



Roads Asset Management Plan 2024





Document Control					
Document ID: Roads Asset Management Plan – 2024					
Rev No	Date	Revision Details	Author	Reviewer	Approver
1.0	02/10/2024	First version for adoption	Shaphal Subedi		



Contents

CONTENTS	I
LIST OF FIGURES.....	III
LIST OF TABLES	III
1 EXECUTIVE SUMMARY	5
1.1 Recommendations	6
2 INTRODUCTION	8
2.2 Background.....	8
2.3 Alignment to Strategic Planning	11
2.4 Legislative Requirements	12
2.5 Plan Framework	13
2.6 Data Confidence	13
3 CURRENT STATUS OF ROADS ASSETS.....	15
3.1 Age Profile.....	15
3.2 Condition Profile	17
3.3 Technical Condition and Assessment.....	18
3.4 Recommendations	19
4 LEVELS OF SERVICE	20
4.1 Community Scorecard 2022	20
4.2 Asset Levels of Service Consultation	22
4.3 Community Service Requests	23
4.4 Recommendations	24
5 LIFE CYCLE MANAGEMENT	25
5.1 Operational and Maintenance Planning.....	28
5.2 Recommendations	30
6 RISK MANAGEMENT	31
6.1 Asset Criticality	33
6.2 Recommendations	33
7 FUTURE DEMAND	34
7.1 Population and Demographics	34
7.2 Industry Trend.....	35
7.3 Acquisition of Assets	36



7.4	Technological Changes	38
7.5	Climate Change	38
7.6	Change in road function and classification	38
7.7	Recommendations	39
8	FINANCIAL SUMMARY	40
8.1	Fair Value	40
8.2	Current Funding Levels	40
8.3.	Funding Strategies	41
8.4	Renewal Funding Gap Analysis.....	43
8.5	Maintenance Funding.....	50
8.6	Acquisition	50
8.7	Key Performance Indicators (KPI)	51
	Summary	52
8.8	Recommendations	53
9	IMPROVEMENTS, MONITORING, AND REVIEW	55
9.1	Performance Monitoring.....	55
9.2	Improvement Plan	55
9.3	Review Procedures	56
APPENDIX A	GLOSSARY	57
APPENDIX B	ASSET INFORMATION SUMMARY	60
	Roads - surfaces, pavements, and formations.....	61
	Roads - kerbs	63
	Road Bridges.....	66
	Bus Shelters.....	68
	Car Parks.....	71
	Roads Equipment.....	73



List of Figures

Figure 1-1: Life Cycle Summary (Roads – Like for Like; Bus Shelter, and Car Park)	6
Figure 2-1: City of Kalamunda Asset Portfolio	9
Figure 3-1: Age profile of roads	16
Figure 3-2: Age profile of assets other than roads	16
Figure 3-3: Condition profile of road surface and pavements	18
Figure 4-1: 2022 Community survey outcome summary- Building and maintaining local road.	21
Figure 4-2: 2022 Community survey outcome summary- traffic management.....	21
Figure 4-3: 2022 Community survey outcome summary- street sweeping.....	22
Figure 4-4: Community service requests related to Road's assets	24
Figure 5-1: Asset Life Cycle (Source: IPWEA, 2015).....	25
Figure 5-2: Maintenance expenditure 2018-2023.....	29
Figure 7-1: Forecast Population (Source: https://forecast.id.com.au/kalamunda)	34
Figure 7-2: Forecast age structure (Source: https://forecast.id.com.au/kalamunda).....	35
Figure 8-1: Roads Funding Gap Analysis (Like for Like for Condition 4 and 5).....	44
Figure 8-2: Roads Funding Gap Analysis (Upgrade to Asphalt in Urban Area).....	45
Figure 8-3: Bus Shelters Funding Gap Analysis Conditions 4 and 5	48
Figure 8-4: Car Parks Funding Gap Analysis (Condition 4 and 5)	49
Figure 8-5: Life Cycle Summary (Roads – Like for Like; Bus Shelter, and Car Park).....	53
Figure 9-1: Asset Management Improvement Plan for Roads Assets	55

List of Tables

Table 1-1: Projected Life Cycle Summary (Roads, Bus Shelters, and Car Parks)	5
Table 2-1: Summary of road assets covered in this AMP.....	9
Table 2-2: Road hierarchy	11
Table 2-3: Legislation and Regulations.....	12
Table 2-4: Data confidence	14
Table 3-1: Average age of each asset category	15



Table 3-2: Average Condition of Road Assets17

Table 4-1: Level of service responses22

Table 5-1: Roads asset life cycle activities26

Table 5-2: Maintenance expenditure percentage29

Table 6-1: Road assets risk assessment31

Table 6-2: Critical assets33

Table 8-1: Roads asset valuations as of 30/06/2023 (Millions)40

Table 8-2: Grant funding sources41

Table 8-3: Renewal Recommended funding scenarios46

Table 8-4: Maintenance and Operational expenditure and funding scenarios50

Table 8-5: Future expected funding scenarios51

Table 8-6: Definitions of Key Performance Indicators51

Table 8-7: KPI values of Roads assets 2023-203852



1 Executive Summary

Roads Asset Management Plan (AMP) details information about road assets including action required to provide a level of service most cost-effectively while outlining associated risks. The plan defines the service to be provided, how the service is provided, and what funds are required to provide the service generally over a 15-year planning period.

The Roads AMP covers the assets of the road comprising:

- Roads (627.3 kilometers)
- Kerbs (965.4 kilometers)
- Road Bridges (3 assets)
- Bus Shelters (174 assets)
- Car Parks (226,004 square meters)
- Road Safety Barriers (109 assets)
- Signs (223 assets)
- Traffic Management Devices (975 assets)

These assets have a significant value (replacement cost) estimated at \$378.03M. All the asset categories show a better-than-average condition of three. Condition three assets satisfy our current asset service level for these categories. In a 2023 community satisfaction survey, 80% of respondents stated that they are satisfied with the existing road surface condition, and traffic treatments and intersections to control and slow traffic are in acceptable conditions.

The projected lifecycle annual cost necessary to provide the services covered by this AMP includes the renewal, operation, maintenance, and acquisition of existing assets at condition 4 is presented below (Table 1.1 and Figure 1.1).

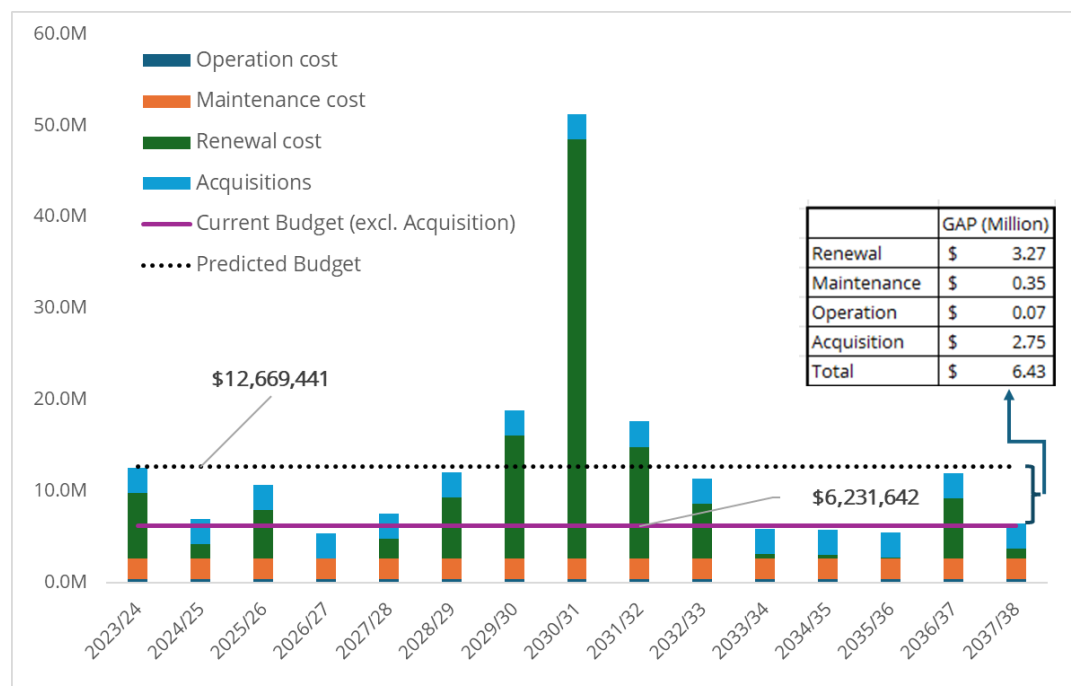
Table 1-1: Projected Life Cycle Summary (Roads, Bus Shelters, and Car Parks)

	Roads	Car Parks	Bus Shelters
Renewal (Like for Like)	\$6,632,771	\$447,844	\$228,334
Maintenance	\$2,060,000	\$92,000	\$30,000
Operation	\$420,000	\$6,486	-



Acquisition	\$2,748,506	\$3,500	-
-------------	-------------	---------	---

Figure 1-1: Life Cycle Summary (Roads – Like for Like; Bus Shelter, and Car Park)



The City needs to consider the following mitigation measures to avoid the risk:

- Establishing appropriate maintenance inspection schedules, intervention levels, and response times as part of a Maintenance Management Plan.
- Continuing with regular monitoring and condition rating of the road network
- Continuing with road bridge inspections.
- Continuing to plan for and seek funding.

1.1 Recommendations

Notable recommendations arising from the report include:

1. Increase the funding for the renewal of road assets (surface, pavements, and road equipment), bus shelters, and car parks.



2. Increase the funding for the maintenance and operation cost of road assets (surface, pavements, and road equipment), bus shelters and car parks.
3. Develop a Maintenance Management Plan to include routine defects inspection intervals, service standards (for example quality and timeliness of repairs), and performance measures.
4. The city implementing an Enterprise Resource Planning (ERP) system should improve the use of a new asset management system with maintenance management including mobile capacity for field crews conducting condition assessment and raising work orders linking with existing or new assets.
5. Develop a Kalamunda Moving Strategy which will include a major roads functional classification review aimed at improving access and safety.



2 Introduction

2.2 Background

The City has an Asset Management Policy that requires the creation of Asset Management Plans for each asset class. This Asset Management Plan (AMP) for the Roads asset class is the first major review of the original plan written in 2018.

The City is responsible for managing, operating, and maintaining the infrastructure asset classes for roads, pathways, drainage, parks, and buildings.

Asset Management Plans are developed for each asset class for the following purposes:

- Sustainable management of assets for the community,
- Inform the Long-Term Financial Plan,
- Document existing practices and identify opportunities for improvement,
- Meet legislative and reporting requirements,
- Support business cases and funding applications, and
- Support community and organisational needs.

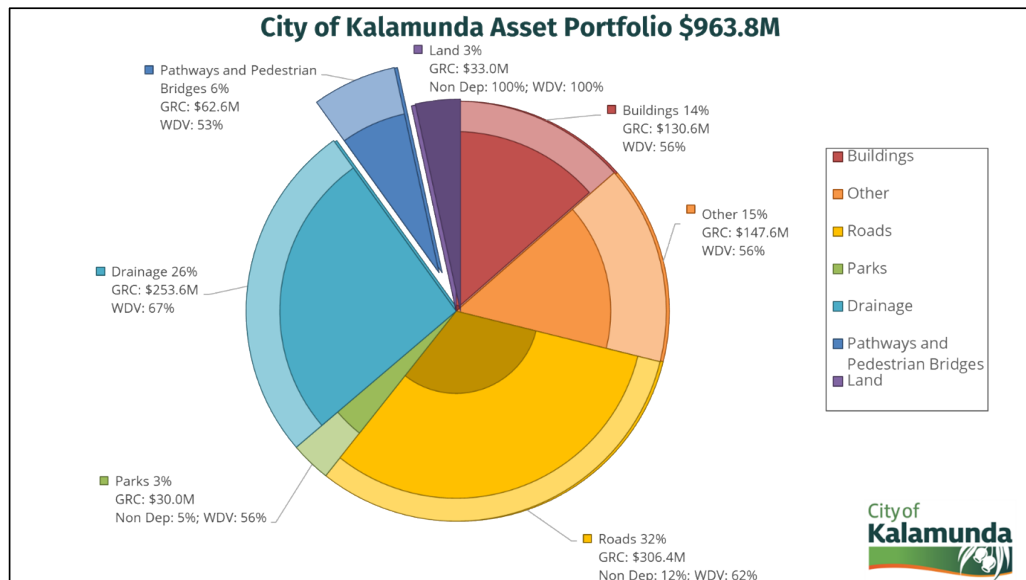
This document is informed by:

- Asset Management Council Policy (Policy C-ASS01)
- Asset Management Strategy 2017 - 2021
- Long Term Financial Plan 2023-2037
- 2022 Asset Levels of Service Survey Community Engagement Results
- Development Services future planning information

Roads are an important part of the City of Kalamunda's asset portfolio, comprising 32% of the total gross replacement value (see Figure 2.1 below).



Figure 2-1: City of Kalamunda Asset Portfolio (Gross Replacement Cost; Date: 30th June 2023)



Constructed assets included in this AMP are grouped into seven groups and their related inventory and financial data for individual assets are recorded within the City's corporate asset management system Assetic myData (Table 2.1).

Table 2-1: Summary of road assets covered in this AMP

Asset Category	Asset Details	Total Measure
Roads	Includes road surfaces, pavements, and formations within road reserves. 14.33km of City roads are gravel roads (unsurfaced). Excludes private roads and roads located within private properties.	627.33km
Kerbs	Kerbs are located along the edge of the roads and car parks	965.4 km
Bridges	Includes bridges located on roads for vehicle traffic. Pedestrian bridges will be covered under the Pathways AMP.	3 no's



Asset Category	Asset Details	Total Measure
Bus Shelters	Bus stop shelters maintained by the City. The concrete boarding pads at bus stops are excluded as they are managed by the Public Transport Authority (PTA)	174 shelters
Car Parks	Includes on-street and off-street car parks managed by the City. Privately managed car parks within shopping centre and other car parks within private properties are excluded.	316 assets covering an area of 226,004m ²
Roads Equipment	Semi-rigid and flexible barriers are erected on roadsides to prevent accidental damage to properties and people. Bollards and fences are included in the Parks AMP.	109 barriers with a total length of 11.62 km
Signs	Includes Facility sign, Information sign, Interpretive sign, Locality Sign, Memorial sign, Reserve sign, and Trail Sign but excludes road name signs.	223 Different types of signs
Traffic Management Devices	Includes roundabouts, median islands, and other local area traffic management devices.	975 Different Types of Traffic Management Devices

Further details of assets covered in this Roads AMP can be found in Appendix B: Asset Information Summary.

Landscaped road verges are not part of the Roads AMP and will be included in future revisions of the Parks AMP.

The road network consists of five hierarchies defined by the Main Roads Western Australia as shown in Table 2.2.

**Table 2-2: Road hierarchy**

Hierarchy	Predominant Purpose	Length of Roads within the City (km)
District Distributor A (DA)	High capacity and high traffic volumes traveling between industrial, commercial, and residential areas.	46.8
District Distributor B (DB)	Reduced capacity but high traffic volumes traveling between industrial, commercial, and residential areas.	27.4
Regional Distributor (RD)	Roads link significant destinations and are designed for the efficient movement of people and goods between and within regions.	38.8
Local Distributor (LD)	Movement of traffic within local areas and connect access roads to higher order Distributors.	80.0
Access Road (A)	Provision of vehicle access to residential properties	434.3

2.3 Alignment to Strategic Planning

The Roads AMP has been prepared to be aligned with the following objective and strategy of the City's Kalamunda Advancing 2031: Strategic Community Plan

- Objective 3.2 – To connect the community to key centre of activity, employment, and quality amenities.
 - Strategy 3.2.1- Ensures existing assets are maintained to meet community expectations.
 - Strategy 3.2.2- Provide and advocate for improved transport solutions and better connectivity through integrated transport planning.

The City's Corporate Business Plan (CBP) includes several priority actions for each Strategy.



2.4 Legislative Requirements

The City must meet the requirements of various Federal and State legislation and regulations. These main legislation and regulations related to road Asset Management are detailed in Table 2.3.

