plan

Renewal is major capital work which does not significantly alter the original service provided by the asset, 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 considered to be an acquisition resulting in additional future operations and maintenance costs.

Assets requiring renewal are identified by the following approaches.

- The first method uses Asset Register data to project the renewal costs (current replacement cost) and renewal timing (acquisition year plus updated useful life to determine the renewal year), and
- The second method uses an alternative approach to estimate the timing and cost of forecast renewal work (i.e. condition modelling system, staff judgement, average network renewals, or other).

The estimates for renewals in this Asset Management Plan were based using both approaches as defined below.

- Gravel Re-Sheeting – Second Method
- Bitumen Resealing – Second Method
- Asphalt Renewals – Combined
- Pavement Rehabilitation – First Method
- Kerb & Channel Renewals – First Method
- Footpath Renewals – First Method

The typical useful lives of assets used to develop projected asset renewal forecasts are shown in Table 5.3. Asset financial useful lives were last reviewed in 2022.<sup>6</sup>

**Table 5.3: Useful Lives of Assets**

Asset Category	Asset Type	Asset Sub-Type	Useful life
Carpark	Formation	Bitumen	Unlimited Life
		Composite	Unlimited Life
		Concrete	Unlimited Life
		Gravel	Unlimited Life
	Pavement	Bitumen	70
		Composite	70
		Concrete	70
		Gravel	15
	Surface	Bitumen	15
		Composite	30
		Concrete	60

<sup>6</sup> Enter Reference to Report documenting Review of Useful Life of Assets

Footpaths	Asphalt Footpath		60
	Bitumen Footpath		60
	Concrete Footpath		60
	Exposed Aggregate Footpath		60
	Pavers Footpath		40
	Porphyry Footpath		40
	Gravel Footpath		20
Kerb & Channel	Barrier Kerb		80
	Barrier Kerb & Channel		80
	Concrete Invert		80
	Edge Restraint		80
	Layback Kerb & Channel		80
	Layback Kerb & Tray		80
	Maintenance Strip Kerb		80
	Other Kerb Type		80
	Semi-mountable Kerb Type 1		80
	Semi-mountable Kerb Type 2		80
	Semi-mountable Kerb Type 3		80
<b>Sealed Roads</b>			
Formation	Asphalt	Rural	Unlimited Life
		Urban	Unlimited Life
	Bitumen	Rural	Unlimited Life
		Urban	Unlimited Life
	Concrete	Rural	Unlimited Life
		Urban	Unlimited Life
Pavement	Asphalt non-structural	Rural	70
		Urban	70
	Bitumen	Rural	60
		Urban	70

	Concrete	Rural	100
		Urban	100
Surface	Asphalt non-structural	Rural	30
		Urban	30
	Bitumen	Rural	15
		Urban	15
	Concrete	Rural	75
		Urban	75
<b>Unsealed Roads</b>			
Formation	Formed Natural Soil	Rural	Unlimited Life
		Urban	Unlimited Life
Pavement	Formed Gravel/Wearing surface	Rural	15
		Urban	12
Unformed		Rural	Unlimited Life
		Urban	Unlimited Life

### 5.3.1 Renewal ranking criteria

Asset renewal is typically undertaken to either:

- Ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate (e.g. replacing a bridge that has a 5 t load limit), or
- To ensure the infrastructure is of sufficient quality to meet the service requirements (e.g. condition of a footpath).<sup>7</sup>

It is possible to prioritise renewals by identifying assets or asset groups that:

- Have a high consequence of failure
- Have high use and subsequent impact on users would be significant
- Have higher than expected operational or maintenance costs
- Have potential to reduce life cycle costs by replacement with a modern equivalent asset that would provide the equivalent service.<sup>8</sup>

The ranking criteria used to determine priority of identified renewal proposals is detailed in Table 5.3.1.

<sup>7</sup> IPWEA, 2015, IIMM, Sec 3.4.4, p 3|91.

<sup>8</sup> Based on IPWEA, 2015, IIMM, Sec 3.4.5, p 3|97.

**Table 5.3.1: Renewal Priority Ranking Criteria**

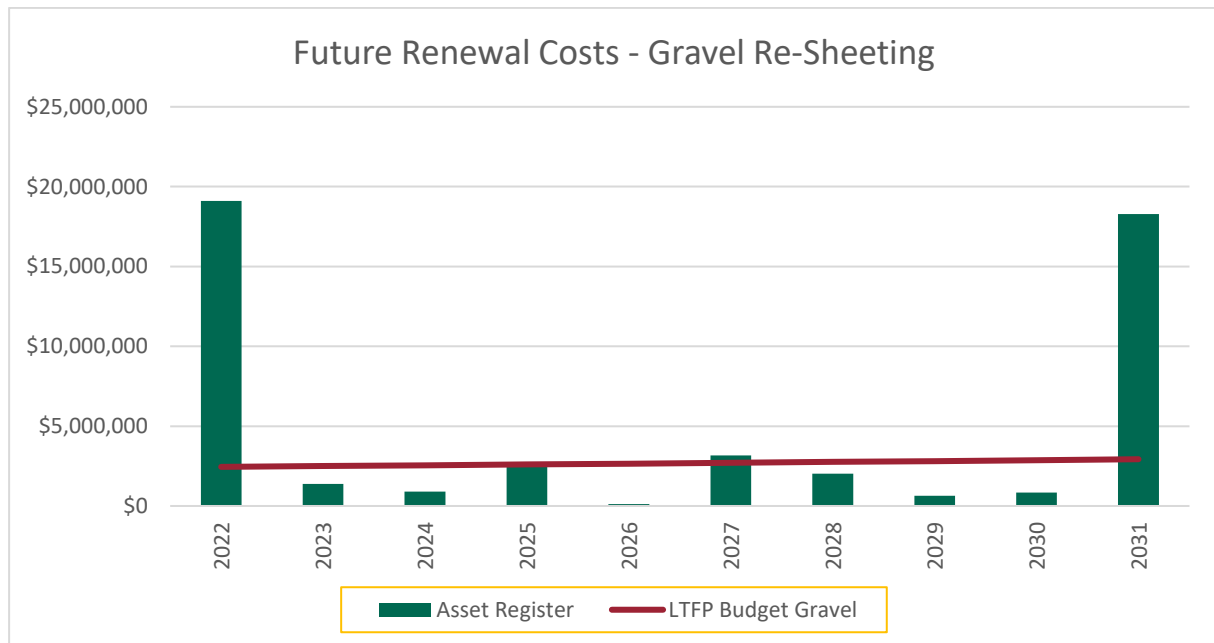
Asset	Star Rating Score Weighting (%)	Condition score Weighting (%)
Unsealed Roads	40	60
Sealed Roads	20	80

#### 5.4 Summary of Future Renewal Costs

Forecast renewal costs are projected to increase over time if the asset stock increases. The forecast costs associated with renewals are shown relative to the proposed renewal budget in Figure 5.4.1. A detailed summary of the forecast renewal costs is shown in Appendix D.

##### Gravel Re-Sheeting

**Figure 5.4.1: Forecast Renewal Costs (Gravel Re-Sheeting)**

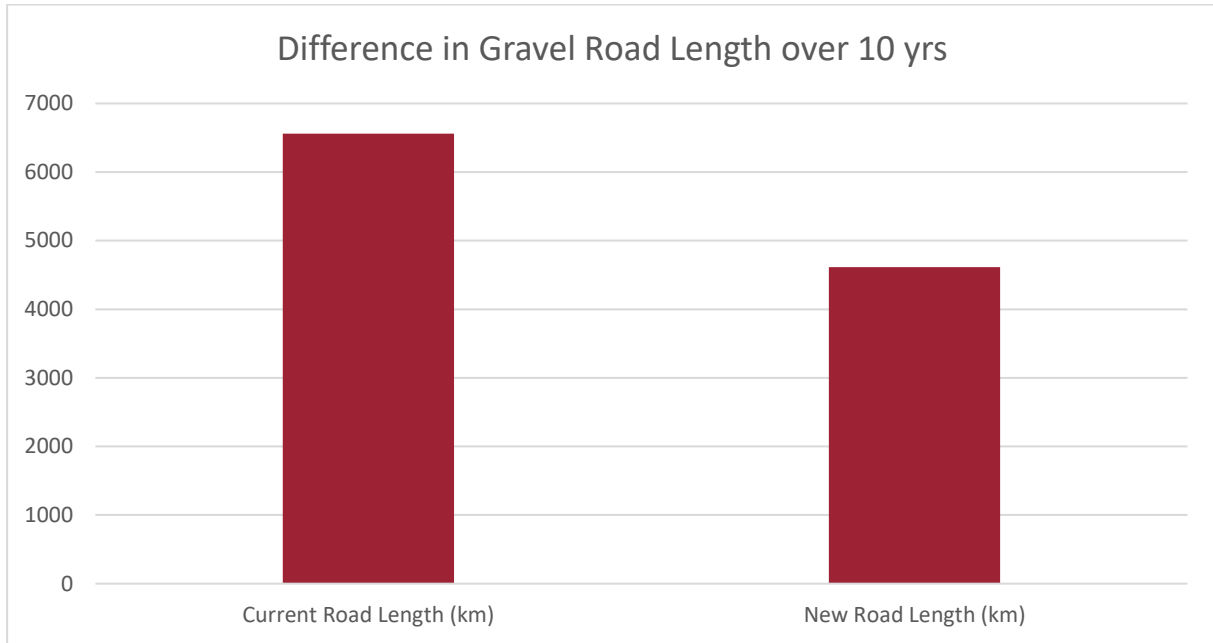


All figure values are shown in current day dollars.

