City of Cockburn

wetlands to waves

Roads Asset Management Plan

2020–2024

cockburn.wa.gov.au

Front cover photo is taken at Berrigan Drive, Jandakot.

Document Control					
Version No	Date	Revision Details	Author	Reviewer	Approver
1	Sept 2012	Draft to managers	Asset Services	Road services	
2	Feb 2013	Final version for adoption	Asset Services	Engineering services Manager	Council
3	Aug 2015	Final Version 2014 - 17	Asset Services	Engineering services Manager	Executive Group
4	June 2018	Final version 2017 - 20	Asset Services	Engineering services Manager	Executive Group
5	Sept 2021	Final version 2020 - 24	Property & Asset Services	Roads Services	Executive Committee (ExCo)

Acknowledgement of Country

The Mayor, Councillors and staff of the City of Cockburn acknowledge the Whadjuk Nyungar people of Beeliar boodja as the traditional custodians of this land. We pay our respect to the Elders, past, present and emerging.

Table of Contents

Glossary

ASPEC (M, O, R, D) Specification
ASPEC data Specification and the City's operational register classification i.e. Marina and Coastal Infrastructure, Open Space, Road and Drainage Specification.

Asset
A physical component of a facility which has value enables a service to be provided and has an economic life of greater than 12 months.

Asset Class
Groupings of assets of similar nature and use in a local government's operations (AASB 166.37)

Asset Classification
A division of the asset class regarded as having particular shared characteristics

Asset Type
Defines the range of assets held in the asset classification ie ASpec

Asset Condition
Is a measure of the asset's physical integrity to enable prediction of maintenance, rehabilitation and renewal requirements.

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

Capital Renewal Expenditure
Expenditure/ works on an existing asset which returns the service potential or the life of the asset to that which it had originally.

Capital New Expenditure
Expenditure used to create new assets or to increase the capacity of existing assets beyond their original design capacity or service potential.

Capital Upgrade Expenditure
Expenditure which enhances an existing asset to provide a higher level of service or expenditure that will increase the life of the asset beyond that which it had originally.

Current Replacement Cost (CRC)
The cost of replacing the service potential of an existing asset, by reference to some measure of capacity, with an appropriate equivalent asset.

Depreciation
The wearing out, consumption or other loss of value of an asset whether arising from use, passing of time or obsolescence through technological and market changes.

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

Depreciated Replacement Cost
The replacement cost of an existing asset less an allowance for wear and consumption, having regard for the remaining economic life of the existing asset.

Expenditure
The spending of money on goods and services.

Fair Value
Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date.

Funding Gap *
Difference between estimated budgets and projected expenditures from the Long Term Financial Plan for maintenance and renewal of assets, totalled over a defined time.

Gap Analysis
A method of assessing the gap between a business's current asset management practices and the future desirable asset management practices.

Integrated Planning and Reporting
A framework for establishing community priorities and linking this information into different parts of a local government's functions.

Level of Service *
The defined service quality for a particular activity or service area against which service performance can be measured. Service levels usually relate to quality, quantity, reliability, responsiveness, environmental, acceptability and cost.

Life Cycle Management
The total cost of an asset throughout its life including costs for planning, design, construction, acquisition, operation, maintenance, rehabilitation and disposal.

Long Term Financial Plan (LTFP)
Supported by the Asset Management Planning Process the LTFP is a ten year rolling plan that informs the Corporate Business Plan to activate Strategic Community Plan priorities. From these planning processes, Annual Budgets that are aligned with strategic objectives can be developed.

Maintenance
All actions necessary for retaining as asset as near as practicable to its original condition but excluding rehabilitation or renewal.

M, O, R Specification
ASPEC data Specification and the City's operational register classification i.e. Marina and Coastal Infrastructure, Open Space and Road Specification.

Non-Asset Solution
The process used to identify the alternative methods of addressing, reducing and/ or increasing demand for services other than by adjusting asset capacity.

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

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

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

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

Replacement Cost
The cost of replacing an existing asset with a substantially identical new asset.

Risk Management *
The application of a formal process to determine the range of possible values relating to key factors associated with a risk in order to determine the resultant ranges of outcomes and their probable occurrence.