Table 2-3: Legislation and Regulations

Legislation	Requirement
Australian Standards (guidelines)	The national benchmarks for products and services.
Financial accounting standards AASB 116 "Property, Plant and Equipment" and AASB 13 "Fair Value Measurement".	Accounting for assets including valuations.
Local Government Act 1995 (WA) and subsidiary legislation including the following: Local Government (Financial Management) Regulations 1996. Local Government (Functions and General) Regulations 1996	The Act provides the principal legislative framework around which the roles, purpose, responsibilities, and power of local government as set out. Under the Act, regulations set out a minimum requirement for all WA local governments to develop and maintain a Strategic Community Plan and Corporate Business Plan. This compels the local governments to establish long-term service and asset strategies through robust asset management practices.
Main Roads Act 1930	The power to legislate the maintenance and works on public roads.
Occupational Safety and Health Act 2020 and subsidiary legislation including the following: Codes of Practice	The legislative requirements for organisations and individuals about occupational safety and health.
Planning and Development Act 2005	The legislative requirements for land use planning and development.
Road Traffic Act 1974 and Road Traffic Code 2000	Use and definition of roads and standards



Legislation	Requirement
Planning and Development Act 2005 and Regulations 2009	Roads were created as a result of development, and access to roads.
Land Administration Act 1997 and Land Management Regulations 2006	Creation and identification of road reserves.
Other Standards and Regulations	Other relevant legal requirements and standards include, but are not limited to: Austroads and Australian Standards (AS) All other relevant State and Federal Acts & Regulations All Local Laws and relevant policies of the organization

2.5 Plan Framework

Key elements of this AMP are:

- Current Status of Assets – describes age and condition of asset stock. (Refer to Chapter 3)
- Levels of service – specifies the levels of service to be provided by Roads Assets. (Chapter 4)
- Life cycle management – summary of how the City manages its existing and future assets to provide the required services. (Chapter 5)
- Risk Management – provides assessment of higher levels of risks to the City in providing service. (Chapter 6)
- Future demand – how this will impact future service delivery. (Chapter 7)
- Financial summary – what funds are required to provide the required services. (Chapter 8)
- Asset management improvement plan – key actions to improve the City's roads asset management. (Chapter 9)

2.6 Data Confidence

A qualitative assessment of the overall confidence of the data used in this Roads AMP is shown in Table 2.4.

**Table 2-4: Data confidence**

Data Set	Confidence Level (1- Certain - 5- Doubtful)	Comments
Asset age	2	Validation of age was conducted using historical aerial images.
Asset condition	1	Asset condition assessment and rating of all assets have been carried out within past two years.
Asset inventory completeness (inclusion of all assets)	1	All data collected.
Asset inventory accuracy (dimensions and material)	2	Road widths and construction materials have been validated. No validated data for pavement depth.
Replacement costs	2	As per the Fair Value valuation using industry standards.
Useful lives	2	As per the Fair Value valuation using industry standards.



3 Current Status of Roads Assets

A summary of the age and condition profiles of each asset category related to this AMP is shown in this section. Detailed information on individual asset categories is shown in Appendix B.

3.1 Age Profile

The average estimated age of each Roads asset category as per the City's asset register as of 30 June 2023 is summarised in Table 3.1. It also shows the average useful life across different types of assets within each category as per the City's 2023 Infrastructure valuation report (JLL, June 2023).

Table 3-1: Average age of each asset category

Asset Category	Average Age (years)	Average Useful Life
Roads - Surface	22.04	48
Roads - Pavement	39.49	80
Kerbs	36.31	80
Bridges	70.23	100
Bus Shelters	29.84	42
Car Parks - Surface	18.21	37
Car Parks - Pavement	27.03	60
Roads Equipment	14.98	50

The age of the surface and pavement are considered separately as pavements are long-life components and surfaces are short-life components. Normally, the surface is renewed several times within the life of the pavement. Most pavements are in their original state from when they were constructed.

Almost all the asset categories are nearly past half of their respective useful lives, indicating an ageing asset stock which may result in higher maintenance expenditure.

The age distribution of each Asset Category is shown graphically in Figures 3.1 and 3.2.



Figure 3-1: Age profile of roads

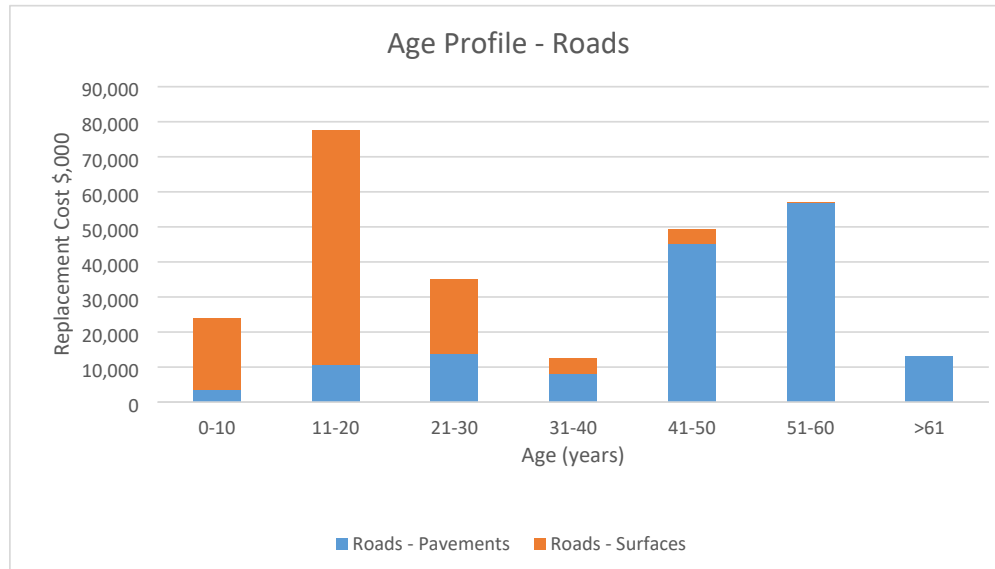
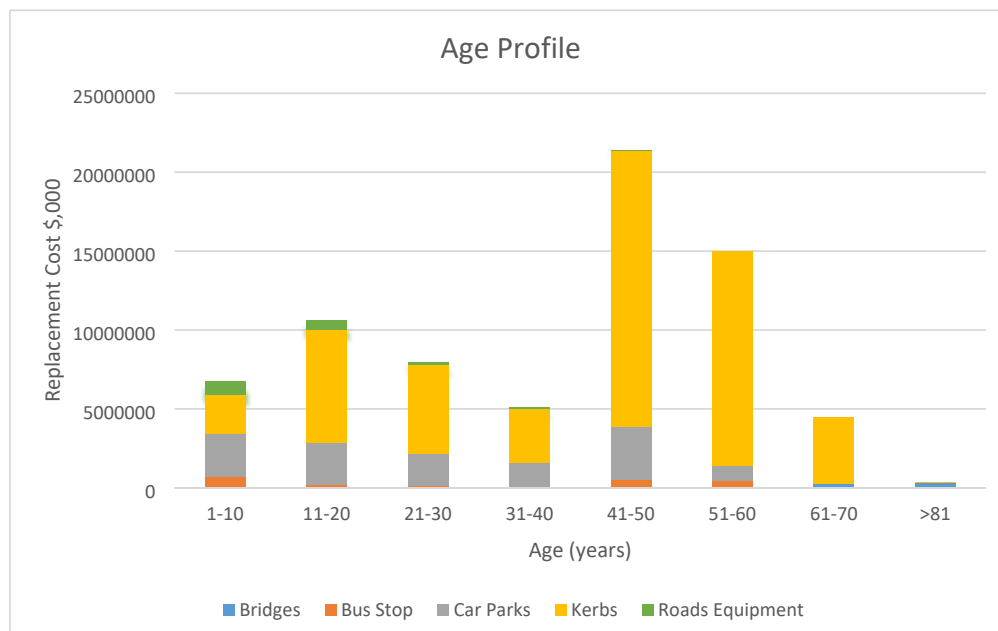


Figure 3-2: Age profile of assets other than roads





3.2 Condition Profile

The physical condition of each asset (excluding roads) is rated on a 1 to 5 scale, with 1 being new or very good condition and 5 being very poor condition. The condition of roads is assessed based on individual defects and then aggregated to create a condition index for surfaces and pavements.

The condition profiles shown below are based on condition rating surveys carried out during the 2022/23 financial year. Table 3.2 shows the average condition of each Roads asset category. Condition 1 represents an asset in new or very good condition, while a 5 represents an asset in very poor to unusable condition.

Table 3-2: Average Condition of Road Assets

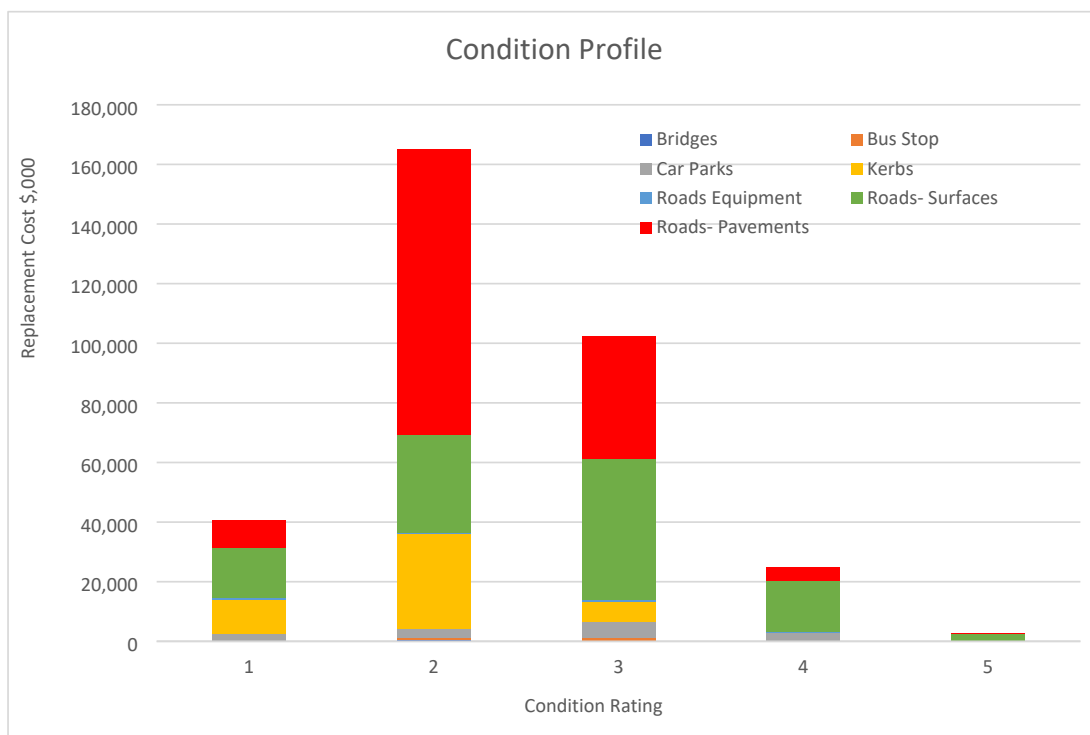
Asset Category	Average Condition
Road surfaces	2.76
Road pavements	2.23
Kerbs	1.92
Bridges	2.0
Bus Shelters	2.36
Car park surfaces	2.35
Car park pavements	2.1
Roads Equipment	1.94

All the asset categories show a better-than-average condition of three. Condition three assets satisfy our current asset service level for these categories.

The replacement costs for each Asset Category for each condition rating are detailed in Figure 3.3.



Figure 3-3: Condition profile of road surface and pavements



3.3 Technical Condition and Assessment

While the pavement condition based on current defects is in very good condition for the City's Road network, some of the recent detailed pavement investigations indicate that the structural capacity of distributor roads will become inadequate within the next decade. Increasing the structural capacity of high-volume roads involves major renewal or total reconstruction of pavements and requires significant capital investment.

More technical investigations are required for pavements, such as a Falling Weight Deflectometer and core sampling.

The overall physical condition of road surfaces is good (average 2.76), however, there is a considerable number of roads that have surfaces older than 30 years. The average useful life of road surfaces is 48 years (refer to Section 3).

Surfaces that are older than the expected life can experience:

1. Rapid deterioration towards the end of their useful life, and



2. Community requests to upgrade the surfacing of older residential streets from sprayed seals to asphalt to meet current community aesthetic and road noise expectations.

3.4 Recommendations

Based on the asset conditions, the following are recommended:

- Conduct structural investigations of pavements such as Falling Weight Deflectometer testing and core sampling for high-priority roads.



4 Levels of Service

The level of service is the outcome received by users of a particular service which provides the basis for all life cycle management activities. The International Infrastructure Management Manual (IPWEA, 2015) defines the level of service as “the parameters or combination of parameters that reflect social, political, economic and environmental outcomes that the organization delivers”.

Community Levels of Service relate to how the community perceives the service in terms of safety, quality, quantity, reliability, responsiveness, cost/efficiency, accessibility, and legislative compliance.

Supporting the Community Levels of Service are operational or technical measures of performance (Technical Levels of Service), which are developed to ensure that the minimum community levels of service are met. These technical measures relate to service criteria such as quality, availability, and safety.

The City needs to commit to annual funding to deliver acceptable service standards for the road assets. These funds provide for the regular maintenance, upgrade, and timely replacement or renewal of assets. The community is directly impacted if the assets are not maintained and renewed at the accepted service levels.

The following sections 4.1 and 4.2 detail the City’s endeavours to gain an understanding of the community’s expectations of levels of service for Road’s assets.

4.1 Community Scorecard 2022

In 2022 the City commissioned Catalyse Pty Ltd. to conduct a community survey to evaluate community priorities and measure the City’s performance against key indicators in the Strategic Community Plan. While this survey is not intended directly for asset management, the survey outcomes can be considered as an indicator of community satisfaction with current road service levels and can be correlated to road asset conditions to gauge the technical level of service.

The following figures show the summary of outcomes related to the roads (Catalyse Pty Ltd, June 2022). 73% of the respondents indicate a positive performance (excellent, good, or ok) for the City’s Road maintenance and 80% on traffic management and control on local roads (Figure 4.1, Figure 4.2, and Figure 4.3). The performance index score of the City is below the average of other participating councils in WA.



Figure 4-1: 2022 Community survey outcome summary- Building and maintaining the local road

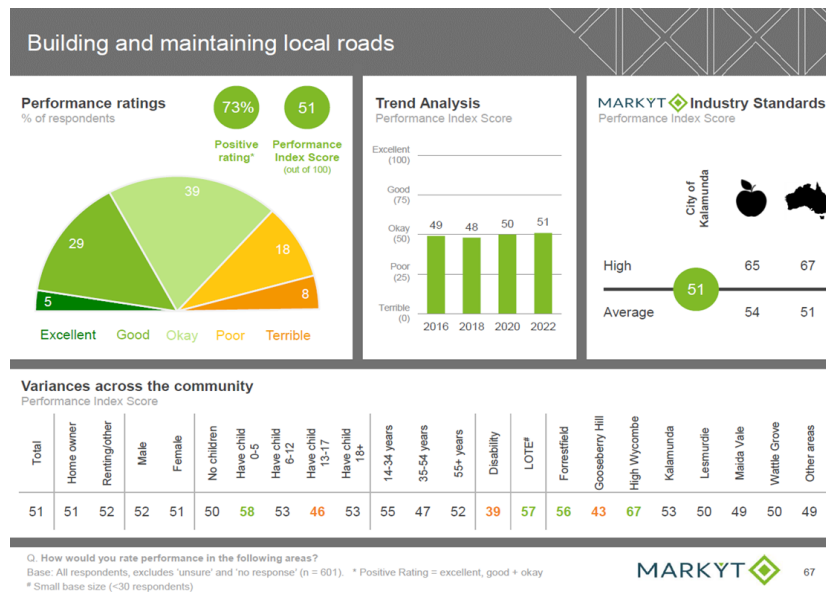


Figure 4-2: 2022 Community survey outcome summary- traffic management

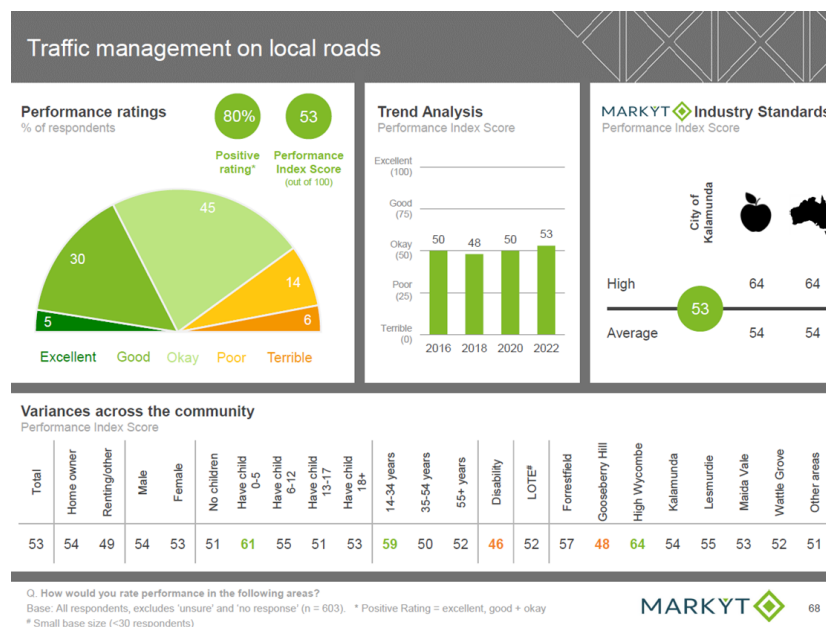
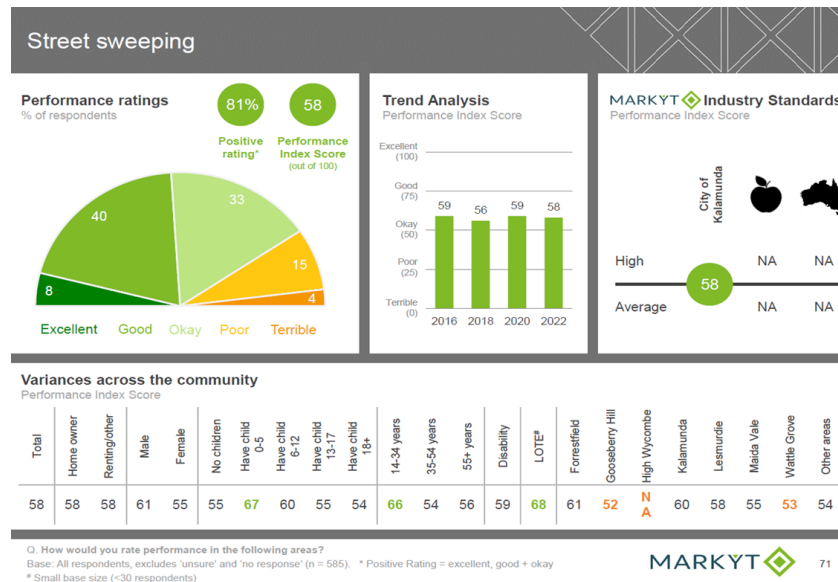




Figure 4-3: 2022 Community survey outcome summary- street sweeping



4.2 Asset Levels of Service Consultation

In February and March 2024, the City conducted a community asset level of service consultation through an online questionnaire.