Over 8 years (one complete renewal cycle) there is significant difference between the current budget allocated within the Long-Term Financial Plan (\$27,374,301) compared to the amount required to maintain the current service of the gravel road network on an 8 year life cycle (\$49,060,993). This dollar difference (\$21,686,692) equates to a shortfall of approximately 30% (194.618 km) of the current gravel road network not being maintained to the required service level.

The risk of not funding this work over the long term will be the existing gravel road network will deteriorate to a lesser standard (Natural Surface). This gradual reduction in Network Length is demonstrated in Figure 5.4.2 below.

**Figure 5.4.2: Reduction of Gravel Road Length**



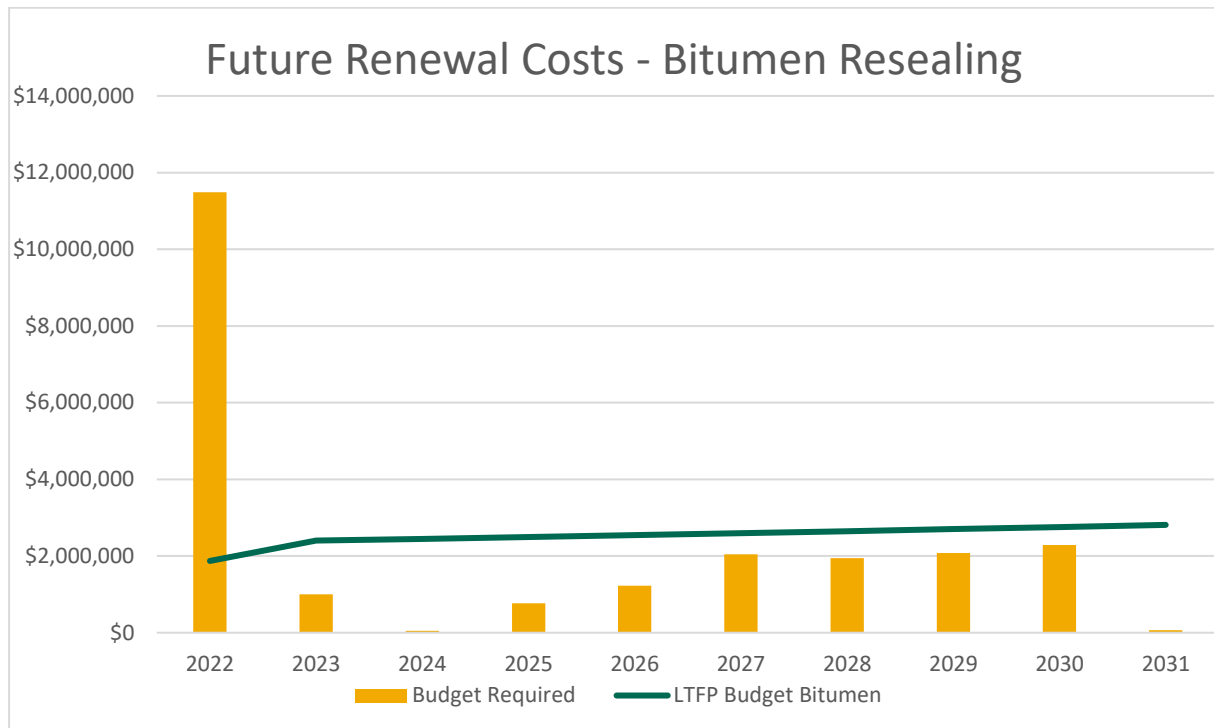
A review of the current Road Register against the Desired Designs Standards within TRC's Transport Strategy has indicated there is approximately 285 km of formed gravel road which should be a natural surface road. This means council is currently providing a higher level of service for such roads.

The review also identified that there is approximately 171 km of Natural Surface roads (i.e. Cashmere – Kirrama Rd) that requires upgrade to a Formed Gravel standard.

The result of the review is that the total Formed Gravel Road network should be approximately 541 km in length compared to the current length of 655 km. This will result in a reduction of 114 km in length of the formed gravel road network. Based on the length reduction to 541 km, with a renewal rate of \$12/m<sup>2</sup> and a useful life of 8 years, the recommended Gravel Re-Sheeting Budget could be reduced to approximately \$3,250,000 per year compared to \$3,940,000 to maintain the current Gravel Road Network.

## Bitumen Resealing

Figure 5.4.3: Forecast Renewal Costs (Bitumen Resealing)



All figure values are shown in current day dollars.

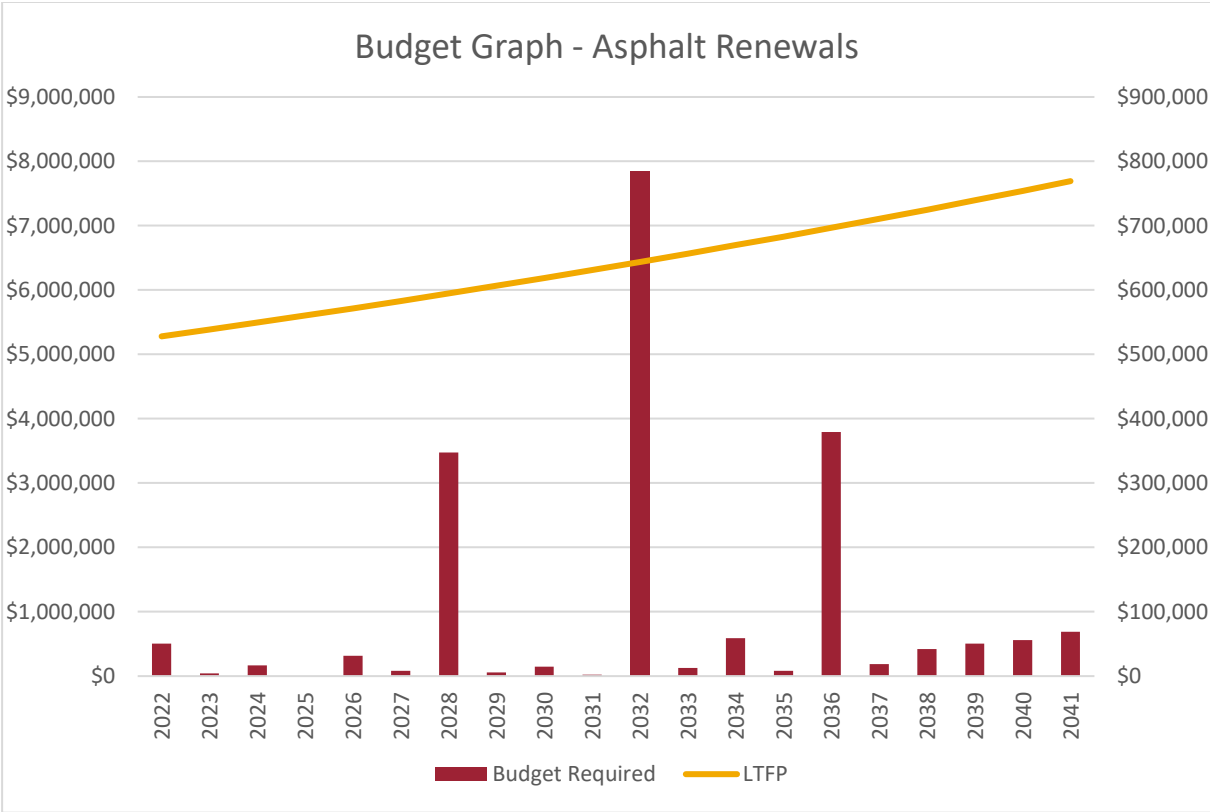
Based on the data in the above graph, over the long term there is little difference between the 10-year capital budget, and the budget required to maintain a 12 yr life for the bitumen resealing. There is a large difference in the 2022 financial year as the backlog of seal age of twelve years or greater. Through continuous budgeting as per the 10-year capital plan the backlog of bitumen resealing renewals will catch up by 2030.

An increase in pavement failures will increase the required amount for pavement rehabilitation works (which are significantly more expensive) as bitumen seals start to fail due to not being renewed at the appropriate interval and potentially an increase in the maintenance budget to maintain the roads for a longer time frame.



**Asphalt Renewals**

**Figure 5.4.4: Forecast Renewal Costs (Asphalt Renewals)**



All figure values are shown in current day dollars.

