

Roads

Service Driven Asset Management Plan 2015

Road Asset Management Plan

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Executive Summary

Bayside City Council owns, operates and maintains the road and footpath network that provides transport services to the community with a replacement value of \$418.6M¹. Council's current annual expenditure on this asset class is \$9.8 million, representing 17% of Council's total budget².

Road assets are vital to the mobility of the community allowing for the safe, efficient and sustainable movement of vehicular, bicycle and pedestrian traffic within and across Bayside.

Purpose of the Road Service-Driven Asset Management Plan

The purpose of the Road Service Driven Asset Management Plan (R-AMP) is to document a robust business case for continued investment into asset-based road services to the Bayside community. In this sense this document is a *Service-Driven* Asset Management Plan. This document demonstrates a commitment to *liveability* (creating a great place to be) through *delivery of excellent services*, which are key result areas of the Bayside Better Place Approach and with the *Planning Infrastructure and Transport* outcome of the Bayside Community Plan. Furthermore, the R-AMP demonstrates the commitment to Goal 7 of the 2013-17 Council Plan of a *financially responsible Council with good governance*.

This document is used to inform decision making about Council's existing road infrastructure assets through a focus on improved asset data, the testing and validation of asset management assumptions and the prediction of long term financial renewal requirements. The R-AMP includes the drivers for upgrading the capacity of existing assets and the construction of new parts of the network to improve the levels of service provided by road infrastructure in the future. As a demonstration of Council's long term financial sustainability, the 10-year financial requirements for the operation and maintenance, renewal and upgrading of Bayside's existing road infrastructure in addition to the construction of new assets are presented in this document.

Asset Description

The assets covered in this R-AMP include:

- 360 km local roads
- 721 km footpaths
- 683 km kerb & channel
- 15 km laneways
- 5 bridges
- 350 traffic management items (e.g. roundabouts & speed humps)
- 18,139 signs
- 134 car parks

The majority of Bayside's road pavements were constructed between 1920 and 1940 and have long useful service lives (over 200 years for the road pavement). The overall road infrastructure asset stock is considered to be in good condition.

Operations and Maintenance

The current annual cost of Council's road asset maintenance program is \$3,186,502 and is expected to increase to \$4,157,662 in 2025/26 due to annual cost escalation and the additional maintenance requirements of new assets created over this period.

Renewal Financial Demand Forecast for Current Service Level

Renewal financial forecasting using the Moloney Model, which is based on the age and condition of the asset stock, predicts a 2015/16 renewal demand for road assets of \$3,222,284, rising annually to \$3,266,521 in 2024/25 and equating to an average annual renewal cost of \$3.1million over 10 years. Council is committed to meeting the

¹ Brownfield replacement cost - refer to the totals of column C in DOC/14/104795 (for Bayside assets only - excludes VicRoads), increased by 16% to cover the costs of construction in a developed and densely populated municipality (i.e. referred to as brownfield rates, as opposed to greenfield rates which are utilised in asset valuation)

² 2105/16 Budget - Page 65 a percentage of Total Budget of \$115,793 total income in DOC/15/97456

renewal demand by annually updating the Long Term Financial Plan with current renewal forecasts. Bayside does not currently have a renewal gap or backlog of renewal works to address.

Drivers for Improved Levels of Service

The road asset upgrade strategies guide investment into improving the level of service provide by these assets. Several drivers for improved service include:

- Upgrading streetscapes of shopping precincts and villages through a long term program of Activity Centre Streetscape Upgrades.
- New and Upgraded Shared Paths for pedestrians and cyclists to provide safe and convenient alternatives to vehicle use for short trips (implementing Integrated Transportation, Bicycle and Pedestrian Strategies).
- Implementing Bay Trail Safety Audit improvements, particularly intersection improvements.
- Implementing Traffic Management Works

Improvement Plan

This R-AMP includes an improvement plan with actions to address limitations in the scope of this Plan and drive improvements in asset management processes to ensure future versions of this document continue to support Council's commitment to the provision of affordable long term infrastructure-based services that meet the needs of the Bayside community. Such actions include:

- Consolidation of asset register to incorporate all road asset data including traffic management / road reserve assets, car park and laneways.
- Integration of asset systems (Authority (AIMS), CVR, SMEC and GIS).
- Refine asset life forecasts and degradation curves
- Update asset inventory and condition data specifically laneway inventory and condition and bridge condition data.

DO you think Council is showing good goveranance with the ongoing maintaenance and renewal of road and footpath assets across the municipality?

Thinking of road infrastructure and associate assets (footpaths and carparks) can you identify a carpark asset that you feel Council has overlooked for renewal?

Do you have any comments about this Asset Management Plan? And how Council is currently managing its Road Assets?

1.0 Introduction

1.1 Scope and Purpose

The purpose of the Road Asset Management Plan (R-AMP) is to document a robust business case for the continued investment into asset based road services to the Bayside community. In this sense, this document is a *Service-Driven Asset Management Plan*.

This document is used to inform decision making about Council's existing long-life road infrastructure through a focus on improved asset data, the testing and validation of asset management assumptions and the prediction of long term financial renewal requirements. The R-AMP also includes the drivers for upgrading the performance and capacity of existing assets and the construction of new parts of the network to improve the levels of service provided by the road infrastructure in the future. As a demonstration of Council's long term financial sustainability, the 10 year financial requirements for the operation and maintenance, renewal and upgrading of Bayside's existing road infrastructure in addition to the construction of new assets are presented in this document.

The infrastructure covered in this plan includes:

- Local Roads
- Footpaths
- Signage
- Kerb & Channel
- Laneways
- Bridges
- Car Parks
- Bike Paths / Shared Paths / Lanes
- Traffic Management Facilities
- Street furniture

Traffic management facilities include assets such as traffic lights, speed humps, roundabouts, kerb outstands and raised pavements.

Road Assets not covered in this document are private driveways within the road reserve which are not owned by Bayside City Council. These include bus shelters, street lights and street furniture. While not Council owned, these assets effect the overall operation of the road reserve and hence are relevant to this plan. Council does not own street lights but is responsible for ongoing maintenance and or future renewals. These assets are discussed in Appendix 2.

The R-AMP covers the proposed levels of service, future demand, routine maintenance, renewal/replacement, acquisition/creation and decommissioning of the Council's road infrastructure. It also outlines the financial requirements and the key assumptions made in the financial forecasts. It is also a means of outlining the key elements involved in managing the road network. It combines management, financial, engineering and technical practices to ensure that the level of service required by the beneficiaries of the service is provided at the lowest long-term cost to the community within the limits of any fiscal constraints that may be imposed by the Council.

The key purposes of the R-AMP include:

1. Identify the required asset management regime and forecast financial requirements for the current stock of road infrastructure for the next 10 years.
2. Identify the likely growth or change in asset based road services identified by strategic service planning or asset upgrade strategies and predict the financial impact on capital works and operations / maintenance budgets of these changes over the next 10 years.
3. Identify improvement actions required to address limitations in the scope of this R-AMP and drive improvements in the asset management processes.

This R-AMP revision is based on the best available information and represents the second generation of documenting Council's sustainable management of asset based road service provision to the Bayside community.

1.2 Assumptions

In developing this R-AMP, several assumptions have been made, including:

- Asset registers are accurate and complete
- Useful lives and predictive modelling inputs (e.g. Moloney Model) are correct, however as further data and condition for assets is collected and will be revised to best represent the road network
- Current levels of service reflect the community needs
- No known legislative changes or other influences that will impact on, or demand a change in level of service and associated funding throughout the period of the plan
- Current replacement costs (CRC) for all road assets are correct and all forecasts and assumptions are based on the figures provided within the Road Revaluation Report 2014³. The actual project cost of all works associated with the renewal or replacement in Brownfield is expected to be much higher when road, kerb, trees, traffic management, access, easement fences and structures etc. are also taken into consideration
- Operation and maintenance budgets in the Long Term Financial Plan (10 year) already allow for price escalation in subsequent years

1.3 Glossary and Abbreviations

CRC	Current Replacement Cost
T-AMP	Road Asset Management Plan
LCC	Lifecycle Cost
UL	Useful Life
WDV	Written Down Value

1.3 Key Stakeholders

Assets controlled by Council are used by a broad cross section of the community. It is therefore critical that assets are maintained based on need and are fit for purpose. The best person to judge whether an asset is fit for purpose is likely to be the user of the asset. Hence asset users are key stakeholders to this R-AMP.

Stakeholders identified in this plan are the stakeholders who may be consulted when Council seeks input in relation to determination of Levels of Service and intervention levels.

³ DOC/15/85588

Table 1: Key Stakeholders

Internal Stakeholders	
Stakeholder Group	Role or Involvement
Council	Custodian of the asset, with Councillors representing the residents and setting strategic direction as per the Council and Operational Plans.
Executive Team	To ensure that Asset Management policy and strategy is being implemented as adopted, and to ensure that long-term financial needs to sustain the assets for the services they deliver are advised to council for its strategic and financial planning processes.
Manager Infrastructure Assets	As the designated Strategic Custodian of Council's road assets, responsible for the overall strategic management of the assets including asset systems management, condition monitoring, renewal planning, design standards and the development, monitoring and updating of this plan; new and upgrade capital works programs.
Manager City Works	To ensure provision of the required/agreed level of maintenance services and renewal for asset components and delivery of upgrade and new capital works.
Service-driven Asset Management COG	To ensure AM planning meets requirements that optimise useful asset life and service provision.
Manager Finance	To ensure that adequate financial information is provided to Council and to the relevant asset managers to facilitate sound management of the assets
Manager Information Services	To ensure that the relevant IT systems are functioning and that any data within the systems is secure and its integrity is not compromised.
Manager Commercial Services	To ensure that risk management practices are conducted as per Council policy and assist operations managers with advice on risk issues.
Internal auditors	To ensure that appropriate policy practices are carried out and to advise and assist on improvements
External Stakeholders	
Stakeholder Group	Role or Involvement
Community	General users/beneficiaries of the service provided by the road assets, including motorists, cyclists and pedestrians. It includes tourists and visitors to the area.
Maintenance contractors (external)	To ensure provision of the required/agreed level of maintenance services for assets;
Utility Service Providers	Agencies that provide utility services such as electricity, gas, water, sewerage, telecommunications, necessary to facilitate road services.
State and Federal Government Departments	Periodic provision of advice, instruction and support funding to assist with management of the drainage network.
Council's Insurer.	Insurance and risk management issues.

1.4 Legislation

The legislation relevant to the provision of asset based road services are listed in Table 2 below.

Table 2: Legislative Requirements

Legislation	Requirement
Local Government Act 1989	Sets out role, purpose, responsibilities and powers of local governments including the preparation of a long term financial plan supported by asset management plans for sustainable service delivery. Requires that AMP's be prepared to provide basis for long Term financial Plan.
Road Management Act 2004	Purpose is to establish a coordinated management system for public roads that will promote safe and efficient State and local public road networks and the responsible use of road reserves for other legitimate purposes, such as the provision of utility services. Defines the responsible authorities for all roads within the state. It makes Council the controlling authority for Public Local Roads, Boundary Roads and parts of Declared Roads within the municipal area and it is therefore responsible for managing the infrastructure assets within them.
Road Management Act Regulations and Codes of Practice	Sets out structure for Road Management Plan for maintenance phase of whole of life planning. Sets out rules and regulations for the implementation of the Road Management Act
Transport Act 1983	Sets up structure for the provision and regulation of public and commercial transport
Road Safety Act 1986 and Road Safety Regulations 2009	Safety requirements relating to the use and operation of the road network. Sets out regulations for implementing the Road Safety Act
Bayside Local Law No. 2 Streets and Roads	Has Council laws relating to use of road reserves it is responsible for.
Equal Opportunity Act 2010	Within Victoria the Act applies to Council's construction of new footpaths. The intent of this Act is to ensure that a person with a disability has a right to access and use public places in the same way that a person without a disability does. Places used by the public as defined within the Act include public footpaths. A person with a disability can make a complaint of discrimination if a place used by the public is not accessible to them

1.5 Related Reports / Documents

There are a number of strategies, plans and other documents which are relevant to the management of the road asset stock, which are summarised below:

Road Management Plan (2013)

The Road Management Plan (RMP) is the statutory plan under the Road Management Act (2004). The RMP clarifies which roads Bayside is responsible for and the appropriate levels of service to be delivered for those roads. It outlines Council's approach to road maintenance and management. The RMP details the following service levels in its Appendices:

- RMP Appendix 1 – Asset Defect Intervention Level
- RMP Appendix 2 – Asset Inspection Frequency

- RMP Appendix 3 – Road Condition Rating Frequency

As per RMP Appendix 3, the RMP specifies intervals for undertaking condition inspections on each of the road asset sub categories.

Register of Public Roads (2009)

A register has been prepared in accordance with the Road Management Act 2004 containing a list of roads and lanes that the Bayside Council considers are required for general public use and for which the Council is the responsible coordinating road authority. Although VicRoads is the responsible coordinating body for declared main roads and state highways, Bayside is responsible for some of the assets along these roads. Designated responsibilities for these assets are detailed in the VicRoads Guidelines “Road Management Act (2004) Code of Practice Operational Responsibility for Public Roads”.

1.6 Key Issues with Asset-Based Road Services

Issues with asset based road services are discussed in detail in Section 3. Several of the key issues are as follows:

Road Safety

Enhancing road safety is a key commitment for Council. This includes safety of all road users, cyclists and pedestrians. This commitment is enshrined in the Road Safety Strategy adopted in 2014⁴.

Traffic Congestion and Parking

With a projected increase in population and decrease in household size Bayside will continue to experience pressure on car parking facilities and general traffic congestion. Council is committed to increasing options for residents to use sustainable transport to travel to, from around the municipality, but it is not expected that this will alleviate car parking issues in the short to medium term. There will be a need at some future stage for provision of additional car parking, more specifically multi-storied car parking facilities. The objectives and strategies for Car Park assets are set out in the Bayside Planning Scheme and other Council initiatives to manage car parking associated with new development. These are also summarised in Appendix 5.

Increased Pedestrian and Bicycle use

One strategy for alleviating vehicle congestion on roads, and also for contributing to environmental sustainability, is to seek opportunities to encourage the use of non-car transportation modes such as walking and cycling. The drivers for an integrated transportation network, including a greater focus on alternative transportation modes (cycling, walking) are growing. These drivers are environmental, economic and social. As Bayside has an aging population, the need for a well maintained and interconnected footpath network and punctual public transport links has increased.

Activity Centre Streetscape Upgrades

In recent years, Council has been investing in a program of upgrades to the quality of Bayside’s shopping precincts and village streetscapes. These projects are the result of considerable community engagement and a design process to ensure a quality, vital and energised public place is delivered. Managing the expectations and myriad of requirements of the community within the context of Councils budgetary and regulatory framework is an ongoing challenge.

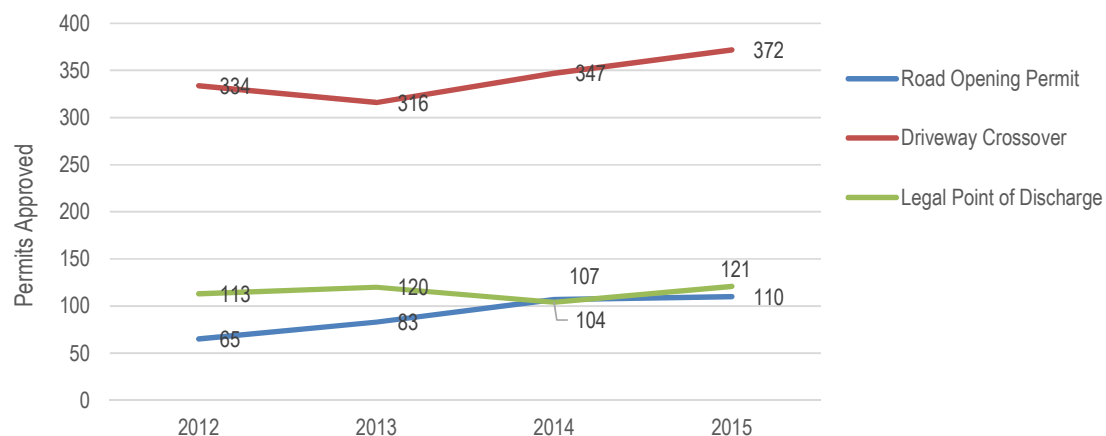
Developer / Utilities Impact to Road Condition

Due to the geographic conditions across the municipality and the Council’s maintenance practices, the road network in Bayside is in good condition and has a long useful life compared the industry standard. Bayside is experiencing increasing levels of development, which has the potential to negatively impact the otherwise stable

⁴ DOC/14/115198

road network. Any excavation of the road pavement, whether by private developer or utility company requires a Council permit. There is a 12 month defects liability period for the ensuing restoration works. After that period Council assumes responsibility. The number of road opening permits issued is significant and a growing issue for Council to monitor (refer to Figure 1).

