Road Asset Management Plan

September 2019

Date Updated: 24 July 2019

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Knox Explorer Reference: D19-37410

Distribution List

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Version 1 – Initial Draft	Asset Systems Developer	13/02/19
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Version 7 – Seventh Draft	Council Meeting	22/07/19
Version 8 – Eighth Draft	Community Consultation	24/07/19
Version 9 – Final	Council Meeting	2/09/19

Executive Summary

Overview

Knox City Council manages 704km of sealed roads and 20km of unsealed roads, with a replacement cost estimated at $643M in 2018-19. The road network has major economic and social value, as it provides connectivity to residents, visitors and businesses across the municipality.

As stated in Council's Asset Management Policy (2019):

> 'Sustainable service outcomes for the community are very much dependent on the performance of the assets that support those services'

Effective lifecycle management is essential given the importance of Council's road network. Figure ES1 below depicts the interdependent stages of the asset lifecycle that must be balanced to maintain agreed service standards at minimal cost, within acceptable risk levels.

Figure ES1 – Stages of the Asset Lifecycle

Council's first Road Asset Management Plan (RAMP) released in 2007 developed many of the mechanisms currently used in Council's road management. The aim of the RAMP 2019 is to review and update these mechanisms. It concentrates on the revision of service standards, measuring asset performance, and optimising the lifecycle management of Council's road assets.

Well defined standards for asset performance are essential when determining long term financial requirements. The service standard that Council intends to deliver through its road network is:

> To provide a **quality** road network that meets the **functional** and **capacity** requirements of the community.

Council's proposed levels of service across these three service attributes are as follows:

Table ES1 – Proposed Service Levels

	Customer Performance Measures	Technical Performance Measures
Quality	**C1.1** Result from Local Government Community Satisfaction Survey for sealed local roads equal to or greater than Metropolitan Council average **C1.2** Fewer than 300 road maintenance requests per 100km of roads **C1.3** Zero over-excess insurance claims each year	**T1.1** 100% of Collector and Link road surfaces in Condition 1 or 2 by 2021-22 (very good or good) 100% of other road surfaces in Condition 1, 2 or 3 (very good, good, or fair) 100% of road pavements and kerb & channel in Condition 1, 2, or 3 (very good, good, or fair) **T1.2** 100% of routine hazard inspections conducted on time **T1.3** 100% of routine maintenance tasks completed on time **T1.4** 100% of temporary and 90% of permanent reactive maintenance tasks completed on time
Functionality	**C2.1** Result from Local Government Community Satisfaction Survey for sealed local roads equal to or greater than Metropolitan Council average **C2.2** Fewer than 750 customer request relating to road function and safety	**T2.1** Road Functionality levels of service are considered in all road renewals
Capacity	**C3.1** Result from Local Government Community Satisfaction Survey for sealed local roads equal to or greater than Metropolitan Council average	

Quality

Quality primarily refers to asset condition, and forms the basis of renewal forecasting.

Perceptions of over-servicing from stakeholders and a review of modelling assumptions based on industry guidelines have prompted a re-evaluation of Council's road service level.

Three level of service scenarios for road surface condition were considered in this RAMP based on condition data obtained in 2015:

1. **'Good':** All roads surfaces in at least Condition 2 (Good) by 2021-22*
2. **'Good/Fair':** Collector and Link road surfaces in at least Condition 2 (Good) by 2021-22, all other road surfaces in at least Condition 3 (Fair)
3. **'Fair':** All road surfaces in at least Condition 3 (Fair).

***Note**: 'Good' was the level of service target set in the RAMP 2007.

Figure ES2 below indicates the renewal funding requirements of each scenario alongside Council's current Long Term Financial Forecast (LTFF).

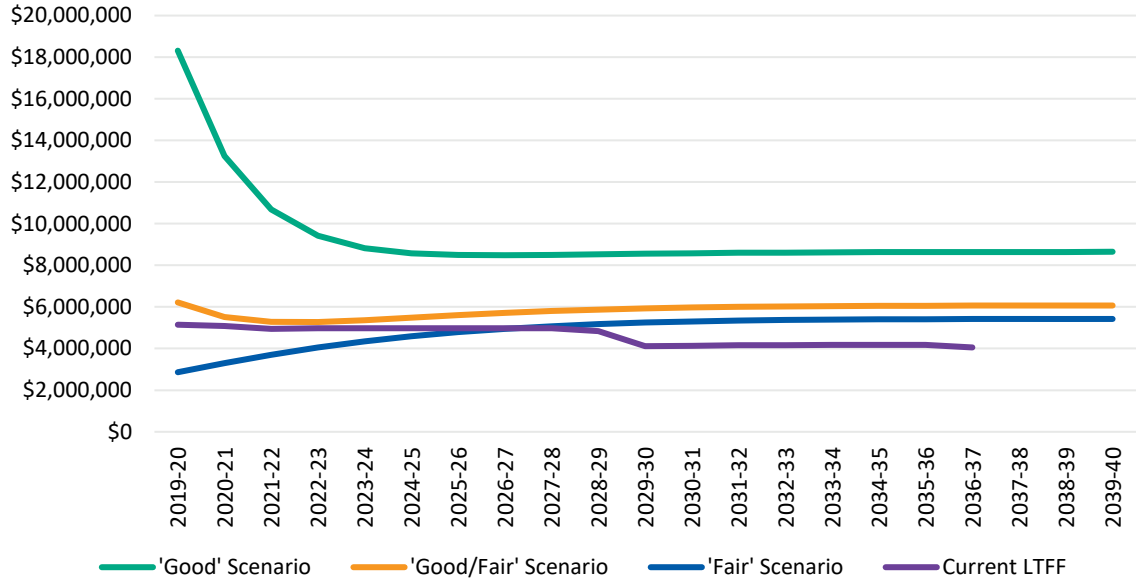

Figure ES2 – Road Surface Renewal Forecast (2018 dollars)

The 'Good' scenario set in the original RAMP would require a significant funding increase in the short-term and an additional $3.5m in annual expenditure going forward, whereas the 'Fair' scenario represents a much lower level of service than Council currently provides.

A 'Good/Fair' level of service is proposed as it strikes a reasonable balance between service level and lifecycle costs, accounting for functional differences across Council's road classifications. Local roads are fully serviceable at 'Fair' condition due to low traffic counts and speed limits, but may require some maintenance such as crack sealing.

The proposed quality levels of service are currently met by:

- 94.5% of road surfaces
- 99% of road pavements
- 100% of kerb and channel.

Figure ES3 below shows what renewal expenditure is required to maintain the proposed levels of service.

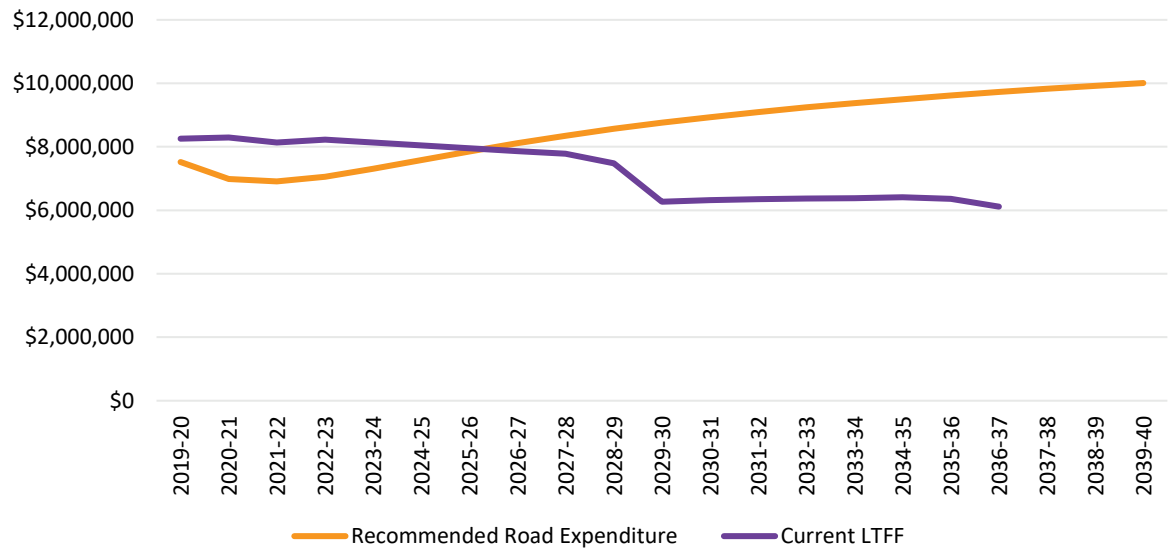

Figure ES3 – Recommended Road Asset Renewal Expenditure (2018 dollars)

The current LTFF exceeds predicted expenditure requirements in the short-term but falls behind in the long-term. Council is continuously improving its modelling methodologies, with new road condition audit data to be obtained in 2019-20. An updated renewal forecast will be produced to validate the proposed service level changes and revise Council's LTFF.

Functionality and Capacity

Functionality refers to a road's capability to provide its intended function. A series of proposed functional levels of service have been developed through consultation with internal stakeholders. These indicators can be used to identify roads for upgrade by entering into consideration during the planning phase of any road renewal.

Capacity is an indication of supply versus demand. It is assessed by comparing road width, traffic, and type against desired characteristics based on the Knox road hierarchy. There are no widespread capacity issues in the Knox road network, but deficiencies can be addressed in the same way as road functionality.

Risk

Managing the risk to road users is an essential consideration for any road authority. Council's proactive road inspection and maintenance program has been demonstrably successful in reducing risk. An average of two over-excess public liability claims relating to roads were received by Council each year prior to the first RAMP; only one such claim has been received since 2013.

The inspection program also mitigates the risk posed by potential hazards on 'Fair' condition roads.

Opportunities

Ten recommendations have been identified in this RAMP to better Council's road management over the next four years. Extending through all stages of the asset lifecycle, these action items represent continuous improvement towards an advanced approach to asset management. The new Asset Management Information System planned for 2020 will further this process through widespread efficiency improvements.

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CHAPTER 1. Introduction

1.1 Plan Overview

Knox City Council (Council) is responsible for the management of an extensive road network on behalf of the community, which supports the broader services of delivering sustainable transport options and providing connectivity across the Knox municipality. This road network consists of approximately 704km of sealed and 20km of unsealed roads, representing not only a significant community asset, but also a significant financial asset for Council (with a replacement value of $643m as of 2018-19).

Effective management of the road network is important both due to the financial implications, and also the services that roads support. As stated in Council's Asset Management Policy (2019):

> Assets enable the provision of services to the community [...] Sustainable service outcomes for the community are very much dependent on the performance of the assets that support those services

This Road Asset Management Plan (RAMP) advances the processes developed in 2007 through Council's first RAMP.

The purpose of this plan is to:

- Demonstrate responsible management of Council's road network
- Meet expectations outlined in Council's Vision, policies and strategies
- Document the level of service Council aims to provide to the community in relation to the road network
- Provide a central framework for management and decision making relating to Council's road assets
- Communicate and justify sustainable funding requirements for Council's road assets
- Identify opportunities for improvement in Council's road management processes.

The plan has been structured according to Figure 1 below.

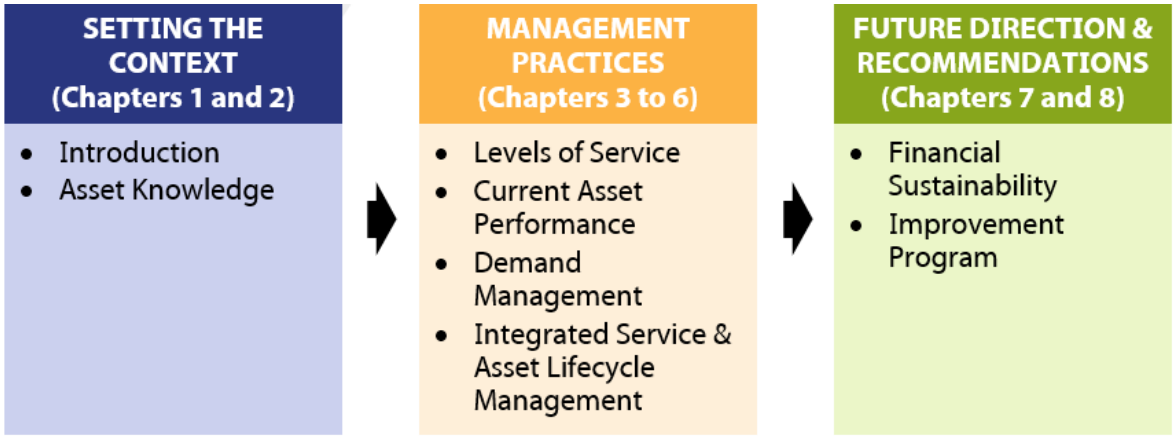


Figure 1 Asset Management Plan framework

1.2 Drivers of Strategic Asset Management

1.2.1 Internal Drivers

City Vision, City Plan and Council Plan

The Knox Community and Council Plan 2017-21 is an outline of goals and strategies for the City as a whole to support attainment of the Vision 2035. These are shared with and implemented by multiple agencies and stakeholders. The Knox Community and Council Plan also outlines targets and initiatives to be undertaken over the next four years corresponding to Council's goals.

Table 1 below outlines the goals, objectives, strategies, and initiatives from these plans that are supported by this RAMP.

Asset Management Policy

Council's Asset Management Policy (2019) articulates Council's overarching commitment to asset management. A key policy statement is that "Council will continue to invest in improving its asset management knowledge and planning, and commit to further research and development of asset management plans for individual asset classes".

Strategic Asset Management Plan

Council's Strategic Asset Management Plan (2014) notes that "it is critical that Asset Management Plans continue to align with the recommended structure, as outlined in the International Infrastructure Management Manual, meet the provisions of the National Asset Management Assessment Framework and start to better integrate with Council service planning processes".

This RAMP also aims to address a key recommendation from the Strategic Asset Management Plan, shown below in Table 2.

Table 1 Goals, Strategies, Targets, and Initiatives from the *Council Plan* relevant to the RAMP 2019

Goal	Strategy	Target/Initiative
GOAL 1: We value our natural and built environment	**Strategy 1.3** Ensure the Knox local character is protected and enhanced through the design and location of urban development and infrastructure	**Initiative 1.3.1** Continue to address Council's Asset Renewal Backlog
GOAL 5: We have a strong regional economy, local employment and learning opportunities	**Strategy 5.3** Promote and improve infrastructure and technology within the municipality and enhance strategic employment places for business	**Initiative 5.3.1** Participate and collaborate regionally to plan for improved infrastructure in and between key priority employment precincts, activity centres and residential areas

GOAL 8: We have confidence in decision making	**Strategy 8.1** Build, strengthen and promote good governance practices across government and community organisations	**Initiative 8.1.5** Strengthen and centralise the coordination, collection and provision of research and data to support future planning by Council **Initiative 8.1.6** Respond to and implement any reforms made to the *Local Government Act 1989*

Source: Knox Community & Council Plan 2017-2021

Table 2 Recommendations from Council's Strategic Asset Management Plan Relevant to the RAMP 2019

(a) Continue to review and update Asset Management Plans, to maintain their currency and validity.
(b) Develop enhancements to the Asset Management Plans, to facilitate progression from core to advanced status, in line with the requirements of the MAV STEP program. Reviewing of AMPs, to have a greater focus on: • Identifying future asset requirements, in line with service planning. • Validation of service levels, in consultation with community requirements. • Advancing understanding of the intrinsic relationship between maintenance, and optimised renewal funding. • Creating a framework for the recognition, analysis, and reporting of new asset categories not previously identified by Council. • Exploring models of management that recognise different ownership options, for managing services other than Council owned infrastructure (particularly buildings).
(c) Continue to centralise the recording and monitoring of AMP recommendations.

Development Contributions Plan

Council is currently assessing the feasibility of implementing a Development Contributions Plan (DCP). Development contributions are one way Council could partially fund the cost of assets, or infrastructure caused by increased demand. A mechanism available through the Planning and Environment Act 1987 is for Council to adopt a DCP. The DCP lists the infrastructure that Council commits to develop over the horizon of the Plan, which is normally 15-20 years.

Council can collect funds from development of dwellings and other land uses toward the developments' share of the cost of infrastructure identified in the Plan. Funds are collected based on the number of additional development of residential dwellings or floor space for other uses over the existing development.

The risk with such a plan is that Council must deliver the infrastructure even if the level of development projected in the DCP does not occur, or if Council's strategic objectives shift. Careful planning is therefore critical, since Council will have reduced capacity to adjust proposed project scopes and priorities. The methodologies and service levels established in this RAMP will contribute to the validity of any such infrastructure program.