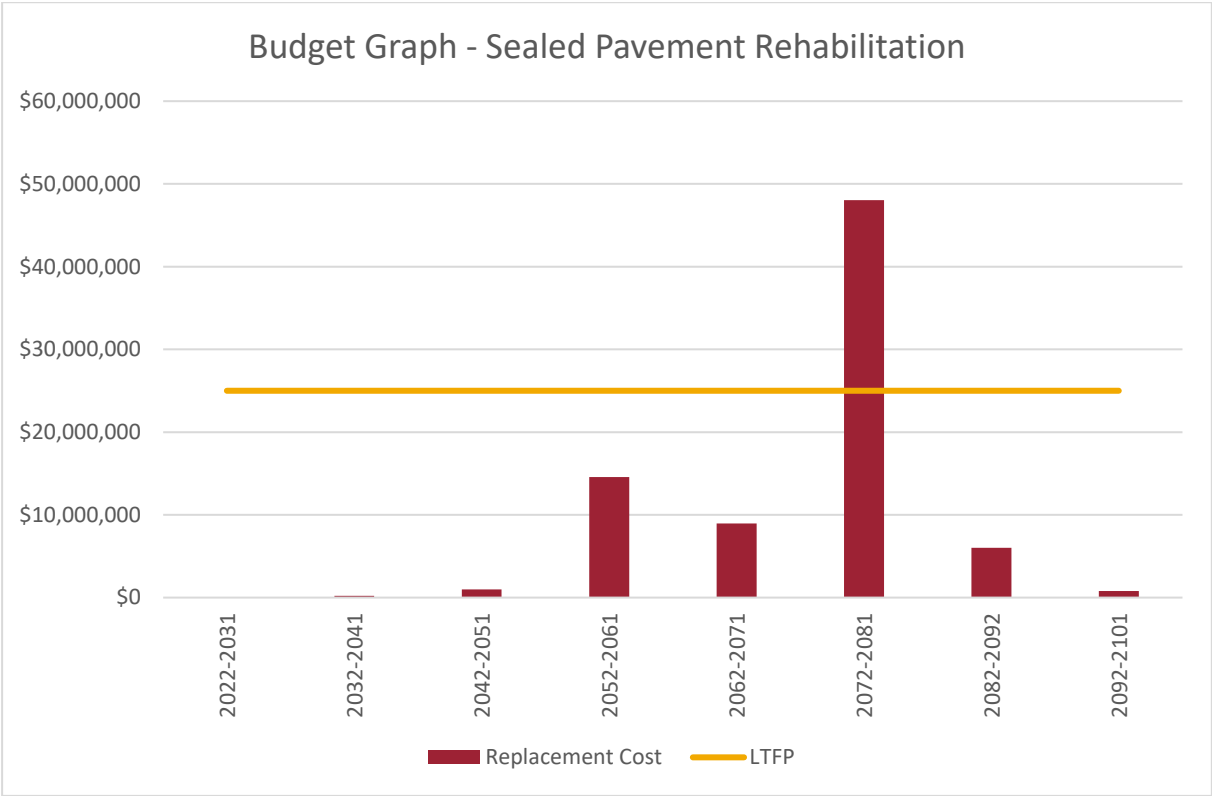
The budget required in Figure 5.4.4 has been developed on a combination of data from CONFIRM (using information on recent asphalt renewals) and data from the Financial Register (using remaining life information) to maintain the existing asphalt road network (98 km) based on a renewal unit rate of \$30/m<sup>2</sup> and a useful life of 25 years with no indexing of costs.

Figure 5.4.4 shows three distinct peaks in works required in 2028, 2032 & 2036 with very little or no works required in other years. There is a distinct gap between the cost of works required and the proposed budget particularly over the next 6 years.

Future revisions of this asset management plan will endeavour to close this gap as better condition data is collected and additional revaluations are undertaken on this asset class. This will be included in the improvement plan moving forward.

**Pavement Rehabilitation**

**Figure 5.4.5: Forecast Renewal Costs (Sealed Pavement Rehabilitation)**



All figure values are shown in current day dollars.

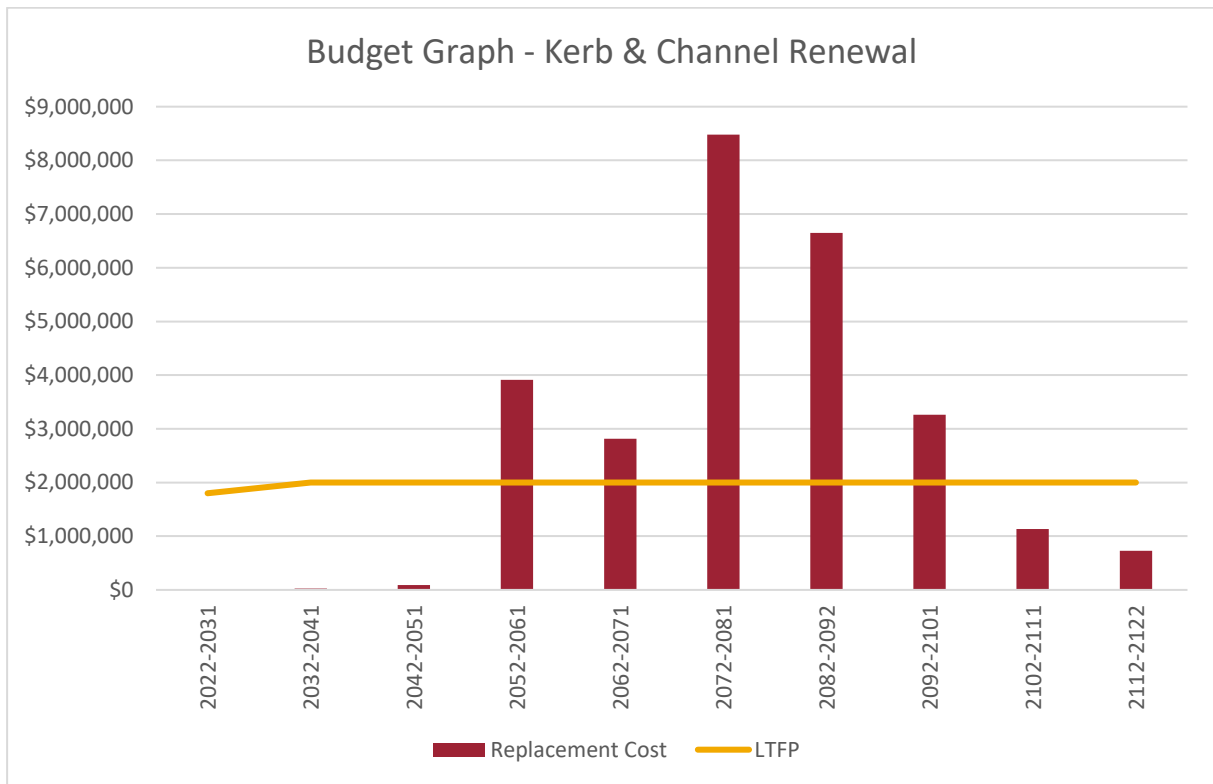
The budget required in Figure 5.4.5 has been developed using data from the Financial Register (using Remaining Useful Life information & Replacement Cost) to maintain the existing Sealed Pavements with no indexing of costs.

Based on this information, the graph shows that there is very little works required over the next 30 years. The 10 Year Capital Budget has been developed using an allocation of \$2,500,000 per year.

Future revisions of this asset management plan will endeavour to close this gap as better condition data is collected and additional revaluations are undertaken on this asset class.