Figure 1. Road Opening Permits 2012 – 2015⁵



Nature Strip Planting by adjacent residents is also growing in popularity. Council's Nature Strip Planting Policy 2014⁶ aims to address issues of permissible construction works, planting and maintenance.

Retaining Walls

There are a number of retaining walls within road reserves in Bayside City Council, primarily in the Beaumaris area. Council does not currently hold an inventory of these assets, but manages them on a case by case basis. The need for a more formalised approach to the management of these Road Assets has been identified. It is recommended that Council's approach to retaining wall management be investigated and retaining wall management be formalised.

⁵Data Extract from Authority 19/02/16

⁶ C/POL/CST/038

2.0 Asset Function & Levels of Service

2.1 Functional Hierarchy

At Bayside City Council, the Road Pavement Assets and Footpath Assets are classified under a hierarchical structure. Road hierarchies are one of the parameters used to determine the relative priorities of various projects for renewal and upgrade in future capital works programs. Hierarchy takes into account function, types of users and user numbers.

The road pavement asset hierarchy is based on traffic volumes and ranges from roads with high traffic flow and volumes, to roads with a low traffic volume and local access function. Bridges and kerb & channel assume the same hierarchy as the roads upon which they are located as they share the same traffic.

All other assets such as street lights are not classified by a hierarchy, but are all classed at the one level (refer to Table 3).

Table 3: Road Hierarchy Categories

Road Category	Function & Responsibility
Arterial (Maximum traffic 35,000 vpd)	<ul style="list-style-type: none">• Arterial roads are the principal routes for the movement of goods and people. They are designed to take into consideration abutting land uses.• VicRoads is responsible for the management and funding of the VicRoads controlled arterial roads. Council is responsible for service roads and footpaths on VicRoads controlled arterial roads as they are considered to be for the use of local residents. Council can apply for road safety funding under various VicRoads funding categories, e.g. bike, if the funding criteria are met. It can advocate for road improvement works to VicRoads and the State Government.
Secondary Arterial (Maximum traffic 14,000 vpd)	<ul style="list-style-type: none">• Secondary Arterial roads primarily provide a linkage between significant residential, industrial and commercial nodes and/or the declared road network. These roads have an identifiable origin and destination. (e.g. suburbs, industrial areas or places of significance)• Council is responsible for the management and funding of Secondary Arterial roads.
Limited Arterial (Maximum traffic 11,000 vpd)	<ul style="list-style-type: none">• Limited Arterial Roads supplement the Arterial roads, but their traffic volumes have largely stabilised and may fall due to attractiveness of alternate routes,• Council is responsible for service roads and footpaths on VicRoads controlled arterial roads as they are considered to be for use by local residents.
Collector Road or Street (Maximum traffic 9,000 vpd)	<ul style="list-style-type: none">• Collector roads collect traffic from local streets and distribute it to arterial roads. They provide access to abutting properties.• Council is responsible for the management and funding of Collector Roads.
Local Street (Maximum traffic 7,000 vpd)	<ul style="list-style-type: none">• A road, Street or Court that that primarily provides direct access for abutting residential, industrial and commercial properties to their associated nodes.• Council is responsible for the management and funding of access places
Lane	<ul style="list-style-type: none">• Access lanes provide access to the side or rear of property.

(Maximum traffic 300 vpd)	<ul style="list-style-type: none"> Council is responsible for the management and funding of access lanes when they are included in the Road Management Plan Road Register.
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Bayside's footpaths have been classified into two categories generally according to the level of use of the path (refer to Table 4).

Table 4: Footpath Hierarchy Categories

Footpath Category	Function & Responsibility
Major	<ul style="list-style-type: none"> Generally high traffic areas adjoining Bayside's shopping precincts, frontages to schools, preschools, maternal and child health centres, Council facilities and the foreshore shared path adjacent to Beach Road and The Esplanade. The major pathways are listed in the Road Management Plan.
Minor	<ul style="list-style-type: none"> Pathways in road reserves in all other areas not described above.

2.2 Levels of Service

Council has determined the standard to which it will design, construct, inspect, maintain and repair its road assets. In developing these levels of service, Council has considered community expectations, current service levels, the level of risk imposed and available resources. Key performance indicators for Technical Levels of Service and Community Levels of Service are shown in Appendix 1. As specified in Section 1.5, details of the adopted Levels of Service are provided in the Appendices of the Road Management Plan⁷:

The target levels of service aim to reflect industry standards and are based on stakeholder consultation, Council Plan goals and priorities, the Long Term Financial Plan (LTFP), the 4 year Capital Works Program and legislative requirements. Council has not conducted direct community consultation with respect to the road assets network. Feedback is received on the performance of the system by community satisfaction reports.

A key objective of asset management planning is to align the level of service with the communities' expectations. The relationship with the cost of the service is evaluated to determine the optimum level of service the community is prepared to pay for. Current levels of service for maintenance are assumed to be reflecting the balance between customer expectations and financial affordability.

2.2.1 Community Levels of Service

Community Levels of Service relate to the community's expectation and perception of the performance / quality of a service that is delivered by Council. It may include such things as function, style, performance, level of cleanliness, maintenance responsiveness, quality and type of consumables, safety and accessibility.

In assessing the value that a council owned asset provides the community, the following questions are considered relevant:

- Is the service delivery provided by the asset meeting Council's service objectives and the needs and expectations of the community?

⁷ Road Management Plan TRIM DOC/13/151778 (Appendix 1-4)

- Is the design of the asset appropriate, does it need upgrading?
- How does the performance of the asset compare to industry benchmarks?
- Is future capital renewal or upgrade of the asset justified?

Stakeholder expectations relating to roads may vary depending on the location, nature and use of the particular road. The adopted Levels of Service applicable to roads are documented in Council's Road Management Plan. These service levels have been the subject of community consultation process.

Community engagement is used to determine level for service expectations, such as in the development of Council's Community Plan. During the development of *Bayside 2020 Community Plan*, over 1,140 people participated in the community engagement process. Council is currently consulting with community stakeholders for the updated *Community Plan 2025*. Furthermore, each year stakeholders have the opportunity to comment on the draft Council Plan, and the draft Budget including allocation for capital works and maintenance.

Local Government Victoria co-ordinates an annual Local Government Community Satisfaction Survey for Victorian municipalities. The objective of the survey is to gauge the importance of council services as assessed by the general community, and the performance of individual councils across a range of service areas. Between 2013/14 and 2014/15, the community satisfaction within Bayside for local roads and footpaths improved from 63% to 65%⁸. Bayside City Council's rating on the key measure of Sealed Local Roads remained on par being significantly above the State-wide average, although two points lower than the Metropolitan average.

To determine the levels of service, a clear understanding of the community's needs, expectations and preferences is required. Ongoing consultation will be carried out with respect to levels of service detailed in the R-AMP, Road Management Plan and associated design and construction standards. The objectives of this consultation are to:

- Inform users of the level of service to be offered;
- Focus the Council on the delivery of the required levels of service;
- Measure the effectiveness of the R-AMP;
- Identify the costs and benefits of the services offered; and
- Enable the community to assess suitability, affordability and equity of services offered.

2.2.2 Technical Levels of Service

Technical levels of service include the parameters to assess the required technical aspects including function, design, applicable standards and any statutory requirements. The Technical Service Standards are aligned with:

- | | |
|-----------------------|-------------------------------|
| • Quality | • Aesthetics |
| • Quantity | • Reliability |
| • Safety | • Responsiveness |
| • Capacity | • Environmental acceptability |
| • Fitness for purpose | • Costs |

⁸ Community Satisfaction Survey 2015 Bayside City Council TRIM DOC/15/ 91073 Pages 9 & 21

Standards have been established for the design and construction of road infrastructure and are documented in the Bayside City Council *Standard Drawings*⁹ which can be accessed on Council's web site and the intranet. When appropriate, standards adopted by other relevant authorities such as Austroads and VicRoads are also utilised.

2.2.3 Maintenance Service Levels

Council provides maintenance of road assets through the Infrastructure Services Maintenance Contract¹⁰. The contract specifies levels of the service to be provided, including inspection frequencies, repair intervention levels and response times have been established. Specific service levels are set out for road asset sub categories including: roads, bridges and major culverts; laneways; kerb and channel; footpaths; car parks as well as signs and street furniture.

Routine maintenance Standards are documented in the Specification for the Infrastructure Services Maintenance Contract (see Section 4.6.1). The service objectives in the Specification of the maintenance contract include:

- (i) provide safe, effective and affordable assets within the municipality;
- (ii) prolong the life of Councils assets;
- (iii) develop an effective partnering relationship with the Contractor;
- (iv) minimise risk to public safety;
- (v) minimise Council exposure to public liability or service failure through the effective management of services and assets;
- (vi) ensure ratepayers and service users are satisfied with these aspects of Councils service delivery;
- (vii) maintain and enhance the aesthetic value of the municipality; and
- (viii) allowing for technological and other service improvement across the Contract Period.

The Infrastructure Services Maintenance Contract specifies performance criteria with respect to the servicing of maintenance requests, including response times for all asset categories under the contract. These response times are considered appropriate and aligned to community expectations.

It should be noted that in instances where requests related to periodic maintenance, future renewal or upgrade works, these may be delayed and prioritised for inclusion in annual works program or for consideration at budget time.

It is also stated in the maintenance contract that performance targets for compliance to the above response times for service requests is to be 90%.

It is envisaged that the levels of service will be reviewed regularly as more accurate data becomes available and customer expectations and resource allocations are reassessed.

2.3 Service Level Review

The objective of the service level review process is to gain a better understanding of the needs and expectations of existing and future service recipients over time. This will allow better definition of meaningful levels of service and performance measures.

The review process should be repeated on a 3 to 5 year cycle to ensure that knowledge of community needs and expectations remains current in the light of changing environmental, financial, political, social and technical factors.

⁹http://www.bayside.vic.gov.au/living_in_bayside/standard_drawings.htm

¹⁰DOC/12/56629

Addressing changing customer needs and expectations, as determined by the review, are part of the continuous R-AMP improvement cycle.

In 2014, Bayside Council developed a Strategic Service Review Framework¹¹ in the context of the following factors:

- Tightening funding environment,
- Commitment to business excellence and continuous improvement,
- Internal audit report¹² recommending development of strategy outlining service provision into the future,
- Best value provisions of the Local Government Act and,
- MAV Step program direction.

A framework for Council services reviews was developed together with the initial program reviews for 2014/15. The initial reviews were for Statutory Planning, Family and Children's Services, Fleet Management and Youth Services. A rolling program of reviews for subsequent years will be identified through the annual departmental planning process.

3.0 Future Demand

Future demand is a key consideration in asset management planning for Council's road assets. Predictions have been made for the future growth or decline in demand for road assets. Future demand can be predicted by taking into account trends in population size, age distribution, density and trends in tourism, leisure activities and changes in technology. Trends regarding active modes of travel (walking / cycling) and public transport usage rates are of particular significance. Our understanding of future demand will improve as more data is collected and analysed.

3.1 Population and Demographic Trends

Bayside's estimated resident population for 2014 was 99,947 persons, an increase of 1,652 persons (1.7%) from 2013. In 2011, Bayside had a high proportion of parents and homebuilders (35 to 49 years), older workers and pre-retirees (50 to 59 years) and empty nesters and retirees (60 to 69 years). Bayside is considered to be an 'older' community with an average age of 42 years in 2011, compared to 36 years across the Greater Melbourne area. Compared to Greater Melbourne, Bayside had lower proportions of adults in the 'young workforce' aged 25-34 years; and more frail aged persons aged 85 years and over. Bayside also had higher proportions of older workers and pre-retirees aged 50-59, empty nesters and retirees aged 60-69 and seniors aged 70 to 84 years.

Over the next decade, Bayside will experience higher levels of growth, particularly during the 2017 -2020 period. In 2016, the total population of the City of Bayside is forecast to be 103,110 persons. It is expected to increase by 9,858 persons to 112,968 by 2026, at an average annual growth rate of 0.9%.

Most of the growth in dwellings and population in Bayside will occur from large residential development sites including:

- Bay Road in Sandringham
- the former CSIRO site in Highett
- multiple sites around the Hampton railway station
- multiple sites in Brighton (Bay Street, Martin Street, Asling Street, New Street, Warleigh Grove)

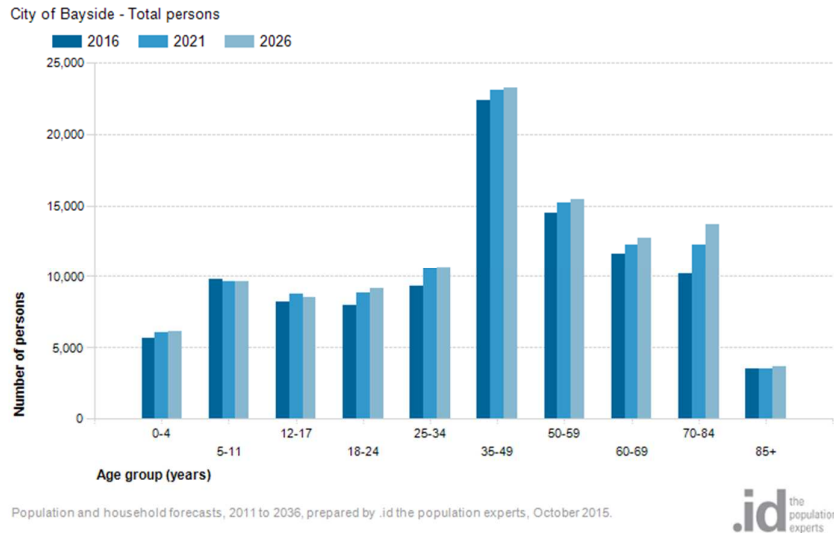
¹¹ Strategic Service Review Framework, 21 October 2014, FOL/13/33581

¹² Deloitte, Service Driven Asset Management, July 2012.

- the Jack Road site in Cheltenham.

In 2016, Bayside will still have high proportions of residents aged 35 to 49 years, mature adults aged 50 to 59 years and empty nesters and retirees aged in their sixties (refer to figure 3a).

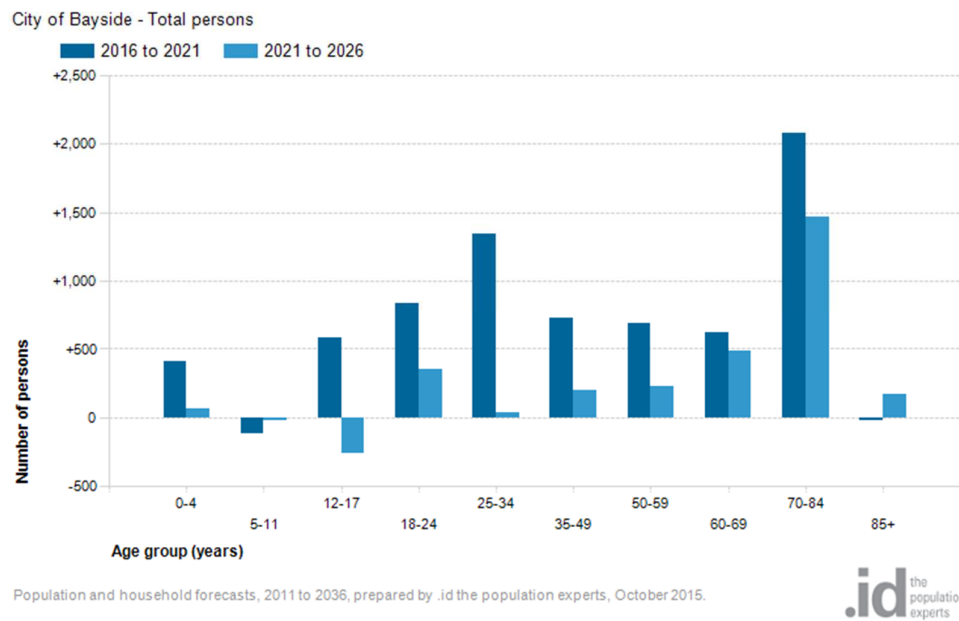
Figure 3a: Forecast Population by Service age groups, City of Bayside, 2016 to 2026



Source: id consulting, *City of Bayside Population Forecasts*, 2015

The most significant demographic change over the 2016 to 2026 period is going to be the growth in the population of seniors aged 70-84 years (refer to Figure 3b). The population of seniors will increase by nearly 3,500 in ten years, a growth of 35%.