Table 4.1 details the percentages of respondents agreeing and disagreeing with the various statements in the questionnaire, related to road assets.

Table 4-1: Level of service responses

Item No	Statement	Agree (%)	Disagree (%)	Neither Agree or Disagree (%)
1	The road surfaces in the City of Kalamunda are in an acceptable condition	53	35	12
2	The street lighting in the City of Kalamunda is sufficient	50	30	20
3	Roads have a sufficient level of lighting when driving at night in the City of Kalamunda	45	31	24



Item No	Statement	Agree (%)	Disagree (%)	Neither Agree or Disagree (%)
4	I do not experience visual obstructions at intersections or corners whilst driving in the City of Kalamunda	32	57	11
5	I do not experience many traffic delays in the City of Kalamunda	28	61	11
6	Speed limits in the City of Kalamunda are sufficient	66	23	11
7	Traffic treatments e.g. speed humps, islands, chicanes, and intersections to control and slow traffic are acceptable	37	16	48

According to Item 1, half of the respondents agreed that road surfaces and enough street lighting in the City of Kalamunda are in acceptable condition. The maximum satisfaction is for the speed limits in the City of Kalamunda.

Items 2 to 6 are related to the road amenity (Street lighting) which will be addressed through future asset and maintenance management plans.

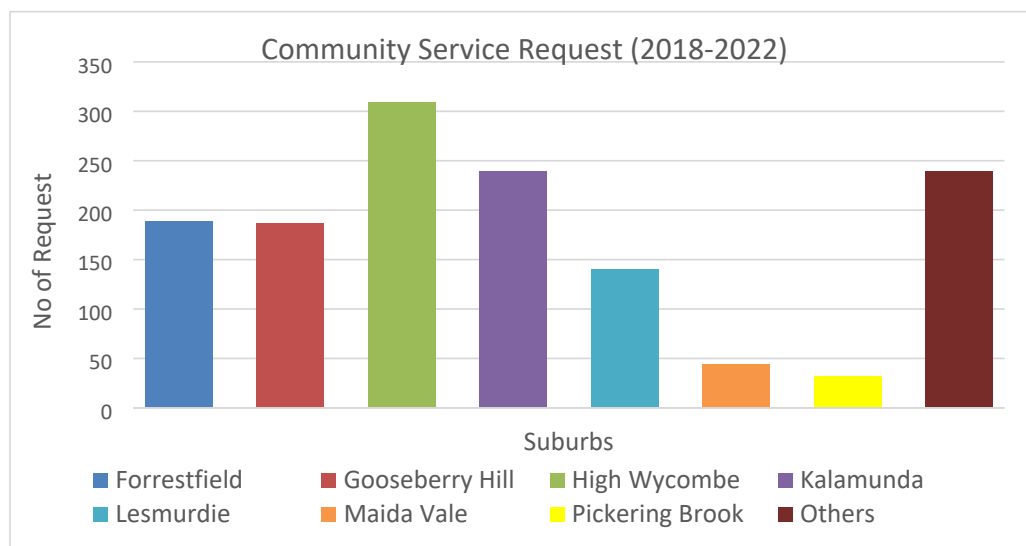
4.3 Community Service Requests

The number of requests received from the community relating to the services provided by the City is an indicator of the community's perception of the level of service.

Figure 4.4 shows the total number of requests about roads (including road verge and lighting issues), kerbs, car parks, bridges, safety barriers, signs (including speed signs), and traffic-related issues within the last 5 years. Most requests are from High Wycombe (275) which corresponds to the higher population areas. In comparing the previous RMP 2018, which is 22% less residents request in High Wycombe.



Figure 4-4: Community service requests related to Road's assets



4.4 Recommendations

Only one recommendation is identified from the Levels of Service reviews, as follows:

- Improve the City's customer request recording system by linking requests to appropriate asset categories and where feasible, to individual assets in the asset register.



5 LIFE CYCLE MANAGEMENT

New roads are mostly built as part of new subdivisions including duplication, extension, and upgrading of existing roads. Subdivision roads are built by the developers and are gifted to the City. Some of the road upgrade works are undertaken by Main Roads WA and then handed over to the City.

Road assets are maintained by the City throughout their useful life and their performance and condition are monitored to ensure that they deliver a satisfactory service to the community at an appropriate cost.

The ability to meet the levels of service is determined, in part, by how these assets are managed through their useful life. When assets do not perform as required, they are renewed, upgraded, or disposed of (Figure 5.1).

Figure 5-1: Asset Life Cycle (Source: IPWEA, 2015)



A summary of various activities undertaken during the life of road assets is detailed in **Error! Reference source not found..**

**Table 5-1: Roads asset life cycle activities**

Life Cycle	Description
Identify Need (Developments)	New roads are generally gifted by private parties through subdivision developments, which in turn arise from town planning. The standard that guides subdivisional road construction in the City is the Local Government Guidelines for Subdivisional Development (IPWEA, 2016).
Identify Need (Upgrades)	<p>The need for other assets on existing roads is considered on a case-by-case basis such as:</p> <ul style="list-style-type: none"> • New kerbing is generally installed when a road or car park is being upgraded. • Installation of new bus shelters based on level of need. • New car parks are created to cater to facility demands. <p>Road equipment is installed to address identified safety issues.</p> <p>Road asset upgrades mostly consist of</p> <ul style="list-style-type: none"> ○ Intersection upgrades due to increased traffic or safety issues. ○ Upgrading road safety barrier end treatments to meet current standards.
Plan, Design, Create / Build	Assets not gifted as a result of developments are projects managed by the City, which includes planning, designs, and construction.
Operate/ Maintain	<p>After construction, assets are operated and maintained including:</p> <ul style="list-style-type: none"> • Road sweeping • Tree pruning • Waste removal <p>Major maintenance activities include:</p> <ul style="list-style-type: none"> • Road surface and base maintenance (pothole patching, crack sealing, etc.) • Kerb maintenance (replacing damaged kerbs) • Gravel road grading • Road verge/ shoulder maintenance



Life Cycle	Description
	<ul style="list-style-type: none"> • Crossover and line marking maintenance. • Bus shelter maintenance (side panels and bench seat replacement, painting, etc.) • Installation and maintenance of fences, barriers, guideposts, and signage
Rehab/Modify (Renewal)	<p>Renewing road and car park surfaces and pavements is one of the City's largest expenses. Road renewal works are complex and require a high level of technical skills in selection, planning, design, and delivery. The condition data for the whole road network was collected in 2022/23. The collected data and treatment matrix are then used within the City's asset predictive modelling tool (Assetic Predictor) to identify the road sections for renewal. This forms the basis for the City's 15-year Long Term Financial Plan.</p> <p>Predictive modelling has also been carried out for two other major asset categories car parks and bus shelters.</p> <p>The City's current road, car park, and bus shelter renewal programs are as follows:</p> <ul style="list-style-type: none"> • Surfacing and pavement renewal works on distributor network roads and are mostly grant-funded. • Surfacing renewal on access and local distributor roads (residential roads) • Renewal of on-road car parks carried out with road renewal works. • Renewal of off-street car parks is generally considered on a case-by-case basis or considered under renewal/ upgrade to the related community facility. • Renewal of bus shelters is carried out on a case-by-case basis. <p>The renewal of other asset categories is carried out as follows</p> <ul style="list-style-type: none"> • Kerb renewals are carried out as part of road renewal works or under maintenance works. • Road bridge renewal works are fully funded and carried out by the MRWA.



Life Cycle	Description
	<ul style="list-style-type: none">Full or partial renewal of safety barriers is mostly done under maintenance works when the barriers get damaged.
Dispose	Disposal requirements are assessed on an individual case-by-case basis.

5.1 Operational and Maintenance Planning

The City currently has various maintenance programs and emergency response mechanisms for the road assets, it is recommended to develop and document a formal maintenance / operational plan that is linked to the City's overall Asset Management and corporate goals. This plan is required to address key service delivery risks and be able to help meet community expectations.

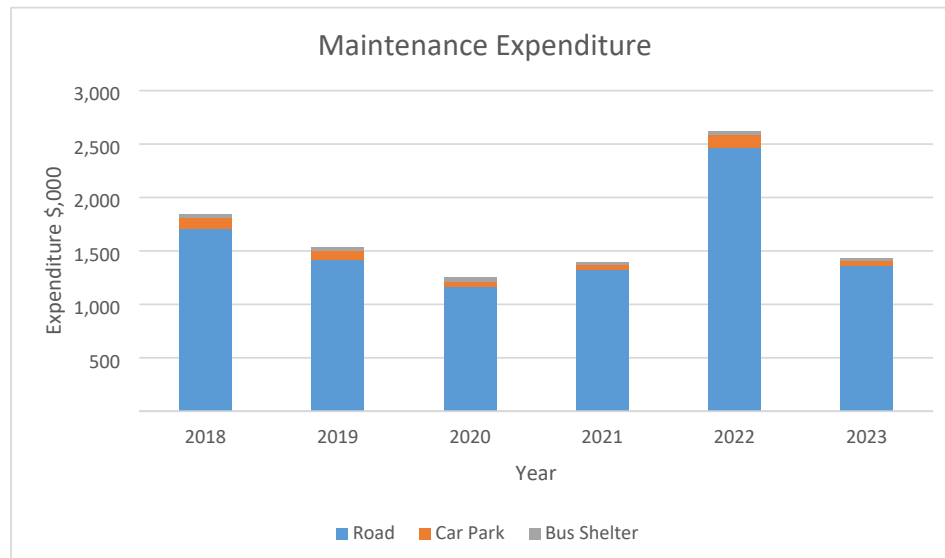
Operational and maintenance planning involves taking a structured approach to developing asset operational plans and procedures and generally consists of the following activities (IPWEA, 2015):

- Establishing operational objectives and intervention criteria
- Developing maintenance plans and procedures
- Developing operational process plans
- Planning for emergencies, crises, and incidents
- Operational structure and support requirements, and
- Operational improvements.

The City's current work order and complaints recording system is not efficient in extracting information on maintenance work types, costs, and identification of assets on which the maintenance is carried out. This is one of the key barriers to maintenance planning and asset life-cycle costing, this information is needed to identify optimum renewal intervention levels for the renewal of assets.

It is recommended to investigate the use of a maintenance software system with mobile capability with a new Enterprise Resource Planning (ERP) system.

The following graph (Figure 5.2) shows the breakdown of the City's annual maintenance expenditure related to roads (including kerbs, safety barriers, and signs), car parks, and bus shelters.

**Figure 5-2: Maintenance expenditure 2018-2023**

Following Table 5.2 shows the average annual expenditure as % of replacement value.

Table 5-2: Maintenance expenditure percentage

Asset Category	Annual average expenditure (2021 to 2023)	% of total gross replacement value
Roads (including kerbs, safety barriers, bridges, and signs)	1,715,000	0.5
Bus Shelters	25,000	1.4
Car Parks	76,000	0.6

The amount of maintenance expenditure is generally a reflection of the organization's level of service preference and the condition of its asset stock. The typical maintenance expenditure percentages for high-value infrastructure assets (e.g. roads, bridges, car parks) vary between 0.1% to 0.6% as per the Local Government & Municipal Knowledge Base.



5.2 Recommendations

- Develop a Maintenance Management Plan to include routine defects inspection intervals, service standards (for example quality and timeliness of repairs), and performance measures.
- Investigate the use of new software for improved maintenance management including mobile technology, and integration with financial system and asset management systems.
- Identify high-maintenance car parks and explore the possibility of developing cost-effective renewal projects.



6 Risk Management

An assessment of risks associated with road assets has been undertaken per the City's risk matrix. This assessment has identified several high risks to the City, as shown in Table 6.1.

Table 6-1: Road assets risk assessment

Potential Hazardous activities	Likelihood	Consequence (What can happen?)	Risk Level (Inherent)	Recommended Risk Treatment	Risk Level (Residual)
Injury to the public arising from asset defects such as potholes, edge breaks, damaged kerbing, bus shelters and Roads Equipment.	Almost certain	Moderate (Health and Safety)	High	Establish appropriate maintenance inspection schedules, intervention levels and response times as part of a Maintenance Management Plan.	Medium
Premature or rapid deterioration of road condition	Possible	Significant (Financial)	High	Regular monitoring and condition rating of road network	Medium
Bridge failure	Rare	Critical	High	1. The City is currently undertaking annual Level 1 visual bridge maintenance inspections 2. MRWA undertakes five yearly Level 2	High



Potential Hazardous activities	Likelihood	Consequence (What can happen?)	Risk Level (Inherent)	Recommended Risk Treatment	Risk Level (Residual)
				structural inspections	
Excessive traffic delays arising from failures in the road network	Possible	Significant (Reputation)	High	Plan for emergencies by developing a Maintenance Management Plan that includes emergency responses to asset failures.	Low
Lack of renewal funding	Unlikely	Significant (Financial)	Medium	Continue to plan for and seek funding.	Low
Major natural events (e.g. bush fire, flood, earth slip, extreme weather) leading to severe damage or failure of the assets	Rare	Critical	High	Respond to major events as per the City's Emergency Management Plan. It covers the whole spectrum of emergency needs, including prevention, preparedness, response and recover.	High

Assessment of job safety risks for the personnel involved in asset service delivery (for example maintenance) are not included in this Roads AMP. Such job-specific assessments are done routinely according to the City's Occupational Health and Safety policies and procedures.

The assessment of corporate-level risks affecting the organization as an entity is



undertaken within the City’s corporate risk assessment process.

6.1 Asset Criticality

Identification of critical assets is essential for risk minimization and budget optimization. **Error! Reference source not found.** details the definitions of assets that are considered critical within their asset category.

Table 6-2: Critical assets

Asset Category	Definition of Critical Assets
Roads	District Distributor A, B, and Regional Distributor roads totalling 113km.
Kerbs	Kerbs on critical roads and areas with identified drainage and erosion issues
Bridges	Timber Road Bridge No. 827 is located on Mundaring Weir Rd.
Bus Shelters	Shelters at bus stops with more than 40 boarding passengers per day. There are 4 critical bus stops within the City as per the March 2023 statistics provided by the Public Transport Authority.
Car Parks	Car parks (see Appendix B for details with condition 5)
Roads Equipment	Barriers on critical roads or on roads where the posted speed is greater than 60km/h

Apart from the definitions above, the City does not currently have a method of managing critical assets differently.

6.2 Recommendations

- Develop a criticality assessment process for road assets such that criticality is considered when considering new, renewal, and funding needs and priorities.



7 Future Demand

Changes that drive demand for road assets may include growth in population demographic changes, land use changes, and new technologies. These changes will have an impact on services provided by the road assets and the asset life cycle activities detailed in Section 5. The demand is managed through a combination of maintaining and upgrading existing assets, providing new assets, and non-asset solutions.

Changes to the usage of the road network can also impact the extent of assets managed by the City, for example, where a road is reclassified to a higher-order road it may then fall under the management of Main Roads WA.

7.1 Population and Demographics

The population prediction conducted indicated that the population in the City to grow by 15.25% or 9,721 persons during the period 2024 – 2046 (Figure 7.1). Further, between 2021 and 2031, the age structure forecasts for the City of Kalamunda indicate a 13.2% decrease in the population under working age, a 34.7% increase in the population of retirement age, and an 11.2% increase in the population of working age (See Figure 7.2). General growth in the population will drive the increase in personnel vehicle traffic and public transport patronage.