**Kerb & Channel Renewals**

**Figure 5.4.6: Forecast Renewal Costs (Kerb & Channel Renewal)**



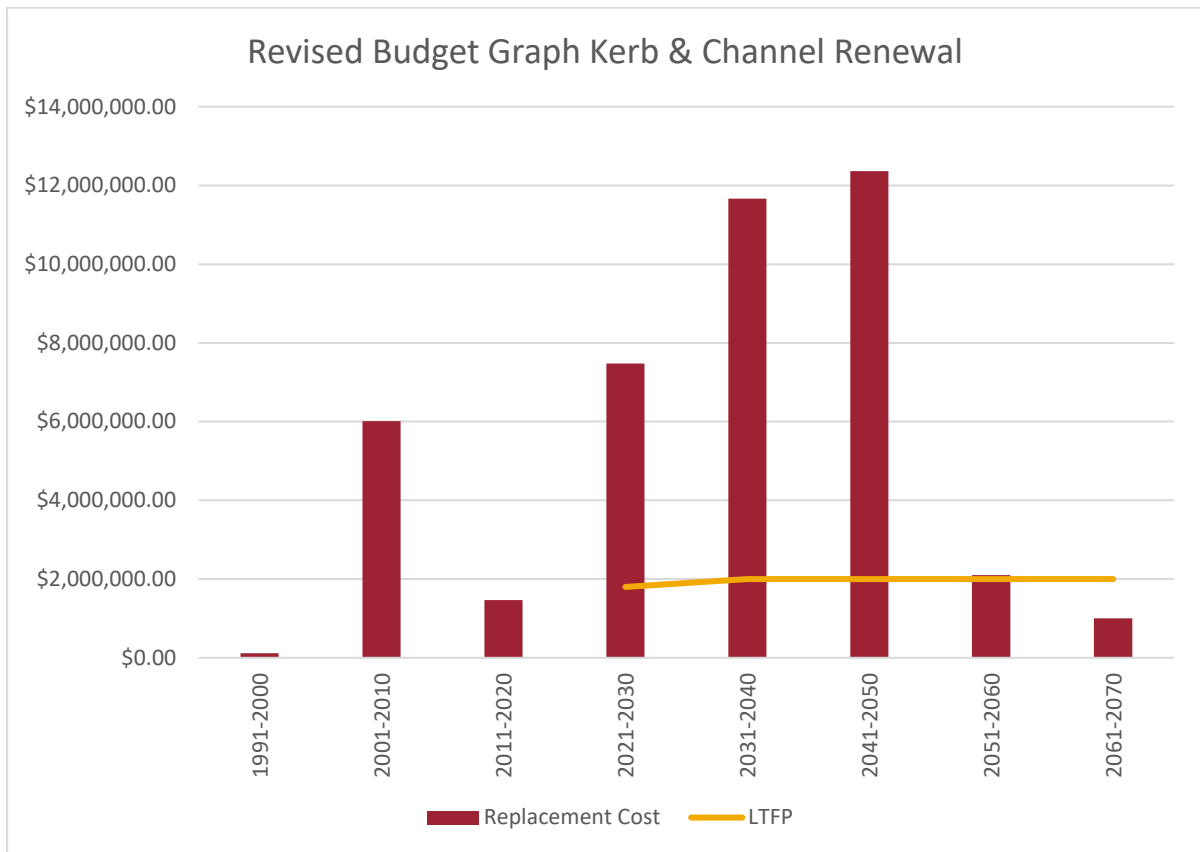
All figure values are shown in current day dollars.

The budget required in Figure 5.4.6 has been developed using data from the Financial Register (using Remaining Useful Life information & Replacement Costs) to maintain the existing Kerb & Channel with no indexing of costs. Based on this information, Figure 5.4.6 shows that there is very little works required over the next 30 years. The Budget (LTFP) has been developed using an allocation of \$200,000 per year.

There is significant gap between the financial and asset registers which is caused by considerable differences in the Useful Life and Unit Rates. The Financial Register has useful lives that range from 75 – 100 years and Unit Rates that range from \$55 - \$115/m to replace. The Asset Register has a useful life of 50 years and a Unit Rate of \$150/m to replace.

The adjusted Useful Life and Replacement Costs were added to the Financial Register and using the Acquisition Year, a revised Forecast Renewal Cost graph was created as shown below:

**Figure 5.4.7: Revised Forecast Renewal Costs (Kerb & Channel Renewal)**

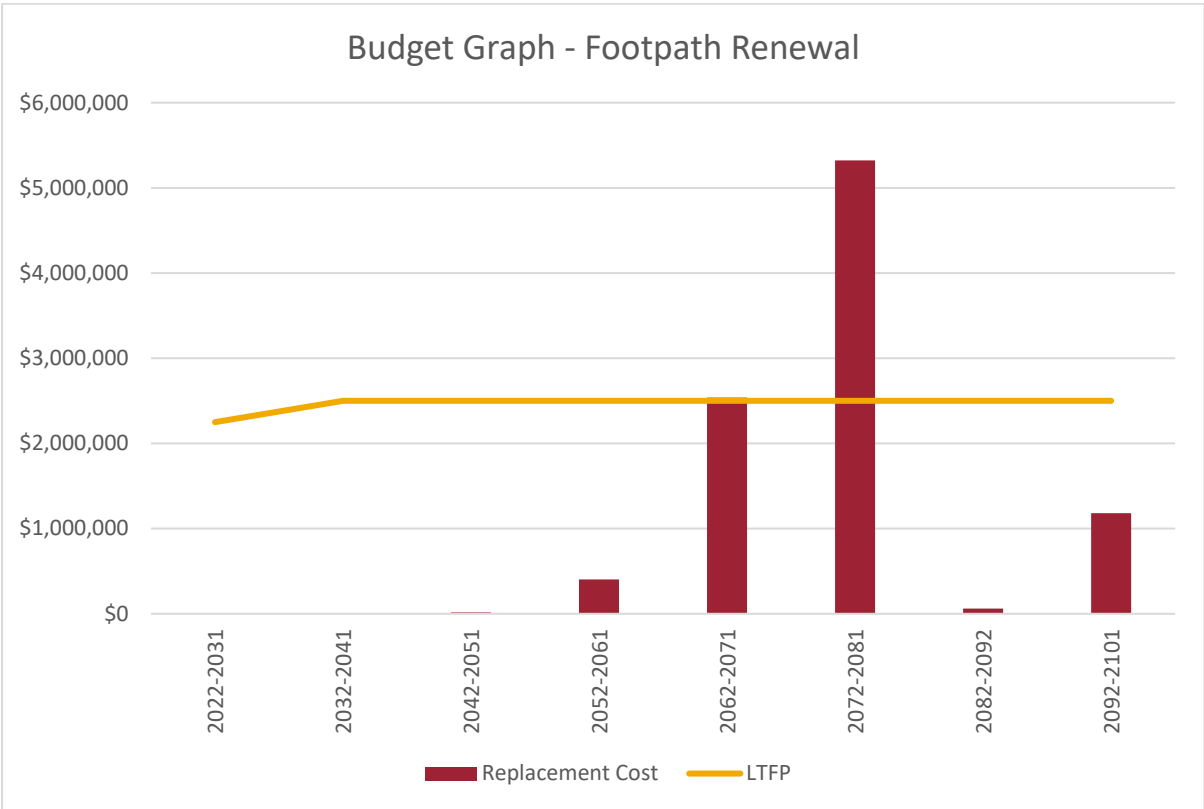


Based on the asset register Useful Life and Replacement Cost shows that there is approximately \$7,600,000 worth of Kerb & Channel that should have already been replaced. This additional work could be funded from other programs where funding is not required.

Future revisions of this asset management plan will endeavour to close this gap as better condition data is collected and additional revaluations are undertaken on this asset class.

**Footpath Renewals**

**Figure 5.4.8: Forecast Renewal Costs (Footpath Renewal)**



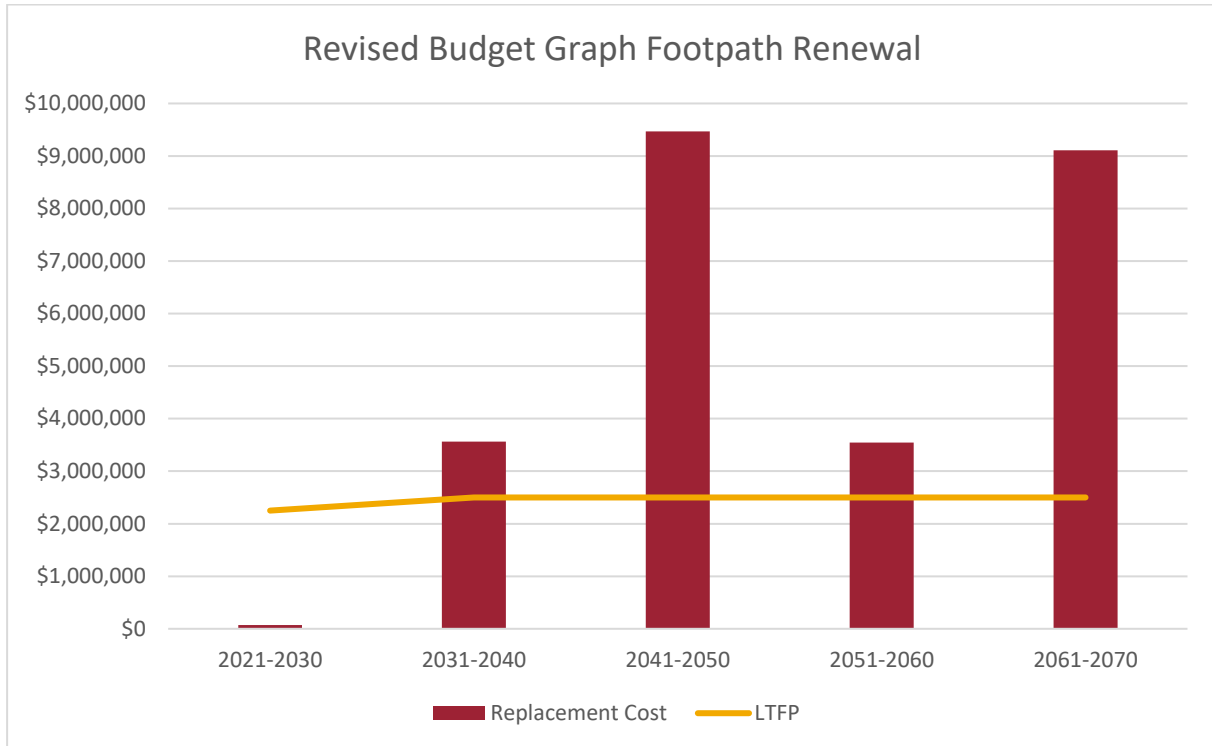
All figure values are shown in current day dollars.