Strategic Community Plan
The strategy and planning document that reflects the longer term (10+ year) community and local government aspirations and priorities.

Useful life *
Either:
(a) the period over which an asset is expected to be available for used; or
(b) the number of production or similar units (i.e. intervals, cycles) that is expected to be obtained from the asset.

Source: **Government** of WA Asset management framework and guidelines, Glossary
*****Source: DVC 2006, Glossary 'Asset Investment Guidelines'

1. Executive Summary

With the implementation of the City's Integrated Corporate Planning Framework, the Road Asset Management Plan (RAMP) has been developed to establish sustainable financial management, robust governance, continuous improvement and best practice management of the City's infrastructure assets.

The RAMP covers the 2020-2021 to 2023-2024 financial years and outlines the services provided by the Engineering Service Unit in delivering strategic and operational asset management activities for communities that utilise the City's Roads, Car parks and Traffic Management Devices (Road Items).

The RAMP is one of eight AMPs developed by the City and forms part of the City's Strategic Asset Management Planning Framework (SAMPF). The RAMP will be developed every four years in alignment with the Corporate Planning Framework ensuring that the City's long term financial planning (LTFP) is supported by timely and accurate asset information and financial projections derived from a structured and strategic asset management planning process.

The 2020 - 2024 version of the RAMP is developed by the City and in accordance with the International Infrastructure Management Manual (IIMM) has achieved intermediate level status.

The RAMP improvement strategy will guide the Engineering Service Unit to continuously improve services provided, establishing best practice strategic and operational asset management methodologies across people, processes and systems.

The road infrastructure asset category is currently the City's highest value asset grouping.

Table 1.1 Road Infrastructure Assets Summary Table as at September 2020

Asset Type	2013-14	2013-14	2016-17	2016-17	2019-20	2019-20
	Dimension	CRC $m	Dimension	CRC $m	Dimension	CRC $m
Road	6,503,248 m2	444.4	6,887,079 m2	466	6,990,828 m2	549 .7
Road Item	378,670 m2	18.62	352,455 m2	14	377,630 m2	35.1
Car Parks	121,047 m2	8.93	182,109 m2	16	191,958 m2	18
Kerbing	1,448 km	54.04	1,484 km	56	1,625 km	58
TOTAL		**$525.98m**		**$552.62m**		**$660.60m**

The key messages from the RAMP are summarised below:

Asset Data & Condition Analysis

- The data utilised to develop the RAMP is considered to be approximately 95% accurate and of medium confidence. The recent condition ratings were established via a partial network audit conducted by Talis in August 2019.

- The RAMP Infrastructure assets are in excellent condition with 37% of the road assets in condition 1 and 2, 60% in condition 3 and 3% in condition 4 and 5.

Level of Service and Risk Management

Level of Service is a measurable target which determines the type and extent of services delivered to the Community. Road Infrastructure levels are measured internally and, by the community to determine adequate provision. The following findings have been drawn from the CATALYSE Pty Ltd Survey 2019.

- Community satisfaction for the City's road maintenance service is high, with 87% of those surveyed either delighted or satisfied.
- Management and control of traffic is the number one concern for both residents and businesses.
- Existing controls and expenditure to mitigate risk are considered adequate, thus reducing the impact on service delivery.

See **(Section 3)** for further information

Future Growth and Demand Management

Projected future growth is supported by the City's Strategic Planning Business Unit's population and demographic research study's, whilst demand management is catered for by the upgrade and construction of existing and new assets through the delivery of the City's adopted Major Capital Work strategies, programs and plans.

- A cumulative growth of 58 km to the Road surface network over the next 5 years. This represents a 1% growth per annum.

- Estimated project costs of $90 million invested through the delivery of the ten year capital works program outlined in the Long Term Financial Plan.

See **(Section 4)** for further information

Lifecycle Management

The lifecycle management section details how the City plans to manage and operate both current and future assets to sustainably agreed levels of service.