A DCP is a significant strategic planning policy for Council with several approval hurdles. The Plan must be prepared in accordance with State government guidelines and Ministerial Directions. Council approves its adoption into the Planning Scheme by way of an amendment to the Scheme, and the Minister of Planning has the final say on the DCP's effect.

Road Management Plan (2015)

Council's Road Management Plan (RMP) (2015) details the roads for which Council is responsible, and sets maintenance standards based on community expectations which are established through community consultation. Road maintenance standards are based on inspection frequencies, defect intervention levels, and rectification timeframes. Delivering the agreed maintenance levels of service grants Council defence against civil liability claims in accordance with the Road Management Act (2004).

Council's RMP (2015) consequently drives many of the processes behind Council road maintenance. It is reviewed following Council elections, normally every four years.

1.2.2 External Drivers

National Asset Management Assessment Framework

The Local Government and Planning Ministers' Council developed a National Asset Management Assessment Framework to foster a nationally consistent approach to asset management in 2009. For some time, most Victorian Councils have been part of the Municipal Association of Victoria's (MAV) asset management capacity building approach, the STEP program. The development of a National Asset Management and Financial Planning Assessment Framework for Local Government provides the assessment framework of the STEP program. One of the eleven elements of this assessment framework is the requirement for Councils to work towards preparing documented asset management plans for all material asset categories. The framework also outlines key inclusions and components of a typical asset management plan, which are consistent with the recommendations of the International Infrastructure Management Manual.

ISO 55000:2014 Asset Management

Since the RAMP (2007), there has also been the introduction of ISO 55000:2014 Asset Management (ISO 2014). The standard is intended to assist asset managers in the establishment, implementation, maintenance and advancement of an asset management system. It also provides a process by which organisations can become accredited in their asset management practices, although this is not currently required of local governments.

Local Government Act Review

The Local Government Act (1989) provides a framework for the establishment and operation of Victorian Councils. A review of the act is currently underway, which will introduce additional requirements for the management of assets. These include proposed changes such as:

- A council must develop, adopt and keep in force an Asset Plan
- The scope of an Asset plan is for at least 10 years
- An Asset Plan must include information about maintenance, renewal, acquisition, expansion, upgrade, disposal and decommissioning in relation to each class of infrastructure asset under the control of the Council

Council will monitor the review, and adapt to any new requirements as they enter into legislation.

1.3 Plan Framework & Asset Management Approach

This plan has been developed based on guidance provided by the International Infrastructure Management Manual and the National Asset Management Assessment Framework.

As this plan is a revision of Council's first RAMP (2007), it is intended that it will enable Council to progress further towards **advanced** asset management maturity.

1.4 Related Documents

1.4.1 Asset Management Plans

This RAMP forms part of Council's suite of Asset Management Plans. Plans already adopted by Council are as follows:

- Building Asset Management Plan (2019)
- Drainage Asset Management Plan (2010)
- Open Space Asset Management Plan (2011)
- Car Park Asset Management Plan (2013)
- Bridge Asset Management Plan (2013)
- Playground Asset Management Plan (2013)
- Street Tree Asset Management Plan (2016)
- Footpath Asset Management Plan (2016)

1.4.2 Related Studies & Strategies

Other documents that influence the strategic direction of Council road asset management include:

- Integrated Transport Plan (2015)
- Road Management Plan (2015)

The results of financial modelling, presented later in this document, will inform Council's Long Term Financial Forecast and Annual Budget.

1.5 Consultation for this Plan

A number of internal and external stakeholders provided input and feedback into the development of this RAMP.

- Councillors
- Asset Management Steering Group members
- Sustainable Infrastructure Department
- Operations Department
- Project Delivery Team
- Executive Management Team

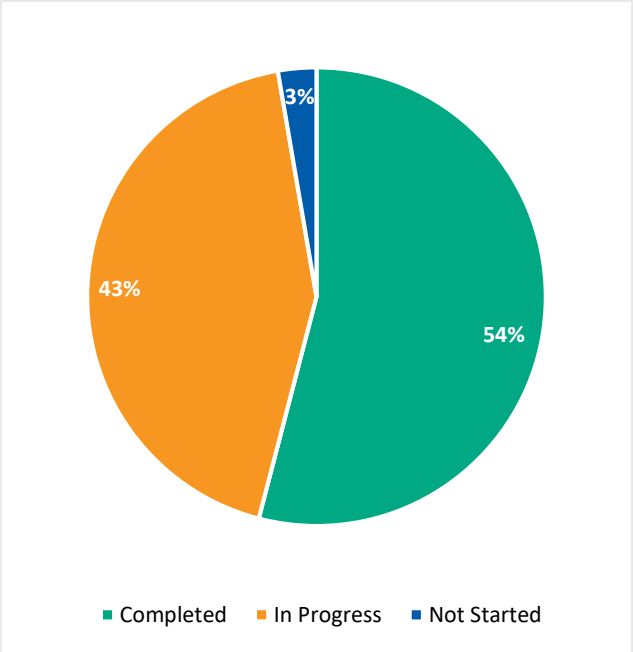
1.6 Implementation of the RAMP 2007

The RAMP (2007) did not explicitly document improvement actions, however a retroactive improvement plan was developed to monitor its implementation.

Asset Management Plan recommendations are actioned formally through business plans, or informally through evolving practices within Council. Implementation of the RAMP (2007) was roughly 80.4% complete in April 2019, as shown in Figure 2 below.

The high proportion of completed actions demonstrates Council's on-going commitment to asset management plan implementation. It also reflects the many advancements in the field of asset management since the RAMP (2007) was released; some recommendations are no longer suitable or

worthwhile within the modern context. Outstanding recommendations were reviewed during the development of this RAMP, and incorporated where appropriate.



Number of Recommendations

Completed	In Progress	Not Started	Total
20	16	1	37

Figure 2 Implementation Status of RAMP (2007) Recommendations

CHAPTER 2. Asset Knowledge

2.1 Asset Ownership and Responsibility

2.1.1 Roads Managed by Council

Council's Public Road Register (as defined under the Road Management Act (2004)) defines the roads within the scope of this plan. These include:

- Public Roads for which Council is both the Coordinating and Responsible Road Authority as defined under the Act; and
- Public Roads for which Council is the Responsible Road Authority under an agreement with another Coordinating Road Authority (for example Service roads adjacent to VicRoads arterial roads).

All of the above are listed in Council's Asset Register and are owned and/or managed by Council.

Where issues arise relating to ownership and maintenance responsibilities, Council's Geographic Information Systems (GIS) and Asset Register are used as guidance, informed by Codes of Practice associated with the Road Management Act (2004). The Asset Strategy and Traffic & Transport teams are also involved in clarifying road responsibilities.

Figure 3 Typical road asset under Council's responsibility

2.1.2 Roads Not Managed by Council

There are a number of roads within the municipality that are the responsibility of other authorities or private entities, and therefore not considered part of Council's management responsibility (and not covered by this plan). These include:

- VicRoads arterial roads
- Eastlink
- Private roads

- Roads within the Municipality for which Council is not the Responsible Road Authority under an agreement with another Coordinating Road Authority.

2.2 Assets in the Road Reserve

Figure 4 below presents some of the typical Council-owned assets found in the road reserve. Sections 2.2.1 and 2.2.2 outline which of these assets are within the scope of this plan.

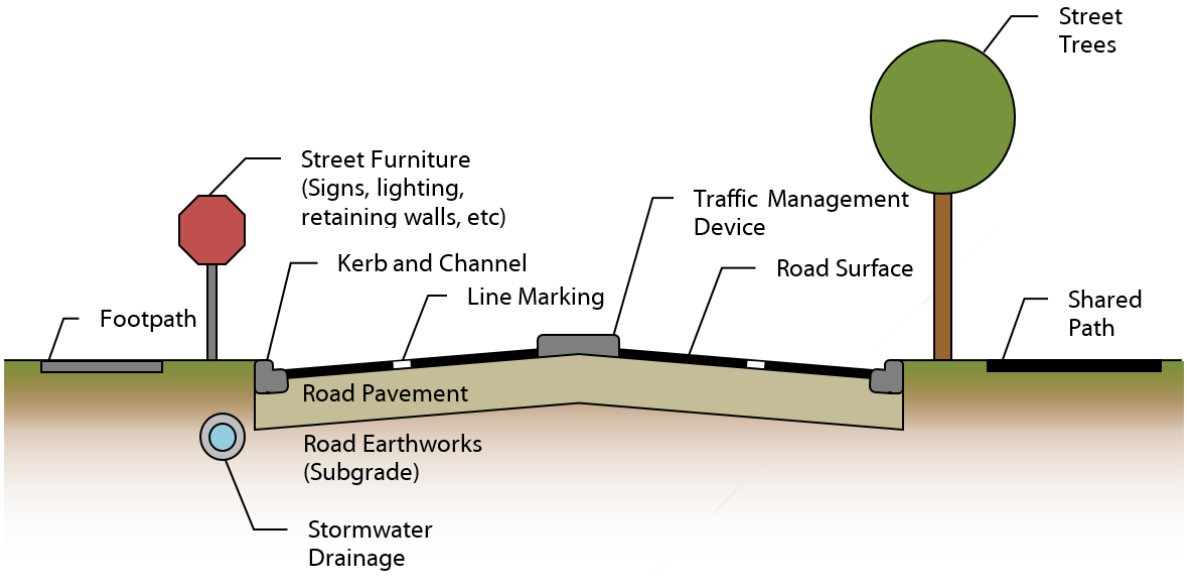


Figure 4 Typical Assets in the Road Reserve

2.2.1 Included Assets

The assets within the road reserve that are included as a part of this plan have been grouped as **major** and **minor** assets. This is based on their value and importance to the service delivered by Council's roads.

These assets and groupings are as follows:

Major Assets

- Road surface
- Road pavement
- Road earthworks
- Kerb and channel.

Minor Assets

- Line marking
- Local Area Traffic Management devices (LATM's)
- Road furniture (incl. street lighting, signage, retaining walls, etc)
- Pedestrian crossings.

2.2.2 Excluded Assets

Aside from the assets listed above, there are a number of other assets that are located in road reserve. These include:

- Footpaths and shared paths
- Bridges and major culverts
- Stormwater drainage
- Street trees
- Carparks
- Right of ways (except those used as a road).

These assets have not been included in this RAMP as their management is covered elsewhere in Council's suite of asset management plans.

2.3 Asset Inventory

2.3.1 Major Assets

Table 3 below summarises the inventory of major assets in Council's asset register covered by this plan. Sealed roads consist of a road surface, pavement and earthworks. Unsealed roads consist of pavement and earthworks only.

Table 3 Major Asset Inventory (as of February 2019)

Asset Type	Amount (km)
Sealed roads	704.2
Unsealed roads	19.9
Kerb and Channel	1347.0

2.3.2 Minor Assets

Council does not currently maintain a database of minor road reserve assets including line markings, LATMs, road furniture and retaining walls.

Council would benefit from including some of these minor asset types in its asset register. The lack of proactive management of LATMs and retaining walls could have future cost implications, and potentially pose a risk to the community.

RECOMMENDATION – Lifecycle Management of Additional Road Reserve Asset Types

Collect and maintain a database of additional road reserve assets, including retaining walls and LATMs.

Why? These assets represent significant monetary value, and could pose a risks to the community if not properly maintained. Managing them in a systematic way will mitigate risks and decrease lifecycle costs.

How? Establish a set of criteria for the identification of these asset classes, including important attributes, and conduct a council-wide audit. Then develop service level targets to inform future budget requirements.

2.3.3 Street Lighting

The vast majority of Council's street lighting is maintained by energy distributors such as Ausnet Services through maintenance agreements. The databases used by these organisations are made available to Council. However, Knox does not have a centralised record of Council-owned public lighting that is outside of such agreements.

2.4 Asset Hierarchy and Criticality

Asset criticality measures how severe the consequences will be if an asset fails to deliver its intended function. Criticality is categorised through an asset hierarchy, which is a framework through which Council can set service standards.

Council's road hierarchy with desired characteristics is documented in the RMP (2015), shown below in Table 4.

Table 4 Road Asset Hierarchy

Classification	Typical Function/Features	Desirable Traffic Conditions			Desirable Physical Features		
		Two Way AADT (24 hour)	% Commercial Vehicles	Posted Speed Limit (km/h)	Kerb Type	Width (m)	Surface
Link Road	• Efficiently channel traffic through the Municipality; • Carry traffic between major commercial, industrial and residential areas; • Link VicRoads arterial roads; • Provide for through traffic movements and heavy vehicle use.	Over 6,000	Less than 7%	50 to 80	Barrier/ rollover	7.4 to 12.0	Asphalt
Collector Road	• Provide connectivity to commercial and residential areas from Link Roads or directly from the VicRoads arterial network; • Concentrate locally generated traffic to an outlet; • Provide direct access to the local road network but road does not act as a through traffic route; • Carries local traffic to shops, schools, commercial districts, hospitals, sporting and other local facilities.	Less than 6,000	Less than 5%	50 to 60	Barrier/ rollover	6.4 to 11.3	Asphalt
Industrial Road	• Service local light industries concentrated in small areas that tend to be adjacent to VicRoads arterial roads; • Road is in an Industrial Zone.	Less than 6,000	Variable	50 to 60	Barrier	7.6 to 11.8	Asphalt
Access Road	• Provide access to abutting residential properties; • Public amenity, safety and aesthetic aspects of these roads take priority over speed and ease of movement of vehicles.	Less than 2,000	Less than 3%	15 to 50	Rollover/ plinth or no Kerb & Channel	3.8 to 8.8	Asphalt/ Concrete
Unsealed Road	• Predominantly gravel/crushed rock surface; • May function as Link, Collector or Access road.	Less than 1,000	Less than 1%	50		Varies	Gravel

Source: *Knox Road Management Plan* 2015

2.5 Useful Lives

Useful lives indicate the expected life of an asset type before it becomes unserviceable. Table 5 below lists Council's adopted useful lives for major road asset types.

Table 5 Road Asset Useful Lives

Asset Component	Material/Hierarchy	Useful Life (years)
Road Surface	Spray Seal	10
	Asphalt	30
	Concrete	50
	Pavers	25
	Crushed Rock	5
Road Pavement	Link Road	90
	Collector Road	130
	Industrial Road	90
	Access Road	185
	Unsealed Road	30
Earthworks	All	N/A
Kerb and Channel	All	70

Benchmarking of useful lives with other similar councils is carried out periodically, particularly when Council undertakes condition audits, prepares Asset Management Plans or completes renewal forecasting. There has been no change to road component useful lives since the adoption of the previous RAMP 2007. The accuracy of Council's current useful lives is discussed further in Section 4.2.

2.6 Asset Age Profile

Figure 5 below shows the age profile of Council's major road assets (road surface, pavement, earthworks and kerb & channel).

Although Council endeavours to maintain an accurate database of road construction dates, there are some deficiencies in the current data set. Assets that were renewed prior to the 1990s are based on the date of original creation, as Council only began documenting renewals in the mid-1990s. Additionally, road renewal data is not always immediately entered into the asset register.

RECOMMENDATION – Verify Road Asset Years of Construction

Verify road asset year of construction listed in the asset register.

Why? Up to date and accurate data about assets assists Council to model future financial requirements, as well as prioritise assets for renewal.

How? Compare renewal records held by Construction against dates listed in asset register.

The majority of Council's roads are between 30 and 50 years old (as seen by the age profiles of the Pavement and Earthworks assets), but over 25% of road surfaces were constructed or renewed within the last 10 years. This distribution reflects the increase in road investment following the original RAMP (2007). Similar rates of renewal for road pavement and kerb & channel are not seen as these assets have longer useful lives.

Approximately 40% of Council's Road Surface assets are beyond their expected useful life of 30 years, which in itself is not necessarily cause for concern. The decision to renew an asset is based on condition rather than age, as many factors can extend or reduce functional life.