The budget required in Figure 5.4.8 has been developed using data from the Financial Register (using Remaining Useful Life information & Replacement Costs) to maintain the existing Footpath with no indexing of costs. Based on this information, Figure 5.4.8 shows that there is very little works required over the next 30 years. The Budget (LTFP) has been developed using an allocation of \$250,000 per year.

There is significant gap between the financial and asset registers which is caused by considerable differences in the Useful Life and Unit Rates between the Financial Register and the Asset Register. The Financial Register has useful lives that range from 50 – 150 years and Unit Rates that range from \$18 - \$250/m to replace. The Asset Register has a useful life of 50 years and a Unit Rate of \$180/m to replace.

The adjusted Useful Life and Replacement Costs were added to the Financial Register and using the Acquisition Year, a revised Forecast Renewal Cost graph was created as shown below:

**Figure 5.4.9: Revised Forecast Renewal Costs (Footpath)**



Based on the asset register Useful Life and Replacement Cost, there is still very little footpath requiring replacement over the next 20 years.

In the short term, there is opportunity to re-allocate the majority of the budget from the Footpath Renewal program to other renewal programs i.e. Kerb & Channelling where funding is insufficient.

Future revisions of this asset management plan will endeavour to close this gap as better condition data is collected and additional revaluations are undertaken on this asset class.

### **5.5 Road Upgrades**

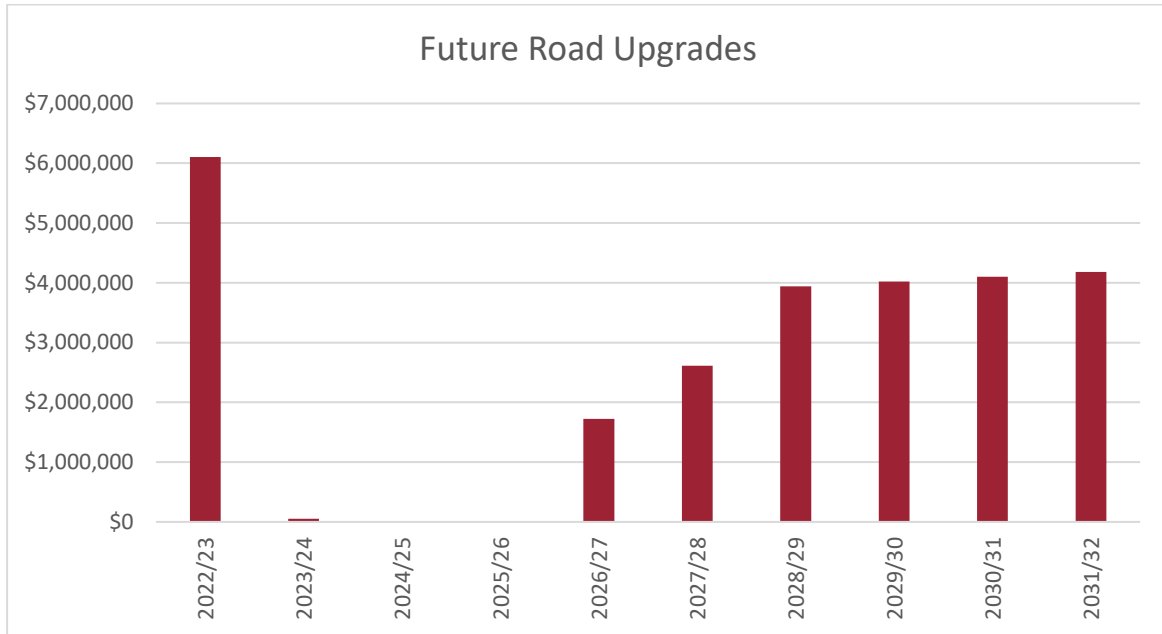
Within the current Capital budget for 2022/23 and the proposed LTFP, an allocation has been included to upgrade roads. At present, the focus of the projects is on upgrading unsealed roads to a sealed standard.

Work has been completed on developing a prioritised list of Capital Upgrade projects created by using a gap analysis for each road based on the difference between the Desired Standard (as defined in the Transport Strategy) and the Current Standard linked to the Star Rating of the road. This list will be used as a starting point for the development of future capital works programs when completed.

This analysis has identified approximately \$69,000,000 worth of upgrade works i.e. Upgrade to Bitumen Seal, Widening of Existing Sealed Roads. The funding of capital upgrade should only be considered where renewal of an existing asset is required.

This issue will be included in the improvement plan in Section 8.2

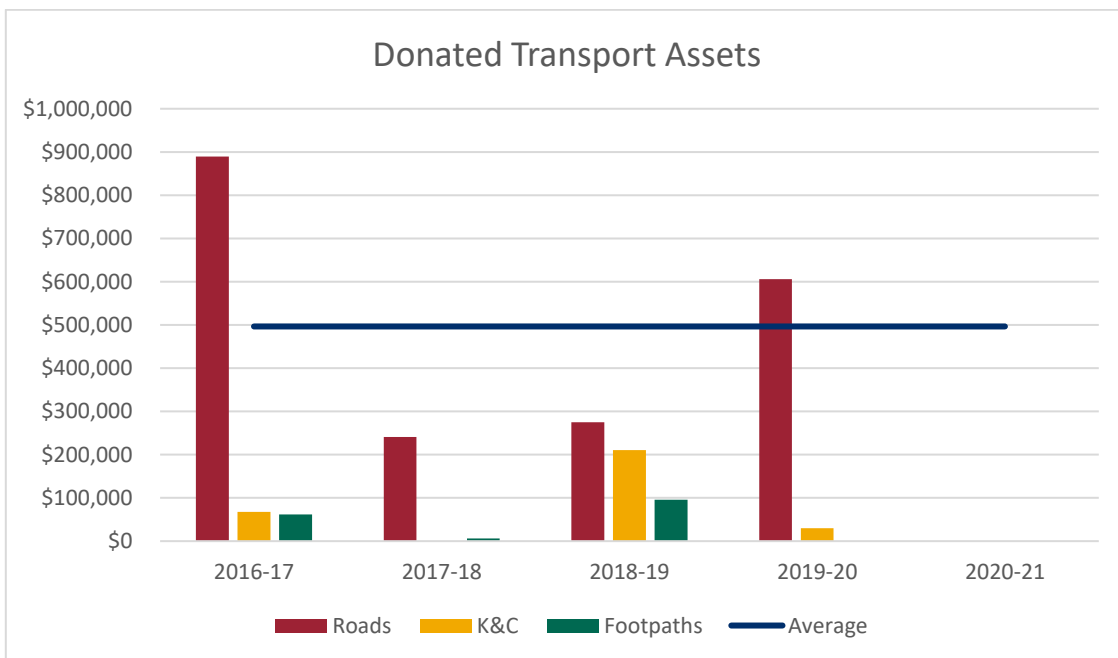
**Figure 5.5.1: Budget Allocation for Road Upgrades (LTFP)**



## 5.6 Acquisition Plan

Acquisition are new assets that did not previously exist or works which have been identified in the LGIP (Currently estimated at \$5,200,000). They may result from growth, demand, social or environmental needs. Assets may also be donated to the Council. Figure 5.6.1 identifies the value of donated Transport Assets that have been received by Council in the last 5 yrs. It is expected that this trend will continue during the life of this plan.

**Figure 5.6.1: Donated Transport Assets**



The average amount (\$496,480) of Donated Assets over the last 5 years has been used as part of the Lifecycle Summary information in Figure 5.8.1. Council does not have plans to build any new roads over the life of this Asset Management Plan. This has been reflected in Council’s Local Government Infrastructure Plan (LGIP) which is available on Council’s website.