- Current Maintenance & Operational expenditure is adequate however future budgeting requirements to meet appropriate service levels need to be assessed.
- Planned maintenance work represents 56% of the total roads maintenance expenditure for 2019-20.
- By 2029-30 required expenditure for Operations and Maintenance is expected to be around $3.2m per year.

See **(Section 5)** for further information

Financial Analysis
Road Surface Renewal Forecasts

The City has developed a 10 year resurfacing renewal plan which will drive the budget planning process and form the basis to the City's long term financial planning.

- The City's road network is in excellent condition with 37% of the road surface currently rating as either a 1 or a 2. (Excellent or Good).
- Currently only 3% of road surface has reached the renewal intervention level of condition 4 (Poor).
- The higher risk rated assets (condition 4 & 5) were internally reconditioned late 2019 and form the basis of the 5 year Resurfacing Renewal Program.
- See **(Section 6)** for further information

Sustainability of Service Delivery

The City will compile and report its Road assets performance in relation to the Dept. of Local Government's Asset Management Guidelines and Framework.

Based on actual expenditure in 2019/20, the following table indicates the City's performance in managing Road infrastructure assets as at September 2020.

Asset Class	2019-20 Consumption Ratio %	Sustainability Ratio % (10 Years)	Renewal Funding Ratio %	
			10 Year	5 Year
Road (Surface Only)	57.76	72	99	97
Dept. of LG Standard	Met	Met	Met	Met

Sustainability ratios for Road infrastructure have been forecast for the next 10 years to reflect the improvements and the anticipated funding strategy from the latest LTFP. The sustainability ratio for 2029/30 period is predicted to be 72% with the renewal funding ratio for the same period predicted to be 99%.

See **(Section 6)** for further information

AMP Improvement Strategy and Monitoring

Most of the strategic improvements identified in the previous RAMP are now complete. Further improvements have been identified that will enhance future revisions of the plan and provide greater financial alignment with the Long Term Financial Plan.

- Monitoring performance levels against service standards.
- Annual review and update of Risk Register.
- Review asset custodianship across service units to better target ongoing operational asset maintenance and renewal expenditure.

See **(Section 8)** for further information

2. Introduction

2.1 Background

This RAMP has been developed to assist the Engineering Services Business Unit to outline the management of assets, compliance with regulatory requirements, and to highlight the funding required to provide the appropriate Levels of Service.

The assets covered by this plan are summarised in Table 2.1.1. Figures as at September 2020 have been extracted from Council's Technology One Enterprise Asset Management System (EAM)

Table 2.1.1 Road Infrastructure Assets covered by this Plan as at June 2020

Asset category	Asset type	Dimension	Replacement Value $
Road	Surface	6,990,828	208,951,444
	Base	6,990,828	150,760,515
	Sub Base	6,990,828	189,761,786
	Kerbing	1,542,012	57,940,754
Car Parks	Surface	191,958	6,035,029
	Base	191,958	3,985,055
	Sub-Base	191,958	5,021,630
	Kerbing	83,430	2,970,691
Road Item	Anti-skid surface	9,278	1,024,048
	Bus Embayment	5,963	508,702
	Median Island	299,430	8,940,321
	Parking (road)	inc in car parks	
	Roundabout	38,046	2,117,383
	Splitter Island	26,266	2,026,548
	Speed Plateau	4,940	1,236,922
	Surface	292,671	19,327,237
TOTAL			**660,608,064**

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

City of Cockburn Strategic Community Plan 2020 – 2030

City of Cockburn Corporate Business Plan 2016/17 – 2019/20

City of Cockburn Annual Business Plan 2019 – 2020

City of Cockburn Long Term Financial Management Plan 2020/21 – 2029/30

Key stakeholders in the preparation and implementation of this asset management plan are shown in Table 2.1.2.