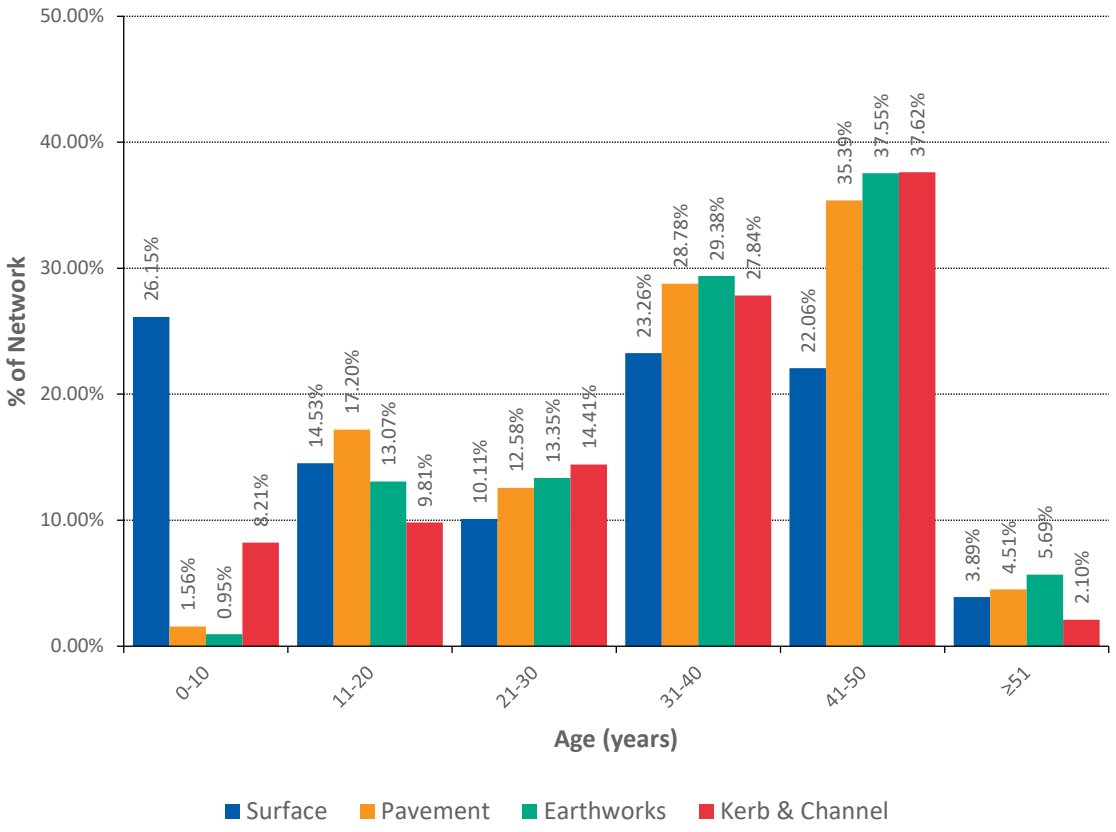


Figure 5 Age Profile of Road Assets (2018)

2.7 Unsealed Roads

All Council unsealed roads on a weekly basis to identify defects or the need for grading, ensuring they are kept to a high standard.

The long-term cost benefits of upgrading gravel roads to asphalt was demonstrated in the RAMP 2007. Council currently funds these works when an unsealed road is not meeting functional requirements, but they can also be funded through resident contributions. Use of the functionality and capacity assessment frameworks contained in Section 4.2 will help identify where unsealed upgrades are required. This process is further detailed in Section 6.3.1.

2.8 Asset Valuations

Road valuations are reported in Council's financial reports under the Infrastructure Asset Category. Annual financial reports are prepared in accordance with relevant accounting standards such as AASB 116, as well as Council's Fixed Asset Accounting Policy. In line with these standards, asset components purchased or constructed which have a value above the prescribed threshold level ($5,000 for surface/kerbs and $20,000 for substructure/earthworks) are recorded as non-current assets. Assets with a value below the threshold level are treated as expenditure in the year of purchase.

In 2017-18 the total current replacement cost of Council road assets was reported as $643M, with a written down value of $457M. Formal asset valuations are undertaken on a three year cycle and verified by Council's Finance Department, before entering into the Annual Report. Unit rates are monitored and new assets are brought to account over the years between valuations.

Asset valuations are predominantly undertaken by the Sustainable Infrastructure Department which determines representative unit rates to apply to the validated asset inventory. Valuations are based on the assumption that each asset is constructed on undisturbed ground (i.e. a greenfield site). Rates for the various components of Council's road assets (per square metre) are derived using historical expenditure and industry price guidelines. Straight line depreciation is then applied to determine the written down value, based on consumed useful life.

Table 6 below summarises the current and recent valuation of Council's road network.

Table 6 Road asset valuations – 2013/14 to 2017/18

Asset Component	Valuation	Financial Year				
		2013-14	2014-15	2015-16	2016-17	2017-18
Surface	Current Replacement Cost ($,000)	78,746	84,038	76,891	84,353	93,490
	Written Down Value ($,000)	28,355	32,525	27,857	34,144	41,948
Pavement	Current Replacement Cost ($,000)	281,163	282,447	294,957	295,542	296,460
	Written Down Value ($,000)	218,088	217,529	225,362	224,020	223,000
Earthworks	Current Replacement Cost ($,000)	136,136	136,527	132,929	132,929	133,245
	Written Down Value ($,000)	136,136	136,527	132,929	132,929	133,245
Kerb and Channel	Current Replacement Cost ($,000)	115,482	115,008	120,744	119,985	119,739
	Written Down Value ($,000)	61,012	59,339	62,261	60,253	58,701

Source: Valuation data has been obtained from Council's Annual Reports

2.9 Asset Management Information Systems

Council's asset knowledge exists predominantly in the asset register of its corporate asset management information system, Lifecycle, and spatially through GIS.

Ongoing data management work is undertaken primarily by the Asset Strategy team. Data management also involves collation and verification of data discrepancies to ensure all asset data is recorded accurately and appropriately.

2.9.1 Lifecycle – Asset Register

Road assets defined in terms of segments within Council's asset register. Segments are typically blocks of road between intersections, up to 400m in length.

For each road segment, the asset register includes the following populated fields:

- GIS Link (unique identifier)
- Street Name
- Suburb
- From Road
- To Road
- Road Hierarchy
- Segment Area
- Segment Length
- Segment Width
- Pavement/surface and kerb material

2.9.2 IntraMaps – GIS

IntraMaps is used by Council to provide a spatial representation of Council's assets. The system has a number of map layers for road assets for which the Asset Strategy team is responsible. Each road segment in Intramaps is assigned a unique GIS identifier.

2.9.3 Lifecycle – Work Order System

Council's Work Order System is used to facilitate delivery and record maintenance activities undertaken by the Operations department on Council assets. In general, Work Orders are created whenever a maintenance request is received from a customer, or when a Council officer identifies a maintenance issue that exceeds intervention levels (through proactive hazard inspections). Work Orders created using this system are linked to the asset register by way of unique identifiers.

2.9.4 Pavement Management System

Council currently uses the SMEC Pavement Management System as a basis for Council's renewal modelling and management of major road assets. The system uses defect and condition data collected through condition audits to determine a renewal program aimed at optimising lifecycle costs.

2.9.5 Updating the Asset Register

Robust procedures for capturing new assets and asset modifications are required for Council to have confidence in its asset knowledge.

New assets are created through Council's capital works program or from developer contributions. When new road assets are created, or an existing road is significantly altered, the data in the GIS and Council's Asset Register is updated by the Asset Strategy team. This occurs either via the existing subdivision handover process or through the capital works handover process.

Road **renewals** are primarily managed by the Construction Team, who undertake treatments such as resurfacing. Data is updated in customised renewal modules in Lifecycle by the Construction Team, and later imported into the Asset Register by the Asset Strategy team.

Road **reconstructions** are major renewals where road pavement is replaced, undertaken by the Project Delivery team. Since they are less numerous, these works do not have a formal handover process.

Routine asset condition audits are used to verify and update Council's Asset Register.

Section 6.3.1 describes opportunities for improvements to the asset handover process

2.9.6 Asset Management System Upgrade

Council is currently undertaking an upgrade of its asset management system, LifeCycle. The new system is planned for implementation in 2020, and will facilitate management of Council's roads through features such as:

- Standardised data formats
- Improved data validation
- Easy access to asset register data for field staff
- Improved GIS Integration.

CHAPTER 3. Levels of Service

3.1 Overview

Road assets service the broader community by:

- Connecting communities throughout Knox
- Facilitating community interaction within the municipality
- Offering access to residential, commercial and community services
- Providing alternative transport choices, incorporating public transport and on-road bicycle lanes.

The standard at which an asset fulfils its intended functions is known as the service level**.** There is an inherent relationship between the standard of service offered by an asset, the cost, and risk.

Levels of service are used to define and evaluate these trade-offs.

3.2 Stakeholders – Internal & External

There are a number of other internal stakeholders involved in the management of Council roads. The teams involved are described below in Table 7.

Table 7 Key Internal Stakeholders with Road Asset Management Responsibilities

Service	Service Description	Council Department
Transport and Traffic	Traffic and Transport plans for local traffic management, manages traffic counts, advocates for improvements to the road network, and is a key input into the configuration of new or upgraded roads.	Sustainable Infrastructure
Construction Group	Construction Group is in charge of renewing road surfaces, kerb and channel, and other road assets such as road furniture. The team also provides Project Delivery with candidate roads for reconstruction.	Operations
Work Services	Works services carries out regular inspections of Council's road assets to identify defects, and manages road maintenance.	Operations
Asset Strategy	Asset Strategy undertakes regular condition audits of the road network, creates renewal priority lists, determines renewal funding requirements, maintains the asset management information system, and produces asset management plans.	Sustainable Infrastructure
Project Delivery	Project Delivery undertakes design and reconstruction of road pavements and surfaces, as well as LATMs. The team is also responsible for the production of standard drawings relating to road assets.	Community Infrastructure

The roads managed by Council are primarily local in nature, meaning that local residents are the biggest stakeholder external to Council. Other external stakeholders include:

- Community Groups
- Business Operators
- VicRoads
- Public Transport Victoria
- Bicycle Network Victoria
- Emergency Services
- Transport Operators
- Service Authorities
- Contractors working on behalf of Council

3.3 Community Expectations

Understanding Community expectations is vital for ensuring that Council delivers an appropriate level of service. Community expectations regarding road asset levels of service are gauged through:

- Informal interactions between Council officers and the community as part of normal daily activities
- Community consultation undertaken during the development of strategic documents (i.e. Community and Council Plan 2017-2021, Road Management Plan 2015 and Integrated Transport Plan 2015) or major projects
- Participation in the community satisfaction surveys (where available)
- Reviews of community maintenance requests
- Reviews of relevant legislative requirements
- Alignment with overarching strategic and corporate goals.

3.3.1 Investigation of Community Needs

Community recommendations and complaints regarding the road network are generally received by the Traffic & Transport team. Requests received cover a wide range of issues including traffic, parking, signage, road condition, line marking, roadside vegetation and lighting.

Community needs are also investigated when undertaking designs for major projects. There is typically considerable engagement undertaken with the community to seek feedback and input into Council's proposals. This form of engagement is based on specific locations and projects, rather than a broader assessment of expectations.

3.3.2 Review of Community Satisfaction Results

Council participates in the annual Local Government Community Satisfaction Survey (LGCSS) which is coordinated by the Department of Environment, Land, Water and Planning. The LGCSS provides Council with feedback on community satisfaction each year. Council's performance is benchmarked against 79 other Victorian Councils.

The current survey format includes an indicator called 'Sealed Local Roads'. Whilst this provides an overall indication of the community's satisfaction with the road network, it does not provide

sufficient detail for Council to measure its performance in the management and delivery of the network.

Section 4.1.1 below discusses the survey results and recommends investigating new methods for determining customer satisfaction in addition to the LGCSS.

3.3.3 Analysis of Customer Trends

The figures below summarise the history of customer requests received by Council relating to Council roads. Figure 6 relates to customer requests which resulted in maintenance and cleaning of road assets and Figure 7 relates to the functional aspects of Council's road assets.

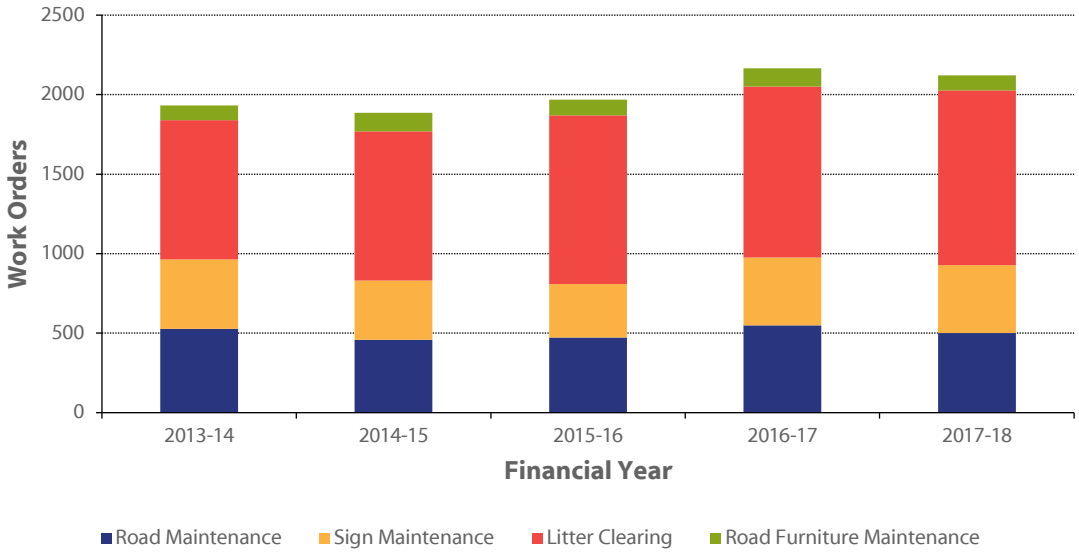


Figure 6 Customer Requests Relating to Road Maintenance (2013-14 to 2017-18)

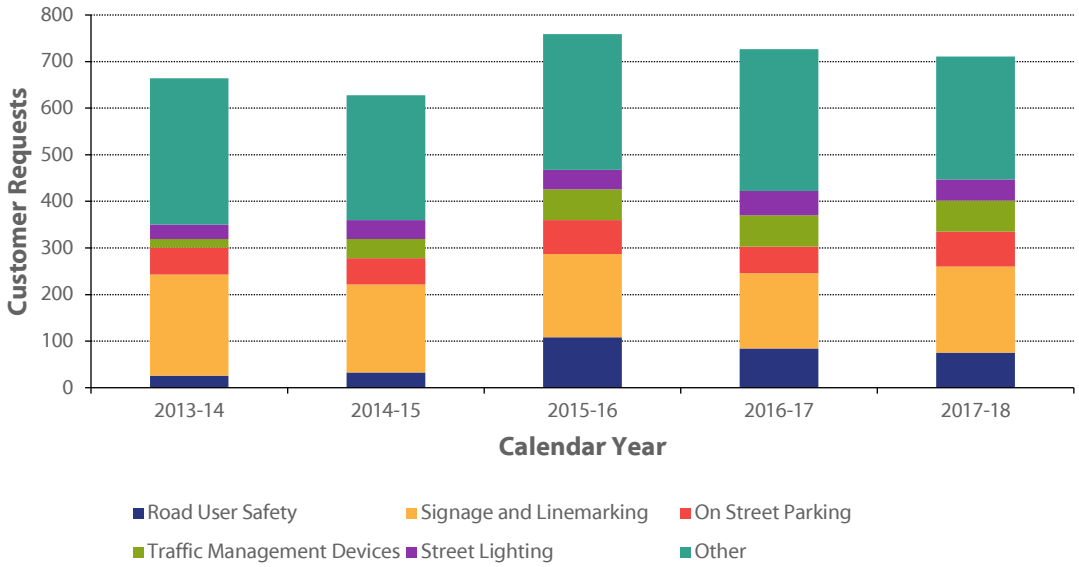


Figure 7 Customer Requests Relating to Road Safety and Functionality (2013-14 to 2017-18)

Figure 6 demonstrates that Council's RMP (2015) holds maintenance requests at a consistent level. Council's Works Services department has been able to effectively manage the workload over this period.

On the other hand, Figure 7 shows an increase in the customer requests relating to road functionality. This plan introduces functional service levels for Council's road assets with the intention of reducing such requests in the long term. Additional details are provided in Section 3.6.

3.4 Risk Management

Risk management is an integral part of mature asset management. The application of sound risk management allows for continual improvement in decision making and processes and is an essential consideration in the development of budgets and appropriate levels of service.

There are three major risks relating to Council's roads assets that have been identified in Council's corporate risk register, outlined below in Table 8.

It is not possible for Council to address all defects and eliminate all risks; however they are being mitigated through the actions identified in the table below.