Figure 7-1: Forecast Population (Source: <https://forecast.id.com.au/kalamunda>)

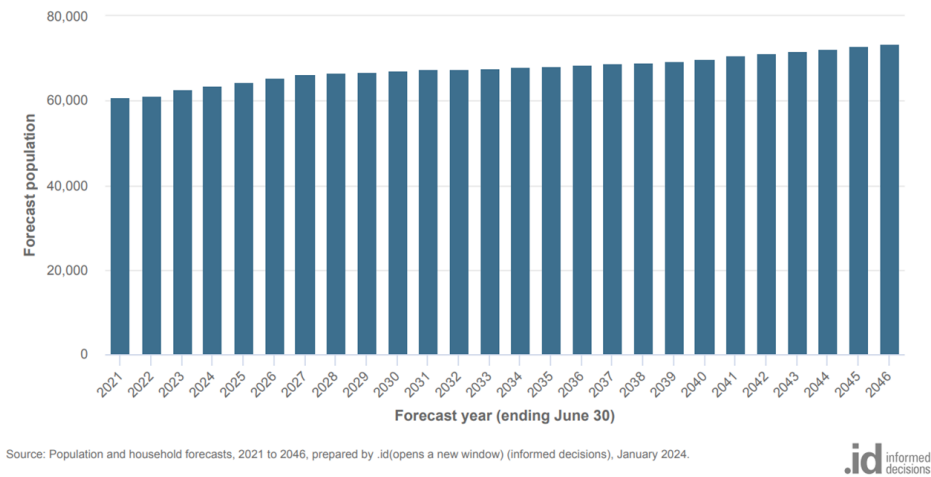
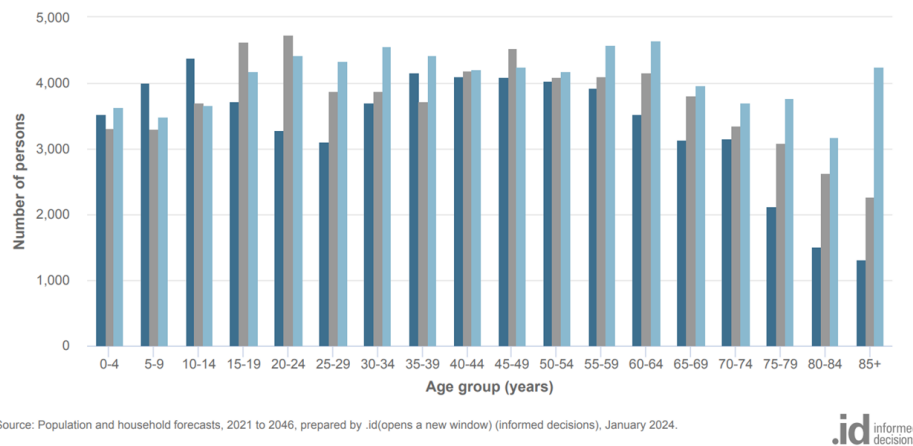


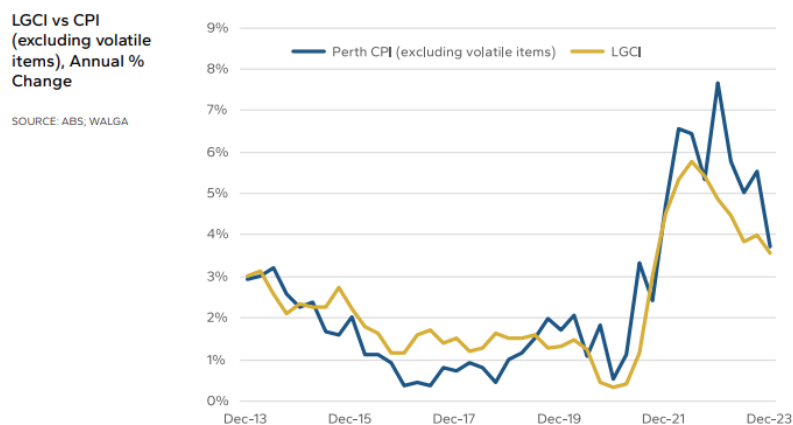


Figure 7-2: Forecast age structure (Source: <https://forecast.id.com.au/kalamunda>)



7.2 Industry Trend

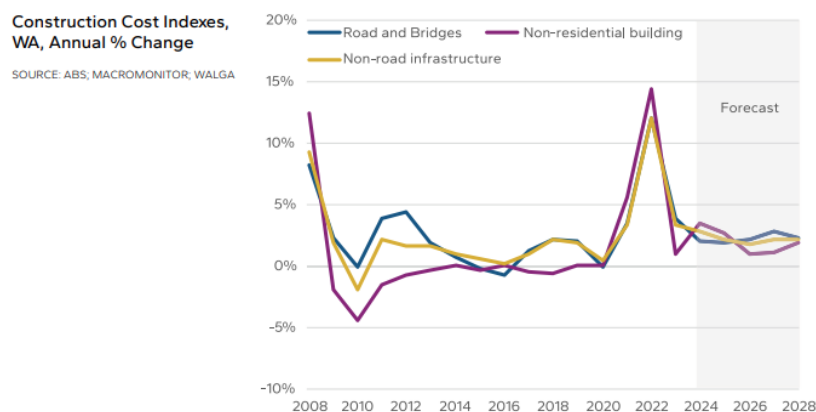
The WALGA Economic Briefing for March 2024 shows the below graph showing the % Change in Perth CPI and the LGCI. The Local Government Cost Index (LGCI) increased by 0.8% in the December quarter, down from 1.3% in September. Over the year to December, the LGCI increased by 3.5%, down from the 4.8% recorded in December 2022. The LGCI is forecast to fall to 3.1% in 2024-25 and then 2.8% in both 2025-26 and 2026-27. As construction cost growth eases, employee costs are the main driver of cost growth for local governments.





Likewise, The WALGA Economic Briefing for March 2024 shows the below graph shows Construction Cost Indexes, WA, Annual % Change for non-residential building, non-road infrastructure, and Roads and Bridges. The report explained that construction costs have steadied after the recent increases as demand weakens and the supply-chain constraints ease. While the cost of materials is easing, construction wages are rising rapidly.

The bitumen price closely tracks the oil price, which has fallen from its recent highs driven by the post-pandemic stimulus and the geopolitics surrounding the war in Ukraine. Forecasts in 2023-24 for cost increases for bitumen (+5.1%) and asphalt (+4.7%) are more modest and expected to continue to grow slower in the coming years.



7.3 Acquisition of Assets

An asset may also be acquired at no upfront capital cost directly to the Council from the major land developments, development contribution plan (DCP), and other stakeholder projects (MainRoads, Western Power, Public Transport Authority).

Major developments that are expected to generate higher demand for the City's Roads Assets are:

- Forrestfield- Airport Link - High Wycombe Train Station – (suburb – High Wycombe)
- Lot 25 Gilba place, Maida vale-- (Suburb – Maida Vale)
- 12 Bruce Road, Wattle Grove — (Suburb – Wattle Grove)



- The Hales Estate, Forrestfield — (Suburb – Forrestfield)
- Lot 50 Lawnbrook Rd, Walliston — (Suburb – Williston)
- Lot 6 and 9006 Hale Road, Wattle Grove — (Suburb – Wattle Grove)
- Adelaide Street, High Wycombe Train Station – (Suburb – High Wycombe)
- Lot 9050 Arthur Road, Lot 9005 Gemina Avenue, and Lot 9006 Hale Road, Wattle Grove – (Suburb – Wattle Grove)
- Lots 4 & 500 Hale Road, Wattle Grove – (Suburb – Wattle Grove)
- 655 Welshpool Road East, Wattle Grove – (Suburb – Wattle Grove)
- 980 Abernethy Road, High Wycombe (Suburb – High Wycombe)
- 291 Berkshire Road, Forrestfield— (Suburb – Forrestfield)
- Lot 45 Subdivision, Milner Road- (Suburb- High Wycombe)

Likewise, the excepted DCP contributed Road Assets Projects are:

- Berkshire / Ashby Stage 2 Seagul island
- Bonser Road Stage 2
- Milner Road (Berkshire Road- Sultana Road West)
- Sultana Road West Intersection Upgrade
- Milner Road (Sultana Road West- Stewart Road)
- Milner Road (Stewart Road – Maida Vale Road)
- Raven Street Connector
- TOD Connector (Edge of TOD Precinct – Roe Highway)
- Stewart Road (Milner Road - Brae Road)
- Brae Road (TOD Connector – Brand Road)
- Brand Road (TOD Connector – Brae Road)
- Sultana Road West (Edge of TOD Precinct – Cul-de-sac)
- Milner Rd / Stewart Road Intersection
- Milner Rd / Raven Street Intersection
- TOD Connector / Brand Road Intersection
- TOD Connector / Brae Road Intersection
- Brae Rd / Brand Rd Intersection
- TOD Connector / Brae Road/ Raven Street Intersection
- Brae Rd / Stewart Rd Intersection
- Welshpool Rd/ Coldwell Intersection



These developments will also result in a significant amount of gifted assets to the City requiring an increase in the operational and maintenance activities. It is also required to ensure that the revenue increase from these developments is sufficient for the long-term maintenance and renewal needs of these gifted assets.

The increase in traffic, and heavy vehicles due to industrial and commercial developments, will shorten the life of the City's Road network. Conducting a non-destructive pavement investigation on the City's distributor road network using a Falling Weight Deflectometer and targeted coring for validation and further investigations is recommended.

7.4 Technological Changes

The key technological change affecting Road's assets is the proliferation of car ride-share services (e.g. Uber) and the advent of autonomous and connected vehicles. The changes are expected to impact vehicle numbers and their mass, parking requirements, public transport passenger numbers, and road signage.

Some other activities the City can incorporate include:

Infrastructure Modifications

- Eliminate/reduce parking and add more drop-off and pick-up locations.
- Add electric vehicle (EV) charging infrastructure. The range of the latest EVs is typically 250-600km now, and fast charging can allow a top-up to 80% in about 20 mins.
- Use of new recycled products in road resurfacing recommended by Main Roads.

It is recommended to prepare guidelines along the above lines, for consideration when undertaking early stages of major development work.

7.5 Climate Change

Climate change can have direct and indirect impacts on road infrastructure. Increasing rainfall intensity may impact the road surface and pavement lifecycle.

7.6 Change in road function and classification

The City is currently planning for Welshpool Road East, Abernethy Road, and Canning Road to be prepared to a suitable status for transfer to Main Roads WA's responsibility.



7.7 Recommendations

- Continue to progress the Main Roads WA Road Re-classification of Canning Road, Welshpool Road East, and Abernethy Road.
- Review the safety factors for roads and quantify the future demand.
- Prepare a guideline to ensure future transport and road network planning needs are considered when preparing higher-order land use planning.



8 Financial Summary

This section contains the details financial status, current funding levels, and future funding requirements of Roads Assets. The funding requirement projections are based on the level of service preferences detailed in Section 4.

The summary includes roads that may be transferred to Main Roads WA's responsibility in the future. Once the reclassification is completed, the projections can be adjusted accordingly.

8.1 Fair Value

The City, through an external consultant, undertook a comprehensive Fair Value valuation of its Road Assets for the 2022/23 financial year. The current fair values of Road Assets as reported for the year ending on 30th June 2023 are shown in Table 8.1.

Table 8-1: Roads asset valuations as of 30/06/2023 (Millions)

Asset Category	Total Replacement Value	Written Down Value	Accumulative Depreciation
Roads	\$306.4	\$189.7	\$116.7
Kerbs	\$54.07	\$26.08	\$27.99
Road Bridges	\$0.55	\$0.19	\$0.36
Bus Shelters	\$2.01	\$1.04	\$0.97
Car Parks	\$13.26	\$7.44	\$5.82
Roads Equipment	\$1.74	\$1.25	\$0.49
All Asset Categories	\$378.03	\$222.7	\$155.33

8.2 Current Funding Levels

The City's current 15-year total funding allocations for Roads, Bus Shelter, and Car Park renewal including grant funding is \$4,000,000 per year.



8.3. Funding Strategies

The City actively seeks to maximize the funding income from external sources as a key strategy for asset renewal and upgrades. Details of current external funding sources and objectives are detailed in Table 8.2.

Table 8-2: Grant funding sources

Funding Program	Funding Source	External Funding Available	Annual External Funding (As Applicable)	City Contribution Required
Direct Grants	State Government / Grants Commission	Annual Allocation based on Metropolitan Funding Pool and size of City's Road Network	\$354,348	Nil
Metropolitan Regional Road Group (MRRG) – Road Rehabilitation	State Government / Main Roads WA	Annual Program based on Metropolitan Funding Pool. Maximum of \$900,000 per year per Local Government.	\$900,000	1/3rd of the total project cost
MRRG – Road Improvements	State Government / Main Roads WA	Annual Program based on Metropolitan Funding Pool. Maximum of \$5 million per year per Local Government.	\$2,000,000	1/3rd of the total project cost
Roads to Recovery (R2R)	Federal Government / Federal Government	Allocated based on Federal funding pool. The current five-year program will start in 24/25.	Total- \$6,364,600 2024-25: \$940,225 2025-26: \$1,157,200 2026-27: \$1,374,175 2027-28: \$1,446,500 2028-29: \$1,446,500	



Funding Program	Funding Source	External Funding Available	Annual External Funding (As Applicable)	City Contribution Required
Commodity Routes Supplementary Fund (CRSF)	State Government / Main Roads WA	Considered on a case-by-case basis.	No included	One-third of the total project cost
National Black Spot Program	Federal Government / Main Roads WA	Allocated based on Federal funding pool. Maximum of \$2 million per year per Local Government.	\$500,000	Nil
State Black Spot Program	State Government / Main Roads WA	Allocated based on State Government funding pool. Maximum of \$5 million per year per Local Government.	\$1,500,000	One-third of the total project cost
Bridge Special Projects Program	State Government / Main Roads WA	Considered on a case-by-case basis based on works priority determined by MRWA.	Not included	Nil
New Bus Shelter Program	State Government / Public Transport Authority (PTA)	50% Contribution from PTA for Bus Stops with an average weekday boarding passenger count of 15 or greater	\$7000 per bus shelter	Half of the total project cost
Bus Shelter Maintenance Scheme	State Government / PTA	Allocation is based on the Metropolitan funding pool and qualifying bus shelters under the scheme.	\$30,000	Nil



The following actions will continue to be undertaken by the City to maximize the funding income from the above various funding sources.

- Maintain up-to-date road data in the myData AM System to ensure data is transferred between myData and Main Roads WA IRIS system for Direct Grant funding annual allocation.
- Conduct network-wide and road condition assessments to pre-select road sections with maximum funding possibility through MRRG Road Rehabilitation, MRRG Road Improvement, Commodity Route, and Roads to Recovery Programs.
- Analyse road crash data to identify road intersections or road sections for the National and State Blackspot Funding Programs.
- Undertake annual inspections of Road Bridges to identify specific maintenance works for the Bridge Special Projects Program.
- Identify bus stops with an average weekday boarding passenger count of 15 or greater for subsidy applications to PTA for new bus shelters.
- Submit City Bus Shelter numbers annually to PTA for the Bus Shelter Maintenance Scheme annual allocation.

8.4 Renewal Funding Gap Analysis

The funding 'gap' is a measure of shortfall (or excess) in current funding compared to the funding required to provide desired levels of service. Currently, the level of service desired by the community for renewals is being met.

The Current Roads predictive modelling shown in Figure 8.1 (Like for Like replacement at conditions 4 and 5), and Figure 8.2 (Upgrade to asphalt from spray seal in Urban areas at conditions 4 and 5) below, indicates that the levels of funding allocated are insufficient for a few years and a few years surplus with annual renewal allocation.

- For Like-for-Like replacement (Spray seal will be replaced with spray seal)- The overall funding gap of 2.7 million per year for condition 5 assets and 2.8 million per year for condition 4 assets over the next 15 years (Table 8.3).
- For upgrade to asphalt from spray seal in urban areas- The overall funding gap of 4.3 million per year for condition 5 assets and 4.5 million per year for condition 4 assets over the next 15 years (Table 8.3). The asphalt provides smoother



surfaces with less road noise. All new residential roads are built with asphalt surfaces.

The deficit of funding in the predictive model is triggered by the useful life of the assets when it reaches condition 5. In the graph, there are conditions of 5 triggered peaks due to road surfaces and pavements reaching the maximum useful life, however, this backlog will be cleared over the period, with the funds allocated equally over the 15 years.