Table 2.1.2 Key Stakeholders in the AM Plan

ENTITY:	NATURE OF INVOLEMENT
Internal Stakeholders include:	
The Elected Council	Community representation
Chief Executive Officer (CEO)	Asset management direction and leadership
Executive Committee (ExCo)	Executive management endorsement, sign off and executive ownership
Chief of Operations	Review and strategic management sign off
Manager Engineering Services	Review and line management sign off
Property and Assets Services	Asset Management Plan development, review, continuous improvement and implementation of the AMP maintenance actions
External Stakeholders include:	
City of Cockburn community	Road and service users
City of Cockburn business	Road and service users
Insurers	Assist to manage financial risk of the City
State Emergency Services	Attendance to call-outs and security

2.2 Goals and Objectives of Asset Management

The City of Cockburn exists to deliver services to its community supported by the City's infrastructure assets. The City acquires infrastructure assets by 'purchase', 'contract', construction by council and by handover of 'donated' assets constructed by developers in order to meet the increased demand for services.

The City of Cockburn's goal in managing infrastructure assets is to meet the required level of service in the most cost effective manner for present and future consumers.

The key elements of infrastructure asset management are:

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

This AMP is prepared under the direction of Council's vision, mission, goals and objectives.

The City of Cockburn's vision is:

> *Cockburn, the best place to be*
>
> The City of Cockburn's purpose is:
>
> *Support our communities to thrive by providing inclusive and sustainable services which reflect their aspirations*

The 5 key outcomes as detailed in the Strategic Community Plan (SCP) 2020-2030 are:

- Local Economy,
- Environmental Responsibility
- Community, Lifestyle & Security
- City Growth and Moving Around
- Listening and Leading

The relevant goals and objectives as outlined in the Strategic Community Plan and how these are addressed in this asset management plan are detailed in Table 2.2.1.

Table 2.2.1 Council Goals and how these are addressed in this Plan

Strategic Outcome	Strategic Objective	How Outcomes and Objectives are addressed
Local Economy: A sustainable and diverse local economy that attracts increased investment and provides local employment	1. A City that is 'easy to do business with'.	**Levels Of Service:** Section 3
City Growth and Moving Around: A growing City that is easy to move around and provides great places to live	1. An attractive, socially connected and diverse built environment. 2. An integrated, accessible and improved transport network.	**Levels Of Service:** Section 3 **Demand Management**: Section 4
Listening and Leading: A community focused, sustainable, accountable and progressive organisation	1. Best practice Governance, partnerships and value for money.	**Financial analysis:** Section 6

2.3 Plan Framework

Key elements of the AMP are:

- Levels of Service and Enterprise Risk Management – outlines the levels of service provided by Council and identifies risks to the City.
- Future Growth and Demand – how this will impact on future service delivery and how this is to be met.
- Lifecycle Management – how the City will manage its existing and future assets to provide the required services.
- Financial Analysis – what funds are required to provide the required services.
- Asset management practices.
- Asset management monitoring and improvement plan – how the plan will be monitored and improved to ensure it is meeting Council's objectives.

2.4 Asset Management Maturity

The 2020-2024 RAMP has been developed in accordance with the International Infrastructure Management Manual (IIMM) and complies with the Department of Local Government & Communities Asset Management Framework.

As part of the City's Strategic Asset Management Planning Framework (SAMPF), the RAMP will more accurately forecast future funding for the City's Road Infrastructure,

enabling the organisation to determine future budgeting requirements, sustain the current and future asset base, whilst ensuring that optimisation of activities and programs facilitate for the capture and reporting of adopted service levels.

The RAMP has reached an 'intermediate' level of maturity and provides Executive level monitoring and reporting of key improvement areas from the Improvement Strategy.

With the continued implementation of the Strategic Asset Management Framework, the City will commence measuring service levels for planned and reactive maintenance to determine operational performance and asset utilisation.

The City strives to improve its strategic and operational asset management practices and to continue its journey towards advanced asset management. The Department of Local Government, Sport and Cultural Industries (DLGSC) has developed the Western Australia Local Government Integrated Planning and Reporting Framework The future direction and need for advanced level practices are continually assessed in accordance with this and the City's Asset Management Policy. The Integrated Planning and Reporting Framework is shown Figure 2.4.1.