**5.7 Disposal Plan**

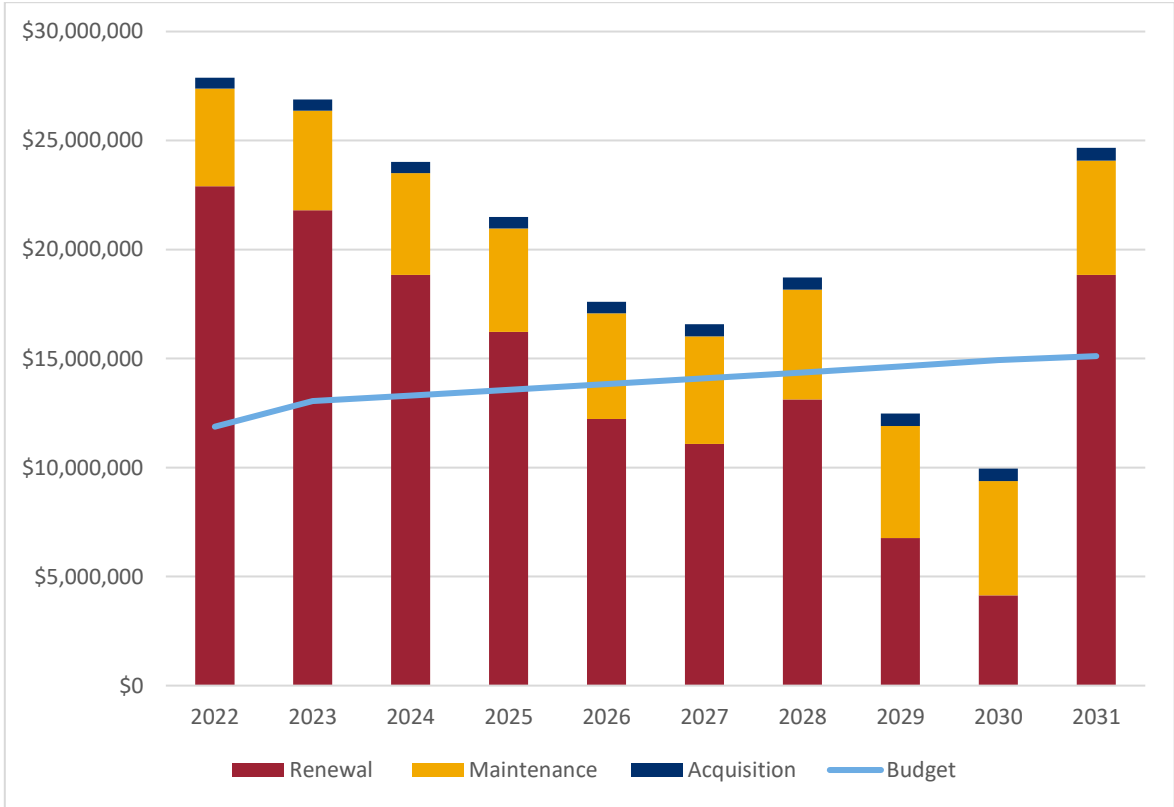
Disposal includes any activity associated with the disposal of a decommissioned asset including sale, demolition or relocation. There are no plans to dispose of any transport assets within this AMP.

**5.8 Summary**

The financial projections from this asset plan are shown in Figure 5.8.1. These projections include forecast costs for acquisition, operation, maintenance, renewal, and disposal. These forecast costs are shown relative to the proposed budget.

The bars in the graphs represent the forecast costs needed to minimise the life cycle costs associated with the service provision. The proposed budget line indicates the estimate of available funding. The gap between the forecast work and the proposed budget is the basis of the discussion on achieving balance between costs, levels of service and risk to achieve the best value outcome.

**Figure 5.8.1: Lifecycle Summary**



All figure values are shown in current day dollars.

In summary, based on current data in the above graphs, there is insufficient budget to maintain the Transport network at its current level of service. This issue has come about because for several years the budget allocated/spent on renewals i.e. Bitumen Resealing, Gravel Re-Sheeting was considerably lower than the required budget.

Further work is required to develop desired standards and the budgetary requirements to meet and deliver those standards. This will be included in the improvement plan for future development.



## 6.0 RISK MANAGEMENT PLANNING

The purpose of infrastructure risk management is to document the findings and recommendations resulting from the periodic identification, assessment and treatment of risks associated with providing services from infrastructure, using the fundamentals of International Standard ISO 31000:2018 Risk management – Principles and guidelines.

Risk Management is defined in ISO 31000:2018 as: ‘coordinated activities to direct and control with regard to risk’<sup>9</sup>.

An assessment of risks<sup>10</sup> associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a ‘financial shock’, reputational impacts, or other consequences. The risk assessment process identifies credible risks, the likelihood of the risk event occurring, and the consequences should the event occur. The risk assessment should also include the development of a risk rating, evaluation of the risks and development of a risk treatment plan for those risks that are deemed to be non-acceptable.

### 6.1 Critical Assets

Critical assets are defined as those which have a high consequence of failure causing significant loss or reduction of service. Critical assets have been identified and along with their typical failure mode, and the impact on service delivery, are summarised in Table 6.1. Failure modes may include physical failure, collapse or essential service interruption.

**Table 6.1 Critical Assets**

Asset Type	Failure Mode	Impact
4.0 – 5.0 Star Rated Bitumen Road	Condition	Condition of road has deteriorated to a point where measures are required (i.e. reduce speed limit) which will impact on significant number of road users.
4.0 – 5.0 Star Rated Gravel Road	Condition	Condition of road has deteriorated to a point where measures are required (i.e. reduce speed limit) which will impact on significant number of road users.
No Alternative Access Roads	Road Closed	The road would be closed until the road is repaired, causing complete isolation for residents beyond road closure.
Limited Access Roads	Road Closed	The road would be closed until the road is repaired, causing significant disruption for residents beyond road closure.
4.0 – 5.0 High Star Rated Footpath	Footpath Closed	Footpath closure which would require pedestrians to use alternative footpath on a High Star Rated Road (Star Rating 4-5) would impact on significant number of pedestrians and businesses.
4.0 – 5.0 High Star Rated Kerb & Channel	Kerb & Channel Damaged/Missing	Kerb & Channel on a High Star Rated Road (Star rating 4-5) which is severely damaged or is missing would impact on the network to drain water effectively which could lead to damage to the road network and/or flooding of adjacent properties.

By identifying critical assets and failure modes an organisation can ensure that investigative activities, condition inspection programs, maintenance and capital expenditure plans are targeted at critical assets.

<sup>9</sup> ISO 31000:2009, p 2

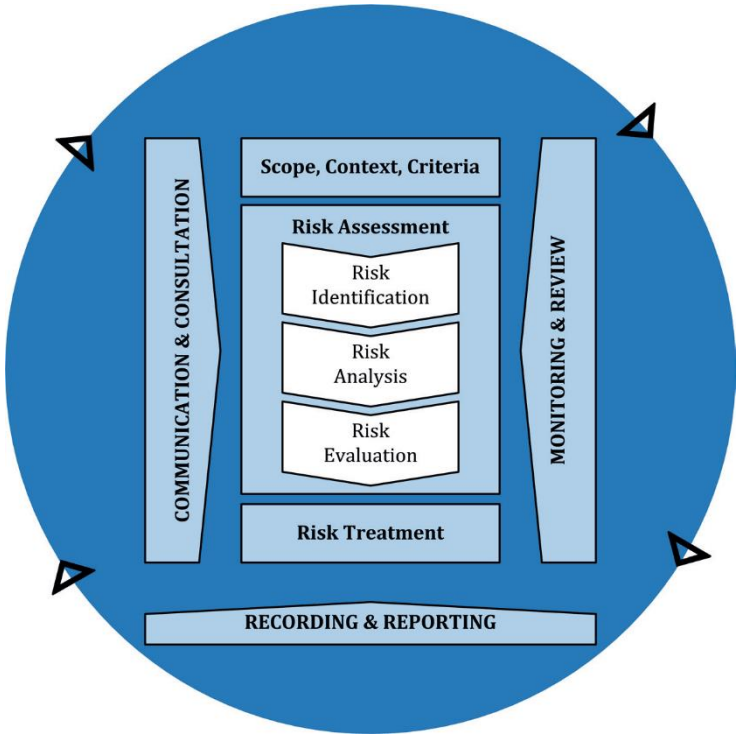
<sup>10</sup> REPLACE with Reference to the Corporate or Infrastructure Risk Management Plan as the footnote

**6.2 Risk Assessment**

The risk management process used is shown in Figure 6.2 below.

It is an analysis and problem-solving technique designed to provide a logical process for the selection of treatment plans and management actions to protect the community against unacceptable risks.

The process is based on the fundamentals of International Standard ISO 31000:2018.



**Fig 6.2 Risk Management Process – Abridged**  
 Source: ISO 31000:2018, Figure 1, p9

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

An assessment of risks<sup>11</sup> associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a ‘financial shock’, reputational impacts, or other consequences.

Critical risks are those assessed with ‘Very High’ (requiring immediate corrective action) and ‘High’ (requiring corrective action) risk ratings identified in the Infrastructure Risk Management Plan. The residual risk and treatment costs of implementing the selected treatment plan is shown in Table 6.2. It is essential that these critical risks and costs are reported to management and the Council.

<sup>11</sup> REPLACE with Reference to the Corporate or Infrastructure Risk Management Plan as the footnote

**Table 6.2: Risks and Treatment Plans**

Service or Asset at Risk	What can Happen	Risk Rating (VH, H)	Risk Treatment Plan	Residual Risk *	Treatment Costs
Road Network – Unsafe for Use	Accidents/Injury to public.  Damage to reputation	High	Repairs and maintenance undertaken by trained and experience staff.  Undertake regular condition/defect inspections.  Maintenance work programmed in line with Maintenance Management Plan and Road Star Rating Intervention Levels.  Renewal Programs developed on Overall Risk rating using a combination of condition and star rating as defined in Transport Strategy.	Medium	Staff time to undertake condition/defect inspections, program works and undertake maintenance works.
Footpath Network – Trip Hazard	Accidents/Injury to public.  Damage to reputation	High	Repairs and maintenance undertaken by trained and experience staff.  Undertake regular condition/defect inspections.  Maintenance work programmed in line with Maintenance Management Plan and Road Star Rating Intervention Levels.  Renewal Programs developed on Overall Risk rating using a combination of condition and star rating as defined in Transport Strategy.	Low	Staff time to undertake condition/defect inspections, program works and undertake maintenance works.
Road Network – Damage from Natural Disaster	Roads closed/damaged.	Very High	Disaster Recovery Funding Arrangement Inspections/Repair works undertaken in line with Road Star Rating.	Medium	Staff time to undertake inspections/repair works.