Figure 3b: Change in Service age population, City of Bayside, 2016 to 2026



Source: id consulting, *City of Bayside Population Forecasts*, 2015

The ageing population of Bayside will put pressure on the provision of community and recreational services and facilities commensurate with that age group. The University of Western Sydney Urban Research Centre prepared

a report in March 2011 titled *Local Government and Ageing* using information provided by twenty councils across New South Wales. The report concludes that “ageing of the population impacts on almost all aspects of local government. The largest financial impact appeared to be in the area of providing appropriate infrastructure.”¹³

3.2 Impact of demographic trends

3.2.1 Principal Public Transport Network

The ageing population in Bayside is likely to put pressure on provision of public transport alternatives to private vehicle trips rather than requiring significant upgrading of the road network.

The State Government planning guidelines Melbourne 2030 and the Victorian Transport Plan recommend upgrading and developing the Principal Public Transport Network (PPTN) to connect activity centres.

The following roads in Bayside are on the PPTN:

- Rusden Street – existing bus route
- New Street (to South Road) – predominantly existing bus route (top section from Rusden is a proposed bus route)
- Bay Street (from New Street to Asling Street) – existing bus route
- Durrant Street, Brighton – existing bus route
- Hampton Street (between Cluden and Centre Road) – existing bus route
- Centre Road – existing bus route
- South Road – predominantly existing bus route (part between The Avenue and New Street is a proposed bus route)
- Bay Road – existing bus route
- Nepean Highway – predominantly existing bus route (part between Rusden Street & Martin street and between Bay Street and Dendy Street is a proposed bus route)
- St Kilda Street/Beach Road (to Bay Road) – potential bus route.

The rationale behind encompassing higher density development along the PPTN and in activity centres is that these locations have good public transport access to activity centres and the jobs, services and facilities within these centres. The intention is that these key linear transport corridors develop into medium density corridors that connect all the activity centres, and provide easy access to high quality public transport for people from the adjacent suburbs.

By focusing development in activity centres and along these corridors, the majority of Melbourne’s residential areas can remain as they are, with development limited to low-rise residential infill development.

However there are issues with this approach that need to be considered and addressed:

- Many of these public transport corridors are also busy motor vehicle roads and the associated noise and air pollution presents health and amenity implications for residential intensification.
- The public transport corridors need to be attractive and safe environments for pedestrians and bike riders. This means active street frontages, vehicle access provided from side streets or rear laneways and modification of streets to favour rapid public transport, bicycle and pedestrians over motor vehicles.
- Clear principles around the transition and overlooking conditions in relation to the properties running along the back boundaries of the designated sites need to be established.

¹³University of Western Sydney Urban Research Centre, 2011, *Local Government and Ageing*, page 4

Taking these issues into account, the following criteria have been used to assess whether roads on the PPTN (including tram routes) are considered appropriate for higher density development. To be considered appropriate, the road must:

- Offer attractive public transport options (i.e. PPTN) to Principal, Major or Neighbourhood Activity Centres.
- Not be along preferred traffic routes as identified in VicRoads Operating Plans (these roads prioritise motor vehicles over other forms of traffic)
- Provide good access (400 – 800m) to public open space and recreational areas.

Using this criteria, the following roads are considered appropriate for increased housing development:

- Rusden Street
- New Street , adjacent to Church Street activity centre
- Bay Street (from New Street to Asling Street)
- Centre Road
- Bay Road (at key locations around Sandringham and proposed Southland Stations and Highett high density residential)

Traffic management measures are required at certain locations to support increased development and improve safety. Intervention works that can be considered to ensure that the additional traffic due to increased development on these roads is reasonably managed include; traffic signals, pedestrian improvements, local area traffic management devices to slow or restrict traffic flow or speed and other related improvement measures such as street lighting upgrade and parking controls.

3.2.2 Strategic Redevelopment Sites

The following sites provide the opportunity for large infill development to be serviced with good public transport access to Principle and major Activity Centres. The following sites met the criteria for Strategic Redevelopment Sites outlined above:

- Nepean Highway & North Road, Brighton
- Beach Road & Georgiana Street, Sandringham
- Nepean Highway & Milroy street, Brighton East
- South Road & Esplanade Avenue and around Milano's
- CSIRO site, Highett
- Mixed Use Zone (MUZ) at corner of Bay Road & George Street, Sandringham
- MUZ to the west of Bay Road Heathland Reserve on the south side of Bay Road, Sandringham
- MUZ – Bay Road & Noyes Street, Highett
- MUZ – Bay Road and Cloyne Street, Highett
- Urban Development Program sites

3.2.3 Infrastructure Contributions

Infrastructure contributions are to be collected from developers by the implementation of the following objectives through the Bayside Planning Scheme and other Council initiatives:

- Preparation of a development contribution plan for Bayside based on renewal of Council's roads, drains and community facilities.

- Collection of an appropriate public open space levy under Clause 52.01 of the planning scheme to fund provision of and improvements to open space to meet the needs of the community.

3.3 Changes in Technology

Technology changes that relate to road assets will allow alternative materials to be considered during maintenance and replacement of assets in the future. Recent examples of technological changes include:

- Replacing street lighting with low energy consumption luminaries, and
- Use of recyclable materials in road surfaces.

There will also be changes to asset management technology, in particular regarding condition monitoring and data collection roles.

3.4 Impact of Climate Change

A report “Infrastructure and Climate Change Risk Assessment for Victoria” was prepared by the CSIRO for the Victorian Government in 2007. The report raises issues relating to infrastructure that may well be at risk due to climate change. Increased frequency and intensity of extreme rainfall, wind and lightning events are likely to cause significant damage to roads and urban facilities. Roads and facilities close to the coast are particularly at risk when storm surges are combined with sea level rise. The Victorian Coastal Strategy 2008 advises that local authorities should plan for a sea level rise of 0.8 m by 2100.

Council adopted the Bayside Climate Change Strategy¹⁴ in May 2012 that sets Council’s direction in terms of environmental sustainability and adaptation to the inevitable consequences of climate change, including storm events of increasing frequency and intensity, can expect an increase in damage to infrastructure including roads due to direct impacts of storm surge or inundation.

To enable Council to give consideration to elements of its road and pathway network assets that may be at risk a checklist (Appendix 6) is provided to undertake this preliminary risk assessment. If a potentially high risk asset is identified, a more detailed risk assessment is required. Where any element, or the structure overall, is at risk suitable response or remedial measures need to be investigated and implemented.

A focus of Bayside City Council’s transportation strategies is on enhancing the sustainability of travel and transportation within the municipality. The environmental benefits of decreasing car dependency and increasing use of alternative modes such as cycling and pedestrian is understood and an increasingly influential factor in the planning and management of Council’s assets.

3.5 Asset Upgrade Strategies

Bayside City Council recognises that each of the various classes and subclasses of road assets have different requirements and provide different services to the community. To this end, Asset Upgrade Strategies are required for specific road categories. The strategies provide a service-driven assessment of asset performance, levels of service and future needs. Each strategy will be a driver for funding referenced in later sections of the R-AMP.

The general principals to be used in the development of Asset Upgrade Strategies are:

¹⁴TRIM refs # DOC/12/55184 & DOC/12/55185

- Each strategy is linked to Councils Long Term Financial Plan (LTFP) and Asset Management Policy and Strategy,
- Each asset will be maintained and renewed to ensure that it agrees to the required standard;
- Strategic planning and asset review process will examine opportunities for consolidation and rationalisation
- Any major changes / upgrades to a road asset would be considered as part of Council's Capital Works Evaluation Process.
- A whole of Council approach will be taken to ongoing management of road assets. This recognises that maintenance and renewal will be at a consistent level.
- The funding strategy process is about identifying each assets renewal and / or upgrade requirements and providing the appropriate funds, in a timely manner to meet service needs. Securing external funding should be explored where appropriate.
- Initial estimates within the strategy will be broad and based on aggregated information.

The Asset Upgrade Strategies which provide guidance to the R-AMP are listed in Table 5 below. Several of these strategies are still in draft, or are yet to commence. The status of scheduling development of these plans is illustrated in the following table together with a list of other plans and strategies that may influence service planning.

Table 5: Asset strategies

Road Asset Category	Asset Strategy
All categories	Activity Centre Streetscape Upgrades draft (2016) Bayside Road Safety Strategy (2014) Road Reserve & Footpath Strategy (2012)
Footpath Assets	Footpath program and policy
Traffic Management	Traffic Management program and policy
Road Assets	Bayside Road Safety Strategy (2014)

3.6 Demand Management Strategies

Demand management strategies provide alternatives to the creation of new assets through managing customer demand. A key long term approach in this R-AMP is to manage demand so that future services can be provided at a reasonable cost without negative impact on service. It is expected that effective demand management strategies will allow efficient management of road assets.

The objective of demand management is to actively seek to manage customer demands for services in order to:

- Optimise the efficiency, utilisation and performance of existing assets;
- Reduce or defer the need for new assets;
- Meet the organisations strategic objectives;
- Deliver a more sustainable service; and
- Respond to customer needs.

Demand factors are analysed comprehensively, and their impact quantified in terms of the following:

- The effect of growth of road assets;

- Any possible future need to increase or decrease assets; and
- The effectiveness of non-asset solutions.

In any instance where a demand requirement impacts affordability for road network upgrades or new works, non asset-based solutions will be considered. Non-asset based solutions may involve adoption of a lower level of service and subsequent acceptance of increased insurance costs and liability.

In addition to the factors mentioned above, risk affects demand for services and consequently the following must be taken into account:

- The methodology and accuracy of forecasts;
- The currency of forecasts;
- The uncertainty of forecasts; and
- Any unforeseen natural factors.

Development of the Asset Improvement Strategies will include consideration of specific demands on road assets. Demand management strategies around increased use of public transport and active travel modes will also be enhanced.

Technological change will be monitored to establish when changes occur that may bring benefits to Council. Monitoring can be by way of media coverage, industry journals, workshops and conferences. Any changes to maintenance regimes will need to be scrutinised as to any impacts on the current maintenance contract arrangements.

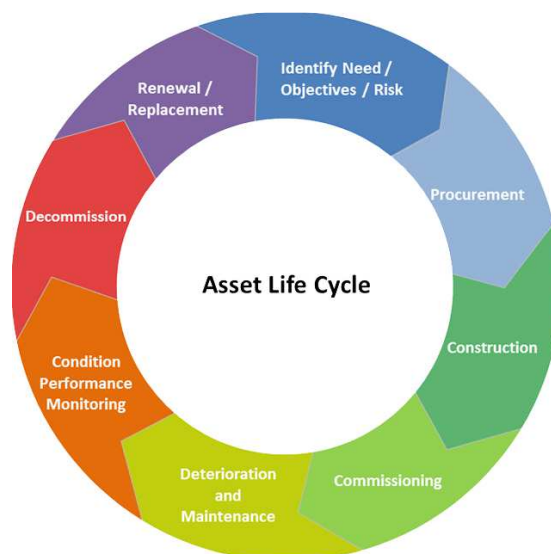
Opportunities for funding new assets are generally limited to income from Government Grants and from Council rates. Although it may be possible to afford a new asset, especially if the subject of a Government grant, what must also be considered as part of the equation is the ongoing commitment to operations and maintenance.

Plans to introduce demand management measures are based on effective community engagement to ensure the resulting level of service meets user / community expectations.

4.0 Life-Cycle Management

Lifecycle management details how Council aims to manage and operate its road assets at the agreed levels of service, while optimising the life cycle costs. This section outlines strategies to ensure sustainability. Based on predictive modelling, testing of assumptions, risk identification and sample testing, a determination has been made as to the necessary level of operations, maintenance and renewal funding to ensure desired levels of service are achieved on a whole of life basis. The figure below provides a graphical representation of the stages in the asset lifecycle.

Figure 4: Asset Lifecycle¹⁵



As custodian of the community's infrastructure, Council's function is to provide a range of services through the management of road assets. The cost imposition to Council involves the following aspects:

- Identifying the need and planning for road assets
- Procurement and construction
- Operations, maintenance and condition monitoring
- Decommissioning or renewal/replacement (end of the useful service life of the asset).

4.1 Asset Types and Quantity

Table 6 and Figure 5 provide a summary of Council's road assets, their physical quantities and current replacement value in brownfield terms.¹⁶ The scope and value of the assets covered by this Plan are identified in the following summary table taken from Council's Road Infrastructure Assets Revaluation Report (30 June 2014).

¹⁵Source: <http://www.dsids.com/images/ph-me-asset-management-life-cycle.png>

¹⁶ Refer to Road Asset Revaluation Report – PDF DOC/14/102218, matches the Summary Table in TRIM ref # DOC/14/104795 plus 16% to adjust Greenfield rates to Brownfield. Also see cell BG5633 – 5635 DOC/14/104336 and DOC/14/104333 to DOC/14/104338.

Figure 5: Bayside's Road Assets

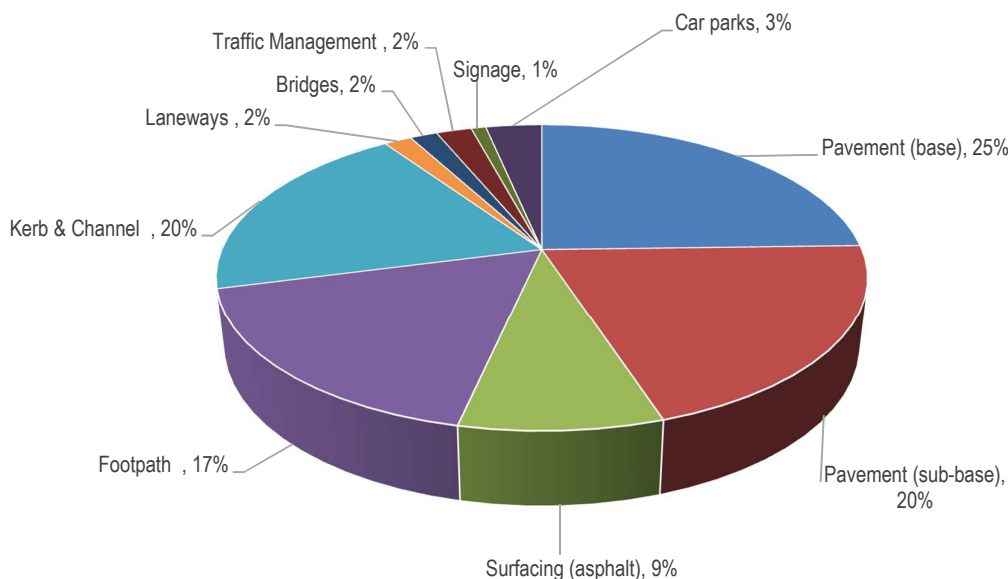


Table 6: Summary of Road Asset Components Quantity and Replacement Costs

Asset Type	Length (kms)	Asset Quantity	Replacement Value	Average Annual Renewal Value ¹⁷
Pavement (base)	353.8 km	2,740,622 m ²	\$102,827,620	\$514,138
Pavement (sub-base)	352.4 km	2,732,734 m ²	\$85,280,552	\$426,403
Surfacing (asphalt)	360.7 km	2,788,765 m ²	\$35,657,463	\$1,018,786
Footpath (asphalt/concrete)	721 km	1,139,587 m ²	\$73,182,226	\$1,829,556
Kerb & Channel (concrete/bluestone)	683.8 km	683,784 m	\$81,672,255	\$1,306,756
Laneways (bluestone/brick/asphalt/concrete)	15 km	55,771 m ²	\$6,863,547	\$114,392
Bridges	-	5 No.	\$6,771,152	\$67,712
Traffic Management (e.g. speed humps, kerb outstand, roundabouts)	-	350 No.	\$8,789,692	\$206,816
Signage	-	18,139 No.	\$3,636,320	\$181,816
Car parks ¹⁸	134 No.	351,559 m ²	\$13,913,199	\$327,369
Total			\$418,594,026	\$5,993,743

4.1.1 Assets not maintained by Council

¹⁷ Average annual renewal value is replacement value divided by useful life and is an indication of the order of magnitude of annual renewal funding requirements over the long term. Actual requirements are gained by modelling.