Figure 2.4.1 The City's Integrated Corporate Planning Framework

The RAMP forms part of the City's Assets Informing Strategies, which consists of the following strategy and asset management plans:

Asset Management Strategy - 2017 - 2024

Buildings AMP - 2020 - 2024

Cockburn Aquatics and Recreation Centre (ARC) AMP - 2020 - 2024

Drainage AMP - 2020 - 2024

Footpath AMP - 2020 - 2024

Fleet and Plant AMP - 2020 - 2024

Marina and Coastal Infrastructure AMP - 2020 -2024

Parks & Environment AMP - 2020 -2024

2.5 Asset Management Plan – Data Confidence Assessment

Each of the five sections within the RAMP were reviewed to determine stakeholder confidence as to the accuracy and maturity of the City's asset data and services.

Table 2.5.1 Data Accuracy

AMP	Contents	Data Confidence
Section 2	Strategic goals & objectives	**A**
Section 3	Levels of Service	**A**
	Risk Management	
Section 4	Growth, Demand, New Assets	**A**
Section 5	Asset data; Age, Condition	**B**
	Operating & Maintenance Expenditure, Renewal Expenditure	
Section 6	Financial statements; Renewals Gap, Ratios	**A**

Ratings are based on the following criteria / inputs.

Table 2.5.2 Data Confidence Criteria

Confidence Grade	Description
A Highly reliable	Data based on sound records, procedures, investigations and analysis, documented properly and agreed as the best method of assessment. Dataset is complete and estimated to be accurate ± 2%
B Reliable	Data based on sound records, procedures, investigations and analysis, documented properly but has minor shortcomings, for example some of the data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or some extrapolation. Dataset is complete and estimated to be accurate ± 10%
C Uncertain	Data based on sound records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which grade A or B data are available.

Confidence Grade	Description
	Dataset is substantially complete but up to 50% is extrapolated data and accuracy estimated ± 25%
D Very Uncertain	Data is based on unconfirmed verbal reports and/or cursory inspections and analysis. Dataset may not be fully complete and most data is estimated or extrapolated. Accuracy ± 40%
E Unknown	None or very little data held.

3. Levels of Service

To support the management of road assets the City has developed industry best practice asset management and customer focussed levels of service (LOS) for infrastructure assets and associated services. These LOS's provide the City with a mechanism to deliver operational activities that endeavour to meet community expectations in the most cost effective manner possible.

The City administers Community and Technical Services levels to ensure that quality service provision is provided in accordance with the City's customer Service Charter and Community Engagement Framework, whilst Technical Services are sustainable, and adhere to all relevant compliance, safety and industry standards.

The RAMP community and technical levels of service are defined to an asset group level and enable the City to monitor and report operational performance against adopted community and technical targets.

Similar to the City's existing Asset Management Plans, future RAMP Service level reporting will be derived from the City's Enterprise Asset Management System (EAM). The Implementation of the EAM will establish improved reporting of operational and maintenance budget expenditure providing increased confidence in projecting future budget needs and service level management.

3.1 Customer Research and Expectations

The City of Cockburn administered the CATALYSE Business and Community Perceptions Survey's to evaluate and monitor performance across a range of services.

552 Residents and 138 local businesses participated in the studies. The surveys were conducted by CATALYSE Pty Ltd and provide Council with valid performance measures that can be benchmarked and consistently monitored over time.

The most recent customer satisfaction surveys were undertaken in October 2019 and the performance comparison of satisfaction levels over the past five years are compared using a traffic light system to measure increasing or decreasing satisfaction.

Key to status

- Drop in customer satisfaction of 3% or more
- Change in customer satisfaction of 2% or less
- Increase in customer satisfaction of 3% or more

3.2 Current Levels of Service

The City of Cockburn has defined service levels in two terms:

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

- Supporting the community service levels are operational or technical measures of performance developed to ensure that at least the minimum community levels of service are met. Technical Levels of Service relate to how the City provides the service using technical terms

Historical tracking of customer satisfaction surveys

Table 3.1.1 Community

Performance Measure	Satisfaction Level (delighted & satisfied)					
	2014-15	2015-16	2016-17	2017-18	2019-20	Status from last year
Overall satisfaction with City of Cockburn (as a place to live)	95	93	99	97	98	
Maintenance of local roads	84	85	82	87	87	
The management and control of traffic on local roads	67	53	66	70	75	

Table 3.1.2 Business

Performance Measure	Satisfaction Level (delighted & satisfied)					
	2014-15	2015-16	2016-17	2017-18	2019-20	Status from last year
How local roads are maintained	76	72	78	80	81	
Parking in commercial areas	49	49	73	76	73	
The management and control of traffic on local roads	57	56	59	66	70	

The satisfaction levels for the management and control of traffic has improved for residents and businesses alike, the maintenance of local roads is still the number one priority for both, key user groups.