Figure 8-1: Roads Funding Gap Analysis (Like for Like for Condition 4 and 5)

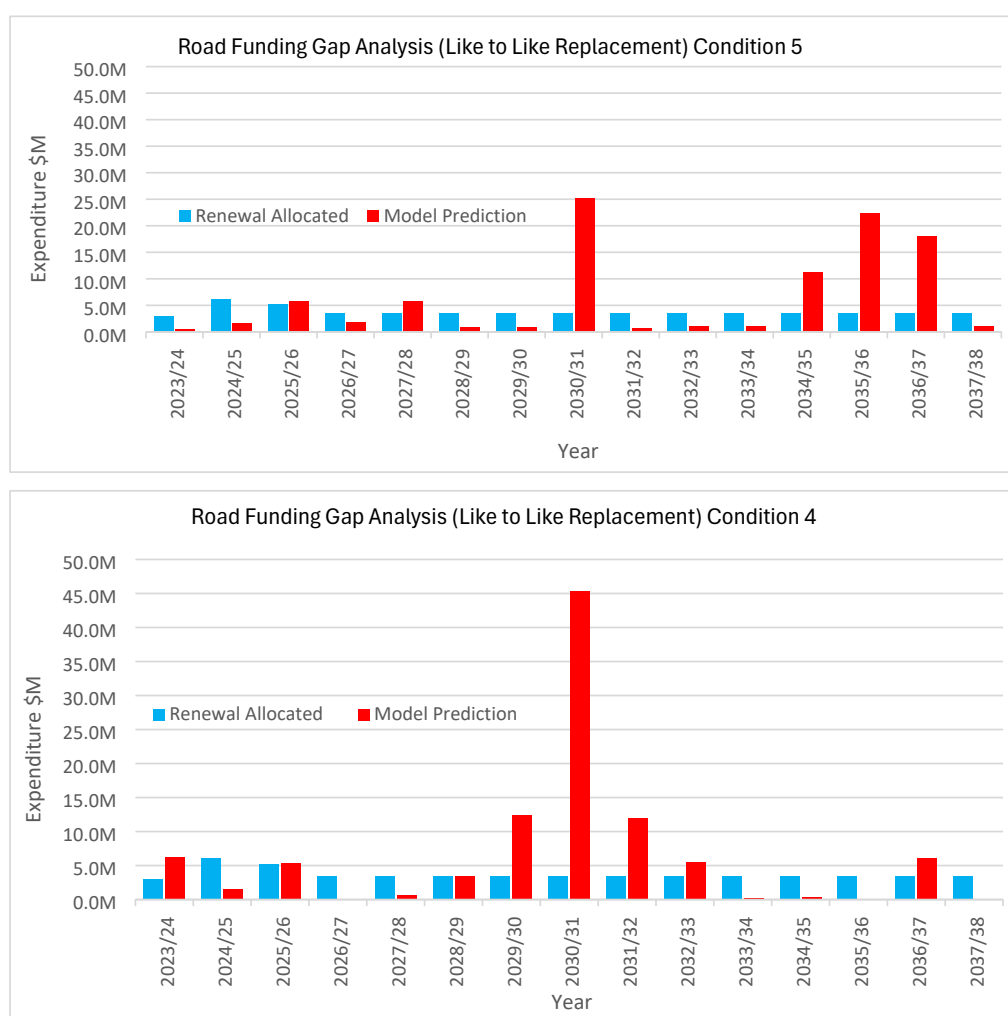
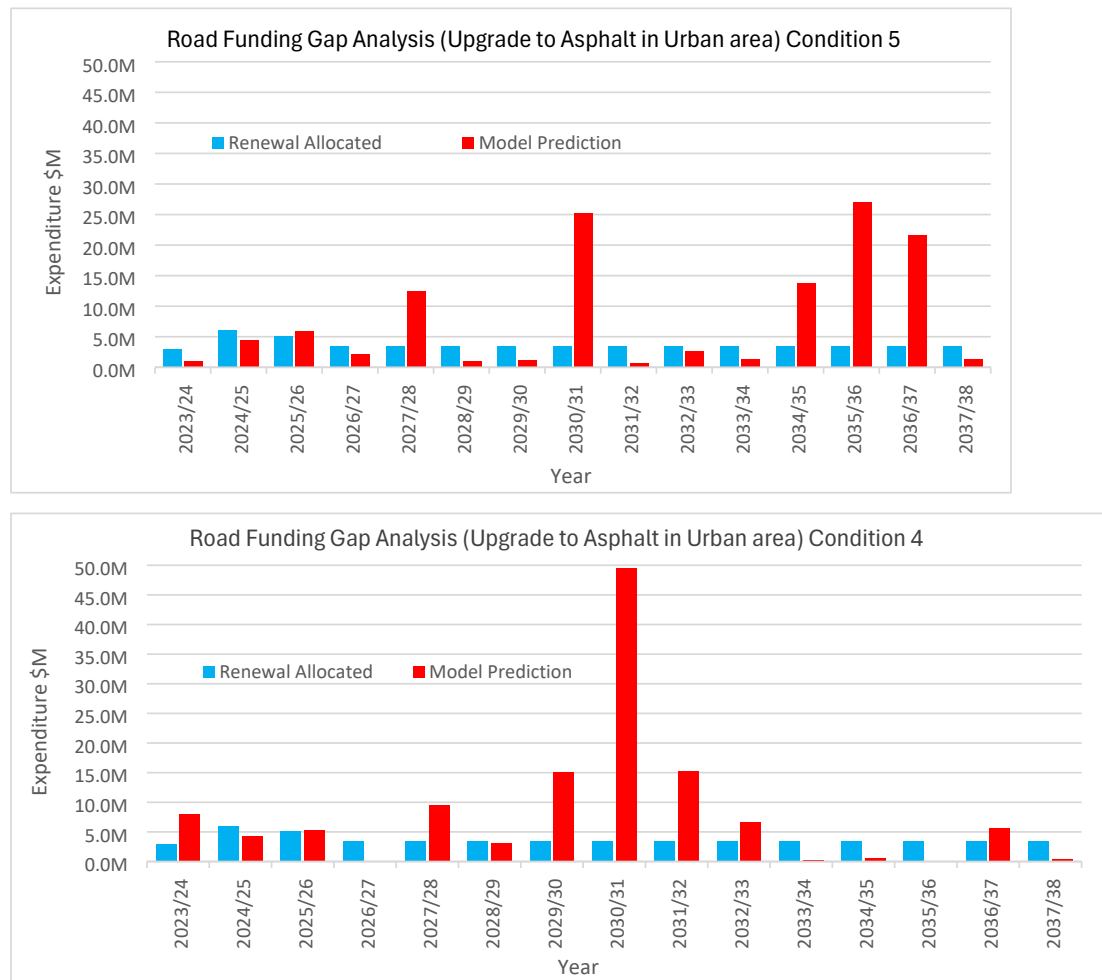




Figure 8-2: Roads Funding Gap Analysis (Upgrade to Asphalt in Urban Area)



**Table 8-3: Renewal Recommended funding scenarios**

Asset Category	Selected Modelling Scenario	15 years predicted cost	Current Annual Renewal Allocation	Annual predicted funding gap
Roads	Like for like resurfacing is done when the surface conditions of roads are at condition 5	97,884,102	3,748,158	2,777,448
Roads	Upgrading of surfacing to asphalt in urban areas when the surface conditions of roads are at condition 5	121,556,374	3,748,158	4,355,560
Roads	Like for like resurfacing is done when the surface conditions of roads are at condition 4	99,491,566	3,748,158	2,884,612
Roads	Upgrading of surfacing to asphalt in urban areas when the surface conditions of roads are at condition 4	123,861,228	3,748,158	4,509,256
Bus shelters	Bus shelters are being renewed at condition 5.	1,600,000	70,000	34,934
Bus shelters	Bus shelters are being renewed at condition 4.	3,425,000	70,000	156,600
Car parks	Car parks are being renewed at condition 5.	4,583,764	222,933	82,651
Car Parks	Car parks are being renewed at condition 4.	6,717,658	222,933	224,910

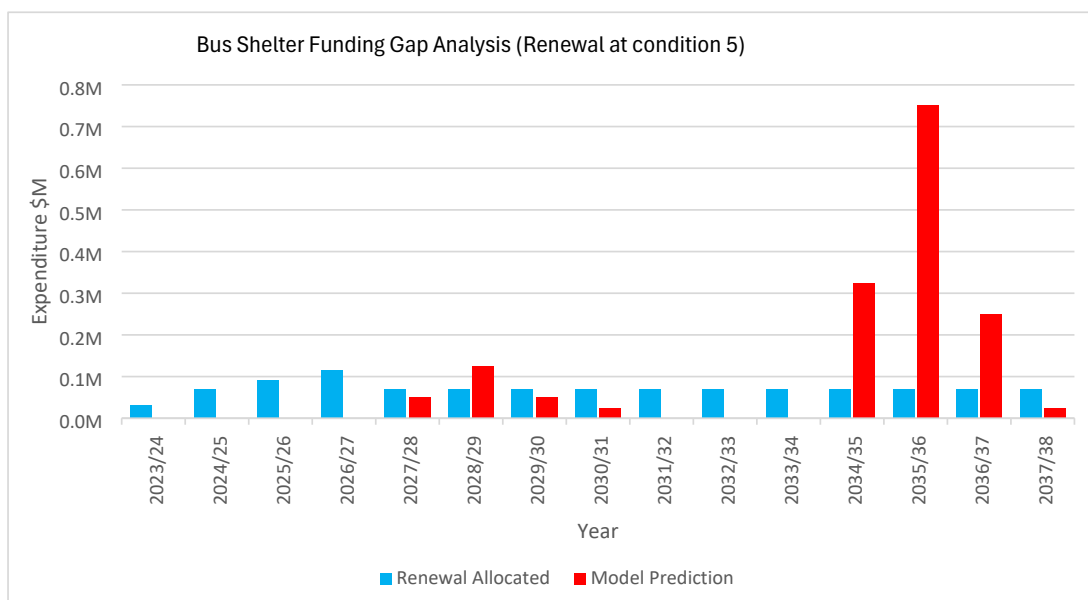
The choosing of intervention 4 (Condition 4) as the option for the renewal program, the overall life cycle cost will be less than the intervene 5, due to the less maintenance and operation cost.

Likewise, the Current Roads predictive modelling shown in Figure 8.3 (Bus Shelter Renewal), and Figure 8.4 (Car park renewal) below, indicates that there is a surplus annual renewal allocation for a few years and insufficient for some years.



- For Bus Shelter renewal - The overall funding gap of \$35,000 per annum for condition 5 assets and \$156,600 per annum for condition 4 assets over the next 15 years (Table 8.3). The bus shelters are modelled on the basis that condition 4 bus shelters will be replaced with the modern equivalent bus shelter with disability access compliant concrete pads and seating. It should be noted that the PTA provides grant funding for stops with more than 15 boarding passengers. Due to the higher number of passengers, these stops are also recommended to renew early.
- For Car park renewal- The overall funding gap of \$82,000 per annum for condition 5 assets and \$224,910 per annum for condition 4 assets over the next 15 years (Table 8.3). It is noted that some of the car parks are likely to be renewed and upgraded through the implementation of facility master plans. Conversely, some of the car parks will require additional funding for upgrades such as disability access, asphalt surfacing, additional drainage, etc. Therefore, aiming to maintain the overall condition of all car parks will provide a balanced level of service to the community.

Figure 8-3: Bus Shelters Funding Gap Analysis Conditions 4 and 5



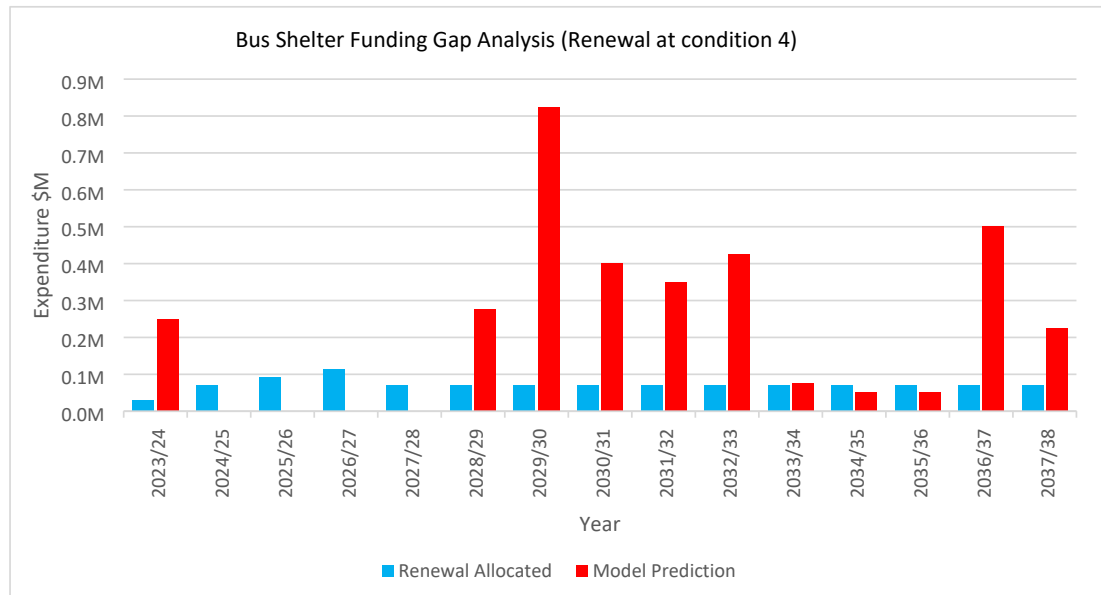
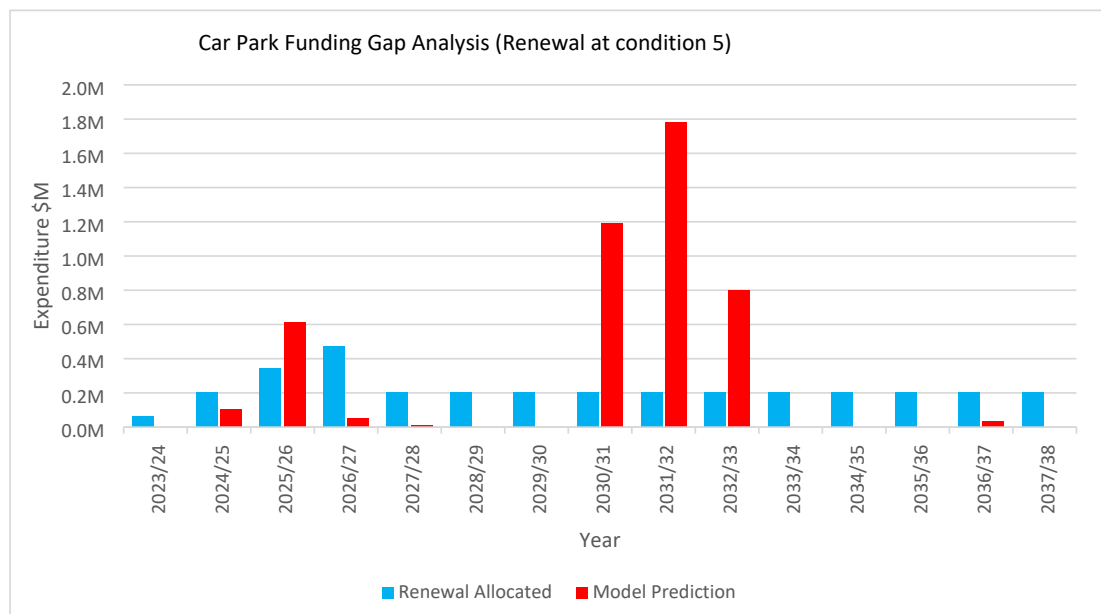
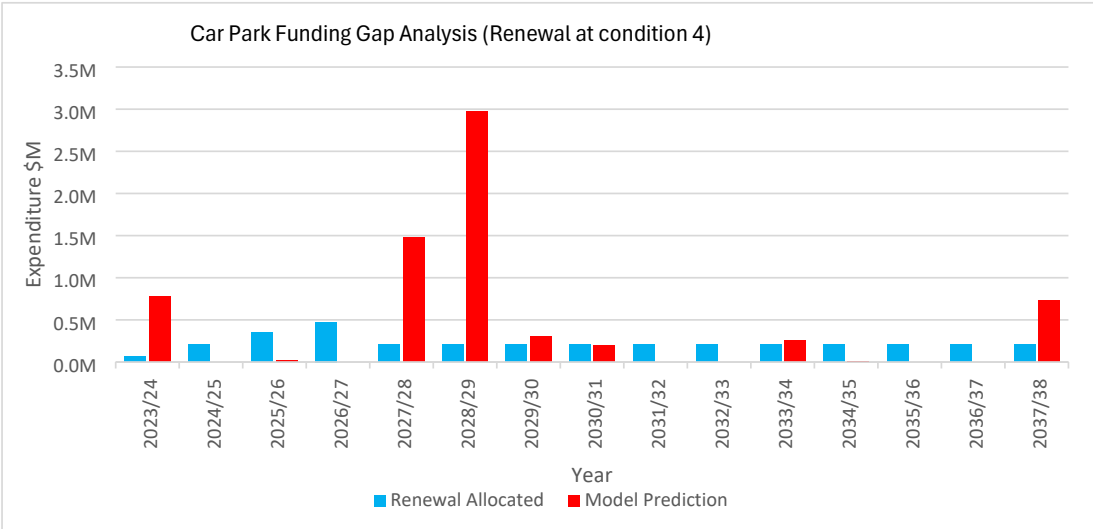


Figure 8-4: Car Parks Funding Gap Analysis (Condition 4 and 5)





8.5 Maintenance Funding

The total possible 15-year subdivision handover and development contribution plan (DCP) predicted contribution is \$14.2 Million, which is 4.6% of the total road replacement cost. Considering the future possible acquisition assets, in the asset management model (Mydata Predictor), we choose the 20% increase in annual maintenance and operational funding for future maintenance, operation, and renewal expenditure to resolve the emergency reactive issues. Table 8.4 below shows the City’s annual maintenance and operational expenditure and predicted funding gap. Operation expenditure includes sweeping and disposal of sweeping and maintenance expenditure includes planned and reactive maintenance, traffic management, and construction sweeping.