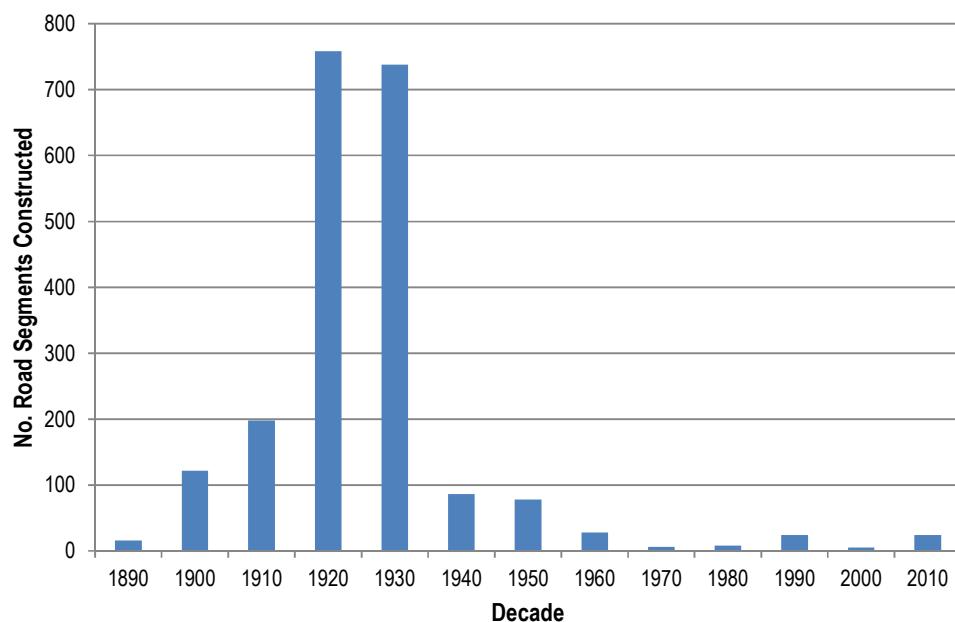
¹⁸ Car Parks were not included in 2014 revaluation - figures are taken from 2011 Road Asset Management Plan

There are assets in the road reserve which are not owned or managed by Council. However, their operation impacts on Council assets or Council service delivery. These assets are listed In Appendix 2. Some examples include fire hydrants, Telstra pits, sewer pits, rail bridges and level crossings. These assets are contained within exclusion zones. Council cannot work within these zones without the permission of the responsible authority. Regardless of Councils maintenance obligations, there is a duty of care and will as far as practicable notify the relevant utility or authority where a defect has been identified.

4.2 Asset Age and Useful Lives

The road assets stock varies in age and useful lives across the asset categories. The road network was predominantly constructed between 1910 and 1950 and is comparatively young in terms of the predicted average life of 200 years. The following Figure 7 shows the age profile by plotting lengths constructed during each 10 year period. It shows that the majority of the asset stock is currently around 80 years of age.

Figure 7: Age of Road Network (Year of Construction)



The following Table 6 shows the useful lives adopted for road assets at Bayside Council. These useful lives have been derived from industry standards. They are also based on engineering knowledge of the local conditions. Most notably, the useful life selected for road substructure (base and sub-base) of 200 years is longer than usual industry standard. Bayside City Council is located in a sand belt. The localised geographic conditions in combination with periodic surfacing treatments and scheduled maintenance, result in long pavement lives.

Table 8: Asset Useful Lives

Asset Class	Asset Sub-Class	Moloney Modelling Value (Yrs)
Road Pavements	Substructure (base)	200
	Substructure (sub-base)	200
	Surface (Asphalt)	20
Kerb & Channel	Concrete	80
	Bluestone	70
Footpaths	Concrete Footpaths	55
	Asphalt Footpaths	16
	Brick footpaths	50
	Gravel Footpaths	30
Car Parks	Sealed Pavement	100
	Sealed Surface	35
	Unsealed	35
Lanes	Concrete Lanes	80
	Asphalt Lanes	20
	Bluestone	20
	Brick Lanes	20
	Gravel Lanes	10
Bridges	Road & Foot Bridges	100

The useful lives cited in Table 6 are those cited in the 2014 revaluation. As Car Parks were not included 2014 revaluation, the useful life has been taken from the 2011 Road Asset Management Plan.

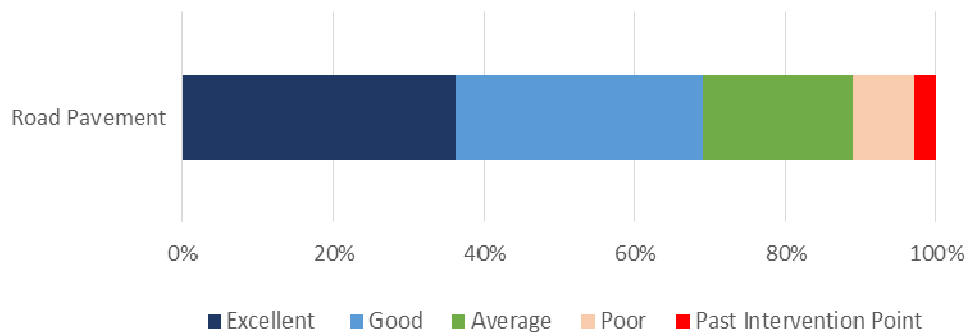
4.3 Asset Condition

Condition audits of the various classes of road asset are undertaken as per the table in Appendix 3.

4.3.1 Road Pavement Condition

Road pavement condition is classified using the SMEC Pavement Condition Index (PCI). SMEC PCI is a 10 point scale where 10 represents a road without defects (perfect condition). Points are deducted from this ranking depending on the level and types of distress present in the pavement. For the purpose of presentation and to align with the Maloney modelling parameters the condition data has been converted into a 5 point scale from “Excellent” to “Past Intervention Point”.

Figure 7: Road Pavement Condition

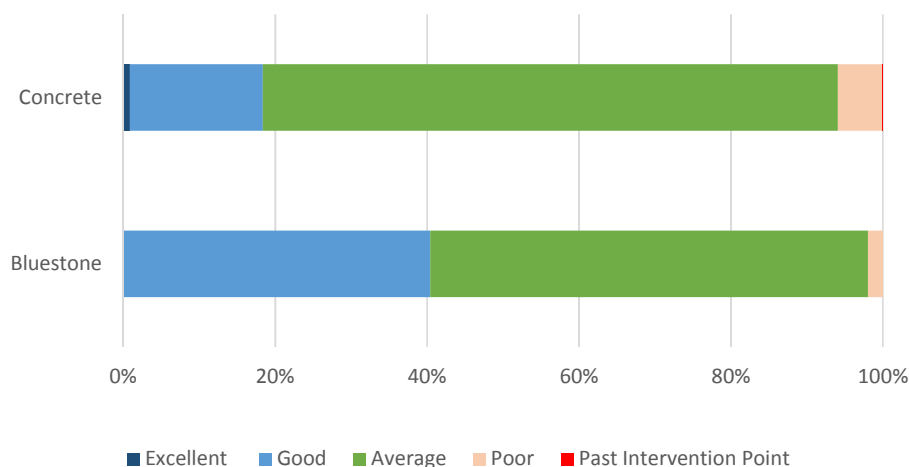


The condition data shows that approximately 90% of the road network is in an average to excellent condition. 8% of the network is rated poor and 3% past intervention point. Road pavement that is assessed on post intervention is listed on the current capital works program for renewal.

4.3.2 Kerb & Channel Condition

The kerb and channel data is presented in Figure 8. As can be seen over 95% of the network is rated above average condition. The bluestone assets are in slightly better condition than the concrete kerb and channel. Generally though the network is in very good condition.

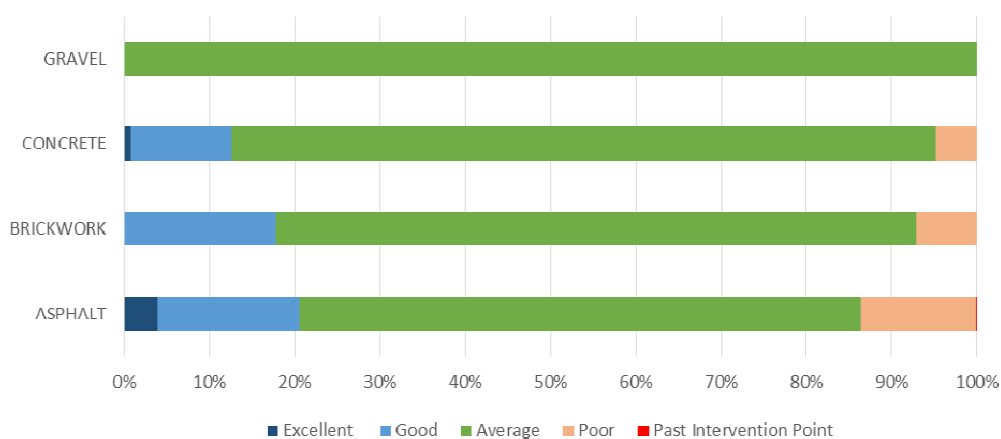
Figure 8: Road Pavement & Kerbing Condition



4.3.3 Footpath Condition

The condition data for the footpath network shows that approximately 85% of the network is rated in an average condition. 100% of the gravel footpaths are in average condition. Concrete, brickwork and asphalt footpaths show a spread from poor to excellent. However the general condition for footpaths of these materials is also average.

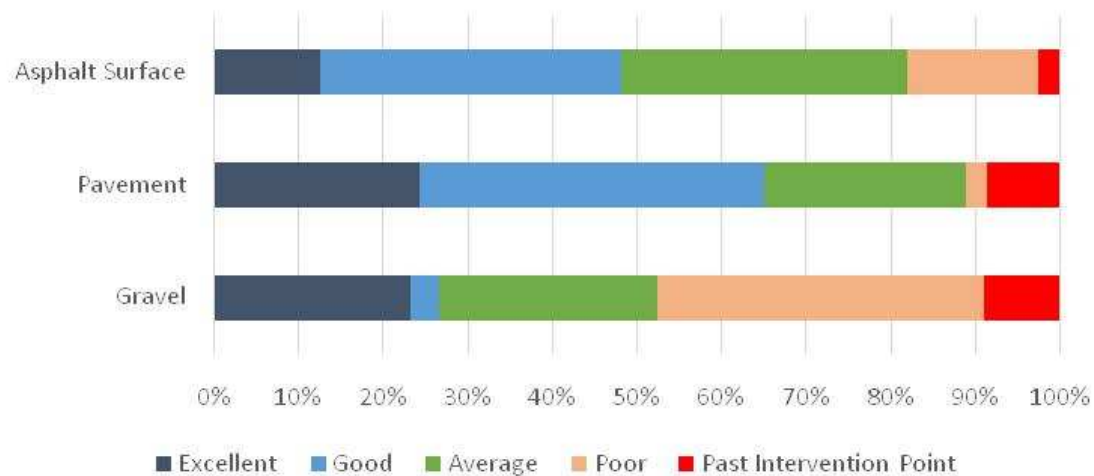
Figure 9: Footpath Condition



4.3.4 Car Park Condition

The car park condition is shown in figure 10 below. Across all carpark types there is approximately 5% of assets which are beyond intervention. Of the gravel carparks almost 45% are in poor condition. For carparks with paved and asphalt surfaces the condition is markedly better with approximately 85% in average to excellent condition. The data extrapolated from the Capital Works Program indicates that the Council will spend \$418,000 on car park renewal in 2015/16, which shall increase steadily over the next ten years.

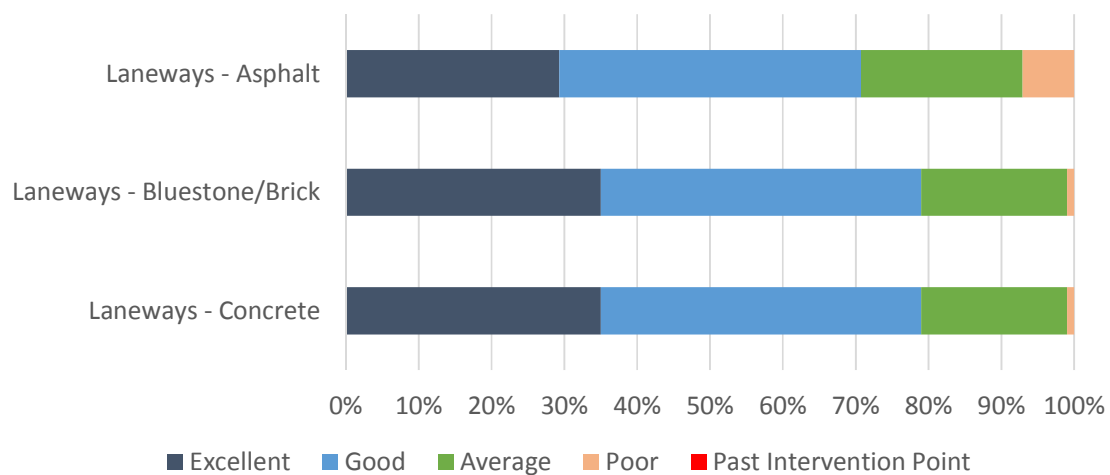
Figure 10: Car Park Condition



4.3.5 Laneway Condition

The condition of laneways is generally good. Approximately 85% of the network is at average to excellent condition with the majority of the assets being good or excellent.

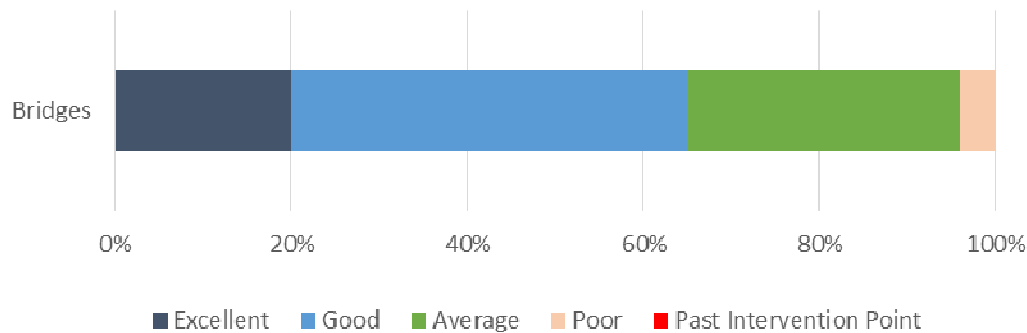
Figure 11: Laneway Condition



4.3.6 Bridge Condition

The bridge condition is presented in figure 12. The condition data shows that approximately 95% of the bridge network is in an average to excellent condition.

Figure 12: Bridge Condition



4.3.7 Asset Capacity and Performance

Asset performance relates to the ability of the asset to perform over time to meet its intended purpose. This involves its ability to meet traffic capacity demands placed on it which over time may significantly increase over the initial design capacity. Similarly the asset is required to meet structural loading requirements which again may increase over time.

In general terms it is believed that the local road network is meeting capacity and performance requirements. Traffic counts are undertaken periodically to review need and performance.

4.4 Asset Data Storage Systems

Asset data for roads and footpaths is stored in several systems. These are detailed in Appendix 4 It is noted that the inventory and condition data for Road Assets is stored in the following systems:

- SMEC
- AIMS
- GIS (Mapping)
- Moloney Modelling
- Excel Spreadsheet
- Access Database

Extensive inventory and condition data on Road Assets (including signage, footpaths, traffic management, and bridges) is collected by Council's Maintenance Contractors. This data is both tables of attributes and also geographical mapping of assets. Further integration of this data into the corporate asset systems is recommended.

SMEC Pavement Management System was implemented in Bayside in 1997. Comprehensive details of all pavements, kerb & channels and footpaths covered by the R-AMP are located in the SMEC database. SMEC

forms the basis for Council's Register of Public Roads. The base asset data in SMEC is also used in the Moloney Financial Modelling process. SMEC has links with Authority Asset Management and Council's GIS as part of the Asset Management Improvement Strategy.

Council is working to establish Authority Aims as the primary Asset Database. Eliminating the use of spreadsheets and Access databases and migrating data into Authority is a high priority.

4.5 Risk Management

Council's Risk Management Process is an integral part of best practice asset management. The application of sound risk management allows for continual improvement in decision making and processes and is an essential consideration in determining appropriate levels of service. The application of sound risk management allows for continual improvement in decision making and processes and is an essential consideration in the determination of appropriate levels of service.

Although it is not possible for Council to address all defects and eliminate all risks, risk is minimised by undertaking inspections to identify critical hazards. The levels of service within the Road Management Plan have been adopted after consideration of potential risks.

The establishment of a Road Classification Hierarchy ensures that roads, footpaths and associated infrastructure are managed and maintained according to their functional importance and have regard to traffic, pedestrian usage, and public safety. The adopted levels of service include the provision of regular safety and structural inspections together with maintenance response times based on road classification.

4.6 Operations and Maintenance

4.6.1 Maintenance Arrangements

Council has a contract arrangement for the maintenance of its road assets. The specific assets maintained within this contract are:

- Roads, Car parks and Bridges
- Footpaths, Kerb & Channel and Drainage Repairs
- Line marking Services
- Street Signs and Furniture

The current Management and Operation Infrastructure Maintenance Services Contract No. 080977 commenced on 3 March 2010. The contract is for an initial period of Seven (7) years with a further option of three (1) year extensions to be exercised at Council's discretion.

The Contractor is required to provide all management, supervision, labour, materials, plant, equipment, profit and overheads to carry out the required works throughout the municipality to the satisfaction of Council. The Contractor will monitor its own performance, maintain updated records of assets associated with these works and report to Council on a regular basis as set out in the Sections to the Specifications. The Contractor has a Maintenance Management System (MMS) to support road maintenance services.