Table 8 Road related risks identified in Council's corporate risk register

Risk Ref.	Risk Description	Cause(s)/ Consequence(s)	Assessed Risk	Control(s)	Residual Risk
Ra06	Failure to comply with Council Road Management Plan.	Cause: - Not meeting maintenance programs - Inadequate reporting - Abnormal weather event Consequence: - Exposing Council to liability/injury/property damage/prosecution claims - Damaged reputation	**MEDIUM**	Existing maintenance programs, annual compliance review conducted by Asset Management, compliance review by Insurer, existing Asset Management System (Lifecycle), Knox Explorer, Pathway System in place to record reported defects & rectification actions. Ongoing monitoring & improvement as required to Asset Management Systems	**MEDIUM**
Rf08	Failing to understand and allow for the full asset lifecycle costs in annual budgets and long term financial forecasts impacts the ability for Council to maintain and deliver the renewal of assets and maintenance program	Cause: - Gaps in our financial framework - Lack of scoping (single dimension), not taking into account lifestyle costs - Political awareness (the ribbon cutting) Consequence: - Asset failure due to lack of maintenance $ - Burden on operation (staff/ budget) - Community expectation not met (community service/ safety not met)	**MEDIUM**	Project Implementation Plans currently require identification of life cycle costs. Identify traceable systems to track life cycle costs directly into long term financial forecast.	**MEDIUM**
Rp08	Failure to attract and retain appropriately skilled staff impacts on the capacity to deliver the required services to manage Councils infrastructure and assets	Cause: - Excessive workload - Inconsistent management of performance - Inconsistent application of working arrangement Consequence: - Discretionary effort decreases - Misspent time - More mental health issues - Lost time - High staff turnover - Lack of business continuity	**HIGH**	Ongoing provision of development opportunities, training and optimum work environment for internal staff. Working with PP to optimize the attraction of quality staff. Use of consultants, staff rotation and higher duties to address work requirements.	**LOW**

3.5 Legislative Requirements

Legislative requirements set the framework for the minimum levels of service that road assets are required to meet. Table 9 below provides an outline of the applicable legislation and the main legislative requirements relevant to road assets which have been considered in the development of this Plan.

Table 9 Legislative requirements relevant to road management

Legislation	Relevant Requirements
Local Government Act 1989	Sets out the purpose and responsibilities of local governments, including: • ensuring that resources are used efficiently and effectively and services are provided in accordance with the Best Value Principles to best meet the needs of the local community; • planning for and providing services and facilities for the local community; and • providing and maintaining community infrastructure in the municipal district. Outlines Council's powers in relation to roads (and related infrastructure) in Sections 203 to 208. Also sets out Council's requirement to prepare a long term financial plan which incorporates funding the management of infrastructure assets.
Road Management Act 2004	Defines Council as the Responsible Authority in relation to the management of local roads. It also states Council, as the Responsible Authority, has a statutory duty to inspect, maintain and repair the road network to the standard specified in Council's Road Management Plan.
Transport Integration Act 2010	Integrates the legislation contained within: • Transport (Compliance and Miscellaneous) Act 1983; • Road Management Act 2004; and • Road Safety Act 1986. Also outlines Council's responsibility to manage financial risk in relation to the management and maintenance of road assets. Requires land use authorities to provide a transport system that is integrated and sustainable with transport decisions made based on a triple bottom line assessment.
Disability Discrimination Act 1992	Outlines Responsible Authorities are to ensure that persons with disabilities have the same rights as the rest of the community.
All other State and Federal Acts and Regulations	For example: Financial Management Act 1994, Road Safety Act 1986, etc

3.6 Levels of Service

The service that Council intends to deliver through its road network is:

> To provide a **quality** road network that meets the **functional** and **capacity** requirements of the community.

Levels of service are specific, measureable objectives by which Council defines its service provision to the community.

Each road segment on the network can be assigned a rating from 1 (very good) through to 5 (very poor) for each of the three service attributes: **quality**, **functionality** and **capacity**. These ratings assist in demonstrating the performance of Council's roads, and determining appropriate investment activity.

Also associated with the service attributes are 'customer' and 'technical' performance measures, which enable Council to monitor delivery of the service and facilitate decision making. Monitoring performance measures allows Council to balance priorities and assess the ongoing performance of management strategies.

3.6.1 Quality Service Attribute

The quality service attribute relates to the physical condition of the road network. This takes into account asset deterioration, as well as the presence of hazards to road users.

Table 10 below outlines the descriptions used to rate the quality (condition) of Council's road assets, in alignment with the generic condition descriptors used by Council for all infrastructure assets.

Table 10 Council Quality (Condition) Rating Descriptions

Condition Rating	Description	% Remaining Life (approx.)
1 – Very Good	Road is as new, near perfect condition	95%
2 – Good	Road is functional and displays superficial defects only	75%
3 – Fair	Road is functional but shows signs of moderate wear and tear	50%
4 – Poor	Road functionality is reduced. Asset has significant defects affecting the fabric of the asset.	25%
5 – Very Poor	Road is not functional, severely deteriorated	5%

Source: *Strategic Asset Management Plan* 2014

3.6.2 Functionality Service Attribute

The functionality service attribute relates to how the road network is providing its intended function.

Function can refer to a sight distances, travel speeds, line marking visibility, signage, as well as many other considerations.

Table 11 outlines the descriptions used to rate the functionality of Council's road assets.

Table 11 Council Functional Rating Descriptions

Functional Rating	Description
1 – Very Good	Road meets service delivery needs in a fully effective manner
2 – Good	Road meets service delivery needs in an acceptable manner
3 – Fair	Road meets most service delivery needs
4 – Poor	Road has limited ability to meet service delivery needs
5 – Very Poor	Road is functionally deficient and does not meet service delivery needs

Based on Table 6 Levels of Service & Community Engagement, IPWEA 2014

There are many contextual variables that can impact the acceptable level of functionality for a road, including road hierarchy, road reserve dimensions, land topography, and neighbourhood character. Table 12 below contains Council's functional levels of service, for which the target rating is '3 – Fair'.

Given the range of factors influencing road functionality, it will not always be feasible to attain a rating of '3 – Fair' for all level of service indicators. Functional improvements can also be costly to implement, and usually require replacing existing assets. Council's functional service levels are primarily intended for consideration in alignment with road renewals or reconstructions. Implementation of these service levels into Council's road management processes is discussed further in Section 7.3.

Table 12 Functional Levels of Service

Description	1 – Very Good	2 - Good	3 - Fair	4 - Poor	5 – Very Poor
Sight Distance & Visibility	No visibility or sight distance issues.	Good visibility and sight distance (including potential visual obstruction caused by other vehicles).	Some instances of poor visibility, but measures are in place to mitigate risks (e.g. low speed limits, LATMs).	Frequent instances of poor visibility, some measures are in place to mitigate risks.	Frequent instances of poor visibility/sight distance, no risk mitigation.
Travel Speed (based on travel speed of 85th percentile)	85th percentile is 5km/h or more below the speed limit.	85th percentile less than 5km/h below the speed limit.	85th percentile >= 2km over the speed limit.	85th percentile >= 5km/h over the speed limit.	85th percentile >= 10km/h over speed limit.
Line Markings and Raised Retro-reflective Pavement Markers (RRPMs)	As new, no loss of marking or reflectivity.	Minor loss of marking or reflectivity. Less than 5% RRPMs missing.	Moderate loss of marking or reflectivity, but critical sections still visible. Between 5-15% RRPMS missing.	Significant loss of marking and reflectivity, partially visible. More than 15% RRPMs missing.	Major loss of marking and reflectivity, barely visible. RRPMs not present where required (e.g. around traffic furniture).
Road Geometry	Crossfall between 2.5-3.5%.	Crossfall between 1.5-2.5% or 3.5-4.0%.	Crossfall between 1.0-1.5% or 4.0-5.0%. Note: On curves or in hilly areas, crossfalls of up to 6.25% are deemed acceptable.	Crossfall 0.5-1% or 5-6.5%, or evidence of vehicles scraping on road surface.	Crossfall 0-0.5% or >6.5%, or significant evidence of vehicles scraping on road surface.
Road Signage	Clear, consistent signage in very good condition.	Clear signage in good condition.	Regulatory and warning signage present and in fair condition.	Regulatory warning signage inadequate, or in poor condition (partially readable).	Regulatory warning signage missing, or significantly damaged (unreadable).
Street Lighting (local roads only)	'P4' classification as per AS1158.	'P5' classification as per AS1158.	Lights on every second pole, or spacing less than 90m.	>90m spacing between lights, or missing near road furniture such as LATMs.	No street lighting.

3.6.3 Capacity Service Attribute

The capacity service attribute refers to how well a road, or road network, is meeting demand.

For individual road assets, the assumed capacity (in terms of Annual Average Daily Traffic (AADT)) of a road is based on the hierarchy outlined previously in Table 4.

For the network overall, the capacity relates to the ability of the network to provide connections between key places and is primarily a function of whether there are missing links.

Table 13 outlines the descriptions used to rate the capacity of Council's road assets (except for Link roads which are the inverse, i.e. <50% of AADT would be 5 – Very Poor).

Table 13 Council Capacity Rating Descriptions

Capacity Rating	Description
1 – Very Good	Road usage well within design capacity with no operational problems (AADT <50% of AADT for hierarchy classification)
2 – Good	Road usage within design capacity and/or minor operational problems occur occasionally (AADT 50-80% of AADT for hierarchy classification)
3 – Fair	Road usage is approaching design capacity and/or minor operational problems occur frequently (AADT 80-100% of AADT for hierarchy classification)
4 – Poor	Road usage exceeds design capacity and/or significant operational problems are evident (AADT 100-120% of AADT for hierarchy classification)
5 – Very Poor	Road usage greatly exceeds design capacity and/or operational problems are serious and ongoing (AADT >120% of AADT for hierarchy classification)

Based on Table 7 Levels of Service & Community Engagement, IPWEA 2014

In addition to the above, road capacity can also be assessed by comparing actual road widths against the desired configurations listed previously in Table 4.

3.6.4 Levels of Service

Table 14 below provides a summary of current and proposed levels of service and performance measures relating to Council's road assets.

Table 14 Summary of Proposed Levels of Service and Performance Measures

	Customer Performance Measures	Technical Performance Measures
Quality	**C1.1** Result from Local Government Community Satisfaction Survey for sealed local roads equal to or greater than Metropolitan Council average **C1.2** Fewer than 300 road maintenance requests per 100km of roads **C1.3** Zero over-excess insurance claims each year	**T1.1** 100% of road surfaces in Condition 1 or 2 (Very good or good) by 2021 100% of road pavements and kerb & channel in Condition 1, 2, or 3 (very good, or fair) **T1.2** 100% of routine hazard inspections conducted on time **T1.3** 100% of routine maintenance tasks completed on time **T1.4** 100% of temporary and 90% of permanent reactive maintenance tasks completed on time
Functionality	**C2.1** Result from Local Government Community Satisfaction Survey for sealed local roads equal to or greater than Metropolitan Council average **C2.2** Fewer than 750 customer request relating to road function and safety	**T2.1** Road Functionality levels of service are considered in all road renewals
Capacity	**C3.1** Result from Local Government Community Satisfaction Survey for sealed local roads equal to or greater than Metropolitan Council average	**T3.1**

Three scenarios for sealed road surface condition level of service will be investigated in Chapter 7 to evaluate potential future expenditure requirements. These scenarios are summarised below in Table 15.

Table 15 Road Surface Level of Service Scenarios

Scenario	Level of Service
'Good' (Level of service based adopted in RAMP 2007)	All roads surfaces in at least Condition 2 by 2021
'Good/Fair'	Collector and Link road surfaces in at least Condition 2 by 2021, other road surfaces in at least Condition 3
'Fair'	All road surfaces in at least Condition 3

CHAPTER 4. Current Asset Performance

4.1 Customer Performance Measures

4.1.1 Customer Satisfaction

Council uses the annual Local Government Community Satisfaction Survey (LGCSS) conducted by the Department of Environment, Land Water and Planning for measuring community satisfaction with road assets. As part of the survey, respondents are asked to rate Council's performance on the condition of sealed local roads over the past 12 months. Results from the previous five calendar years can be seen below in Figure 8.

Council is meeting its service level target of having a satisfaction score at least equal to the average for Metropolitan Councils.

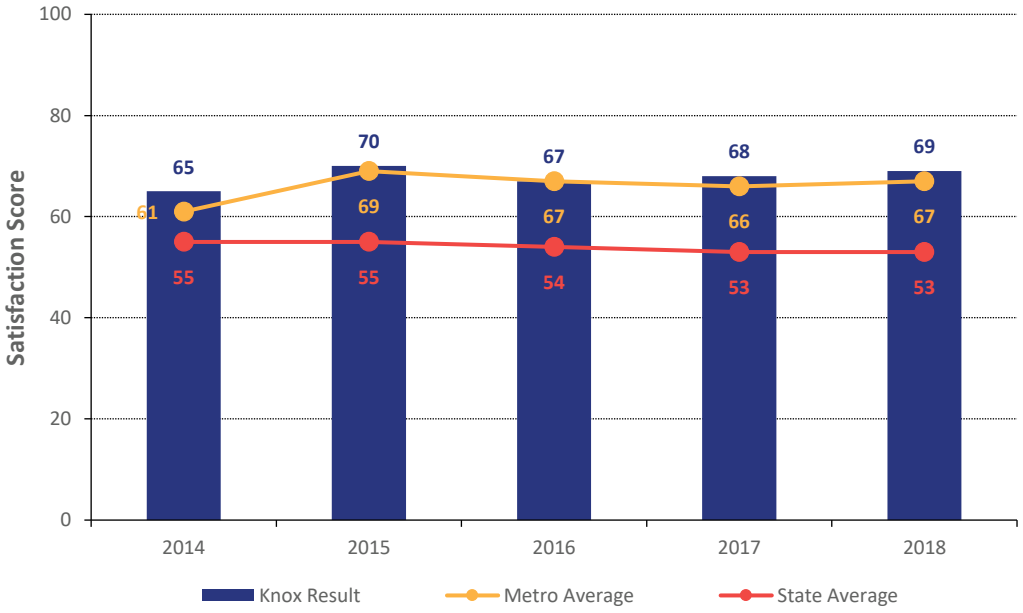


Figure 8 Community Satisfaction Survey Results – Sealed Local Roads (2014-18)

The LGCSS is currently Council's only strategic measure for understanding the community's expectations for roads. However, its uses for specific asset management decision making are limited as it does not provide insight in terms of the three service level attributes: quality, functionality and capacity.

4.1.2 Customer Maintenance Requests

Figure 9 below details the number of customer maintenance requests received by Council relating to road assets.

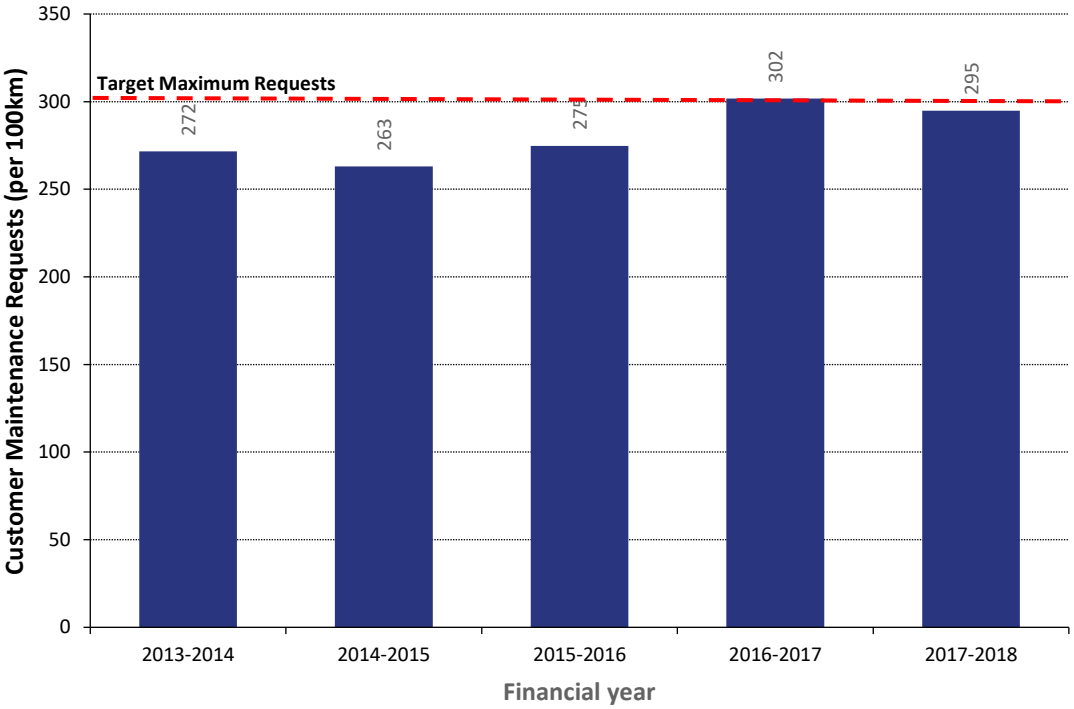


Figure 9 Customer maintenance requests (2013-14 to 2017-18)

The number of maintenance requests received relates to customer performance measure **C1.2** with Council's current service level to receive fewer than 300 requests per 100km of road annually

4.1.3 Customer Road Function and Safety Requests

Figure 10 details the number of customer requests received by Council relating to road asset functionality and safety.