Table 8-4: Maintenance and Operational expenditure and funding scenarios

Asset Category	Annual average Maintenance expenditure (2020-2023)	Predicted Annual Cost	Annual Predicted Gap
Roads (including kerbs, safety barriers, bridges, and signs)	1,715,000	2,060,000	345,000



Bus Shelters	25,000	30,000	5,000
Car Parks	76,000	92,000	16,000
Asset Category	Annual average Operational expenditure	Predicted Annual Cost	Annual Predicted Gap
Roads (including kerbs, safety barriers, bridges, and signs)	350,000	420,000	70,000
Car Parks	5,400	6,486	1,086

8.6 Acquisition

The Council accepts the assets from the developers at no cost, and future maintenance, replacement, and ownership get transferred to the City for accepted assets.

Likewise, In some development areas, there are multiple owners (developers), so the developer's contribution plan (DCP) scheme is necessary to facilitate the equitable provision for the construction of common infrastructure and open spaces. We add these assets to the asset management system as gifted assets. The future expected developers and DCP handover scenarios is shown below in Table 8.5.

Table 8-5: Future expected funding scenarios

Asset Category	Annual average contribution	
	Roads	Car Parks
Developers (Subdivision's Handover)	\$ 853,140	\$3,500
Developers Contribution Plan (DCP)	\$ 1,895,366	
Total	\$2,748,506	

8.7 Key Performance Indicators (KPI)

The key indicators are calculated for Road assets as per the Local Government Operational Guidelines defined in Table 8.6.

**Table 8-6: Definitions of Key Performance Indicators**

Indicator	Purpose	Calculation Method
Asset Consumption Ratio (ACR)	This ratio measures the extent to which depreciable assets have been consumed by comparing their written-down value (fair value) to their replacement cost. Standard is met if the ratio can be measured and is 0.50 or greater.	Asset Consumption Ratio = Fair value/ Replacement cost
Asset Sustainability Ratio (ASR)	This ratio indicates whether a local government is replacing or renewing existing non-financial assets at the same rate that its overall asset stock is wearing out. Standard is met if the ratio can be measured and is 0.90 or greater.	Asset Sustainability Ratio (for the next 15-year period) = Current LTFP funding for the next 15 years/ Annual Depreciation * 15
Asset Renewal Funding Ratio (ARFR)	This ratio is a measure of the ability of a local government to fund its projected asset renewal/replacements in the future and continue to provide existing levels of services in the future. Standard is met if the ratio is between 0.75 and 0.95.	Asset Renewal Funding Ratio = Current LTFP funding/ Funding required to maintain current service levels

The current KPI values of each road asset category are shown in Table 8.7. The below KPI except for the Asset Sustainability Ratio for bus shelters, no other ACR, ARFR, and ASR fall within the acceptable ranges.

Table 8-7: KPI values of Roads assets 2023-2038

Asset Category	Asset Consumption Ratio (ACR)	Asset Sustainability Ratio (ASR)	Asset Renewal Funding Ratio (ARFR)
Roads (including kerbs, road bridges, and safety barriers)	0.60	0.81	0.57
Bus Shelters	0.52	1.42	0.67
Car Parks	0.56	0.85	0.73



Summary

The financial projections from this asset plan are shown in Figure 8.5. These projections include forecast acquisition, operation, maintenance, and renewal costs (choosing interence 4).

These forecast costs are shown relative to the proposed budget. The bars in the graphs represent the forecast costs needed to minimize the life cycle costs associated with the service provision. The proposed budget line indicates the estimate of available funding. The gap between the forecast work and the proposed budget is the basis of the discussion on balancing costs, level of service, and risk to achieve the best value outcome.

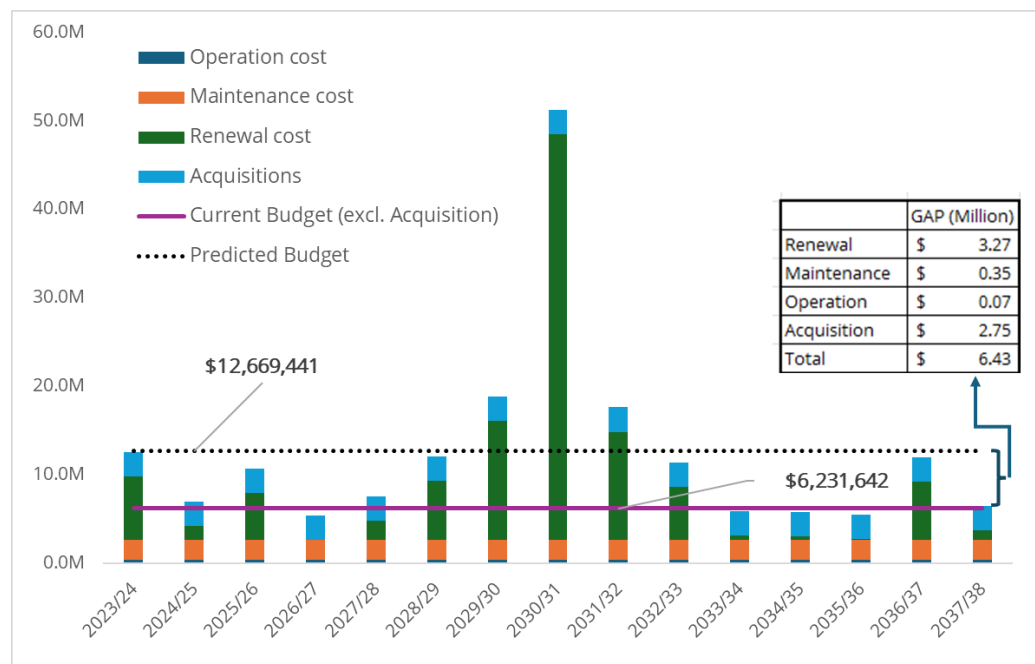
The projected annual lifecycle cost necessary to provide the services covered by this AMP includes the renewal, operation, maintenance, and acquisition of existing assets (Roads, Car Parks, and Bus Shelters) at condition 4 is presented below (Table 8.8).

Table 8-8: Project lifecycle Summary (Renewal, Operational, Maintenance, and Acquisition)

	Roads	Car Parks	Bus Shelters
Renewal (Like for Like)	\$6,632,771	\$447,844	\$228,334
Maintenance	\$2,060,000	\$92,000	\$30,000
Operation	\$420,000	\$6,486	-
Acquisition	\$2,748,506	\$3,500	-



Figure 8-5: Life Cycle Summary (Roads – Like for Like; Bus Shelter, and Car Park)



8.8 Recommendations

- Increase the funding for the renewal, maintenance and operation of road assets (surface, pavements, and road equipment), bus shelters and car parks.
- Continue to optimize grant funding opportunities with appropriate planning and analysis work.



9 Improvements, Monitoring, and Review

9.1 Performance Monitoring

The Asset Planning and Delivery team will monitor the performance of the City's Asset Management activities including.

- Ensuring actions are undertaken from the asset management plans, and
- Assigning tasks through the City's Corporate Business Plan.

9.2 Improvement Plan

The Asset Management Improvement Plan for Roads assets is shown in Table 9.1.

Figure 9-1: Asset Management Improvement Plan for Roads Assets

Task No.	Task	Responsible Department	Timeline
1	Develop a Roads Maintenance Management Plan including: Risk assessments and criticality, Establish response times, Establish inspection frequencies, Consider implementing activity-based costing at the asset level, and Record maintenance requests against individual assets.	Asset Services	25/26
2	Develop a Kalamunda Moving Strategy: Major roads functional classification review aimed at improving access and safety. Improve Road Safety environment.	Asset Planning and Delivery	25/26 to 26/27
3	Progress the Main Roads WA Road Re-classification of Canning Road, Welshpool Road East, and Abernethy Road.	Asset Planning and Delivery	Ongoing



Task No.	Task	Responsible Department	Timeline
4	Implement an Enterprise Resource Planning (ERP) system with a Maintenance Management System including a mobile device for field data collection.		24/25-27/28

9.3 Review Procedures

This AMP will be reviewed every five years or earlier basis per the City's Asset Management Policy.



Appendix A Glossary

All the definitions below apply in the context of Local Government Infrastructure Assets.

Asset Management	Applying management practices to Infrastructure Assets to provide the required Levels of Service most cost-effectively.
Asset Management Plan	A documented plan for managing one or more classes of Infrastructure Assets over their Useful Lives to provide the required Levels of Service most cost-effectively.
Condition	An assessment of the progress of an Infrastructure Asset from new to end of life. The Condition determines the Level of Service provided by the asset and the Maintenance actions required. The Condition also provides an estimate of the Remaining Useful Life.
Condition Rating	A number, typically from 1 (new) to 5 (end of Useful Life), as a measure of the assessed Condition.
Depreciable Amount	The proportion of an asset's Gross Replacement Cost that loses value over time due to Depreciation. The proportion that does not lose value is the Non-depreciating Value.
Depreciation	<p>The loss of financial value of an Infrastructure Asset as it progresses from new to end of Useful Life.</p> <p>Accumulated Depreciation is the total depreciation of the asset to the date of assessment.</p> <p>Annual Depreciation is the loss of financial value in one financial year.</p>
Fair Value	<p>The best estimate of the financial value of Infrastructure Assets in their condition at a point in time. It includes loss of value due to depreciation and depends on an appraisal of active markets, or in the absence of active markets, the cost of constructing the asset.</p> <p>See also Written Down Value, which is an alternative name for Fair Value.</p>
Gross Replacement Cost	The cost of building a new Infrastructure Asset in place of the current one, including the disposal cost of the current one.
Infrastructure Asset	A physically constructed asset with a life of longer than 12 months, which has a financial value, and which provides services to the community.
Level of Service	The quality of experience that the Infrastructure Asset provides to the community.



	<p>Community Levels of Service describe the quality from the perspective of the users, in terms of subjective measures, such as how safe, how clean, how new, etc.</p> <p>Technical Levels of Service describe the quality from the perspective of the providing organization in terms of objective measures, such as how frequently, what metrics, what response time, etc.</p> <p>The organization chooses the objective Technical Levels of Service to provide the users' required Community Levels of Service.</p>
Maintenance	<p>Corrective actions on the Infrastructure Asset that improve its Condition to allow it to achieve its intended Useful Life and to provide its required Level of Service. An example is the repair of defects.</p> <p>See also Operations, which are necessary actions to provide the required Level of Service but do not affect the Condition.</p>
New Works	<p>The creation of an Infrastructure Asset which did not exist before. This increases the Gross Replacement Cost of the organization's assets.</p> <p>See also Renewal, which replaces an existing asset and does not increase the Gross Replacement Cost of the organization's assets.</p>
Non-depreciating Value	<p>The portion of the Gross Replacement Cost of an Infrastructure Asset that does not lose value over time. An example is land, which does not wear out over time and cannot be replaced.</p>
Operations	<p>Expenses or actions on the Infrastructure Asset which are necessary to provide the required Level of Service, but which do not affect its Condition. An example is an electricity supply to provide lighting.</p> <p>See also Maintenance, which covers actions necessary to provide the required Level of Service and that do affect Condition.</p>
Renewal	<p>The replacement of an existing Infrastructure Asset with an asset providing the same Level of Service or capacity. This does not increase the Gross Replacement Cost of the organization's assets.</p> <p>See also New Works, which creates a new asset and does increase the Gross Replacement Cost of the organization's assets.</p>
Upgrade	<p>Modifications or replacement of an existing Infrastructure Asset that increases the Level of Service or capacity. This increases the Gross Replacement Cost of the organization's assets.</p>
Useful Life	<p>The total length of time during which an Infrastructure Asset is expected to be usable and to provide the required Level of Service.</p>



	The Remaining Useful Life is the length of time until an Infrastructure Asset is expected to require Renewal.
Sustainability Ratios	Metrics required by the WA State Government to indicate whether a Local Government's Asset Management practices and budgeting are sustainable in the long term.
Valuation	The regular determination by qualified inspectors and assessors of the Gross Replacement Cost of a collection of Infrastructure Assets, as well as their Accumulated Depreciation, to report on their current Fair Value.
Written Down Value	An alternative name for Fair Value, which is Gross Replacement Cost less Accumulated Depreciation.



Appendix B Asset Information Summary

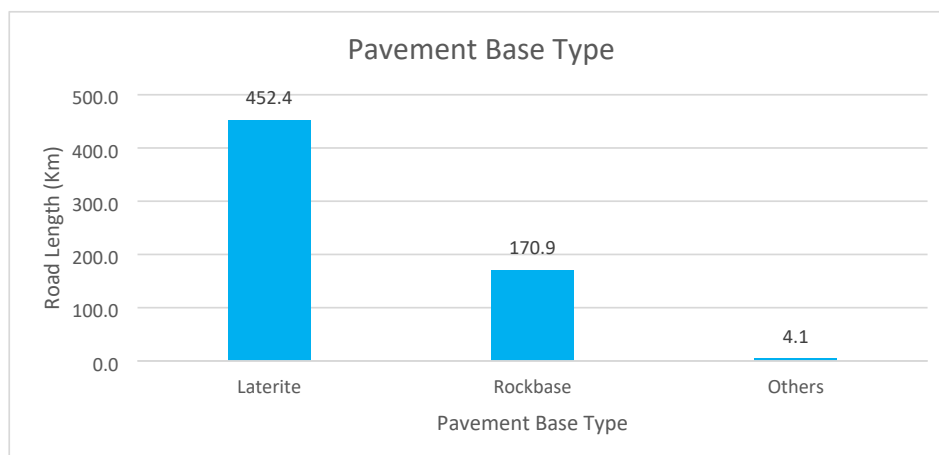
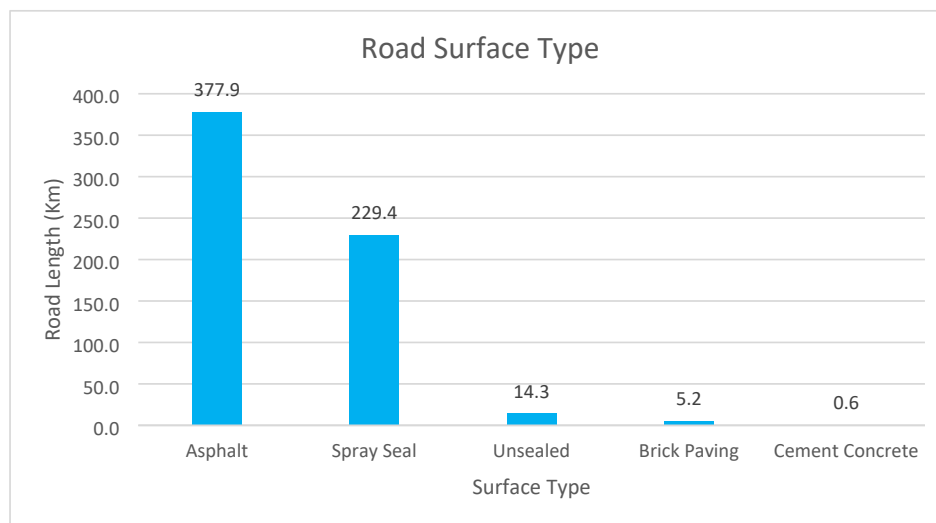
City of Kalamunda- Asset Condition Rating Matrix

Condition Rating Score	Condition	Description
1	Very Good	Asset is in near-perfect condition. Only regular maintenance is required.
2	Good	Asset has deteriorated slightly but only routine maintenance is required to maintain the rating.
3	Average	Asset is in satisfactory condition but showing signs of wear and tear. Moderate levels of periodic (programmed) maintenance are required to maintain the asset in this condition.
4	Poor	Asset is in below-average condition with significant signs of wear and tear. High levels of periodic maintenance may be required to maintain the rating of this asset. Regular safety inspections are required as part of a risk management strategy. A partial or full replacement may require to improve the rating of this asset.
5	Very Poor	Asset is in very poor condition and needs a full replacement. Access restrictions and/or warning signs may be needed until replacement. Regular safety inspections are required as part of a risk management strategy.