As part of Council's contract management procedures, monthly meetings are held to review the Infrastructure Maintenance Service Contract to ensure compliance with the requirements of the Contract and also the requirements of the Road Management Plan.

Various audits of Contractor performance are carried out by Council field staff on a regular basis by undertaking a random audit of 20 percent (20%) of the Infrastructure network.

4.6.2 Inspections

Two types of inspection are undertaken for road assets: Routine maintenance defect identification and periodic asset condition assessment.

Routine maintenance / defect identification

A key Level of Service is the programmed inspection of the road network and associated condition rating. This is essential for the safe and efficient operation of public roads. Bayside City Council has developed a structured inspection program that incorporates a combination of general safety inspections and periodic condition surveys.

The inspection program is detailed in the Road Management Plan. Inspection frequencies within the Plan have been determined after consideration of potential risks.

The inspection program not only identifies safety hazards and facilitates timely repairs, it also feeds into and guides the development of maintenance and capital works programs.

Periodic asset condition assessment

The road network is globally assessed for condition at 3 to 5-year intervals. Amendments and updates to the ratings occur as capital projects are completed or where the condition status of a road component has altered (e.g. due to service authority intervention).

4.6.3 Inspection Recording

Council has an integrated asset management system (AIM) where all data in relation to road infrastructure is recorded. This information includes identifiers for all assets, all defects identified during proactive inspections, details of rectification works and asset condition captured during condition assessments.

The Contractor's Maintenance Management System (MMS) tracks programmed inspections, records defects identified during inspections, records action requests received from the community and tracks repairs, response times and other actions taken. The MMS maintains a works history with clear audit trails. This data is then fed into AIM and is stored for future analysis and reference. Data in AIM can be linked with other systems such as Customer Service Systems, Pavement Management System and GIS.

4.7 Renewal, Upgrade & Disposal Plan

4.7.1 Renewal Prioritisation Process

Planned and reactive renewal works are prioritised in accordance with the following considerations:

- Risk: The risk of failure and associated financial and social impact justifies action (e.g. impact and extent of resulting inability to be able to use the road asset).

- Asset performance: The failure of an asset to meet the required level of service. Non-performing assets are identified by the monitoring of asset reliability, capacity and efficiency during inspections and operational activity. The asset condition is assessed after an evaluation of the condition determined by the condition survey for the SMEC pavement management system and an assessment of road sections reported by the public and Councils Maintenance Contractors.
- Economics: it is no longer economically prudent to continue repairing the asset. (I.e. the annual cost of repairs exceeds the annualised cost of renewals).

With regard to prioritisation of the renewal works, critical works will be programed where:

- The performance of the asset fails to meet the required level of service due to the poor condition of the asset; and
- It is no longer cost effective to continue repairing the asset, and
- The risk consequence of asset failure and the associated financial and social impact of failure justifies replacement of the asset.

Given the relatively young age and good condition of the road assets, significant expenditure on renewal of road assets due to poor condition is not expected over the next 10 to 20 years. This assumption will continue to be tested by ongoing condition based analysis of the assets and adjusted in future plans.

The methodology used to determine sections of road assets for renewal is provided in Appendix 5.

4.7.2 New and Upgraded Asset Requirements

Projects to construct new, extend or upgrade existing assets cater for growth or additional levels of service,

- Works which create an asset that did not exist in any shape or form, or
- Works which improves an asset beyond its original size or capacity, or
- Upgrade works which increase the capacity of an asset, or
- Works designed to produce an improvement in the standard and operation of the asset beyond its original capacity.

For the road network, provision of new or upgraded works fall into the following categories depending upon the extent and type of works:

- Council funded, or
- Developer funded as part of subdivisional development, or
- Contribution to the cost by either the developer and/or Council.

As new projects are brought forward for consideration with the annual budget, they will also have an assessment of these ongoing operational (recurrent) costs presented to Council as part of the overall project cost projections.

4.7.3 Asset Upgrade Strategies

New footpath program and policy

A number of strategies have been developed for active transport modes such as walking and cycling. These strategies include Bayside Walking Strategy (2015), Bicycle Strategy (2013) and the Footpath Treatment Policy. Development of the shared path network is a key component of these strategies. The two existing shared paths in the Bayside area are:

- Bay Trail Shared Path – Approximately 17kms
- Elster Creek Trail – Approximately 1.1kms

A shared path has also been proposed for St Kilda Street (0.23km) proposed for construction in 2016/17.

A safety audit of the Bay Trail was undertaken in 2010. There are a number of outstanding actions that need to be addressed that will see sections of the Bay Trail upgraded. Upgrades may typically include widening sections of the Bay Trail.

Activity Centre Streetscape Upgrades

As part of the recent development of the 'Place Design Manual' an assessment was carried out of the individual centres based on condition and quality of pavement, furniture, plantings and pedestrian access and the centres sensitivity based on its hierarchy and location (including public transport access and community focus).

The proposed program for Activity Centre Streetscape Upgrades for the next 5 years is shown in Table 9.

Table 9. Activity Centre Streetscape Upgrades 2016-2021

Project Name	2016/17	2017/18	2018/19	2019/20	2020/21
Sandringham Village Streetscape Masterplan	\$1,400,000	\$2,000,000			
Beaumaris Concourse Streetscape Masterplan		\$50,000	\$400,000	\$930,000	
Hawthorne Road Village Streetscape Master Plan			\$300,000	\$230,000	
Highbury Activity Centre Street scaping			\$35,000	\$150,000	
Blackrock Activity Centre			\$75,000	\$50,000	\$1,124,864
Totals	\$1,400,000	\$2,050,000	\$810,000	\$1,360,000	\$1,124,864

Traffic Management Unscheduled Works

The Bayside Traffic Management Unscheduled Works includes programs which are not planned for. It may vary from year to year according to the volume of traffic management issues which are identified. Unscheduled works include:

- Regulatory and warning signage;
- Line marking;
- Funding submissions;
- Design work;
- Data capture;
- Traffic engineering advice;
- Traffic management work identified internally by Bayside.

The Unscheduled Works for the previous five years are shown in Table 9.

Table 9. Traffic Management Unscheduled Works 2011-2015

Project Name	2011/12	2012/13	2013/14	2014/15
Totals	\$148,472	\$171,600	\$205,850	\$197,320

Bayside Road Safety Strategy (2014)

The Bayside Road Safety Strategy provides a framework and outlines actions aimed at improving safety of transport for the community. The primary focus of the strategy is education and clarifying the behaviour of the traveling public. The Strategy also aims to ensure the road and path network which is as safe as possible for road users. The Strategy notes (in particular) the need for:

- Accessing funding for implementation of Beach Road Corridor Strategy and blackspot projects.
- Ensure safety considerations (particularly the needs of pedestrians, motorised scooter users and cyclists) are addressed in the design and construction of new or upgraded road assets

Bayside Integrated Transport Strategy 2013-2023

The Bayside Integrated Transport Strategy sets Council's direction for transport planning for the next 10 years and beyond. The Strategy aims to ensure that the needs of all users: pedestrians and cyclists, public transport as well as private cars are considered in the design and management of the road network.

Bayside City Council Bicycle Strategy (2013)

The Bayside Bicycle Strategy sets Council's direction for the development of the bicycle network within Bayside. Replacing the 2003 bicycle strategy, this document aims to develop and promote a bike network which is safe, well connected, accessible and convenient. The strategy refers to the Bicycle Priority Routes (BPRs) and Municipal Bicycle networks (MBNs) and the need to have an interconnected network of paths across Bayside.

A number of actions for new / upgraded infrastructure are recommended in the strategy, specifically addition of contra flow cycle lanes at specific sites, addition or upgrade of on road bike facilities / access at specific sites, improvement / addition of signage. The strategy also proposes the need to develop a process for exploring potential extensions / enhancements to the existing network. No costings were associated with these actions but will need to be determined in future revisions of this asset management plan.

Road Reserve & Footpath Strategy (2012)

The Road Reserve and Footpath Strategy was undertaken to review the policies and practices in management and maintenance of the Road Footpath network and to identify improvements that ensure road footpath infrastructure better meet the needs of the community.

The Strategy refers to policies which impact on management of the footpath network, namely Disability, Street and Park tree management Road Management Plan and Asset Management Policy.

The development of the strategy was driven by customer satisfaction, a need identified in the Local Government Survey¹⁹ and also the volume of customer requests.

4.7.4 Asset Disposal Plan

Council's approach to the disposal of road assets are outlined below.

Footpaths and kerb & channel: There are at present no assets proposed for disposal without replacement.

Local Roads and Laneways: Disposal of roads/laneways could occur where they are:-

- Assessed as not reasonably being required for public use or only provide access to a single property;
- Requested by residents and approved by Council;
- Handed over or back to a private interest of other authority; or

¹⁹The 2011 Local Government Community Satisfaction Survey highlighted the need for improvements in the management and maintenance of the road footpath network. 36% of respondent's believed Roads and Footpaths need improvements.

- Where utilisation studies specifically demonstrates that insufficient or no use is occurring, and the continuing existence of the asset is not justified.

Council does actively seek to dispose of unused laneways that provide little public benefit. The impact of any proposal to dispose of a road asset on other services and assets must be taken into consideration (e.g. access to drainage easements etc.), including those of Utility Services (water, sewerage, electricity, telecommunications, gas). Costs may be incurred associated with the removal or disposal of a decommissioned asset and this may also include any site rehabilitation after the structure has been removed.

When disposal does occur, recognition needs to be made in the recurrent/operating budget of the reduction of associated operating or maintenance costs of the decommissioned assets as well as any removal and site rehabilitation costs.

5.0 Strategic Financial Management

5.1 Current Financial Position

Council's current expenditure for 2015/16 on asset based road services totals \$ 9.8 million, representing approximately 17 % of Councils total budget.²⁰ The breakdown between capital works and maintenance is presented in Table 10.

Table 10: Road Service Budget Allocations 2015/16

Budget Component	2015/16 Allocation
Capital (New, Renewal, Upgrade)	\$6,579,749
Operations and Maintenance	\$3,186,502
TOTAL	\$9,766,251

5.1.1 Maintenance Expenditure

Maintenance expenditure refers to all costs incurred to ensure that asset remains operational, such as pavement regulation, patch repair, crack sealing, traffic management, pit level adjustment and line marking. Maintenance does not include actions which affect the remaining useful life of the asset (as this is defined as renewal).

Approximately 33% of Council expenditure on road assets is on maintenance activities and the current budget is considered to be in line with annual requirements to achieve the adopted level of service standards. Table 11 below provides a breakdown of the annual cost of maintaining road assets.

Table 11: Road Asset Maintenance Allocations 2015/16

Maintenance Activity	Budget (Proposed 2015/16)
Tipping Fees	\$90,000
Street Sweeping	\$932,000
Weed Spraying	\$59,065
Road Maintenance	\$464,477
Footpaths	\$771,162
Kerb & Channel	\$330,130
Line Markings	\$283,380
Road Signs & Street Furniture	\$256,288
TOTAL	\$3,186,502

As can be seen from Table 11, street sweeping, road and footpath maintenance form the major part of the costs associated with road assets.

It is noted that resurfacing renewals is often referred to as maintenance, however within the Asset Management context, are renewals.

While designed to achieve the adopted level of service in the R-AMP, these programs continue to be tested and their effectiveness monitored and measured over time to allow for a future review of the service.

²⁰Figures from Power Budget Report DOC/16/12952, 2014-15 Actuals & 2015-16 Adjusted Budget - Capital & Operating - Info for Asset Management, does not include ESOS budget

Table 12 shows the predicted increase in maintenance costs over the next 10 years due to annual cost escalation and the additional maintenance requirements of new assets created over this period.

Table 12: 10 Year Maintenance Cost Projections

2015/16	2016/17	2017/18	2018/19	2020/21	2021/22	2022/23	2023/24	2024/25	2025/26
\$3,186,502	\$3,282,097	\$3,380,559	\$3,481,976	\$3,586,436	\$3,694,029	\$3,804,850	\$3,918,995	\$4,036,565	\$4,157,662

5.1.2 Capital Expenditure

Capital expenditure covers renewals, upgrades and new assets and increases the value and extends the useful life of an asset. Table 13 below lists all the components of the 2015/16 capital works budget.

Table 13: Components of Road Asset Capital Works Budget (2015/16)

Budget Component	2015/16 Allocation
Renewal capital works	\$5,256,134
New Infrastructure & Upgrade capital works	\$1,323,615
TOTAL	\$6,579,749

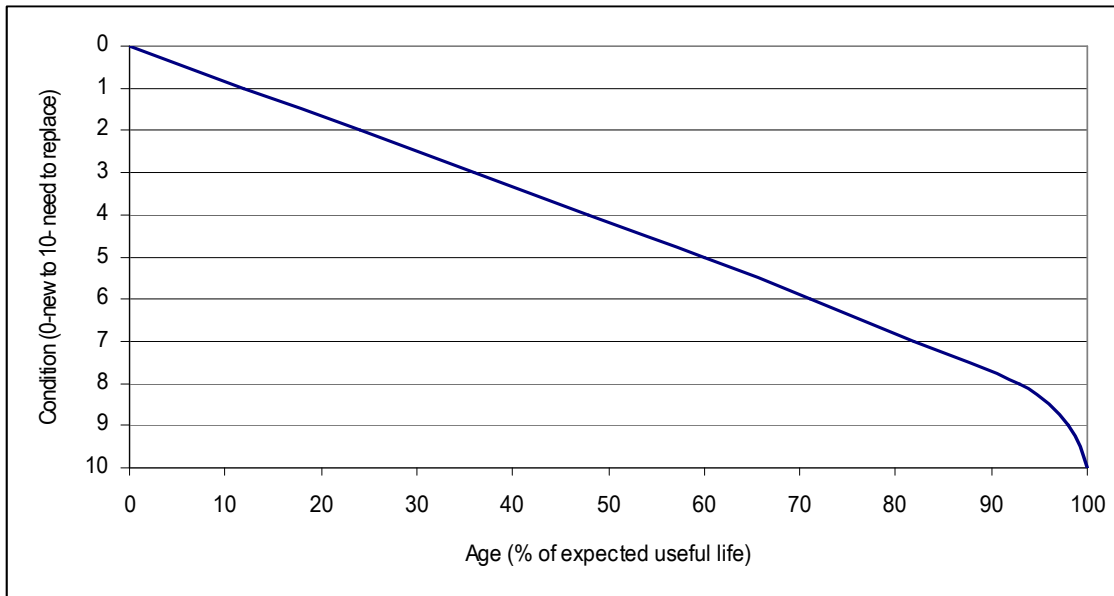
5.2 Renewal Forecasts – Moloney Model Results

The Moloney Renewal Model is a financial modelling tool used to predict future asset renewal expenditure requirements based on asset condition (or age) profiles and using generic asset deterioration curves, the model estimates degradation / consumption of the asset. Two modelling outcomes are available within the software:

- Given a fixed, or predetermined expenditure level, the model predicts the overall average asset condition rating at a future date and plots a bar graph of asset condition verses asset amount; or
- A desired minimum asset condition level is established and the model determines the required annual expenditure to achieve the pre-determined asset condition level.

In the Moloney Renewal Model, the intervention point is known as the Retreatment Intervention Condition Level (RICL). The RICL is the point at which the asset has deteriorated to such a condition that it is economically prudent to initiate the restoration works to bring the condition of the component back to the new condition rating of zero (0).

Figure 13: Default degradation profile used for Moloney Modelling



The RICL range in the Moloney model is 0 to 10. The following initial RICL's have been used for the various asset types for the purposes of financial modelling within this plan.

Table 14: Intervention Levels - Moloney Financial Model

Component	RICL	Component	RICL
Pavement (Arterial and Collector)	8	Carparks Gravel	9
Pavement (Local)	8	Carparks Pavement	8
Asphalt Seal (Arterial and Collector)	7	Carparks Asphalt Surface	7.2
Asphalt Seal (Local)	7	Pathways -Concrete	7
Kerb and channel Bluestone	8.5	Pathways - Brick Paved	8
Kerb and channel Concrete	8.5	Pathways – Asphalt	7.5
Laneways Concrete	8	Pathways - Granitic Sand/Gravel	8
Laneways Other	8	Long Life Bridges	8

5.2.1 Predicted Renewal Expenditure – Pavement, Surfaces, Kerbs and Lanes

Figure 14 demonstrates the renewal funding requirements for sealed pavements, asphalt surfaces, laneways and kerb and channel for the next 10 years.

The renewal demand over 10 years is over \$3.1 million/annum with a peak of \$3.3 million in 2024/25 predicted. At the time of modelling, in 2014, Bayside proposed spending was covering any annual funding gaps over the next 10 years and keep the roads and kerb and channel renewal works at current levels. The proposed renewal expenditure is expected to increase to over \$6 million in 2027 and aims to address any gap, whereby assets reaching their intervention level are treated. (see Asset graphs Group 1 Graph 1 and 4).