The number of road function and safety requests received relates to customer performance measure **C2.2** with a target of less than 750 per year.

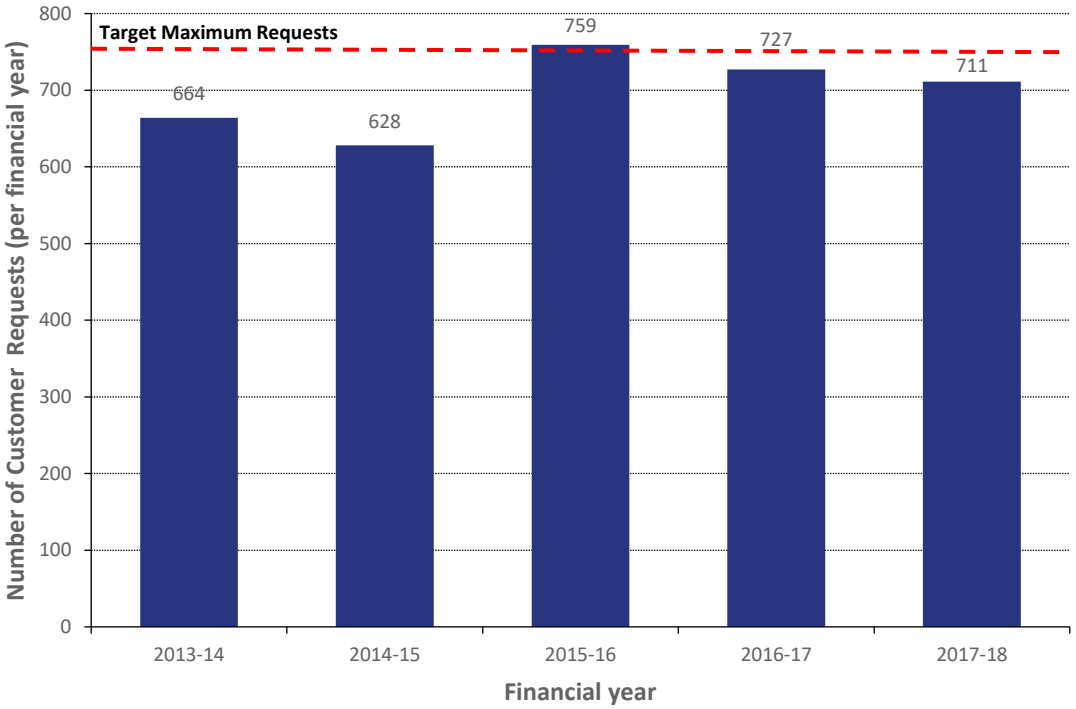


Figure 10 Number of Road Function and Safety Requests (2013-14 to 2017-18)

4.1.4 Insurance Claims History

Insurance claims are managed by Council's Safety, Risk and Wellbeing team. Claims are separated into two categories:

- Public Liability – where a person has been injured or property has been damaged and the claimant is seeking damages from Council
- Property – claims made for loss or damage to Council's infrastructure

Insurance claims relate to customer performance measure **C1.3** with Council's service level of zero over-excess claims relating to roads each year.

Public Liability

Public liability claims typically arise when the following three conditions are met:

1. Council has a clear duty of care regarding the issue in question
2. Evidence of loss experienced by a member of the public
3. Demonstration that Council has breached the duty of care outlined in (1)

An analysis was undertaken for all over- and under-excess public liability claims received in the five year period from 2013/14 through to 2017/18.

Over-excess public liability claims are managed by Council's insurer, MAV Insurance. There has been one over-excess claims made against Council in relation to assets covered by the RAMP from January 2013 to date. A summary of this claim is provided in Table 16 below.

Table 16 Over-excess claims on road related assets from 2013/14 to 2017/18

Year	Cause	Description	Net Paid	Net Incurred*
2013	Road surface/ potholes	Claimant tripped and fell on hole in roadway	$0	$0

*Net incurred amount is a sum of the net paid and an estimate on the likely additional costs/damages which *may* need to be paid in the future (net estimate)

The previous Road Asset Management Plan 2007 (RAMP) documented that there was an average of more than two over-excess claims per year attributed to road infrastructure. There has only been one over-excess claim between 2010 and 2017, demonstrating significant improvement in Council's management of road assets.

Under-excess claims are managed by an insurance provider on behalf of Council. Table 17 below shows a summary of claims under-excess over the five year period from 2013/14 to 2017/18. Over this time Council has paid out a total of $7,414 in under excess claims, from 73 claims totalling $154,938.

Table 17 Under-Excess Claims on Road Related Assets 2013/14 to 2017/18

Year	Claims Received	Claims Finalised	Claims Denied	Amount Claimed	Amount Paid
2013/14	16	18	16	$60,568	$5,748
2014/15	3	7	6	$7,310	$0
2015/16	17	17	6	$35,973	$696
2016/17	18	18	9	$33,320	$440
2017/18	19	19	6	$17,767	$530

The data for both over and under-excess claims demonstrates the legal defence offered through adherence to a Road Management Plan.

Property

Property claims relate more to building and open space assets than civil infrastructure. Council does not have any records of claiming for damages caused to its road assets. There are asset preservation processes in place which allow for recourse against residents and builders that can be proven to have damaged Council's assets.

4.2 Technical Performance Measures

4.2.1 Quality Service Attribute

Condition

The last condition audit conducted on Council's road assets was in 2015. The data collected from this audit can be compared to past audits undertaken in 2006 and 2011 to track the performance of

Council's assets over time. Audits should continue to be undertaken at four yearly intervals with the next audit scheduled for 2018-19.

The condition audit results relate to technical performance measure **T1.1** with Council's current service level to have 100% of roads surfaces in Condition 1 or 2 (very good or good) by 2021 and 100% of road pavements and kerb & channel in Condition 1, 2 or 3 (very good, good or fair).

Figures 11, 12 and 13 present the overall condition ratings (as a percentage of network area) from the past three condition audits.

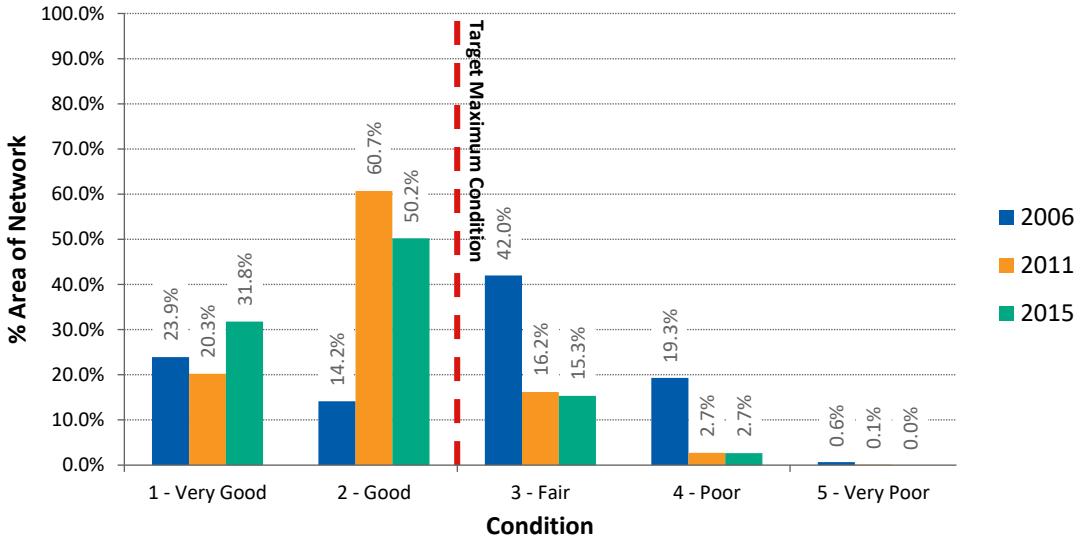


Figure 11 Road Surface Condition data (2006-2015)

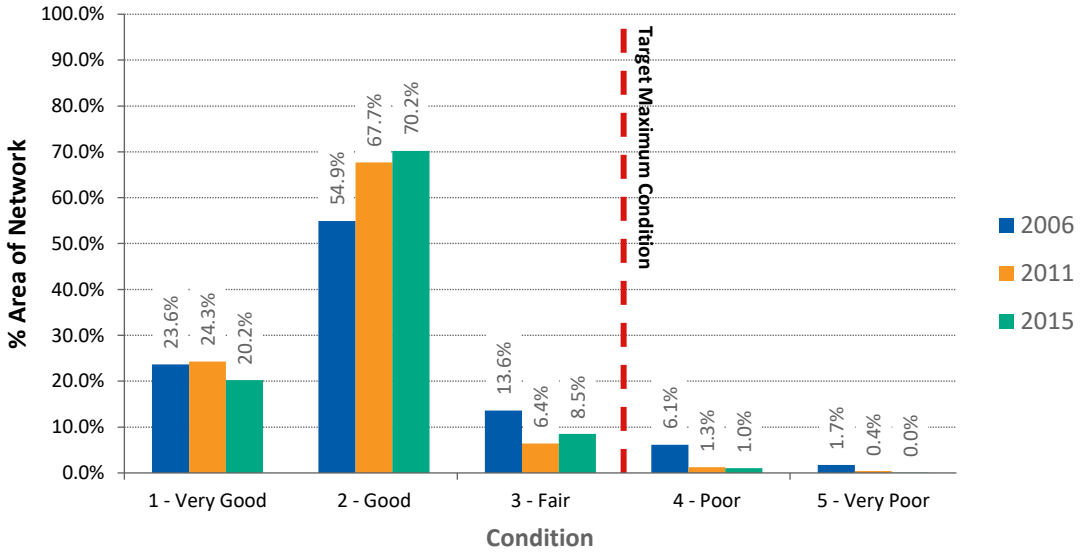


Figure 12 Road Pavement Condition Data (2006-2015)

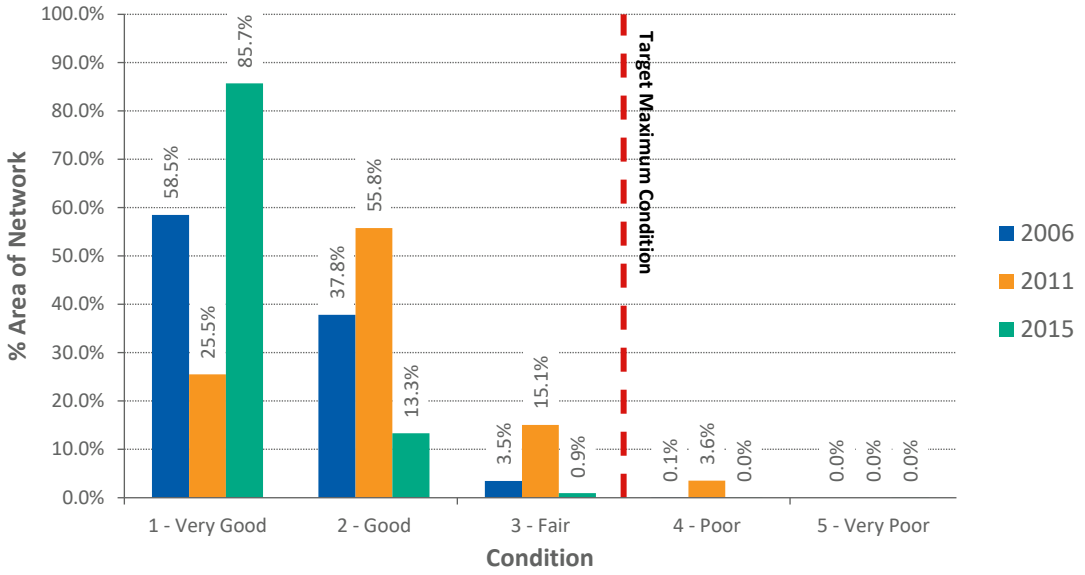


Figure 13 Kerb and Channel Condition Data (2006-2015)

The above results demonstrate the impact of the increased renewal budget that followed the RAMP (2007), with significant improvements in the condition of Council's road assets since 2006.

There has been a noticeable decrease in the percentage of assets beneath the service levels set in the initial RAMP. The percentage of road surfaces in conditions 3, 4 and 5 decreased by over 43% of the network area, and other major road assets in conditions 4 and 5 have been reduced to almost zero.

A major shift in kerb and channel condition was observed between 2011 and 2015, suggesting that the audits differed in their application of condition ratings for this asset type.

RECOMMENDATION – Improve Consistency between Condition Audits

Ensure that condition ratings are consistent between audits, especially for kerb and channel.

Why? So that deterioration curves can be accurately modelled, which are important when estimating future funding requirements.

How? Review existing data, and consider providing photographic examples to future auditors.

Pavement conditions are estimated based on a visual defect survey and by measuring road roughness. Council made use of falling weight deflectometer testing in 2004 on a sample of roads to develop assumptions relating to pavement strength, condition and useful life. These assumptions relating to road pavements should be reviewed to ensure they align with modern industry practices.

RECOMMENDATION – Review Adopted Road Pavement Properties

Review Council's assumptions relating to road pavements such as deterioration curves and useful lives.

Why? Council's current assumptions are based on testing undertaken in 2004, which may no longer align with industry standards. Council has undertaken several audits since that time, which provide additional insight into pavement deterioration.

How? Review industry practices, and use survey data to assess the validity of current assumptions.

Routine Hazard Inspections

In accordance with Council's RMP (2015), all roads in Knox are proactively inspected for hazards. The scope and frequency of the routine hazard inspections is documented in Council's Road Management Plan. Hazard inspections are recorded in Council's Work Order System (Lifecycle). Identified hazards that exceed Council's intervention levels automatically generate Work Orders to enable rectification. Analysis of data stored in the Work Order System shows that these assets have a high success rate of being inspected in accordance with Council timeframes.

The routine hazard inspections relate to technical performance measure **T1.2** with Council's current service level to have 100% of routine hazard inspections completed on time. Figure 14 details Council's performance for hazard inspections over the past five years.

Council can be found liable for incidents that occur due to above-intervention defects on roads that are not inspected within adopted timeframes. Based on Council's insurance claim record over recent years (described in Section 4.1.4), there is no major risk associated with inspection delays on a small percentage of roads.

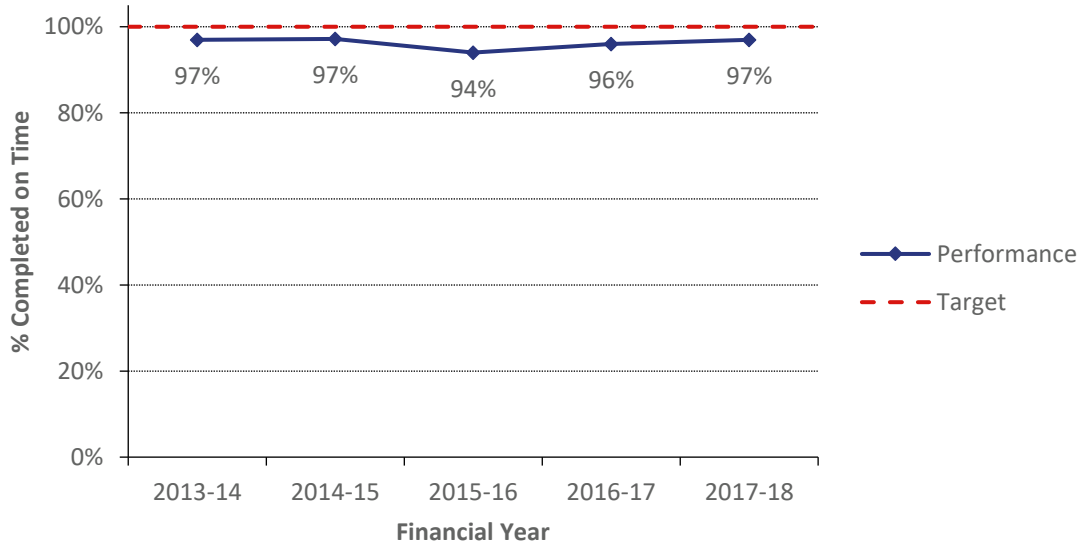


Figure 14 Routine Hazard Inspection Performance – 2013/14 to 2017/18

Though not directly related to any levels of service, Figure 15 shows the percentage of reactive maintenance works generated from Council's hazard inspections compared to those generated from customer requests since 2012-13. The number of maintenance work orders indicated in red has been decreasing since 2014-15, which suggests that network quality is slightly improving.