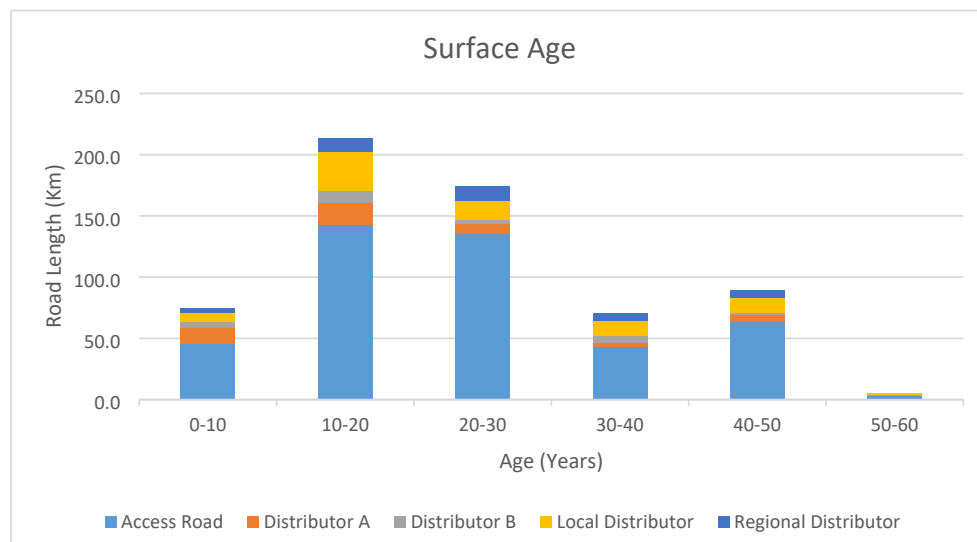
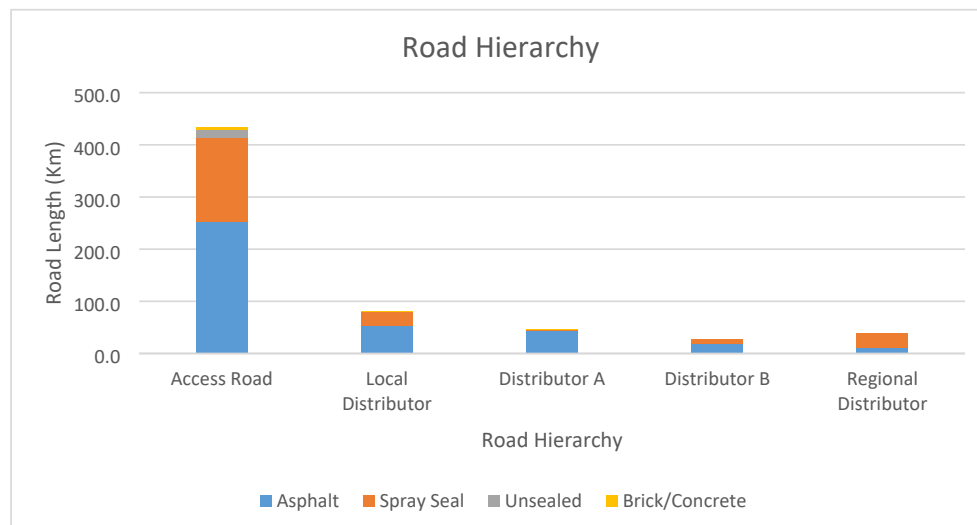
Roads - surfaces, pavements, and formations

There are 627 Km of roads managed by the City, with the majority being sealed (asphalt, spray seal, brick, and cement). There are 14.33 Km of unsealed roads. Most of the road pavements, the layers under the surface, are built using gravel (laterite gravel, blue gravel, or crushed limestone).





In terms of road hierarchy, Access Roads comprise the longest portion of roads being 434 km in total. These are low-traffic volume roads providing access to properties. Of the Access Roads, 110 km have surfaces older than 30 years, with 88 km of them being spray seals. 253 km of roads comprised of pavements older than 50 years, with 128 km of them area access roads.

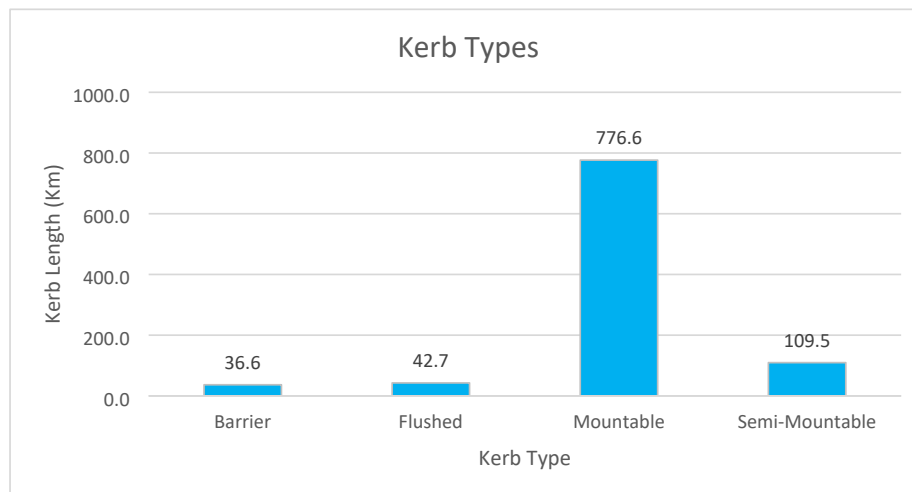




Roads - kerbs

The City's road network includes 965.4 km of roadside kerbs. Kerbs in the road center medians, traffic islands, and roundabouts are recorded with respective assets.

Kerbs are generally provided in urban roads as a mechanism to channel runoff water on roads into an entry pit of an underground drainage system. Kerb network consists of four main types as defined by the MRWA.



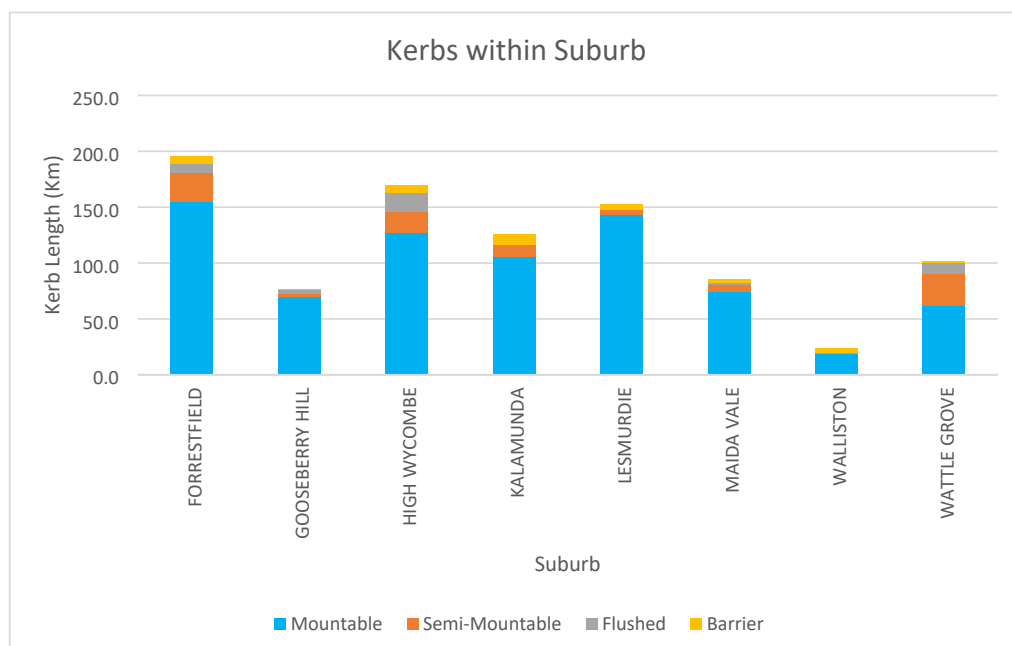
Barrier

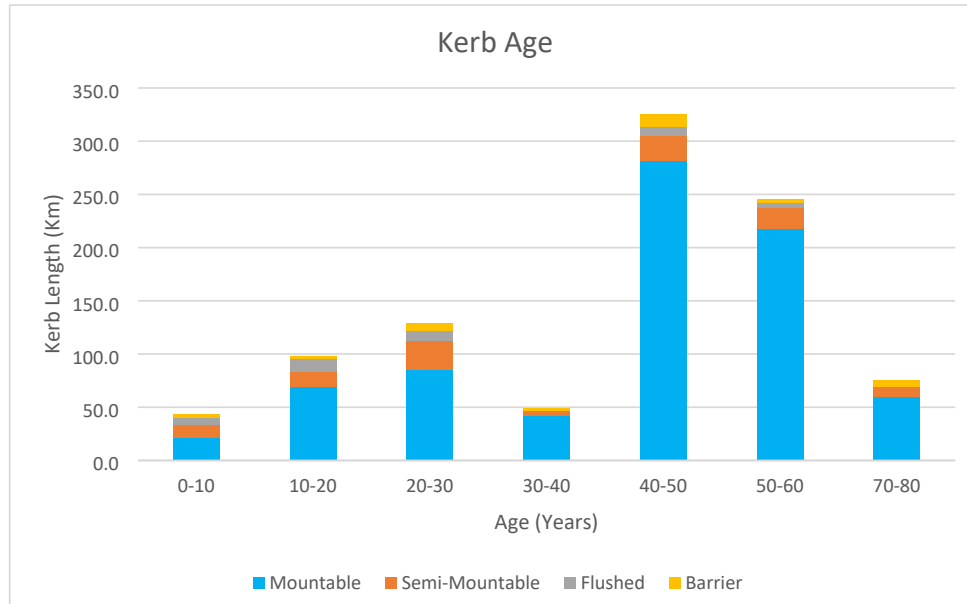
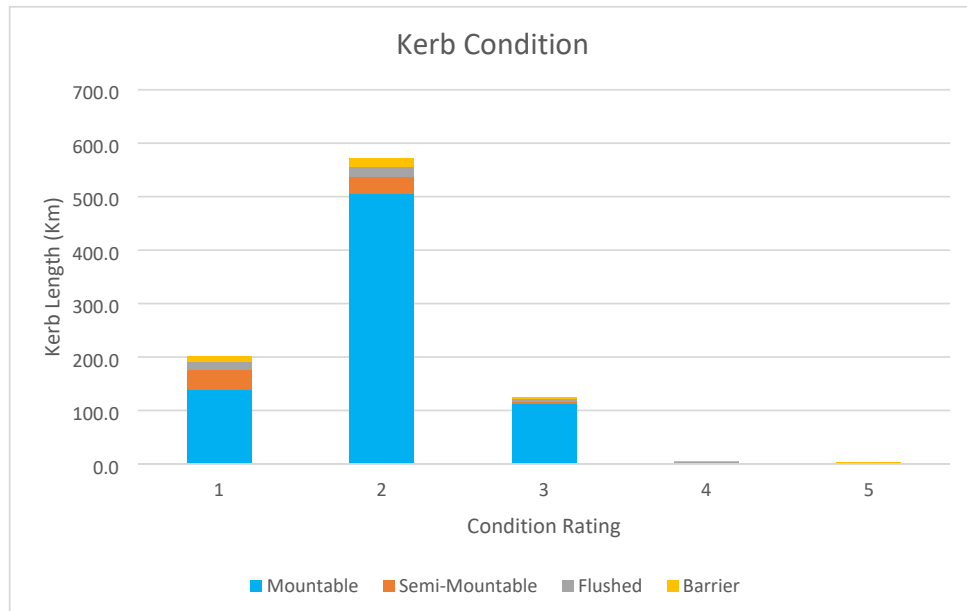
Flushed



Mountable

Semi-mountable





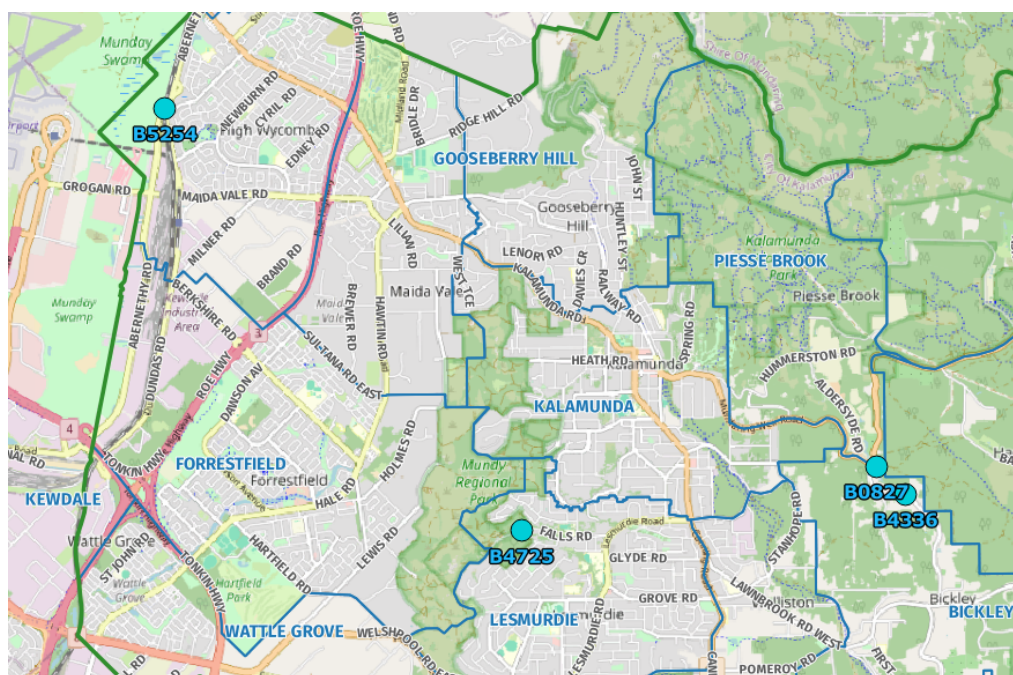


Road Bridges

The Bridge Asset Category consists of 4 road bridges. Three Road bridges (B0827, B4336, and B4725) are owned by the city, and one Road bridge (B5254) is owned by MRWA. The city is only responsible for the maintenance of the guard rail and road surface for MRWA owned bridge.

Each year, the City is responsible for undertaking Level 1 (visual) annual inspections and routine/preventative maintenance of road bridges. Main Roads Western Australia (MRWA) is responsible for 5 yearly structural inspections and providing funding for undertaking structural repairs and upgrading.

Locations of the 4 road bridges (identified by bridge no.) are shown in the following map.





B4725



B0827



B4336



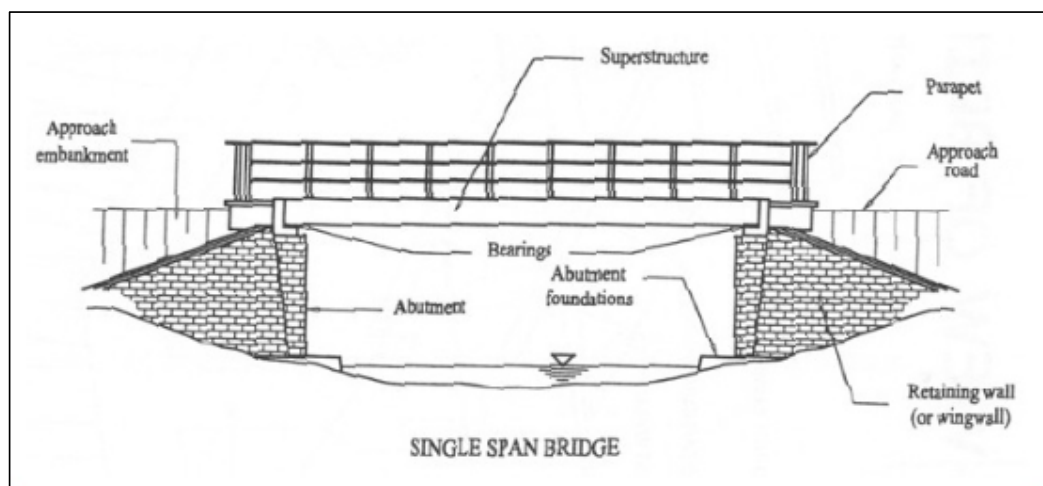
B5254

All the bridges have been assessed for their visual inspection in December 2023 and have been rated considering the visual condition of the bridge sub-structure and super-structure. A rating of 1 represents a bridge in very good condition and a rating of 5 a very poor condition.

Bridge	Age	Total Replacement Value \$,000	Construction Material	Sub-structure visual condition	Super-structure visual condition
B0827	86	309	Timber	3	3
B4336	61	152	Concrete	2	2
B4725	63	53	Concrete	2	2



The City's Road bridges are single spans, and the component of a typical bridge is shown below. The substructure consists of abutments and retaining walls.



Source: <https://www.slideshare.net/illpa/bridge-1403689/11>

Bus Shelters

There are 548 public bus stops located within the City of Kalamunda. The main constructed assets within a bus stop are a shelter and a hardstand. This AMP covers 174 bus stop shelters as the City has the asset ownership and maintenance responsibility of the shelters.