Management and control of traffic on local roads saw an increase in satisfaction from both user groups continuing to demonstrate improvements in this service level from the previous AMP.

The City of Cockburn uses this information to continue developing the Strategic Community Plan and determine the allocation of resources to meet the community's needs.

Tables from 3.2.1 to 3.2.4 outline the City's current Community and Technical Service Levels objectives, measures and performance demonstrating the diversity and quality of services provided by the City's Road Services Team.

3.2.1 Provide a smooth ride to road users

Community – Total number of Customer enquiries and/or requests (C/R) relating to potholes which resulted in maintenance being required via reactive work orders (WO).

COMMUNITY	2014 -15		2015 -16		2016-17		2017-18		2018-19		2019-20		Status
	C/R	WO	C/R	WO	C/R	WO	C/R	WO	C/R	WO	C/R	WO	
Total	149	2	182	1	264	168	210	155	221	111	140	97	

Technical – Road surfaces to be maintained to a good condition with an intervention level being set at condition 4. Condition rating of road surface as a % of total area.

TECHNICAL	% of total area per hierarchy	% of total area in Condition 4 or 5					Status
		2011-12	2012-13	2013-14	2016-17	2019-20	
TOTAL		5.79	4.66	4.49	3.38	2.72	
DA	11.97	1.97	1.69	1.24	0.35	0.38	
DB	7.15	0.35	0.23	0.17	0.10	0.07	
RD	2.71	na	na	0.37	0.09	0.08	
LD	10.25	0.52	0.46	0.53	0.23	0.22	
AR	67.91	2.94	2.29	2.18	2.61	1.95	

3.2.2. Ensure that the road meets user requirements

Community – Total number of Customer enquiries and/or requests relating to roads

COMMUNITY	2014-15	2015-16	2016-17	2018-19	2019-20	Status
Total	300	345	216	275	248	

Technical – Capacity / Utilisation data (ability of the infrastructure to meet service delivery needs)

As reported for the National State of the Assets (NSoA) report 2019 - 20 survey by Projects & Asset Services.

LGA Grading	2019-20 (%)
Very good / good	90
Fair	5
Poor / very poor	5

3.2.3. Provide safe suitable roads free from hazards

Community – Total number of Customer enquiries and/or requests (C/R) related to sweeping versus number of reactive work orders (WO) generated

COMMUNITY	2014-15		2015-16		2016-17		2018-19		2019-20		Status
	C/R	WO	C/R	WO	C/R	WO	C/R	WO	C/R	WO	
Total	207	104	293	108	288	213	269	203	281	136	

Technical – Roads are swept 3 times a year.
Planned maintenance work orders percentage across hierarchies by suburb.

SUBURB	Total roads per suburb %	Sweeping per suburb %	Total Cost of sweeping $/YR	% of Cost per suburb
Atwell	5.44	7.68	44,487	7.76
Aubin Grove	3.38	5.79	32,293	5.63
Banjup	3.17	0.86	5,591	0.98
Beeliar	6.33	6.12	35,614	6.21
Bibra Lake	10.57	5.80	33,466	5.84
Cockburn Central	3.46	1.08	5,973	1.04
Coobellup	3.04	5.85	32,923	5.74