Figure 14 shows the estimated annual expenditure required to fully fund the renewal needs of the urban roads group. Figure 14 shows the effect of implementing the budget for Roads and Bridges proposed in the Long Term Financial Plan.

Figure 14: Predicted Renewal for Major Components of the Road Assets²¹

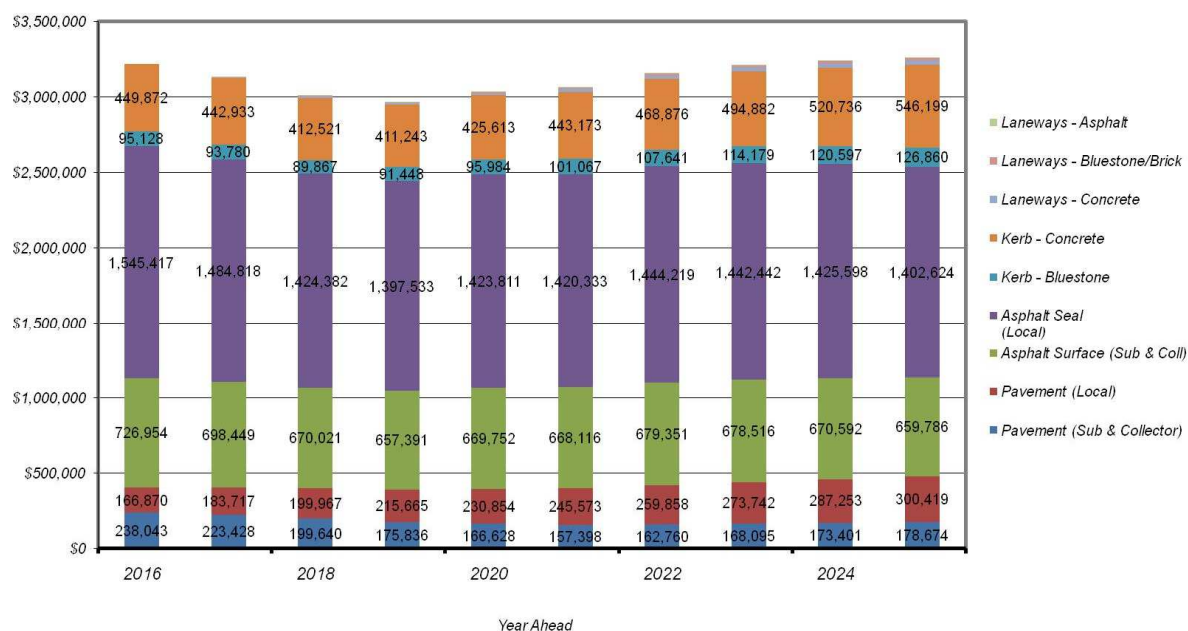
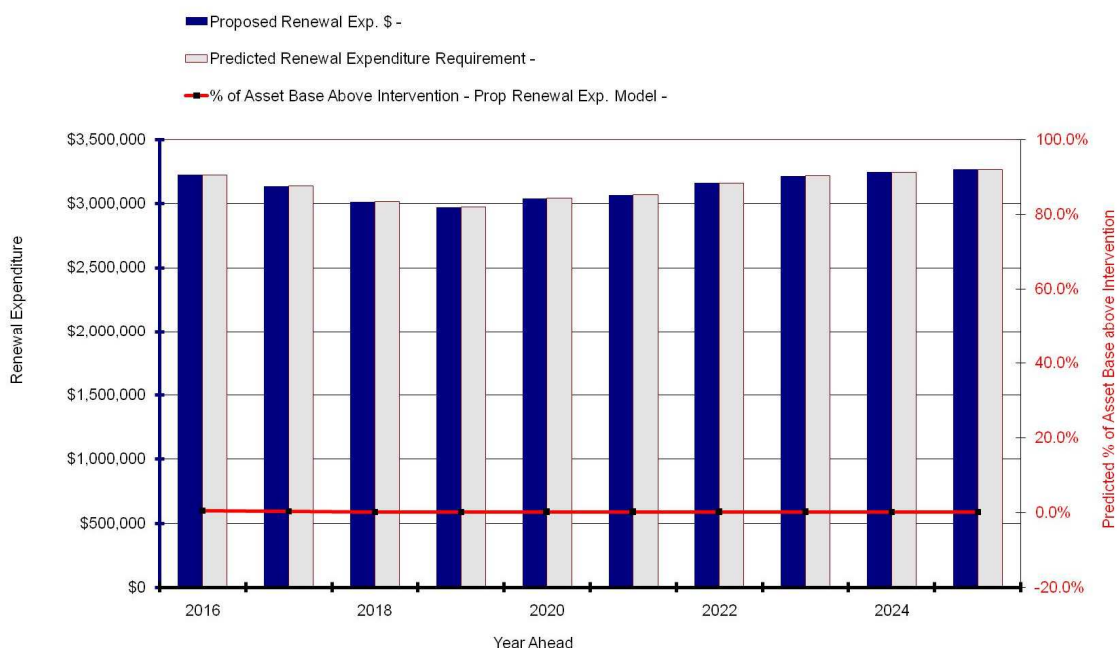


Figure 15: Proposed Expenditure vs. Predicted Renewal Demand²²



The 10 year renewal works cost projections for roads are listed in Table 15 below.

²¹ Data source is file: Asset Graphs, Urban Roads Group, (DOC/16/53713)

²² Data source is file: Asset Graphs, Urban Roads Group, (DOC/16/53713)

Table 15: 10 Year Renewal Works Cost Projections for Road Assets

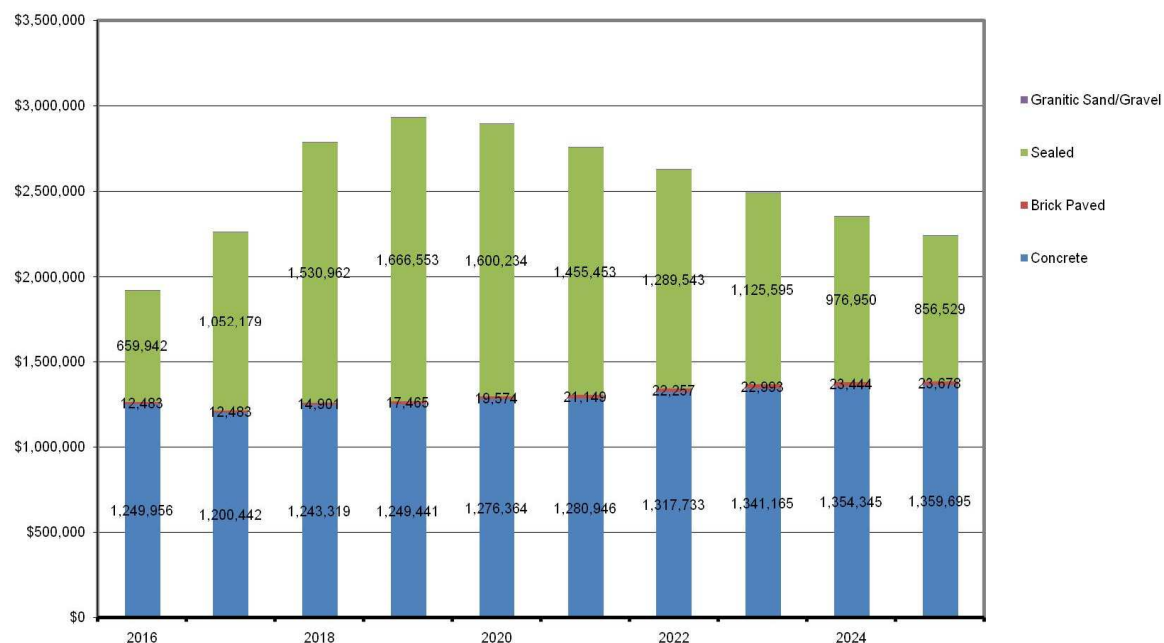
2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
\$3,222,284	\$3,135,960	\$3,012,700	\$2,971,038	\$3,039,561	\$3,067,489	\$3,159,550	\$3,213,851	\$3,245,297	\$3,266,521

5.2.2 Predicted Renewal Expenditure – Footpaths

Figure 16 demonstrates the renewal funding requirements for footpaths for the next 10 years. Footpath materials include concrete, brick-pavers, sealed, granitic sand or gravel. The average annual renewal demand over 10 years is about \$2.5 million/annum with a peak requirement of \$2.9 million in 2018/19.

A significant reduction in concrete footpath renewal has been determined since last reported as condition assessments have shown the concrete to be in better condition, as the useful life of the footpath was increased to 55 years meaning it will take longer reach Intervention Condition Level.

Figure 16: Predicted Renewal – Footpath (by material type)²³



Note: renewal expenditure is separate from ongoing maintenance expenditure (i.e. concrete footpaths will have ongoing repairs and maintenance).

The 10 year renewal works cost projections are listed in Table 16 below.

Table 16: 10 Year Footpath Renewal Works Cost Projections

2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
\$1,922,551	\$2,265,365	\$2,789,611	\$2,934,091	\$2,897,010	\$2,758,568	\$2,630,697	\$2,491,018	\$2,356,062	\$2,241,247

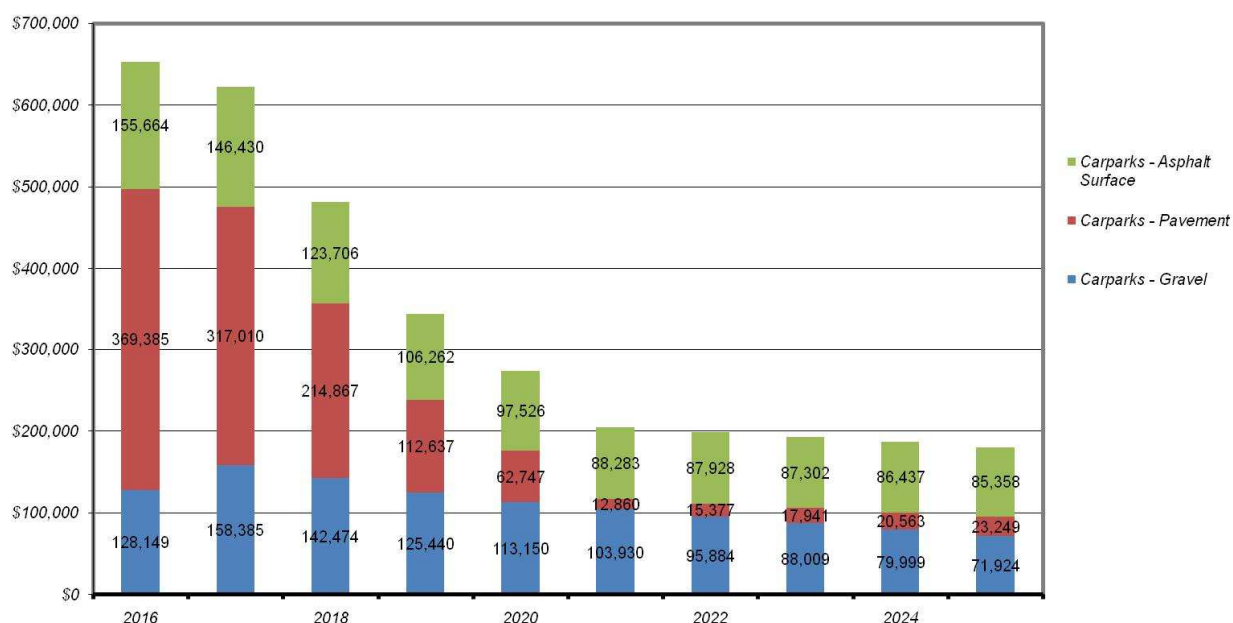
²³ Data source is file: Asset Graphs, Urban Roads Group, (DOC/16/53713)

5.2.3. Predicted Renewal Expenditure – Car parks

Figure 17 below demonstrates the renewal funding requirements for car parks for the next 10 years.

The average annual Renewal demand over 10 years is around \$333 k / annum with a current peak of \$653 k in 2015/16. Based on 2014 modelling, the proposed renewal expenditure is expected to address any gap, whereby assets reaching their intervention level are treated.

Figure 17: Predicted Renewal for Car Parks (by material type)²⁴



The 10 year renewal works cost projections for car parks are listed in Table 17 below.

Table 17: 10 Year Car Park Renewal Works Cost Projections

2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
\$653,198	\$621,825	\$481,047	\$344,339	\$263,423	\$205,073	\$199,189	\$193,252	\$186,999	\$180,531

5.2.4 Predicted Renewal Expenditure – Bridges

Figure 16 demonstrates the renewal funding requirements for bridges for the next 10 years. The average annual renewal demand over 10 years is about \$14 k / annum with a peak requirement of \$21 k in 2024/25.

²⁴ Data source is file: Asset Graphs, Carparks Group, Graph 5 DOC

Figure 18: Predicted Renewal for Bridges²⁵

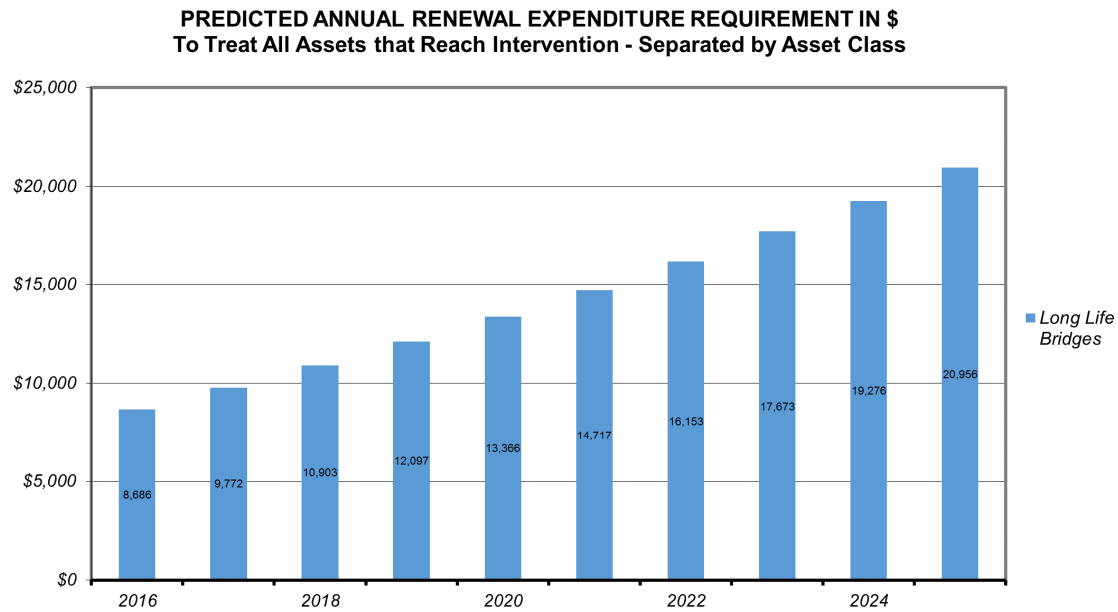
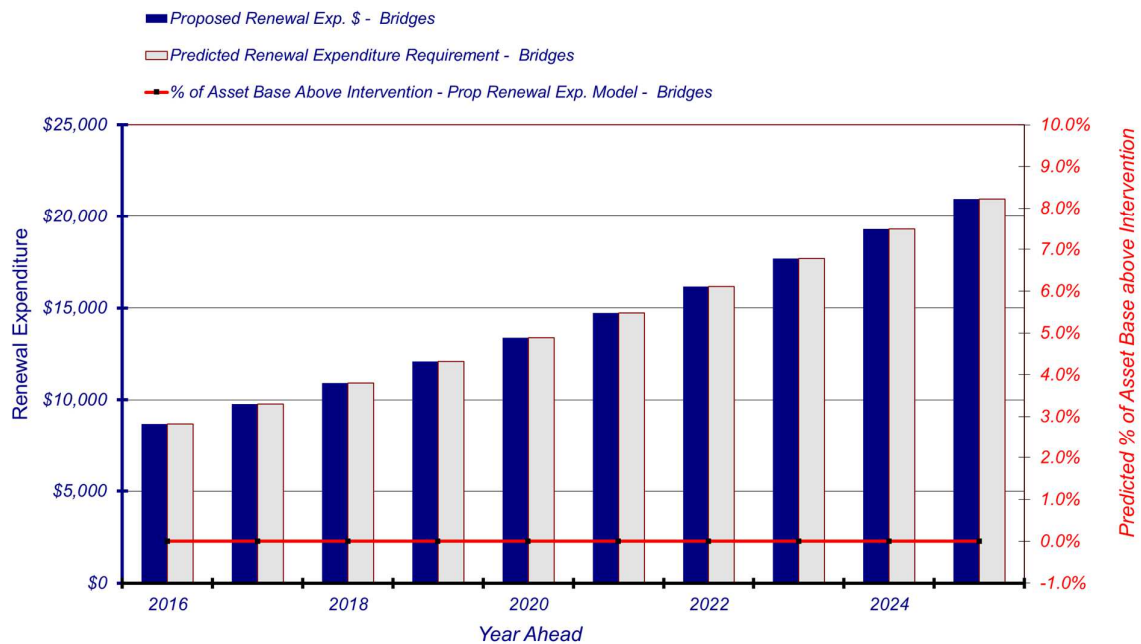


Figure 19: Proposed Expenditure vs. Predicted Renewal Demand²⁶



²⁵ Data source is file: Asset Graphs, Bridges Group, Group 5, (DOC/15/195424)

²⁶ Data source is file: Asset Graphs, Bridges Group, Group 4, (DOC/15/195424)

The 10 year renewal works cost projections for bridges are listed in Table 18 below.