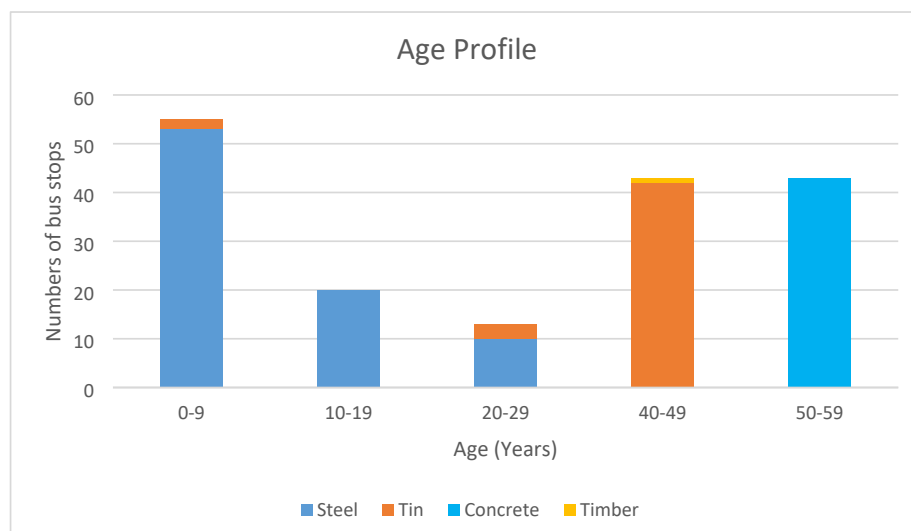
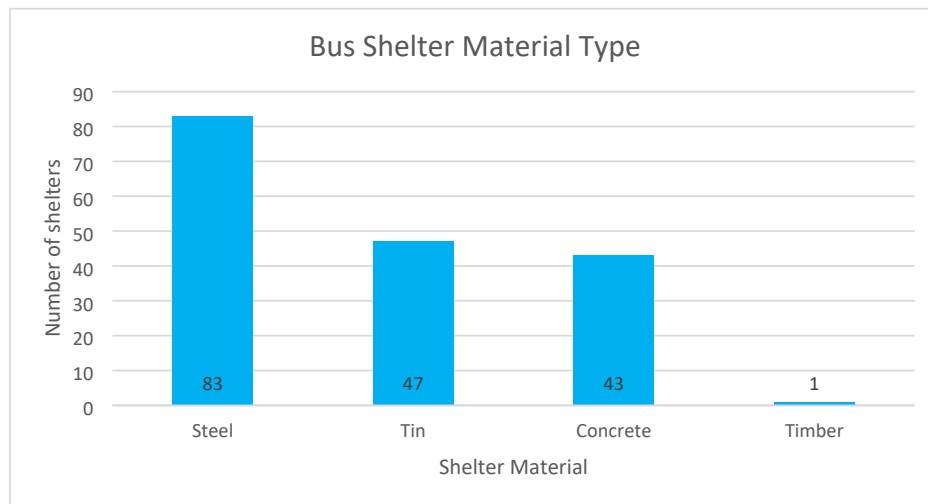
PTA also contributes towards some of the bus stop routine maintenance costs and provides funds for new/ renewal shelters for bus stops with boarding passenger numbers higher than 15.

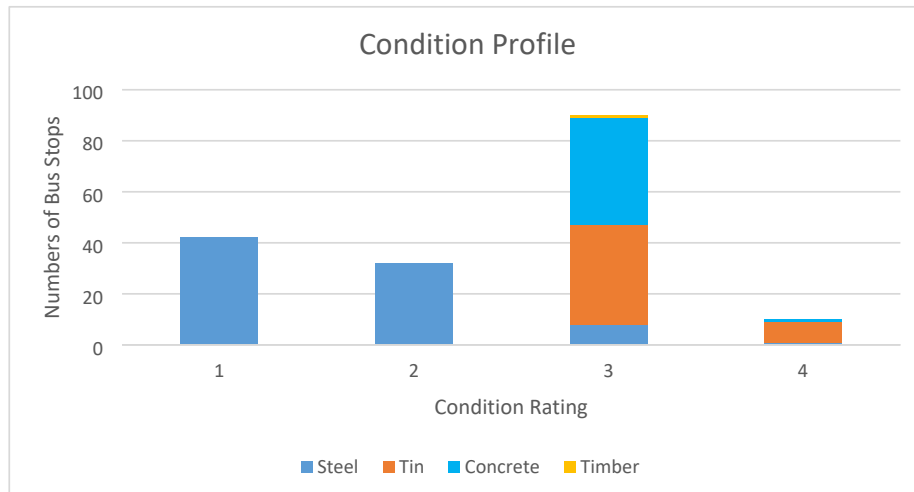
The City's old bus shelters are mostly made of tin and concrete while newer shelters are steel. Steel shelters are of two makes, Esplanade and Miricale. The Miricale shelters are prone to vandalism due to side panels are easily removable. Currently, none of the shelters is with condition 5. Most Condition 4 assets consist of tin shelters which will pass their expected useful life of 20 years.

Restoring of Miricale shelters is mostly undertaken utilizing a maintenance budget while most tin shelters require full replacement as a capital expenditure. The City's current standard new and replacement (modern equivalent) bus shelter is Esplanade.



Most of the concrete shelters are in Condition 3 indicating that they are in good structural condition but require maintenance such as painting and seat repairs. Condition 3 Tin shelters are likely to be able to be kept in the same condition with the timely undertaking of required maintenance.





Typical concrete bus shelter



Typical tin bus shelter



Steel bus shelter (Esplanade)



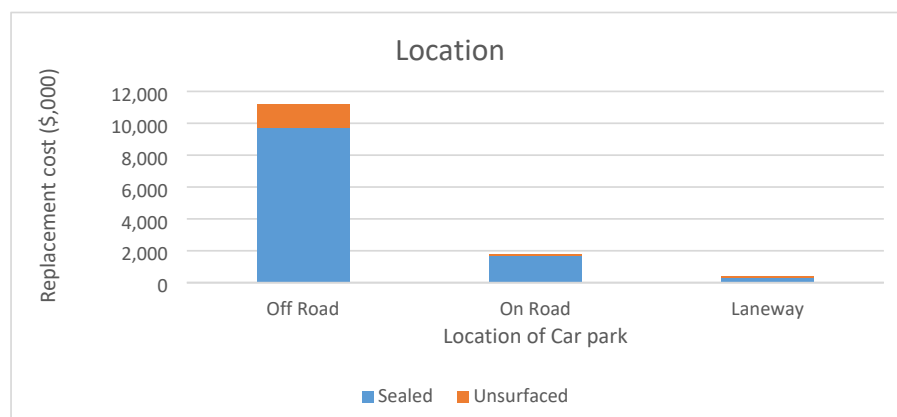
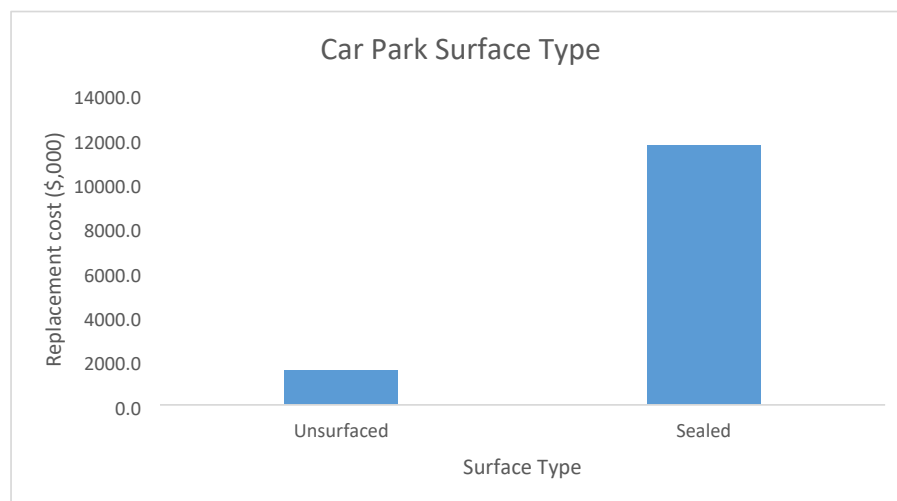
Steel bus shelter (Miricale) with vandalised panels

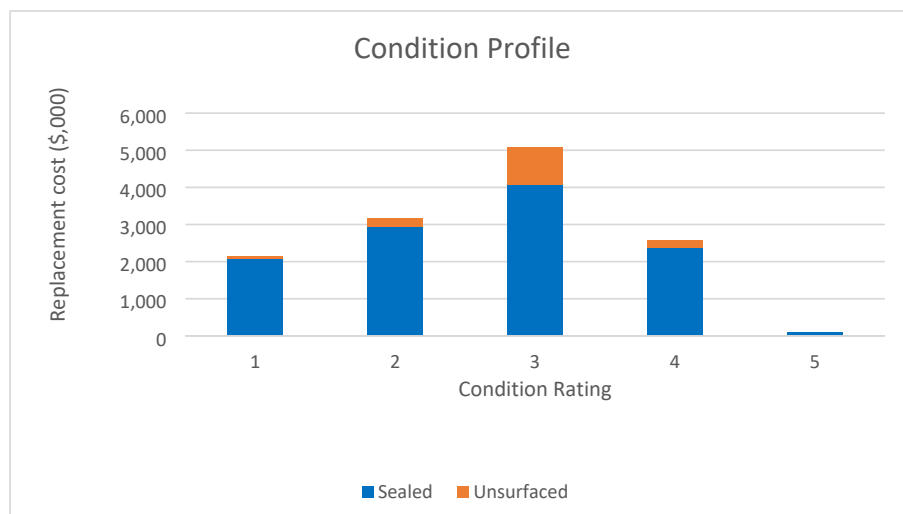
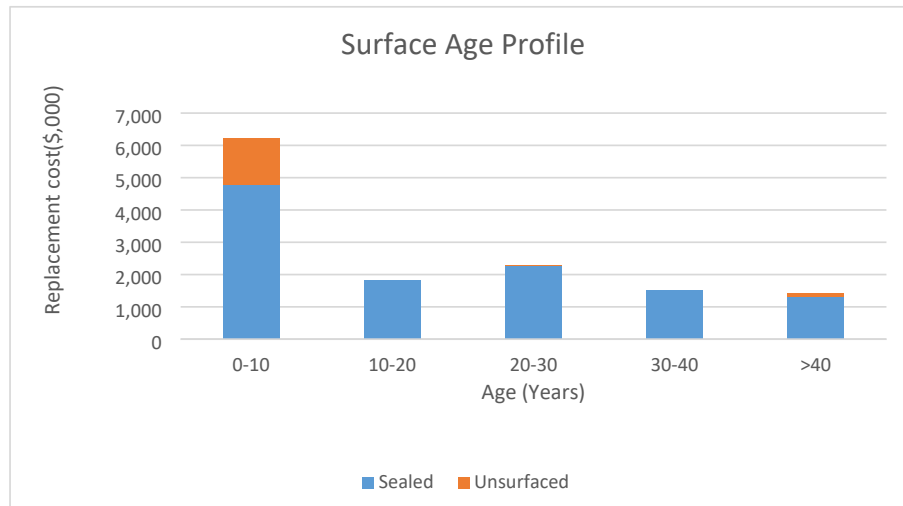


Car Parks

The City owns and manages 316 car park sites comprising a total area of 226,004 m² with a current replacement value of \$13.26 million.

The City's car parks are categorized based on their surface types and location. Sealed car parks consist of an asphalt or spray seal surface while unsealed car parks have a gravel surface. Car parks are located either along the road carriageways (on-road) or away from the road (off-road).







Roads Equipment

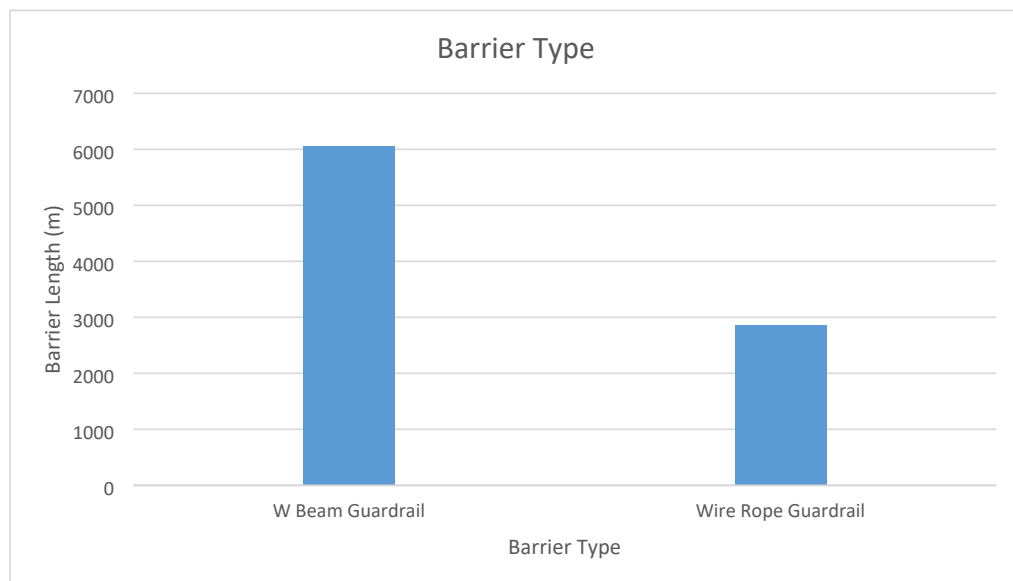
Road safety barriers within the City have a total length of 8,928m with an estimated current replacement cost of \$1,710,709. There are two types as shown below.

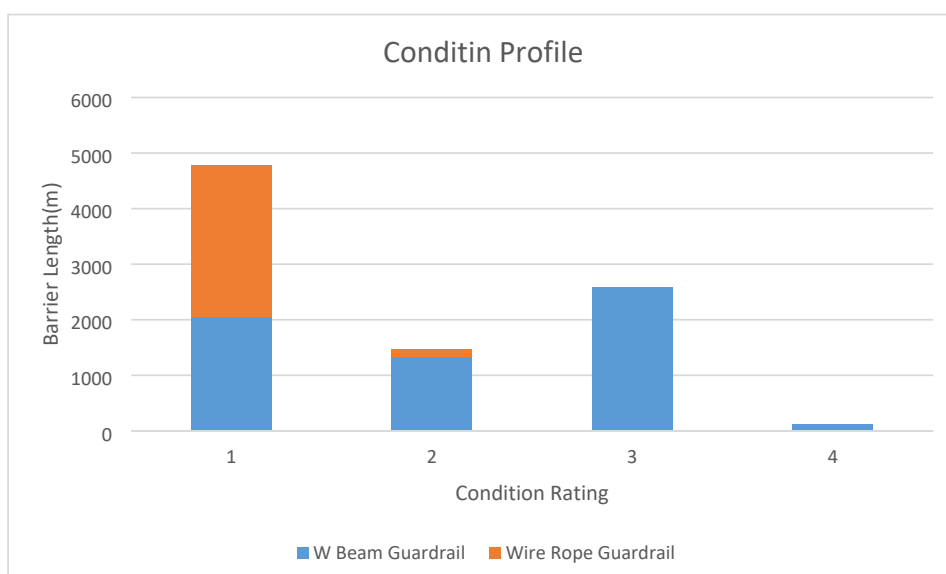
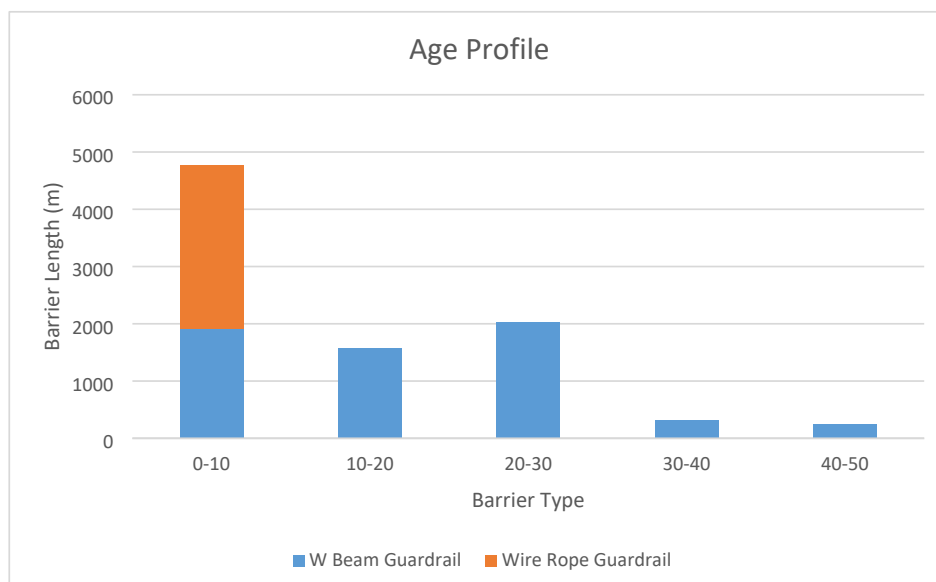


W beam



Wire rope





The City's car parks are categorized based on their surface types and location. Sealed car parks consist of an asphalt or spray seal surface while unsealed car parks have a gravel surface. Car parks are located either along the road carriageways (on-road) or away from the road (off-road).