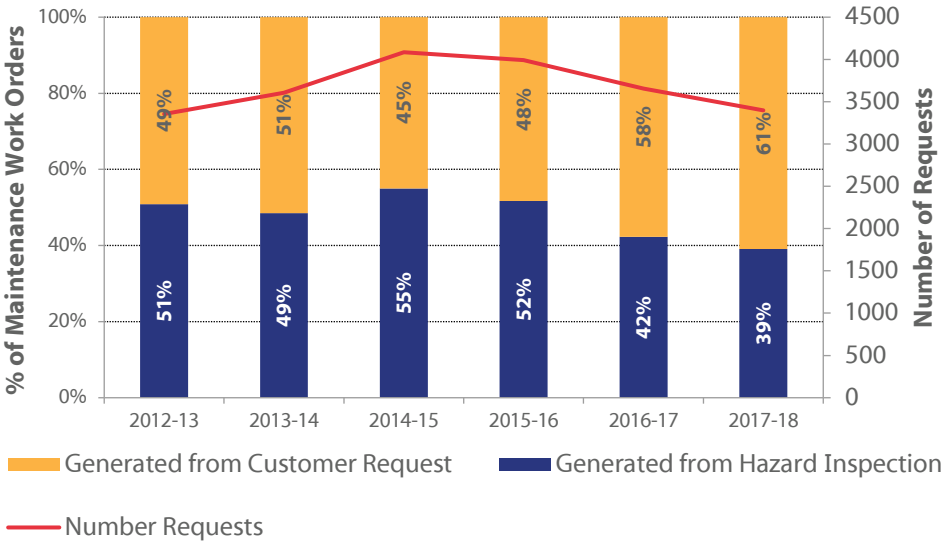


Figure 15 Source of Reactive Maintenance Work Orders – 2013/14 to 2017/18

Routine Maintenance

Although Council undertakes routine road maintenance activities (such as street sweeping, crack sealing, etc.), this information is difficult to analyse for performance as it is stored outside of Council's asset management system. The new asset management system planned for implementation in 2020 will enable data to be collected relating to these activities.

Reactive Maintenance

The Knox Work Order System (Lifecycle) monitors the delivery of Council's reactive maintenance service levels. There are two types of reactive maintenance tasks that are completed following the creation of a work order: temporary works (which are completed to make a high-risk hazard safe in the short term), and rectification works (which provide a more permanent fix to the hazard).

The completion of reactive maintenance works relates to technical performance measure **T1.4** with Council's current service level to complete 100% of temporary and 90% of permanent (rectification) maintenance works on time. Council has successfully provided these service levels over the past five financial years, as demonstrated below in Figures 16 and 17.

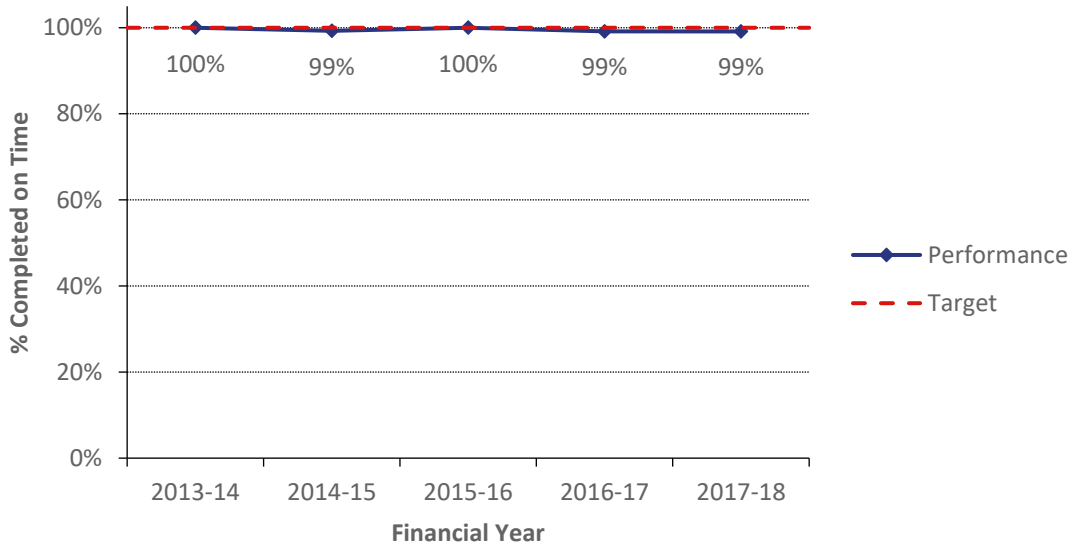


Figure 16 Reactive Maintenance (Temporary) Performance – 2013/14 to 2017/18

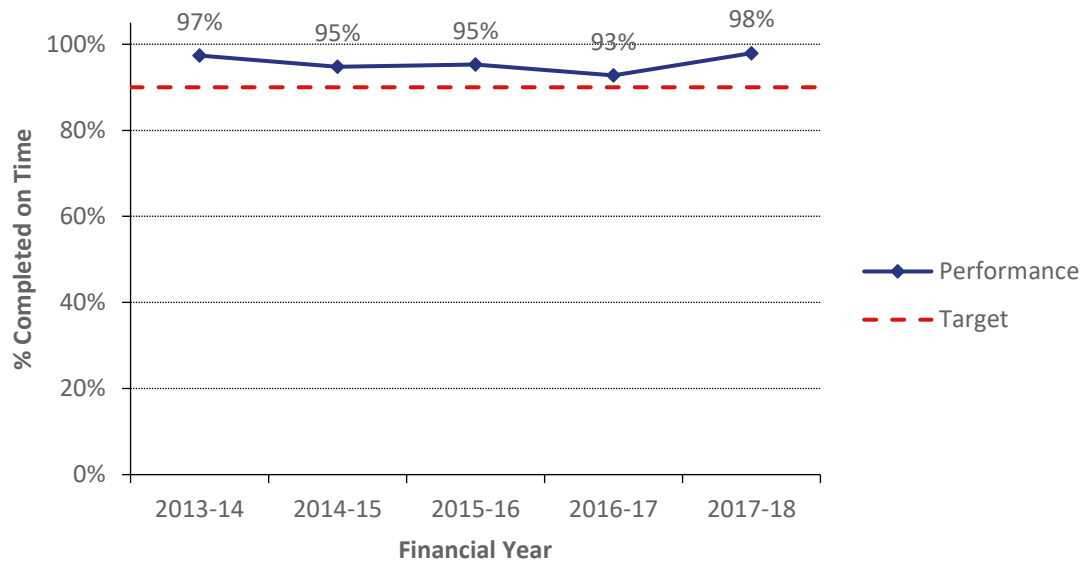


Figure 17 Reactive Maintenance (Rectification) Performance – 2013/14 to 2017/18

4.2.2 Functionality Service Attribute

Council does not collect data relating to road functionality on a network level. Since road functionality usually can't be improved except through reconfiguration, it is not worthwhile to assess unless a reconstruction or renewal is planned.

4.2.3 Capacity Service Attribute

The graph below shows Council's current performance in relation to the technical performance measure **T3.1**, which refers to the capacity of Council's road network, for traffic counts assessed over the past five calendar years. These counts took place on 11% of Council road segments.

Only 2.2% of the data sample has a capacity rating of poor or very poor, which includes link roads with low traffic counts. There is not currently an adopted service level for this measure.

The state of utilisation data is discussed in greater detail in Section 5.1.2.

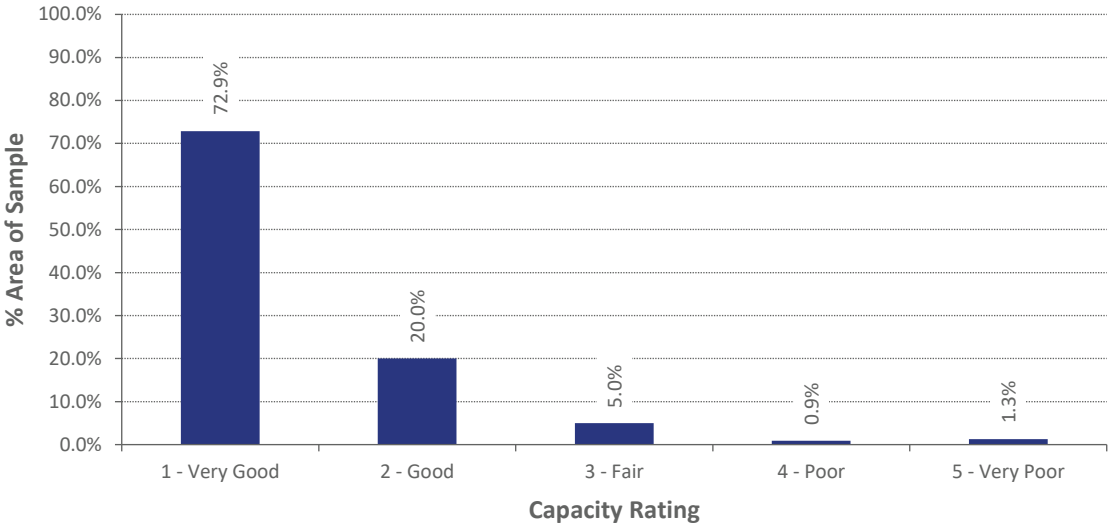


Figure 18 Road Network Capacity Ratings for Traffic Counts 2013-2018.

4.3 Summary of Current Performance

Table 18 provides a summary of Council's performance in relation to the current service levels for the customer and technical performance measures.

Table 18 - Summary of current performance (2017-18)

Customer Performance Measures

Service Attribute	Measure	Current Service Level	2017/18 Performance
Safety	**C1.1**	Community Satisfaction Survey for sealed local roads equal to or greater than Metropolitan Council average	69 (Metro av. 68)
	C1.2	Fewer than 300 customer maintenance requests per 100km of road annually	295
	C1.3	Zero over-excess claims relating to road asset safety annually	0
Functionality	**C2.1**	Community Satisfaction Survey for sealed local roads equal to or greater than Metropolitan Council average	69 (Metro av. 68)
	C2.2	Fewer than 750 customer request relating to road function and safety	711
Capacity	**C3.1**	Community Satisfaction Survey for sealed local roads equal to or greater than Metropolitan Council average	69 (Metro av. 68)

Technical Performance Measures

Service Attribute	Measure	Current Service Level	2017/18 Performance
Safety	**T1.1**	100% of roads surfaces in Condition 1 or 2 (very good or good) by 2021 100% of road pavements and kerb & channel in Condition 1, 2 or 3 (very good, good or fair)	Surface – 90.5%* Pavement - 99%* K & C - 100%* ***Based on 2015 audit**
	T1.2	100% of routine hazard inspections conducted on time	97%
	T1.3	100% of routine maintenance tasks completed on time	Not measured
	T1.4	100% of temporary and 90% of permanent reactive maintenance tasks completed on time	Temporary – 99% Permanent – 98%
Functionality	**T2.1**	Road Functionality levels of service are considered in all road renewals	N/A

CHAPTER 5. Future Demand

5.1 Future Demand

Council recognises the importance of understanding future demand in ensuring appropriate management of infrastructure assets.

5.1.1 Factors Influencing Demand

To forecast future demand, it is important to determine the major drivers of change. The following key factors may contribute to a change in future demand for Council road assets:

- Ageing assets
- Population growth
- Ageing population
- Changes in public transport provision
- Increased dwelling density
- Increased environmental, health and wellbeing awareness.

Ageing assets affects Council's provision of the service to the community, whilst the remaining five factors impact the community's utilisation of the network.

5.1.2 Review of Asset Utilisation Data

Traffic and Transport routinely undertakes traffic count audits on Council roads. As previously noted, Council currently has traffic counts for 11% of the road network over the past 5 years, and 25% of the network since 1995.

The distribution of traffic counts against road hierarchy are shown below in Table 19, it is clear that the vast majority of missing utilisation data is for local access road, which make up approximately 80% of Council's network. Counts for these roads are primarily reactive, as they are the least critical.

Table 19 – Traffic Counts by Road Hierarchy

Road Hierarchy	% with Traffic Counts Complete (since 1995)
Link Road	61.5%
Collector Road	66.6%
Industrial Road	63.0%
Access Road	16.2%
Unsealed Road	21.9%

Note that for the purpose of traffic counts, roads are broken up into segments of up to approximately 400m length. There can be minimal change in traffic from one segment to the next, meaning that counts are not always required.

5.1.3 Future Demand Projections

Whilst some trend analysis has been attempted regarding assessment of Council road utilisation, there is currently insufficient information to forecast changes in network usage.

Knox's population is expected to grow at a rate of 3 to 4% every 5 years until 2041, based on Australian Bureau of Statistics population forecasts. Population growth combined with a history of rising car ownership in Knox as noted in the Integrated Transport Strategy (2015), suggest that demand will increase into the foreseeable future. This trend could be reversed through state and federal investment in public transportation, but there are currently no major proposals.

Council can monitor utilisation and undertake demand projections by routinely undertaking traffic counts along key assets.

RECOMMENDATION – Review Traffic Count Process

Review Council's traffic count program to determine opportunities for improvement.

Why? A systematic approach to traffic counts can provide insight into demand changes at key locations, which can be used to identify future issues.

How? Assess the benefits of changing how Council selects roads for traffic counts.

5.1.4 Demand Impact on Assets

Asset capacity is a function of many factors including road widths, topography, land use, and road network configuration. Nearly 98% of Council roads are within acceptable levels based on the capacity assessment in Section 4.2.3, but such an assessment is limited in scope. Identification of roads with insufficient capacity requires a holistic approach that takes future needs into account.

Increased usage can also increase asset deterioration rates. The life of a road pavement is based on daily traffic and the proportion of heavy vehicles. Traffic growth is modelled in Council's pavement management system and incorporated into future projections of network condition.

5.1.5 Demand Management Strategies

Council must find efficient ways to deal with increasing asset demand.

Demand management refers to the notion that asset solutions (eg. building new infrastructure) are not necessarily the only way to satisfy demand. Managing increasing demands can be achieved by optimising the utilisation of existing assets or through the consideration of alternative initiatives such as regulations, incentives, advocacy, or education.

The Knox Integrated Transport Plan (2015) states:

> 'Managing congestion within Knox requires more direct dialogue with the community about the tools available to collectively manage travel behaviour into the future. Infrastructure solutions alone will not address the growth and development challenges we collectively face. Good planning, behavioural change programs and community partnerships will all contribute to meeting the collective community need for sustainable transport solutions within both Knox and the wider region.'

The action plan from the Knox Integrated Transport Plan (2015) contains a number of strategies aiming to reduce congestions on Council's road network without the provision of new infrastructure.

Other activities Council currently undertakes to address demand issues include advocating to the State Government to take over management of roads which are functioning as arterial roads (eg. Napoleon Rd south of Kelletts Rd) and advocating the construction of new arterial roads (eg. Dorset Rd extension and Stud Rd extension).

CHAPTER 6. Integrated Service & Asset Lifecycle Management

6.1 Asset Lifecycle Stages

Effective management of infrastructure assets involves recognising the intrinsic relationship between all stages of the asset lifecycle. Service level objectives are achieved most efficiently by balancing the maintenance, renewal and disposal of existing assets and the delivery of new and upgraded assets. Figure 19 below shows all stages of the asset lifecycle.

Figure 19 Asset Lifecycle Stages

6.2 Past Expenditure

Funding allocations at each stage of the asset lifecycle impact asset performance.

- **Maintenance expenditure** keeps an asset network safe and functional. It is a recurrent operational cost that ensures assets achieve their useful lives and meet the required level of service.
- **Renewal expenditure** is required to reinstate or rehabilitate existing assets that have deteriorated to such an extent that they no longer meet service standards. It is capital expenditure used to return the service potential or the life of an asset up to that which it had originally.
- **New/Upgrade expenditure** results from ongoing strategic assessment of network functionality. Upgrades enable an increase in the level of service that can be provided, an

increase in the size of the network or an increase in the life or function of the asset beyond that which it had originally.

- **Disposal costs** are generally absorbed into the expenditure for asset renewal or upgrades.

Asset managers must determine the adequate provision of renewal funding to address backlogs in asset investment and to indicate a sustainable level of asset capital funding.

The figures presented in this section summarise recent trends in Council expenditure for maintenance, renewal and new/upgrades of road assets.

6.2.1 New/Upgrade Expenditure

New roads (as well as upgrades) are typically undertaken through the capital works program 4007 - Road and Bridge Construction, which is administered by Council's Project Delivery team. Ranking criteria is used to develop a rolling prioritised list produced by Traffic and Transport.

Recent new/upgrade capital expenditure levels are summarised in Table 20 below. The data represents actual expenditure, which sometimes differs from fully expended budgets. The reason for this is the post-processing undertaken by Finance whereby works are either capitalised or expensed, and allocated to the most appropriate asset class.