Note \* The residual risk is the risk remaining after the selected risk treatment plan is implemented.

### **6.3 Infrastructure Resilience Approach**

The resilience of our critical infrastructure is vital to the ongoing provision of services to customers. To adapt to changing conditions we need to understand our capacity to 'withstand a given level of stress or demand', and to respond to possible disruptions to ensure continuity of service.

Resilience is built on aspects such as response and recovery planning, financial capacity, climate change and crisis leadership.

Formal measures of resilience have not been developed and will be addressed in a future iteration of this asset management plan.

### **6.4 Service and Risk Trade-Offs**

TRC Risk Appetite Statement provides an overarching attitude toward managing risk. In determining its risk appetite, Council will ensure that the desired risk appetite is achievable with the available resources. The Strategic Plans and all Operational Plans for functional areas are required to be consistent with this Risk Appetite Statement.

#### **6.4.1 What we cannot do**

There are some operations and maintenance activities and capital projects that are unable to be undertaken within the next 10 years. These include:

- Maintain current service standards based on existing budgets

#### **6.4.2 Service trade-off**

If there is forecast work (operations, maintenance, renewal, acquisition or disposal) that cannot be undertaken due to available resources, then this will result in service consequences for users. These service consequences include:

- Existing Bitumen Roads reduced to a lower level of service (Gravel Road)
- Existing Gravel Roads reduced to a lower level of services (Natural Road)

#### **6.4.3 Risk trade-off**

The operations and maintenance activities and capital projects that cannot be undertaken may sustain or create risk consequences. These risk consequences include:

- Risk is deterioration of the condition of the transport network to a point where it will impact on the ability to deliver its intended service.

These actions and expenditures are considered and included in the forecast costs, and where developed, the Risk Management Plan.

**7.0 FINANCIAL SUMMARY**

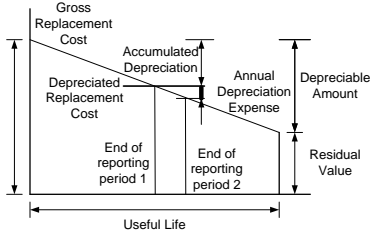
This section contains the financial requirements resulting from the information presented in the previous sections of this AMP. The financial projections will be improved as the discussion on desired levels of service and asset performance matures.

**7.1 Financial Statements and Projections**

**7.1.1 Asset valuations**

The best available estimate of the value of assets included in this AMP are shown below. The assets are valued at fair value

Current (Gross) Replacement Cost	\$307,758,699
Depreciable Amount	\$191,282,186
Depreciated Replacement Cost <sup>12</sup>	\$243,302,261
Annual Depreciation	\$4,802,357



**7.1.2 Sustainability of service delivery**

There are two key indicators of sustainable service delivery that are considered in the AMP for this service area. The two indicators are the:

- asset renewal funding ratio (proposed renewal budget for the next 10 years / forecast renewal costs for next 10 years), and
- medium term forecast costs/proposed budget (over 10 years of the planning period).

**Asset Renewal Funding Ratio**

Asset Renewal Funding Ratio<sup>13</sup> 95%

The Asset Renewal Funding Ratio is an important indicator and illustrates that over the next 10 years we expect to have 95% of the funds required for the optimal renewal of assets.

The forecast renewal works along with the proposed renewal budget, and the cumulative shortfall, is illustrated in Appendix D.

**Medium term – 10-year financial planning period**

This AMP identifies the forecast operations, maintenance and renewal costs required to provide an agreed level of service to the community over a 10 year period. This provides input into 10 year financial and funding plans aimed at providing the required services in a sustainable manner.

This forecast work can be compared to the proposed budget over the 10 year period to identify any funding shortfall.

The forecast operations, maintenance and renewal costs over the 10 year planning period is \$20,028,986 on average per year.

The proposed (budget) operations, maintenance and renewal funding is \$19,310,848 on average per year giving a 10 year funding shortfall of \$718,137 per year. This indicates that 95% of the forecast costs needed to provide the services documented in this AMP are accommodated in the proposed budget. This excludes acquired assets.

<sup>12</sup> Also reported as Written Down Value, Carrying or Net Book Value.

<sup>13</sup> AIFMM, 2015, Version 1.0, Financial Sustainability Indicator 3, Sec 2.6, p 9.

Providing sustainable services from infrastructure requires the management of service levels, risks, forecast outlays and financing to achieve a financial indicator of approximately 1.0 for the first years of the AMP and ideally over the 10 year life of the Long-Term Financial Plan.

### 7.1.3 Forecast Costs (outlays) for the long-term financial plan

Table 7.1.3 shows the forecast costs (outlays) for the 10 year long-term financial plan.

**Table 7.1.3: Forecast Costs (Outlays) for the Long-Term Financial Plan**

Year	Forecast Acquisition	Forecast Maintenance	Forecast Renewal (Including Backlog)
22/23	\$496,480	\$4,475,816	\$22,906,674
23/24	\$506,410	\$4,565,332	\$21,810,085
24/25	\$516,538	\$4,656,639	\$18,843,705
25/26	\$526,869	\$4,749,772	\$16,224,136
26/27	\$537,406	\$4,844,767	\$12,226,870
27/28	\$548,154	\$4,941,663	\$11,081,236
28/29	\$559,117	\$5,040,496	\$13,126,626
29/30	\$570,299	\$5,141,306	\$6,765,384
30/31	\$581,705	\$5,244,132	\$4,134,569
31/32	\$593,340	\$5,244,132	\$18,830,203

## 7.2 Funding Strategy

The proposed funding for assets is outlined in the Entity's budget and Long-Term financial plan.

The financial strategy of the entity determines how funding will be provided, whereas the AMP communicates how and when this will be spent, along with the service and risk consequences of various service alternatives.

## 7.3 Valuation Forecasts

Asset values are forecast to increase as additional assets are added to the network.

Additional assets will generally add to the operations and maintenance needs in the longer term. Additional assets will also require additional costs due to future renewals. Any additional assets will also add to future depreciation forecasts.

## 7.4 Key Assumptions Made in Financial Forecasts

In compiling this AMP, it was necessary to make some assumptions. This section details the key assumptions made in the development of this AMP and should provide readers with an understanding of the level of confidence in the data behind the financial forecasts.

Key assumptions made in this AMP are:

- Annual Increase of 2% applied to Forecast Budget
- Annual Increase of 2% applied to Forecast Acquisition
- Maintenance forecasts have been adjusted annually for inflation at 2%

Accuracy of future financial forecasts may be improved in future revisions of this plan by:

- Undertaking road network condition assessments

- Consulting with community and other stakeholders to finalise the levels of service to be delivered
- Running modelling scenarios for different service levels outcomes

## 7.5 Forecast Reliability and Confidence

The forecast costs, proposed budgets, and valuation projections in this AMP are based on the best available data. For effective asset and financial management, it is critical that the information is current and accurate. Data confidence is classified on a A - E level scale<sup>14</sup> in accordance with Table 7.5.1.

**Table 7.5.1: 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 AMP is shown in Table 7.5.2.

**Table 7.5.2: Data Confidence Assessment for Data used in AMP**

Data	Confidence Assessment	Comment
Demand drivers	B. Reliable	Standard Resource used for TRC (Economy ID)
Growth projections	B. Reliable	Standard Resource used for TRC (Economy ID)
Acquisition forecast	C. Uncertain	Only last 4 yrs used as historic information and straight-line increase applied to future budgets.
Operation forecast	N/A	Roads have no operational expense.
Maintenance forecast	B. Reliable	Considerable work has been undertaken to develop intervention levels linked to defect types and Star Rating.
Renewal forecast - Asset values	C. Uncertain	Significant variation in Asset Information between Financial and Operational Asset Registers.
- Asset useful lives	C. Uncertain	Significant variation in Asset Information between Financial and Operational Asset Registers.

<sup>14</sup> IPWEA, 2015, IIMM, Table 2.4.6, p 2 | 71.

- Condition modelling	C. Uncertain	Significant variation in Asset Information between Financial and Operational Asset Registers.
Disposal forecast	A. Highly reliable	



## 8.0 PLAN IMPROVEMENT AND MONITORING

### 8.1 Status of Asset Management Practices<sup>15</sup>

#### 8.1.1 Accounting and financial data sources

This AMP utilises accounting and financial data. The source of the data is the financial asset register with Technology One software package.

#### 8.1.2 Asset management data sources

This AMP also utilises asset management data. The source of the data is the operational asset register with Technology One software package.

### 8.2 Improvement Plan

It is important that an entity recognise areas of their AMP and planning process that require future improvements to ensure effective asset management and informed decision making. The improvement plan generated from this AMP is shown in Table 8.2.