Table 18: 10 Year Bridge Renewal Works Cost Projections

2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	2024/25
8,686	9,772	10,903	12,097	13,366	14,717	16,153	17,673	19,276	20,956

5.3 New and Upgraded Road Assets

Upgrades to existing road assets and the construction of new assets are driven by Council's adoption of Asset Upgrade Strategies, as discussed in Section 4.7.3. Some of the upgrade expenditure is accounted for as renewal, due to the fact that the works will renew existing elements of the road asset and extend the useful life. Table 19 presents the 10-year costs of the existing and draft Asset Upgrade Strategies.

Table 19: 10 Year Works Totals –Upgrade Strategy²⁷

	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	23/24	24/25
Carpark works										
Renewal	\$418,000	\$416,000	\$433,000	\$450,000	\$675,000	\$715,000	\$758,000	\$804,000	\$852,000	\$903,000
New	\$161,000	\$189,000	\$121,000	\$106,000	\$99,000	\$103,000	\$107,000	\$111,000	\$116,000	\$120,000
Carparks subtotal	\$580,000	\$605,000	\$554,000	\$556,000	\$774,000	\$818,000	\$865,000	\$915,000	\$968,000	\$1,023,000
Footpath works										
Renewal	\$2,116,000	\$2,029,000	\$2,110,000	\$2,194,000	\$3,292,000	\$3,489,000	\$3,699,000	\$3,921,000	\$4,156,000	\$4,405,000
New	\$817,000	\$956,000	\$614,000	\$537,000	\$500,000	\$520,000	\$541,000	\$562,000	\$585,000	\$608,000
Footpath subtotal	\$2,933,000	\$2,985,000	\$2,724,000	\$2,732,000	\$3,792,000	\$4,009,000	\$4,239,000	\$4,483,000	\$4,740,000	\$5,013,000
Road works										
Renewal	\$2,301,000	\$2,081,000	\$2,164,000	\$2,251,000	\$3,376,000	\$3,579,000	\$3,794,000	\$4,021,000	\$4,262,000	\$4,518,000
New	\$888,000	\$1,039,000	\$667,000	\$584,000	\$543,000	\$565,000	\$588,000	\$611,000	\$636,000	\$661,000
Road subtotal	\$3,178,000	\$3,108,000	\$2,824,000	\$2,828,000	\$3,913,000	\$4,138,000	\$4,375,000	\$4,626,000	\$4,891,000	\$5,172,000
Kerb and channel works										
Renewal	\$590,000	\$506,000	\$526,000	\$547,000	\$821,000	\$871,000	\$923,000	\$978,000	\$1,037,000	\$1,099,000
New	\$227,000	\$266,000	\$171,000	\$150,000	\$139,000	\$145,000	\$151,000	\$157,000	\$163,000	\$169,000
Kerb and channel subtotal	\$817,000	\$772,000	\$697,000	\$697,000	\$960,000	\$1,015,000	\$1,073,000	\$1,135,000	\$1,200,000	\$1,268,000
Streetscapes works										
Renewal	\$261,000	\$271,000	\$280,000	\$290,000	\$435,000	\$461,000	\$489,000	\$518,000	\$549,000	\$582,000
New	\$101,000	\$118,000	\$76,000	\$66,000	\$62,000	\$64,000	\$67,000	\$69,000	\$72,000	\$75,000
Streetscapes subtotal	\$362,000	\$389,000	\$356,000	\$356,000	\$497,000	\$525,000	\$555,000	\$587,000	\$621,000	\$657,000
Total works										
Renewal	\$5,686,000	\$5,303,000	\$5,513,000	\$5,733,000	\$8,599,000	\$9,115,000	\$9,662,000	\$10,241,000	\$10,856,000	\$11,507,000
New	\$2,194,000	\$2,568,000	\$1,649,000	\$1,443,000	\$1,343,000	\$1,397,000	\$1,453,000	\$1,511,000	\$1,571,000	\$1,634,000
Transport assets total	\$7,880,000	\$7,871,000	\$7,162,000	\$7,176,000	\$9,942,000	\$10,512,000	\$11,115,000	\$11,752,000	\$12,427,000	\$13,141,000

6.0 Inputs to the Road Asset Service Financial Forecast

²⁷ Bayside LTFP 2014/15 – 2023/24 May 2014

6.1 Overview

The financial requirements resulting from the information presented in preceding sections of this R-AMP are summarised below. These financial projections will continue to improve in accuracy as further information becomes available on the expectations of levels of service from the community and on current and projected asset performance.

These projections will need to be reviewed annually to reflect the actual funding allocated and the scope of the works achieved. For example, if only a fraction of the required renewal budget is allocated or a fraction of the renewal work can be completed within the allocated budget, the result will be a significant impact on the future funding needs and the overall asset performance targets being met.

6.2 Service Financial Forecasts

The figures presented below in Table 20 summarise the funding requirements for road services over the next 10 years.

Table 20: Road Asset Services Projected Funding Requirements

Year	Capital Expenditure		Operations and Maintenance Expenditure
	New Assets & Upgrades	Renewals	
2015/16	\$2,194,000	\$5,686,000	\$3,186,502
2016/17	\$2,568,000	\$5,303,000	\$3,282,097
2017/18	\$1,649,000	\$5,513,000	\$3,380,559
2018/19	\$1,443,000	\$5,733,000	\$3,481,976
2019/20	\$1,343,000	\$8,599,000	\$3,586,436
2020/21	\$1,397,000	\$9,115,000	\$3,694,029
2021/22	\$1,453,000	\$9,662,000	\$3,804,850
2022/23	\$1,511,000	\$10,241,000	\$3,918,995
2023/24	\$1,571,000	\$10,856,000	\$4,036,565
2024/25	\$1,634,000	\$11,507,000	\$4,157,662
TOTALS	\$16,763,000	\$82,215,000	\$36,529,671

6.3 Assumptions

The financial forecasts are subject to and/or limited by the following key assumptions:

- The renewal costs are based on the asset data register (AIM) as at 30 June 2015.
- Modelled outcomes are derived using the Moloney Model and are therefore subject to the limitations of that model and data is used in it., which includes the assumed performance of the asset types and trigger intervention levels.
- Useful Service Lives derived from the asset register are assumed to be a reasonable estimate of the life of the assets.
- Asset quantities within the asset register are assumed to be correct.

7.0 Asset Management Improvements

An active and effective asset management strategy should include continuous review and improvement of the system, data and processes used to manage the assets. The sections below identify areas for potential improvement to facilitate better asset management planning and practice.

7.1 Improvement Plan

Table 21: Required improvements for the Road Asset Management Plan

No	Action	Responsibility	Priority	Target
1	Consolidate Asset Register. Incorporate all road asset data including traffic management / road reserve assets, car park and laneways.	Coordinator Asset Management.	High	2016-17
2	Integrate Authority (AIMS), CVR, SMEC and GIS.	Coordinator Asset Management.	High	2017/18
3	Review degradation curves as condition data becomes available.	Coordinator Asset Management	Medium	2017-18
4	Condition Survey Laneways and install data in SMEC PMS	Coordinator Asset Management	Medium	2016-17
5	Refine initial condition based life forecasts and cash flow projections	Coordinator Asset Management	High	2017-18
6	Review Lane Asset Inventory. Determine which lanes include in Road Register. Establish review on Annual basis. Review list of all unused lanes and roadways to establish a list of those for consideration for disposal. Prepare renewal schedule for Laneways based on condition data.	Coordinator Asset Management	Medium	2017-18
7	Carry out condition surveys of bridges	Coordinator Asset Management	Med	2017-18
8	Review Service Levels set out in Maintenance Contract.	Coordinator Asset Management	Med	2017-18
9	Formalise councils approach to retaining wall management. Develop a retaining wall management policy.	Coordinator Asset Management	Med	2017-18
10	Review and update R-AMP on annual basis.	Coordinator Asset Management	High	Annually

8.0 Standards, Manuals, Guidelines & Reports

1. International Infrastructure Management Manual (IIMM) 2015, IPWEA
2. Australian Infrastructure Financial Management Guidelines 2009, IPWEA
3. Bayside City Council Standard Drawings
4. Consultant's Road Network Condition Assessment Report 2007/08
5. Bayside Road Management Plan
6. Bayside Asset Management Procedures Manual 2011²⁸
7. Local Government Act 1989
8. Road Management Act 2004
9. Road Safety Act 1986
10. Road Safety Regulations 2009
11. Transport Integration Act 2010
12. Austroads Guide to Traffic Engineering Practice
13. VicRoads Design Standards and Practice Notes
14. Cycle Notes
15. Bayside Planning Scheme
16. Equal Opportunity Act 2010
17. Human Rights Charter

²⁸ DOC/12/3738

9.0 Appendices

APPENDIX 1 – TARGET COMMUNITY LEVELS OF SERVICE – ROAD NETWORK

APPENDIX 2 –NON COUNCIL OWNED ROAD RESERVE ASSETS – MAINTENANCERESPONSIBILITY

APPENDIX 3 - ROAD ASSET CONDITION INSPECTIONS

APPENDIX 4 - ASSET DATA STORAGE SYSTEMS

APPENDIX 5 - RENEWAL METHODOLOGY PER ASSET CLASS

APPENDIX 6 – ROAD AND PATHWAY NETWORKS, POTENTIAL RISK FROM CLIMATE CHANGE

Appendix 1. Target Community Levels of Service – Road Network

Key Performance Indicator	Level of Service	Performance Measure	Target Performance	Current Performance	Actions to meet performance target
Service Quality	Community satisfaction with local roads & footpaths	Annual Victorian Local Government Community Satisfaction Survey	Increase the level of satisfaction.	2015 – rating 65(Adequate - an acceptable standard)	As per Services Asset Management Plan
Road Safety	Reduction in the number of injury vehicle crashes on the local road network	VicRoads Crash Statistics	Reduction in the 5 year annual average recorded injury crashes	14% reduction in casualty crashes between 2007-11 and 2011-15. ²⁹	Review of annual Crash Reports
Responsiveness	Council's response to various community raised issues ranging from calls about problems, response to and repair of problems, handling correspondence and service applications	(a) Provision of 24 hour, 7 day per week call-out service to attend to issues; (b) acknowledge receipt of correspondence within 5 working days (c) substantive response to correspondence within 10 days (2 days for email) ³⁰	(a) Service is available (b) 95% (c) 95%	<ul style="list-style-type: none"> • TBD • TBD • TBD 	(a) Nil (b) TBD (c) TBD

²⁹During the five year period from January 2007 to December 2011 inclusive (the most recent for which casualty data analysed from Councils Road Safety Strategy), there have been 966 casualty crashes in Bayside. This compares to the previous total of 1125 casualty crashes during the five year period between January 2002 and December 2006. This represents a **14%** reduction in casualty crashes between the two periods.<https://www.data.vic.gov.au/data/dataset/crashes-last-five-years>

³⁰ Customer Service Brochure

Appendix 2. Non Council Owned Road Reserve Assets & Council Maintenance Responsibility

Asset	Description	Council Maintenance Responsibility
Declared Arterial Roads	VicRoads	No
Private Roads		No
Shared Roads (abutting municipal boundaries)	<ul style="list-style-type: none"> - Head Street, foreshore to St Kilda Street, (Port Phillip City Council) - Thomas Street, North Road to Nepean Highway, (Glen Eira City Council) - Charman Road, foreshore to railway line, (Kingston City Council) 	In most cases the adjoining municipalities are responsible for managing half of the road, depending on the boundary alignment. In many cases it is preferable for one of the abutting municipalities to undertake maintenance for a shared road, with the costs being appropriately shared.
Bus Shelters		No
Bridges/Major Culverts / Overpasses/Footbridges	There are 20 road and footbridges in Bayside that are the responsibility of other authorities. These authorities include Melbourne Water, VicRoads and VicTrack. Responsibility for these structures is defined by the Road Management Act (2004).	No maintenance responsibility except for the following: <ul style="list-style-type: none"> - New Street road bridge - Brickwood Street foot bridge - Cochrane Street road bridge - Asling Street road bridge - Head Street footbridge.
Service Authority Utility Infrastructure	These assets commonly include water supply pipes and fittings, sewerage pipes and manholes, telecommunications cables, pits and structures, electricity distribution wires, poles and structures and, gas supply pipes and fittings.	No
Tram Lines	One tram line in Hawthorn Road (Arterial Road).	No. VicRoads is the responsible Road Authority.
Rail crossings and associated structures (bridges)		No. These assets are maintained by VicTrack in accordance with the road rail Safety Interface Agreement.
Assets & land owned, managed and maintained by other Road and Service Utility Authorities.	Service Authority Assets Crown and Service Authority land/easements – for example, Department of Sustainability and Environment (DSE), Melbourne Water unless specified in the Road Register.	No direct responsibility. However council certification is required following any disruption of Council assets undertaken to access other assets in road reserve. Service Authority carries out (temporary or permanent) reinstatement of the road/pathways/other road reserve assets. Council oversees / certifies.
Street Furniture –Non-council infrastructure in the road reserve includes:	<ul style="list-style-type: none"> - VicRoads signage and signal hardware - Department of Infrastructure bus shelters - Private direction and advertising signs 	No

Asset	Description	Council Maintenance Responsibility
Street lighting(Standard)		Maintenance of all utility timber and concrete power poles is the responsibility of power companies. However Council is responsible for the cost of operating the street lighting service on local road reserves and contributes to the cost of lighting on arterial roads.
Ticket Machines and Guard Rails		No
Vehicle crossovers, nature strips, street trees & driveways	The portion of a vehicle crossing, other than the footpath, located between the carriageway and the property boundary	The responsibility of the adjoining property owner to maintain.
Nature strips & infill areas within urban areas	Those residual areas between the edge of the road or back of the kerb and the property boundary not occupied by the pathway and private road crossings.	These are generally grass nature strips with responsibility for maintenance of the grass and any depressions generally being left to the adjoining property owner. However, under common law, Council as the land owner has an overall responsibility to ensure a minimum level of public safety.
Nature Strip landscaping works within the road reserve that in accordance with Council policy	Private landscaping that is in accordance with Council's Nature Strip Planting Policy but which are not maintained by Council.	On such landscaping or have a potential of causing obstruction/injury/damage to pedestrian or traffic movement, Private roads, driveways, laneways and car parks (Common Property) associated with private ownership.
Single property stormwater drains.	Drains constructed within the road reserve from the property boundary to a discharge outlet in the kerb or into the drain	These drains are the responsibility of the owner of the property being served to maintain
Car Parks	Constructed or unconstructed areas that are generally used for car parking purpose not in the list of car parks on the Register of Public Roads	No

Appendix 3. Road Asset Condition Inspections

3.1 Condition Inspections and Rating Scales

Asset Type	Inspection Details & Frequency		
	Asset Lifecycle Inspection	Maintenance Inspection	Road Safety Audit ³¹
Road network	Visual inspection of defects and roughness and rutting survey Frequency: Once every four years. PCI Rating shown in Section 4.1.4	Visual Inspection on foot. Annually.	N/A
Pathways	Visual inspection. Frequency: Once every four years Rating Scale shown in Appendix 3.2 below	Visual Inspection on foot. Annual excepting foreshore & shopping precinct (Biannual)	N/A
Kerb & Channel	Visual inspection of defects done as part road inspection. Once every four years Rating Scale shown in Appendix 3.3 below	As per road network.	N/A
Laneways	Condition survey undertaken in 2011. Survey to be included in road pavement condition survey cycle.	Done on ad-hoc basis only	N/A
Car Parks	Visual inspections. Currently on an ad hoc basis.	Car parks in shopping centre, hard stand at foreshore – Biannual.	N/A
Signs	Not surveyed as part of lifecycle condition audit.	Visual inspection. Annual.	N/A
Traffic Managemt*	Not surveyed as part of lifecycle condition audit.	Done as part of road network.	Road Safety Audits conducted prior to construction of new asset to assess need and as input to design.
Bridge	Bridges currently inspected on ad-hoc basis. Condition Rating Scale as per Austroads.	Level 1 Bridge Inspection – Annual Condition Rating Scale as per Austroads.	N/A
Line Marking	N/A	Inspected visually on 3 yearly cycle.	N/A

*Traffic management includes speed humps, roundabouts, kerb outstands, raised pavements

³¹ No condition rating undertaken for Road Safety Audit. Audit conducted based on risk matrix.