Table 20 -- Road new/upgrade expenditure – 2013/14 to 2017/18

Year	Expenditure ($'000)
2013-14	326
2014-15	213
2015-16	556
2016-17	1748
2017-18	715

Source: All expenditure data has been obtained from Council's Finance Department

Council generally only carries out one or two new/upgrade road projects each year. Annual expenditure varies based on the scope of these projects.

This section only deals with Council expenditure from the 4007 capital works program. New road assets are also created as part of various developments, which are ultimately handed over to Council as contributed assets, or through other capital work programs.

6.2.2 Maintenance Expenditure

The operational accounts used for the maintenance of road assets include:

- 34115 – St. sweep - day shift
- 34120 – St. sweep - night shift
- 34300 – Road reserve/reactive maintenance
- 34317 – Traffic management maintenance
- 34331 – Unsealed roads grading maintenance
- 34324 – Kerb & channel maintenance
- 34345 – Line marking program

- 34347 – Linemarking reactive
- 34412 – Road furniture maintenance
- 34025 – Works management & administration (general overheads)

The total expenditure charged to the above accounts is summarised in Table 21 for the last five years. This expenditure includes:

- Reactive maintenance costs
- Routine maintenance works (ie street sweeping, line marking, etc)
- A percentage of operational staff wages (ie hazard inspectors)

Table 21 Road maintenance expenditure – 2013/14 to 2017/18

Year	Budget ($'000)	Expenditure ($'000)
2013-14	2,003	1,857
2014-15	2,058	1,970
2015-16	2,116	2,084
2016-17	2,177	1,965
2017-18	2,113	2,337

Source: All expenditure data has been obtained from Council Annual Reports and verified by Finance

6.2.3 Renewal Expenditure

Renewal works for road assets are typically undertaken under the capital works programs 1001 - Road Substructure and Kerb & Channel and 1002 - Road Surface, and are administered by Council's Construction team. Condition audit data collected on the assets are used as the basis of prioritising the works.

Recent renewal expenditure levels are summarised in Table 22 below.

Table 22 Road renewal expenditure – 2013/14 to 2017/18

Year	Budget ($'000)	Expenditure ($'000)
2013-14	4,500	4,139
2014-15	7,461	6,524
2015-16	7,973	5,549
2016-17	9,420	7,393
2017-18	9,519	8,452

Source: All expenditure data has been obtained from Council Financial Reports and verified by Finance

6.3 Asset Lifecycle Management and Prioritisation

6.3.1 New/Upgrades

Asset Option Analysis

Council creates new roads when a gap in the network has been identified, which can be triggered through community requests.

All locations identified as requiring a new road are entered into a list. The roads in this list are then assessed against ranking criteria so that they can be included in the Capital Works Program. The ranking criteria gives Council the ability to prioritise roads so that those offering the greatest benefit are constructed as a priority. The current ranking criteria is shown below in Table 23.

While the criteria below does facilitate ranking upgrades for roads, Council does not have a formal works program for road upgrades.

This is largely due to a predominantly reactive process for identifying candidates for upgrade. Council should consider implementing a proactive program which aligns upgrades with road renewals, which is the most cost effective timing.

RECOMMENDATION – Develop a Process for Prioritising Road Upgrades

Use levels of service to identify road upgrades, in alignment with renewal works where possible.

Why? To ensure that Council's roads are fit for purpose and meet safety expectations in a cost effective way

How? Review ranking criteria for road upgrades to incorporate levels of service and road renewal timing. Produce a priority list with input from stakeholders.

Table 23 - Ranking Criteria for New Roads

Assessment Criteria for Road and Bridge Construction (4007)	Rating	Score
Governance		
Is the proposal a result of a:		
Road Safety Audit?	Yes	5
	No	0
Response to customer complaints regarding a public safety issue?	Yes	5
	No	0
Project listed in Council's Integrated Transport Plan, Rowville-Lysterfield Integrated Local Plan or other strategic document?	Yes	5
	No	0
Social / Community Engagement / Community Benefit		
Does feasibility analysis suggest significant benefits?		
Improved linkage to existing road network & accessibility.	Yes	2
	No	0
Improved public transport or bicycle access.	Yes	4
	No	0
Improved streetscape & environmental impacts minimised.	Yes	2
	No	0
Improved functionality of drainage network.	Yes	2
	No	0
Level of public support (for separate charge scheme).	>80%	10
	>60%,<80%	5
	<60%	0
OR		
Level of community interest (for Council funded roads).	High	10
	Medium	5
	Low	0
Environmental		
Does the project provide potential environmental benefits?	None	0
	Moderate	5
	High	10
What impacts will this project have on the environment?	None	10
	Medium	5
	High	0
Maximum Possible Score		**65**

Design

The design phase incorporates assessment and decision making to deliver design solutions for new roads, road upgrades, road asset renewals and asset alterations.

The design process for Council's new road assets involves two phases:

- Strategic/Preliminary/Concept Design
- Advanced/Detailed Design

Both phases are generally managed by the Program Coordinator responsible for the relevant capital works program.

Concept Design

The concept design phase for road projects tends to involve master planning and consultation with the community and affected stakeholders, depending on the size of the project.

Detailed Design

Detailed design of roads is undertaken either internally by the Project Delivery Team or by a Contractor, depending on the complexity of the project. In either case, road designs are based on Council's Standard Drawings for roads (Drawing Series 200, 220, 230, 240 and 300). These drawings are applicable for all roads created or upgraded within the municipality.

Council's standard drawings are currently administered by the Project Delivery team. The strategy behind these drawings is directed through a Standards Committee, which is made up of representatives from Sustainable Infrastructure, Community Infrastructure, Operations, Planning and City Futures.

Creation

The creation or upgrade of roads is typically delivered under the following capital works program:

- 4007 – Road and Bridge Construction

Implementation of Council's Asset Management Policy (2019) and Untied Funding Allocation Policy (2016) has meant that Council's capital works process includes project ranking and ensures lifecycle funds are allocated to enable sustainable future maintenance and renewal of created and upgraded assets.

Although roads are typically created under these two programs, in reality they may also be created as a component of other capital works programs.

Due to the numerous different programs through which road assets can be created, there are a number of assets which aren't captured in Council's asset management system until sometime after the asset is constructed. It is recommended that a review be undertaken on the asset handover process. This will ensure new and renewed assets are captured so that they can be included in asset management analysis.

RECOMMENDATION – Improve Asset Handover Process

Look to improve the current asset handover process.

Why? To ensure that asset works are promptly entered into the asset database so that they can be used for asset management purposes, and included in maintenance programs as required.

How? Review handover process and ensure information is quickly added to the Asset Register when works occur.

Contributed Assets

Road assets are also contributed by developers through subdivision works. When this occurs the road is designed by the developer (in accordance with Council standards) and approved by Council through the planning referral process. Before a permit is issued, relevant Council departments have the opportunity to review the design drawings and specifications.

Asset data is updated in Council's GIS and Lifecycle systems in accordance with this process.

6.3.2 Maintenance (including Inspections)

Council's Works Services team is responsible for the proactive inspection and maintenance of Council's road assets. The inspection and maintenance activities, and timeframes, have been developed using risk management principles defined in Council's Road Management Plan (2015).

Hazard Inspections

A summary of the frequency of routine hazard inspections for road assets is provided in Table 24. Inspections include looking at the road surface, road pavement, road furniture, kerb and channel, local area traffic management devices, roadside vegetation and signage. The scope of the inspections is limited to the identification of above intervention level defects, and does not involve condition assessment or providing additional information for asset management purposes

Table 24 Routine hazard inspection frequencies for road assets

Road Hierarchy	Frequency
Link Road	6 month cycle
Collector Road	1 year cycle
Industrial Road	1 year cycle
Access Road	2 year cycle

RECOMMENDATION – Increase Scope of Hazard Inspections

Investigate the opportunity for hazard inspections to include collection and validation of data for asset management purposes.

Why? To add value to an existing process, improving confidence in road data by adding an additional inspection process in between regular audits.

How? Determine what data can feasibly be collected, and conduct a benefit-cost analysis.

Asset Preservation Inspections

Asset preservation inspections are conducted before and after a development is constructed. The inspections aim to ensure that Council assets are adequately protected during construction works and that any damage done to the asset due to the construction is repaired at a cost to the developer.

This process is managed by the Asset Preservation team.

Routine Maintenance

Routine maintenance refers to maintenance activities that are conducted on a periodic basis. These works are a proactive way of managing Council's assets. The routine maintenance activities that are currently undertaken on road assets are outlined in the Road Management Plan 2015. These include street sweeping and line marking replacement.

As stated Section 4.2.1, Routine Maintenance is not currently managed in LifeCycle making it difficult to analyse.

Reactive Maintenance

Reactive maintenance activities are generated either through Council's routine hazard inspections, ad-hoc inspections or through customer service requests. All reactive maintenance is managed in Council's Work Order System (Lifecycle). A full list of activities and response times is contained in the RMP (2015)

6.3.3 Renewal

Road asset renewals are funded under the Capital Renewal programs 1001 and 1002. The program is primarily administered and delivered by the Construction team, however Project Delivery undertakes any major renewals.

As discussed in Section 4.2.1, condition data is routinely collected on Council's road assets through scheduled audits which occur on a 4 year cycle. These audits focus on collecting asset attributes that will enable the development of a renewal works program.

Tables 25 and 26 below outline Council's current renewal ranking criteria for road surface and road pavement and kerb and channel. These ranking criteria utilise outputs from the SMEC Pavement Management System (PMS) as an indicator for determining the ranking scores.

Internal stakeholders have indicated that the priority list produced the current ranking criteria does not align with professional judgment, which suggests that a review is required.

RECOMMENDATION – Review Road Renewal Ranking Criteria

Review the existing evaluation criteria and develop a more efficient and accurate way of ranking road asset renewal works.

Why? Improve an existing process, increased confidence in road ranking output data, better asset management outcomes and reduced the need for verification.

How? Investigate different approaches using data obtained in the next road condition audit. Validate outputs, and reach a consensus on the best approach with internal stakeholders.

Table 25 Ranking criteria for road surface renewals

Road Surface Renewal Ranking Criteria	Score
1. SMEC Generated Road Surface Renewal Program	
Road segment listed on the SMEC Pavement Management System surface renewal program:	
Year 1	30
Year 2	25
Year 3	20
Year 4	15
Year 5	10
Not listed	0
2. Road Surface Condition Rating	
Condition rating 1 – Very Good	0
Condition rating 2 – Good	5
Condition rating 3 – Fair	15
Condition rating 4 – Poor	20
Condition rating 5 – Very Poor	25
3. Road Pavement Condition Rating	
Condition rating 1 – Very Good	15
Condition rating 2 – Good	12
Condition rating 3 – Fair	8
Condition rating 4 – Poor	4
Condition rating 5 – Very Poor	0
4. Kerb and Channel Condition Rating	
Condition rating 1 – Very Good	15
Condition rating 2 – Good	12
Condition rating 3 – Fair	8
Condition rating 4 – Poor	4
Condition rating 5 – Very Poor	0
5. Hierarchy Classification	
Link Road	10
Collector Road	8
Industrial Road	6
Access Road	4
Unsealed Road	0
6. Can works be integrated with other Capital Works programs?	
Yes	5
No	0
Total possible score	**100**

Please note that the Road Surface Renewal Ranking Criteria will be reviewed during the 2018/19 Road condition audit.

Table 26 Ranking Criteria for Road Pavement and Kerb & Channel Renewals

Road Pavement and Kerb & Channel Renewal Ranking Criteria	Score
1. SMEC Generated Road Pavement Renewal Program	
Road segment listed on the SMEC Pavement Management System pavement renewal program:	
Year 1	30
Year 2	25
Year 3	20
Year 4	15
Year 5	10
Not listed	0
2. Road Pavement Condition Rating	
Condition rating 1 – Very Good	0
Condition rating 2 – Good	5
Condition rating 3 – Fair	15
Condition rating 4 – Poor	20
Condition rating 5 – Very Poor	25
3. Road Surface Condition Rating	
Condition rating 1 – Very Good	0
Condition rating 2 – Good	4
Condition rating 3 – Fair	8
Condition rating 4 – Poor	12
Condition rating 5 – Very Poor	15
4. Kerb and Channel Condition Rating	
Condition rating 1 – Very Good	0
Condition rating 2 – Good	4
Condition rating 3 – Fair	8
Condition rating 4 – Poor	12
Condition rating 5 – Very Poor	15
5. Hierarchy Classification	
Link Road	10
Collector Road	8
Industrial Road	6
Access Road	4
Unsealed Road	0
6. Can works be integrated with other Capital Works programs?	
Yes	5
No	0
Total possible score	**100**

Please note that the Road Pavement & Kerb and Channel Criteria will be reviewed during the 2018/19 Road condition audit.

6.3.4 Disposal

Financial sustainability requires a balance between the maintenance, renewal and disposal of existing assets and the delivery of new and upgraded assets. The purpose of asset disposal is therefore to ensure that Council resources are not spent on maintaining and renewing assets that are no longer required. Effective asset disposal enables Council to use its limited resources for maximum community benefit. The principles relating to disposal are outlined in Council's Asset Management Policy (2019).

In practice, disposal of road assets rarely occurs. Council does not currently have a formalised methodology in place for determining whether a road asset should be disposed of or not.

6.4 Asset Lifecycle Responsibilities

Table 27 below summarises the Council teams with involvement in stages of the road asset lifecycle.

Table 27 Road Asset Management Responsibilities

Asset Lifecycle Phase						
Planning	**Design**	**Construction**	**Operations and Maintenance**	**Renewal**	**Disposal**	**Monitoring**
Asset Strategy Traffic & Transport	Project Delivery	Project Delivery	Works Services Construction	Construction Project Delivery	Project Delivery Traffic and Transport	Asset Strategy Traffic & Transport

CHAPTER 7. Financial Sustainability

7.1 Introduction

In pursuit of good governance, Council must ensure roads are managed in a way that is financially sustainable and caters for community expectations and demand. Funding allocations at each stage of the lifecycle impact the standard to which Council assets perform. This chapter explores funding required to enable Council to deliver the levels of service outlined in this Plan.

7.2 Funding Sources

Council has access to a number of funding sources to support the lifecycle management of road assets. Funding sources include:

- Rates
- Federal and State Government Grants
- Private and Public Partnerships
- Borrowings
- Earnings from Asset Disposals
- Development Contributions Plan.

Council's Asset Management Policy (2019) recommends that Council proactively seek grants and partnership opportunities to supplement investment in asset provision.

7.3 Financial Forecasts

7.3.1 New/Upgrade

Council does not have a regular program for the delivery of new or upgraded roads, as noted in Section 6.2.1. Future expenditure can only be estimated based on historical spending, which averages to approximately $700,000 per year.

Actual expenditure varies widely, since decisions regarding new and upgraded roads are primarily reactive. It is envisaged that implementation of the proactive program recommended in Section 6.3.1 will provide clarity on future spending requirements.

7.3.2 Maintenance

Maintenance expenditure within Council has remained stable over recent years, as indicated in Section 6.3.2. Given the slow growth of Council's road asset network, maintenance costs will not change significantly unless road defect intervention levels are reviewed.

Future maintenance requirements are consequently taken as $2.05M per year (based on the average of the past five financial years).

It should be noted that defects occur more frequently on poor quality roads, meaning that changes to condition levels of service can also impact maintenance requirements.

7.3.3 Renewal

A financial model has been used to determine what funding is required to deliver the quality service levels outlined in Section 3.6.

Although forecasting is undertaken after every condition audit to inform the LTFF (most recently in 2015), actual funding road renewal funding has not matched predictions over the past few years. A review has involved changes to some modelling assumptions, which can have an impact on funding predictions. These factors are significant enough to require re-assessment of Council's service provision.

The forecasting contained in this chapter involves network level analysis based on condition data from 2015. The model calculates what renewal expenditure is required to retain a desired minimum asset condition in line with specified levels of service, based on the present condition distribution. Since the last road audit was undertaken in 2015, the condition distribution used for modelling was estimated based on renewals undertaken between 2015 and 2018.

Council was unable to use its Pavement Management System (SMEC) in this RAMP due to an on-going detailed review of the database. The SMEC review will be completed prior to delivery of the 2019 road condition audit. Improved implementation of the SMEC modelling system will significantly improve road renewal prioritization, as noted in Section 6.3.3.

RECOMMENDATION – Increase Use of Pavement Management Systems

Pavement Management Systems to be used for future renewal prioritisation and financial modelling.

Why? To enhance financial forecasting accuracy and understanding of Council's road network service levels.

How? Bring the SMEC database up to date, and calibrate to produce reliable financial forecasts.

The assumptions used in this Chapter for unit costs and expected useful lives are outlined below in Table 28.