**Table 8.2: Improvement Plan**

Task	Task	Responsibility	Resources Required
1	Development of Customer Level of Service Standards for Function & Safety	Manager Roads & Projects.	Internal Staff
2	Development of Technical Level of Service Standards	Manager Roads & Projects.	Internal Staff
3	Development of Renewal Programs to deliver Service Standards within available funding.	Manager Roads & Projects. Roads & Transport Asset Management Officer. Manager Finance.	Internal Staff. Tech1 Strategic Asset Management Software
4	Alignment of Unit Rates & Useful Lives between Operational and Financial Asset Registers. (Revaluation of Transport Assets due 2021/22)	Manager Roads & Projects. Roads & Transport Asset Management Officer. Asset Accountant. Manager Finance.	Internal Staff. Tech1 Asset Register Software.
5	Development of Desired Service Levels for Maintenance Activities	Manager Roads & Projects. Roads. Coordinator Maintenance.	Internal Staff
6	Development of Capital Works Program to upgrade Transport Assets that are below the Desired Standard as per the Transport Strategy.	Manager Roads & Projects. Roads & Transport Asset Management Officer.	Internal Staff

<sup>15</sup> ISO 55000 Refers to this the Asset Management System

7	Revision of Transport Strategy.	Manager Roads & Projects. Roads & Transport Asset Management Officer. General Manager Infrastructure	Internal Staff
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### 8.3 Monitoring and Review Procedures

This AMP will be reviewed during the annual budget planning process and revised to show any material changes in service levels, risks, forecast costs and proposed budgets as a result of budget decisions.

The AMP will be reviewed and updated annually to ensure it represents the current service level, asset values, forecast operations, maintenance, renewals, upgrade/new and asset disposal costs and proposed budgets. These forecast costs and proposed budget are incorporated into the Long-Term Financial Plan or will be incorporated into the Long-Term Financial Plan once completed.

### 8.4 Performance Measures

The effectiveness of this AMP can be measured in the following ways:

- Meeting the Customer Level of Service Performance Target.
- Meeting the Technical Level of Service Performance Target.

## 9.0 REFERENCES

- IPWEA, 2006, 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, [www.ipwea.org/IIMM](http://www.ipwea.org/IIMM)
- IPWEA, 2008, 'NAMS.PLUS Asset Management', Institute of Public Works Engineering Australasia, Sydney, [www.ipwea.org/namsplus](http://www.ipwea.org/namsplus).
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- IPWEA, 2012 LTFP Practice Note 6 PN Long-Term Financial Plan, Institute of Public Works Engineering Australasia, Sydney
- ISO, 2018, ISO 31000:2018, Risk management – Guidelines
- Tablelands Regional Council Transport Strategy 2019 – 2024
- TRC Strategic Asset Management Plan 2017-17
- TRC Annual Operation Plan
- TRC Annual Budget
- Draft 10 yr Capital Plan 2021/22
- idcommunity, population and demand forecast, <https://profile.id.com.au/tablelands>
- IPWEA Practice Note 1 – Footpaths & Cycleways
- IPWEA Practice Note 2 – Kerb & Channel
- IPWEA Practice Note 9 – Road Pavements

**10.0APPENDICES**

**Appendix A Acquisition Forecast**

**A.1 – Acquisition Forecast Assumptions and Source**

Acquisition budget was calculated using average value from last 4 years of donated assets from developments and indexed at 2% annually

*Table A1 - Acquisition Forecast Summary*

Year	Contributed
2022	\$496,480
2023	\$506,410
2024	\$516,538
2025	\$526,869
2026	\$537,406
2027	\$548,154
2028	\$559,117
2029	\$570,299
2030	\$581,705
2031	\$593,340

**Appendix B      Maintenance Forecast**

**B.1 – Maintenance Forecast Assumptions and Source**

Maintenance forecast has been based on applying a 2% annual index to the 2021/22 forecast budget on Table 5.2.1

*Table B1 - Maintenance Forecast Summary*

<b>Year</b>	<b>Maintenance Forecast</b>	<b>Total Maintenance Forecast</b>
2022	\$4,475,816	\$4,475,816
2023	\$4,565,332	\$4,565,332
2024	\$4,656,639	\$4,656,639
2025	\$4,749,772	\$4,749,772
2026	\$4,844,767	\$4,844,767
2027	\$4,941,663	\$4,941,663
2028	\$5,040,496	\$5,040,496
2029	\$5,141,306	\$5,141,306
2030	\$5,244,132	\$5,244,132
2031	\$5,244,132	\$5,244,132

**Appendix C    Renewal Forecast Summary**

*Table C1 - Renewal Forecast Summary*

**Gravel Re-Sheeting**

<b>Year</b>	<b>Renewal Forecast (Asset Register)</b>	<b>Renewal Budget</b>
2022	\$15,825,664	\$2,450,000
2023	\$1,380,628	\$2,500,000
2024	\$907,259	\$2,550,000
2025	\$2,598,524	\$2,601,000
2026	\$125,071	\$2,653,020
2027	\$3,172,560	\$2,706,080
2028	\$2,016,116	\$2,760,202
2029	\$638,161	\$2,815,406
2030	\$835,671	\$2,871,714
2031	\$18,275,664	\$2,929,148

**Bitumen Resealing**

<b>Year</b>	<b>Renewal Forecast (Asset Register)</b>	<b>Renewal Budget</b>
2022	\$11,485,503	\$1,800,000
2023	\$1,001,484	\$1,872,000
2024	\$49,095	\$2,400,000
2025	\$763,352	\$2,448,000
2026	\$1,225,582	\$2,497,000
2027	\$2,047,256	\$2,547,000
2028	\$1,942,110	\$2,598,000
2029	\$2,075,510	\$2,650,000
2030	\$2,288,255	\$2,703,000
2031	\$67,813	\$2,757,000

**Asphalt Resurfacing**

<b>Year</b>	<b>Renewal Forecast (Asset Register)</b>	<b>Renewal Budget</b>
2022	\$503,396	\$528,000
2023	\$40,290	\$538,560
2024	\$166,167	\$549,331
2025	\$0	\$560,318
2026	\$317391.6	\$571,524
2027	\$80817	\$582,955
2028	\$3476241	\$594,614
2029	\$56442	\$606,506
2030	\$146594.1	\$618,636
2031	\$23040	\$631,009

**Pavement Rehabilitation**

Year	Renewal Forecast (Asset Register)	Renewal Budget
2022	\$5,027,051	\$2,500,000
2023	\$5,027,051	\$2,550,000
2024	\$5,027,051	\$2,601,000
2025	\$5,027,051	\$2,653,020
2026	\$5,027,051	\$2,706,080
2027	\$5,027,051	\$2,760,202
2028	\$5,027,051	\$2,815,406
2029	\$5,027,051	\$2,871,714
2030	\$5,027,051	\$2,929,148
2031	\$5,027,051	\$2,987,731

**Kerb & Channel**

Year	Renewal Forecast (Asset Register)	Renewal Budget
2022	\$866,547	\$0
2023	\$866,547	\$200,000
2024	\$866,547	\$200,000
2025	\$866,547	\$200,000
2026	\$866,547	\$200,000
2027	\$866,547	\$200,000
2028	\$866,547	\$200,000
2029	\$866,547	\$200,000
2030	\$866,547	\$200,000
2031	\$866,547	\$200,000

**Footpaths**

Year	Renewal Forecast (Asset Register)	Renewal Budget
2022	\$608,400.00	\$0.00
2023	\$608,400.00	\$250,000.00
2024	\$608,400.00	\$250,000.00
2025	\$608,400.00	\$250,000.00
2026	\$608,400.00	\$250,000.00
2027	\$608,400.00	\$250,000.00
2028	\$608,400.00	\$250,000.00
2029	\$608,400.00	\$250,000.00
2030	\$608,400.00	\$250,000.00
2031	\$608,400.00	\$250,000.00

**Appendix D Budget Summary by Lifecycle Activity**

Data has been used from both the Financial and Operational Asset Registers. No Index has been applied to the renewal budget.

*Table D1 – Budget Summary by Lifecycle Activity*

Year	Acquisition	Maintenance	Renewal	Total
2022	\$496,480	\$4,475,816	\$22,906,674	\$27,878,971
2023	\$506,410	\$4,565,332	\$21,810,085	\$26,881,827
2024	\$516,538	\$4,656,639	\$18,843,705	\$24,016,882
2025	\$526,869	\$4,749,772	\$16,224,136	\$21,500,776
2026	\$537,406	\$4,844,767	\$12,226,870	\$17,609,044
2027	\$548,154	\$4,941,663	\$11,081,236	\$16,571,052
2028	\$559,117	\$5,040,496	\$13,126,626	\$18,726,239
2029	\$570,299	\$5,141,306	\$6,765,384	\$12,476,989
2030	\$581,705	\$5,244,132	\$4,134,569	\$9,960,406
2031	\$593,340	\$5,244,132	\$18,830,203	\$24,667,674