3.2 FOOTPATH CONDITION RATING

	ASPHALT FOOTPATH	CONCRETE	GRANITIC SANDS/GRAVEL	BRICK/PAVERS
1	Just as new construction, with perfect alignment and a sound surface condition showing no indications of distortion. Excellent appearance, visually pleasing, no patching, obvious blemishes or weed growth. Surface texture is smooth with minor or insignificant loss of the surface binder or fine aggregate (sand size) around the aggregate mix of the asphalt.	Just as new construction, with perfect alignment and a sound surface condition showing no indications of distress.	Just as new construction with a sound surface, well defined edges and no weed growth.	Just as new construction, with perfect alignment and a sound surface condition showing no missing grouting or indications of distress.
2	A sound construction with good surface condition and no distortion, but may show limited surface ageing, surface distress or evidence of maintenance activities. These may include a coarse surface texture due to the loss of binder and fine aggregates (sand size) to a depth of approximately 2mm. Sporadic, fine and widely spaced cracking with no associated distortion (such as tree root damage) or successfully executed permanent surface repairs which do not distort the original surface profile and blend well with the surrounding surface	A sound construction with good surface condition and no distortion, but may show limited ageing and or sporadic localised distress such as fine, widely spaced cracking with no stepping.	A sound construction with good surface condition but edges may have become not well defined and limited surface washout or wearing may have occurred.	A sound construction with good surface condition and no distortion, but may show limited missing grouting and or sporadic localised distress such as fine, widely spaced gaps between paving elements with no stepping.
3	Reasonable construction with a serviceable but aged surface or may show some signs of distress, such as cracking or minor distortion. These may include a coarse to rough surface texture displaying a reasonable loss of binder, and filler aggregates to a depth of approximately 5mm, exposing much of the asphalt main stone matrix. Fine to moderate cracking (< 10 mm wide) effecting less than 30% of the surface area. The surface profile may display minor undulations (< 50mm in a 2 meter lateral direction) or distortions (< 10mm in a 150mm lateral direction) due to subsidence, tree root damage, poorly executed repairs or temporary patches.	Reasonable construction with a serviceable surface showing some signs of surface distress, such as fine to moderate cracking or minor distortion (< 10mm vertical movement within a 500mm lateral dimension in any direction).	Reasonable construction with a serviceable surface showing some signs of surface distress, such as uneven surface condition up to 10mm over a 1 metre length, not well defined edges or localised weed growth.	Reasonable construction with a serviceable surface showing some signs of surface distress, such as fine to moderate cracking between elements or minor distortion (< 10mm vertical movement within a 500mm lateral dimension in any direction).

	ASPHALT FOOTPATH	CONCRETE	GRANITIC SANDS/GRAVEL	BRICK/PAVERS
4	A below average construction showing substantial surface deterioration or distress or moderate levels of distortion. These may include a rough surface texture with significant loss of binder, filler aggregates and the primary stone matrix in the asphalt mix. The presence of wide cracking (> 10mm) or extensive fine to moderate cracking effecting more than 30% of the surface area. The surface profile may display significant undulations (between 50mm and 100mm in a 2 meter lateral direction) or distortions (between 10mm and 30mm in a 150mm lateral direction).	The surface showing substantial distress, such as extensive and wide cracking (5-10mm) across 25 – 50% of the pavement and/or substantial distortion (between 10mm and 25mm vertical movement within a 500mm lateral dimension in any direction).	The surface showing substantial distress, such as extensive and marked unevenness (10-25mm over 500 mm) across 25 – 50% of the pavement and/or substantial washout, extensive bad definition of the edge and widespread (25-50%) weed growth.	The surface showing substantial distress, such as extensive and wide cracking (5-10mm) across 25 – 50% of the paving and/or substantial distortion (between 10mm and 25mm vertical movement within a 500mm lateral dimension in any direction).
5	The construction is suffering from extensive and substantial distress that renders it incapable of conducting its intended function or is considered a hazard to pedestrian traffic. These may include the disintegration of the asphalt surface due to ageing or defects such as potholes and cracking. The presence of extensive wide cracking (> 30% of the surface area). The surface profile may display unacceptable undulations (> 100mm in a 2 meter lateral direction) or distortions (> 30mm in a 150mm lateral direction).	Surface suffering from extensive and substantial distress such as very extensive (>50% of assessed area) and wide cracking (>10mm) and or shoving, tilting or disintegration of the pavement (> 25mm vertical movement within a 500mm lateral dimension in any direction). Footpaths that provide a slippery hazardous surface such as moss, build up, or a drop of greater than 50mm at the pathway start or end are all included in this category.	Surface suffering from extensive and substantial distress such as very extensive (>50% of assessed area) disintegration of the pavement (> 25mm vertical displacement within a 500 mm lateral dimension in any direction). Footpaths that extensively washed or worn away or widespread and major (> 50%) weed growth.	Surface suffering from extensive and substantial distress such as very extensive (>50% of assessed area) and wide cracking (>10mm) and or shoving, tilting or disintegration of the pavement (> 25mm vertical movement within a 500mm lateral dimension in any direction). Footpaths that provide a slippery hazardous surface such as moss, build up, or a drop of greater than 50mm at the pathway start or end are all included in this category.

3.3 - KERB & CHANNEL CONDITION RATING

Condition Rating	%	Description
1	100 – 80	Kerb or Channel in good condition showing no surface deterioration , cracking or misalignment. Providing completely unrestricted longitudinal storm-water drainage adjacent to the road pavement over the entire 25m section.
2	60 – 79	Kerb or Channel materials and construction in sound condition showing only occasional cracking affecting less than 2m of construction / 25m section. Kerb & Channel may display not more than two occurrences of negligible distortion such as less than 5mm vertical movement within a 2m dimension along the Kerb & Channel, or less than 5mm stepping resulting from cracks or misalignment of precast sections. These defects must not cause ponding or impede storm water drainage adjacent to the road pavement.
3	40 – 59	Kerb or gutter showing signs of surface deterioration or the construction is affected by sporadic areas of cracking between 2 and 10 lineal metres / 25m section. Kerb & Channel may display minor distortion such as 5 – 10mm vertical movements within a 2-metre dimension along the channel or 5 – 10mm stepping resulting from cracks or misalignment of precast sections. These defects may cause localised minor ponding but do not impede storm water drainage adjacent to the road pavement.
4	20 – 39	Kerb or Channel materials showing substantial surface deterioration or the construction is affected by areas of cracking over the majority of the 25m section , or shorter lengths may be affected by intense cracking, debilitating the integrity of the structure. Kerb & Channel may display distortion >15mm vertical movement within a 2 metre dimension along the channel or >10mm stepping resulting from cracks or misalignment of precast sections. This will also include the rolling back of sections which cause a step and drainage obstruction between the road and channel and impedes the storm water drainage adjacent to road pavement and failing to perform its intended function regardless of affected length.
5	0 – 19	Kerb or Channel construction is damaged or suffering structural failure from intense cracking, distortion, stepping or rolling back, such that it is unable to perform any reasonable drainage function, or may compromise the adjacent pavement or is a hazard to traffic or the public. This rating applies to the 25m Section regardless of affected length.

Appendix 4. Asset Data Storage Systems

Asset Type	SMEC	AIMS	GIS (Mapping)	Moloney Modelling	Excel Spreadsheet	Access Database	Public Road Register ³²	Comment
Road Pavement Assets	✓		✓				✓	SMEC is primary database for Road Asset data. Raw condition data is uploaded into SMEC to calculate the Pavement Condition Index (PCI).
Kerb & channel	✓							SMEC is primary database for Kerb & Channel data.
Footpaths	✓		✓					SMEC is primary database for Footpath Asset data.
Car Parks					✓			Last survey conducted in 2011 Primary database is MS Excel spreadsheet. Attributes held in the Excel Spreadsheet are: Location, Area, car space numbers, carpark surface (sealed or unsealed), and Surface condition. The information on the car parks is no longer considered current. A survey to determine the current state of the car parks and to create better lists of the various component attributes should be carried out as a matter of high priority.
Lanes			✓			✓	✓	Last survey carried out in 2004, data collected on Length, Width, Location, Surface type, Surface condition, and means of drainage.
Un-Constructed Laneways			✓			✓	✓	Last survey carried out in 2004, data collected on Length, Width, Location, Surface type, Surface condition, and means of drainage.
Bridges						✓		A MS Excel database system is being utilised for the management of bridge assets.
Traffic Management Facilities		✓						Partial inventory of traffic management facilities in Authority Aims. It has been prepared and managed by finance not by the Assets Team.
Signage		✓						Partial inventory of signage facilities in Authority Aims. It has been prepared and managed by finance not by the Assets Team.

Note: Inventory data held by Maintenance Contractors City Wide on Traffic Management facilities, signage.

³²Bayside Register of Public Roads

Appendix5. Renewal Methodology per Asset Class

Asset Class	Renewal Methodology	New / Upgrade Methodology
Roads	<p>Preliminary list of roads for resurfacing prepared based on: Council's pavement management system database (SMEC), Pavement consultant reports, Complaints from residents, and Information from maintenance and engineering staff of the Council. List is inspected and prioritised for consideration in the annual program. Annual program is circulated for coordination of development works to reduce any potential conflict with other departments, service authorities and VicRoads. At the same time Council's preferred asphalt contractor will assess those roads and recommend appropriate treatment and prepare estimates accordingly. After receiving feedback from other departments and estimates from the contractor a program is prepared for the resurfacing program. Preparation works i.e. patch repair, edge repair and crack sealing are completed by Council's maintenance contractor prior to asphalt resurfacing.</p> <p>The road reconstruction and design program is for reconstructing a road pavement at the end of that pavement's life. The works include pavement design, reconstructing pavement, asphalt overlay, kerb and channel construction, footpath reconstruction (if necessary), line-marking, traffic signs installation and drainage systems construction.</p> <p>The annual reseal and resheet program is referred to as periodic maintenance, however it is in fact renewal. Table 11 below lists all components of the 2015/16 capital works budget.</p>	<p>As an established, densely populated municipality there would be rare, if any occasion for Council to construct new road pavement assets.</p> <p>New Road Assets are generally assumed from developers on completion of a new development. Developers must design and construct new assets in compliance with Councils standard drawings. Council will supervise the construction of the new assets to ensure that they are constructed in accordance with Council standards. At handover there is also a 12 month defects liability period.</p>
Pathways	<p>Condition data collected in the lifecycle condition audit is analysed. Footpath segments selected for treatment on the basis of condition data. A program is prepared to enable work to be carried out in an efficient manner. Renewals are also undertaken through the maintenance contract. These renewals are identified and programmed utilising condition data collected by the maintenance contractor.</p>	<p>The need for a footpath or cycleway asset may arise from feedback from stakeholder consultation or a road safety audit. Bike paths may be constructed on a road of created as a shared paths designated as part of an existing footpath.</p> <p>Council may also assume footpaths from a private development. This may be a significant development such as a new subdivision, or on a smaller scale for example</p>

Asset Class	Renewal Methodology	New / Upgrade Methodology
		part of a vehicle cross over. In either case the developer must comply with Council's standard drawings. The new asset is inspected for quality and subject to a defects liability period. The new asset will be in a road reserve.
Kerb & Channel	Condition data collected in the lifecycle condition audit is analysed. Kerb & Channel segments selected for treatment on the basis of condition data. A program is prepared to enable work to be carried out in an efficient manner. Renewals are also undertaken through the maintenance contract. These renewals are identified and programmed utilising condition data collected by the maintenance contractor.	<p>New kerb and channel assets constructed by Council</p> <p>Council may also assume responsibility for kerb and channel assets from private developments. The process would be the same as that described for footpath assets.</p>
Car Parks	<p>Condition data is analysed to determine which car parks are in need of replacement and programs are structured for this work to be carried out in an efficient manner.</p> <p>Renewals are also undertaken through the maintenance contract. These renewals are identified and programmed utilising condition data collected by the maintenance contractor.</p>	<p>New car park assets will be planned and constructed with the following considerations set out in the Bayside City Council Planning Scheme:</p> <ul style="list-style-type: none"> • Ensure parking provision for new development does not impact unreasonably on the availability of existing street parking. • Minimise the number of vehicle crossings in residential streets to maximise on street parking and minimize pedestrian danger points • Discourage parking dispensations for new residential developments within boundary of Principal or Major Activity Centre or large Neighbourhood Activity Centre. Encourage sustainable forms of transport within development. • Prepare car parking precinct plans for Major Activity Centres and strategic redevelopment sites which address: <ul style="list-style-type: none"> ○ existing / future shortfall of car parking within the centre of development; ○ location of any shared car parking to be developed; ○ improvements to PTN / other sustainable modes of travel in lieu of car parking developments; ○ level of contribution per space: ○ specific requirements of any Green Travel Plan required. <p>Assets assumed from private developments will be subject to the process outlined for Footpath assets above.</p>

Asset Class	Renewal Methodology	New / Upgrade Methodology
Bridges	The renewal methodology for Bridges is based on Bridge Condition data. This data is uploaded to the Moloney system. The modelling software will produce a program of renewals for these assets.	There are currently no strategies or plans for new or upgraded bridges.
Signage	Renewal of signage is currently based on information collected in maintenance inspections. These renewals are identified and programmed utilising condition data collected by the maintenance contractor.	New signs are installed according to demand, drive by parking changes and traffic management improvement.
Traffic Management	Renewal of existing traffic management facilities or building new assets is triggered in response to a reported road safety risk. The Road Safety team are alerted of a risk, by the public, and will inspect the site to determine whether action will be taken. Renewal of signage is currently based on information collected in maintenance inspections. These renewals are identified and programmed utilising condition data collected by the maintenance contractor.	New traffic management facilities are installed when special need is identified.
Un-Constructed Laneways	Where abutting owners wish to have an unconstructed laneway paved a survey of all the abutting land owners is undertaken to assess whether there is strong support for a Special Rate or Charge Scheme. Where it is planned to construct laneway pavements, contributions by abutting land owners should conform to "Councils Policy for Ratepayer Contributions towards the Provision of New Infrastructure Assets – September 1998"	Where unconstructed laneways are not required for access, drainage or strategic purposes Council has a policy, "Discontinuance and Sale of Roads, Right of ways and Drainage Reserves", September 2007, which sets out principles to be adhered to for their discontinuance and sale to abutting land owners.

Appendix 6 – Road and Pathway Networks, Potential Risk from Climate Change

Road & Pathway Networks - Elements at Potential Risk from Climate Change		Reference <i>Infrastructure and Climate Change Risk Assessment for Victoria – CSIRO Report to the Victorian Government 2007</i>		
	Road/Pathway:			
	Issue of Concern:			
	Asset ID & Location (Address):			
Risk Scenario		Risk Assessment		
		Likelihood	Impact	Risk Rating
Road and Pathway Network				
<ul style="list-style-type: none"> Increased frequency and intensity of extreme rainfall events may cause significant flood damage to road, pathway and bridge infrastructure. Accelerated degradation of materials, structures and foundations may occur through increased ground movement and changes in groundwater. Increased temperature and solar radiation could reduce the life of asphalt on road surfaces. Increased temperature stresses the steel in bridges through expansion and increased movement. Increased temperature causes expansion of concrete joints, protective cladding, coatings and sealants on bridges. Lack of water for compaction increases maintenance costs for unsealed roads, especially in rural areas. Increased risk of wildfire can damage or destroy timber bridges and sealed pavements and result in high risk for tree damage close to roadways (falling trees). 	Roads - Sealed			
	Roads - Unsealed			
	Pedestrian pathways			
	Shared pathways			
	Kerb & channel			
	Roadside drains			
	Bridges - Roads			
	Bridges - Pedestrian & Shared Paths			

Risk Assessment Notes:

Likelihood:

Consequence/Impact:

Risk Rating:

Refer to AS/NZS 4360:2004 & Council's Risk Assessment Policy for guidance

Rate as Probable (likely to occur), Possible (may occur), or Improbable (conceivable but highly unlikely)

Use Council's risk assessment policy or AS/NZS 4360 to establish severity level of consequence

Use Council's risk assessment policy or AS/NZS 4360 to establish risk rating