Table 28 Lifecycle Cost – Unit rates and Service Life

Asset Component	Renewal Unit Rate	Useful Life (years)
Road Surface (asphalt)	$26 per m^2	30
Road Pavement	$70 per m^2	90-185 (based on road hierarchy)
Kerb and Channel	$130 per m	70

Road Surface

As noted in Section 3.6.4, the three level of service scenarios to be evaluated for road are:

1. **'Good':** All roads surfaces in at least Condition 2 by 2021-22
2. **'Good/Fair':** Collector and Link road surfaces in at least Condition 2 by 2021-22, other road surfaces in at least Condition 3
3. **'Fair':** All road surfaces in at least Condition 3

The results for road surfaces are shown below in Figure 20.

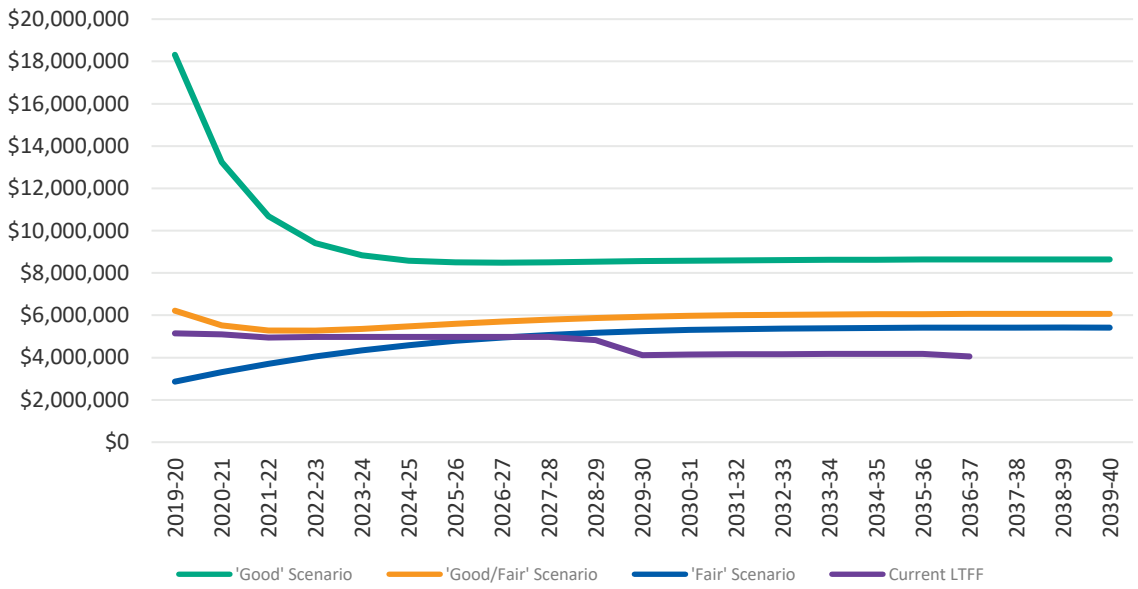


Figure 20 Road Surface Renewal Forecasts

Based on the above graph:

- The **'Good'** scenario, which is the service level aspiration set by the RAMP 2007, appears unachievable without a significant increase in renewal funding, with a long-term average required funding of $8.6M each year
- The **'Good/Fair'** scenario most closely matches current expenditure levels, with a long-term average required funding of $6M each year
- The **'Fair'** scenario demonstrates that a considerably lower level of service could reduce the LTFF by $1-2M annually over the next five years, with a long-term average required funding of $5.4M each year

Analysis has been undertaken to determine why a large jump in funding would be needed for Council to meet the previously targeted 'Good' scenario.

One key factor has been a decision to reduce road surface budget allocations. Although modelling undertaken in 2015 was based on the 'Good' scenario target, actual budgets were reduced based on feedback from Construction Group that over-servicing was occurring.

Table 29 Road Surface Renewal Budget Allocation

Financial Year	Predicted Budget Requirement (2015)	Actual Budget Allocation	Funding Gap
2016-17	$6,973,306	$4,390,000	-$2,583,306
2017-18	$7,008,942	$5,000,000	-$2,008,942
2018-19	$7,083,821	$5,300,000	-$1,783,821
2019-20	$7,194,590	$5,400,000	-$1,794,590

In addition, Council has adjusted some of its assumptions regarding road surfaces as part of the modelling review process. The amount of time a road surface spends in 'Good' condition was

reduced to match the frameworks provided by Council's Strategic Asset Management Plan (2014) and the Institute of Public Works Engineers Australasia (IPWEA) Practice Note 9 - Road Pavements (2015). Road surfaces are now predicted to reach 'Fair' condition more rapidly, greatly increasing the expenditure required to maintain a 'Good' level of service.

Road Pavement and Kerb and Channel

A 'Fair' level of service renewal forecast for pavement and kerb and channel is shown below in Figure 21.

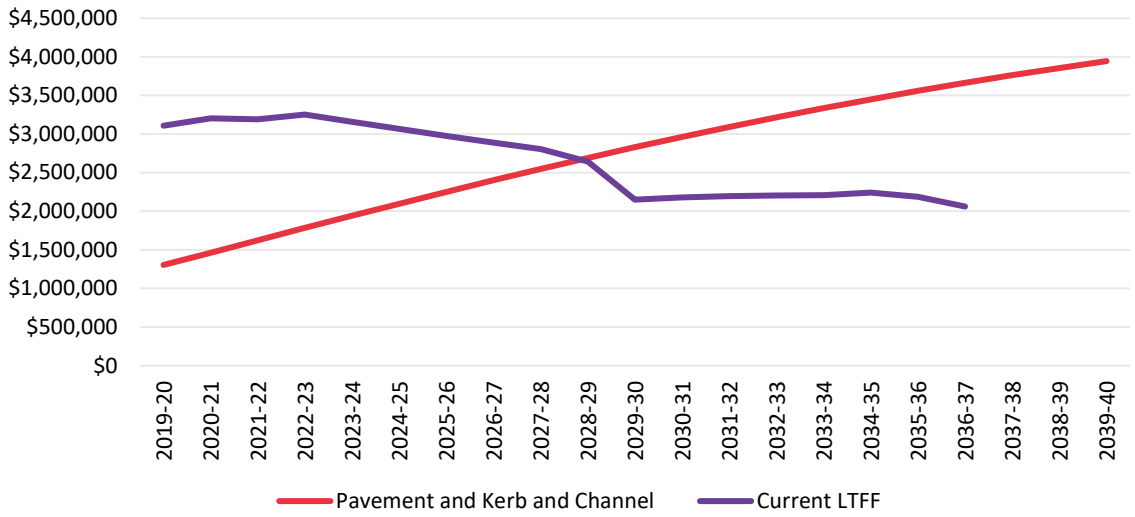


Figure 21 Road Pavement and Kerb & Channel Renewal Forecast

The required renewal expenditure for pavement and kerb and channel is projected to increase in a linear fashion over the next 20 years. The discrepancy against Council's current LTFF is primarily the result of adjustments made due to a perceived under-spend.

Table 30 below tabulates predicted renewal requirements against actual budget allocations. When compared against Table 29 above, it is evident that funds have been balanced between the two programs. It should be noted that the Pavement and Kerb and Channel program incorporates surface renewal where it relates to road reconstructions. The actual difference between forecast and allocated renewal funding is consequently somewhat smaller.

Table 30 Road Pavement and Kerb and Channel Renewal Budget Allocation

Financial Year	Predicted Budget Requirement (2015)	Actual Budget Allocation	Funding Gap
2016-17	$1,800,543	$5,030,830	$3,230,287
2017-18	$1,056,444	$3,000,000	$1,943,556
2018-19	$1,203,437	$3,000,000	$1,762,705
2019-20	$1,430,747	$3,200,000	$1,769,253

Further work is required to achieve an alignment between modelling outputs and professional judgment for these assets. A review of Council's road pavement useful lives was suggested in Section 4.2.1, which could have a major impact on forecasted expenditure requirements.

The 2019 road condition audit will assess kerb and channel through the methodology described in IPWEA Practice Note 2 – Kerb & Channel (2014). A higher proportion of assets are expected to be considered 'Fair' or 'Poor' under the new criteria, which will increase predicted funding requirements.

7.4 Recommended Forecast

A comparison of the advantages and disadvantages for each road surface scenario are shown below in Table 31.

Table 31 Comparison of Funding Scenarios

Scenario	Advantages	Disadvantages
'Good'	• High level of service for all roads • Level of service ambition previously endorsed in RAMP 2007	• Does not account for differences in road use • Road surfaces are replaced when they are still generally functional • Leads to perceptions of over-servicing • Large 'back-log' of surfaces to be replaced • Approx. $3.5M extra annual expenditure required relative to status quo, which would be taken from other renewal programs • Requires increased operational resourcing
'Good/Fair'	• Accounts for differences in road use • Advanced asset management approach • Closely matches current LTFF in near-term • High profile roads are kept in 'Good' condition	• More maintenance required on local roads • Slight reduction in service level
'Fair'	• Approx. $1M saved annually compared to status quo over next five years • Meets typical levels of service (IPWEA Practice Note 9, pg. 18)	• Leads to reduced amenity on all Council roads • More maintenance required on all roads, including high profile roads • Moderate reduction in service level

Low vehicle speeds and traffic levels mean a 'Good' surface has marginal benefit over a 'Fair' one on local roads. 'Fair' condition roads are still serviceable but may require some maintenance. From an engineering perspective, local road surfaces should be targeted for renewal before surface defects allow water to cause subsurface deterioration, which can incur costly rehabilitation works. Assuming proper maintenance such as crack sealing, this generally occurs when the surface reaches 'Poor' condition.

The ‘Good/Fair’ scenario is therefore recommended to inform future road renewal budget allocations as it strikes a reasonable balance between service level and expenditure.

Figure 22 below depicts the combined recommended renewal expenditure for road surface, pavement, and kerb and channel alongside Council’s 2018-19 LTFF.

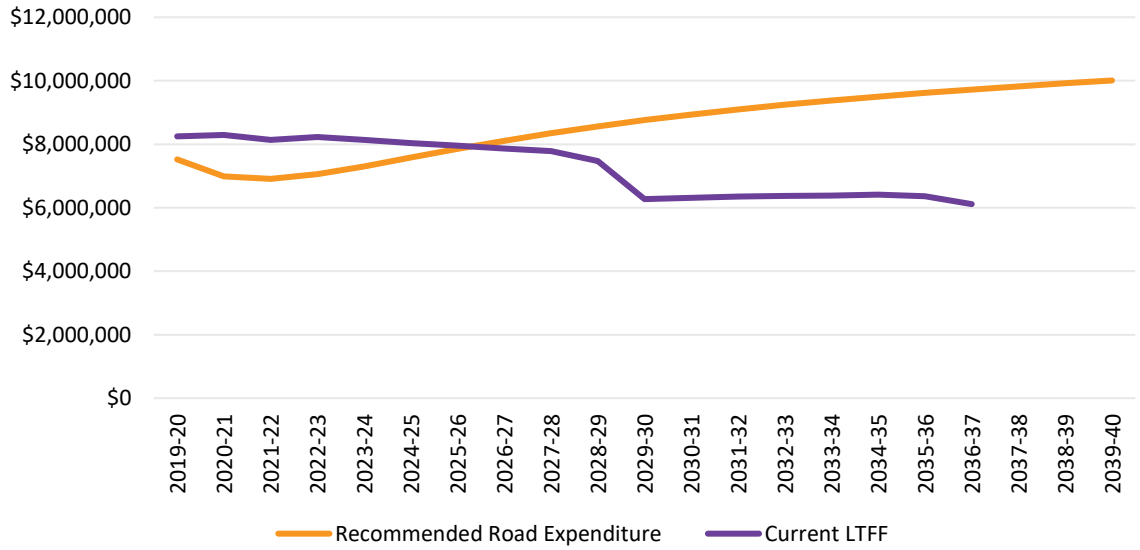


Figure 22 Recommended Road Renewal Expenditure

The LTFF for renewal expenditure is reviewed annually, taking into account recent condition audit results and funding requirements from other asset classes. Council is currently working on improving its modelling methodologies, in addition to obtaining new road condition data in 2019-20. Updated renewal forecast scenarios will be presented to Council for deliberation following completion of these projects.

Table 32 below provides a summary of projected road asset expenditure over the next five financial years.

Table 32 Estimated and Recommended Funding Levels

	PROPOSED FUNDING (2019 $'000s)				
	2019/20	**2020/21**	**2021/22**	**2022/23**	**2023/24**
Capital Works – New/Upgrade					
Indicative Funding	700	700	700	700	700
Current LTFF	—	—	—	—	—
Funding Shortfall	—	—	—	—	—
Capital Works – Renewals (Road Surface, Pavement and Kerb and Channel Only)					
Recommended Funding	7,522	6,984	6,910	7,058	7,303
Current LTFF	8,252	8,293	8,133	8,228	8,133
Funding Shortfall	**730**	**1,309**	**1,223**	**1,170**	**830**
Operating Budget – Maintenance					
Estimated Funding	2,050	2,050	2,050	2,050	2,050
Current LTFF	2,117	2,065	2,104	2,142	2,182
Funding Shortfall	**67**	**15**	**54**	**92**	**132**

A sustained commitment to the provision of adequate funding and resources to the entire asset lifecycle is required to achieve desired service levels.

Funding decisions should be based on information that justifies initial expenditure and demonstrates the longer term benefits and costs. Continuous assessment and improvement of Council's asset management practices is required to ensure that assets deliver the agreed level of service in the most cost effective manner.

CHAPTER 8. Improvement Program

8.1 Introduction

This chapter collates the recommendations provided throughout this RAMP into an implementation program.

The implementation program is intended to be resourced through existing operational budgets, and business planning processes.

While the majority of the implementation will be facilitated by the Asset Strategy team, and the Sustainable Infrastructure Department, it is expected that cross-organisational support and resourcing will be required to continue improving road asset management practices.

Progress towards achieving the recommendations from this RAMP are regularly reported to Council's audit committee.

8.2 Improvement Recommendations

Table 29 below summaries the improvement recommendations, highlighting:

- Recommended actions
- Key responsibilities
- Target Timeframes
- Estimated Costs (expressed in Equivalent Full Time (EFT) or $)

The team responsible for each of the improvement recommendations should incorporate the project into their annual business plans. The additional EFT costs in these improvements is not expected to require any new staff.

8.3 Implementation and Review

All internal stakeholders have a significant role to play in the delivery of sustainable asset management and the implementation of improvement recommendations.

The Asset Strategy team is responsible for the review and updating of this Plan.

Implementation of the improvement recommendations, set out in Table 30, should be monitored on an annual basis and used to inform business planning activities and budget priorities in subsequent years.

Review of this Plan should occur at five yearly intervals, with a focus on updating asset performance, service levels, financial forecasting, and the applicability of outstanding improvement projects. The model presented in Chapter 7 should be updated to reflect impacts of new works and improvements in Council's asset knowledge. Updates of the financial model should incorporate:

- Future condition audit results
- Changes to the improvement project priorities and expected costs

- Asset changes resulting from renewal works
- Asset changes resulting from capital upgrades
- New developments

Table 32 Improvement recommendations

Action ID	Recommended Action	Key responsibility	Support from	Action Year	Upfront Cost	Ongoing Cost (Annual)
RAMP 1	**Lifecycle Management of Additional Road Reserve Asset Types**	Asset Strategy	N/A	1-2	0.1EFT	0.1EFT
RAMP 2	**Verify Road Asset Years of Construction**	Construction Group	Asset Strategy	1-2	0.1EFT	N/A
RAMP 3	**Improve Consistency between Condition Audits**	Asset Strategy	N/A	4	N/A	N/A
RAMP 4	**Review Adopted Road Pavement Properties**	Asset Strategy	Construction Group Project Delivery	1-2	0.05 EFT	N/A
RAMP 5	**Review Traffic Count Process**	Traffic and Transport	Asset Strategy	2-3	0.1EFT	0.05 EFT, $5,000-$10,000
RAMP 6	**Develop a Process for Prioritising Road Upgrades**	Asset Strategy	Traffic and Transport	2-3	0.1EFT	N/A
RAMP 7	**Improve Asset Handover Process**	Asset Strategy	All Key Stakeholders	2-3	0.3 EFT	0.1 EFT
RAMP 8	**Increase Scope of Hazard Inspections**	Works Services	Asset Strategy	1-2	0.25 EFT	0.25 EFT
RAMP 9	**Review Road Renewal Ranking Criteria**	Asset Strategy	Construction Group/Project Delivery	1	0.1 EFT	N/A
RAMP 10	**Increase Use of Pavement Management Systems**	Asset Strategy	Construction Group/Project Delivery	1-2	0.1 EFT	0.05 EFT