SUBURB	Total roads per suburb %	Sweeping per suburb %	Total Cost of sweeping $/YR	% of Cost per suburb
Coogee	3.73	7.32	42,140	7.35
Hamilton Hill	7.12	9.61	54,850	9.57
Hammond Park	4.15	5.34	30,221	5.27
Henderson	3.03	0.00	0	0.00
Jandakot	4.97	1.43	8,276	1.44
Lake Coogee	3.27	2.52	14,415	2.51
Leeming	1.26	2.38	13,504	2.36
Munster	0.28	0.00	0	0.00
North Coogee	2.58	4.57	26,730	4.66
North Lake	1.51	2.87	16,103	2.81
South Lake	4.38	4.06	23,322	4.07
Spearwood	7.33	7.62	44,427	7.75
Success	8.26	3.41	17,759	3.10
Treeby	3.52	1.34	8,133	1.42
Wattleup	3.40	4.85	27,590	4.81
Yangebup	5.82	9.50	55,379	9.66
TOTAL	**100.00**	**100.00**	**573,195**	**100.00**

3.2.4 Maintain roads by proactive repairs

Technical – Lower percentage of maintenance done by reactive repairs

Technical	2014-15	2015-16	2016-17	2019-20	Status
Road maintenance %					
Reactive maintenance	61.12	66.77	60.78	43.89%	
Planned maintenance	38.88	33.23	39.22	56.11%	
Verge maintenance %					
Reactive maintenance	9.42	4.79	2.82	NA	
Planned maintenance	90.58	95.21	97.18	NA	

3.3 Enterprise Risk Management

In 2015 the City implemented a Risk Management & Safety System (RMSS) in which all operational and strategic risks are captured, rated and receives ongoing monitoring based on their level of risk.

Additionally, in 2017 the Risk Management Framework was adopted with the aim of supporting an integrated and effective organisation wide approach to risk management.

The implementation of the Framework sought to:

- Ensure a consistent approach to the risk management process across Council;
- Establish a structured process for undertaking the risk management process to identify, assess and control/treat risks;
- Encourage the integration of risk management into the strategic and operational process across all Business Units of the Council

There are currently no Extreme or High Risks associated with Road Infrastructure only substantial risks as determined by the City's risk register.

Table 3.3.1 Substantial Risk and Existing Controls

Risk Description	Risk Rating	Proposed Treatment	Due Date
Delays in road projects and financial loss due to road design projects not adhering to current City's Project Management (PM) process, change in PM process, lack of resources, human error	Substantial	1. Standards are continually reviewed for all projects undertaken.	Ongoing
Traffic congestion, Reputational damage, Road safety due to Inadequate traffic modelling, Incorrect analysis of the land uses, Inaccuracy in priorities of the City's road network upgrade	Substantial	1. District Traffic Study (DTS) updated every 5 years. 2. Strategic Planning provide expert land use input into DTS. 3. By the use of regularly updated traffic data & traffic forecasts from the DTS work priority and peer review.	Ongoing
Failure to comply with current road design standards resulting liability exposure and reputational damage	Substantial	1. Sign Off process 2. Membership of peak bodies 3. Relationship with Main Roads and other stakeholders 4. Road Safety Audit	Ongoing

Risk Description	Risk Rating	Proposed Treatment	Due Date
Failure to plan for the future maintenance and the road assets resulting in asset failure and service delivery delay	Substantial	1. Supporting the City's Asset Management Team. 2. Reviewing process, engage an external consultant 3. Strategic Planning provide expert land use input into District Traffic Study	Ongoing

The City uses a matrix based approach when addressing risk level, treatment and responsibility as detailed in Table 3.3.2

Table 3.3.2 Risk Treatment Matrix

Risk Level	Code	Criteria	Treatment	Responsibility
LOW	L	Risk acceptable with adequate controls, managed by routine procedures. Subject to annual monitoring or continuous review throughout project lifecycle.	Management through routine operations/project, Risk Registers to be updated.	Service Unit Manager/Project Manager
MODERATE	M	Risk acceptable with adequate controls, managed by specific procedures. Subject to semi- annual monitoring or continuous review throughout project lifecycle.	Communication and awareness of increasing risk provided to SM, Risk Registers to be updated.	Senior Manager/Project Manager
SUBSTANTIAL	S	Accepted with detailed review and assessment. Action Plan prepared and continuous review.	Assess impact of competing Service Unit/Business Unit Projects. Potential redirect of Service Unit/Business Unit resources. Risk registers to be updated.	Director/Steering Committee
HIGH	H	Risk acceptable with effective controls, managed by senior management/executive. Subject to quarterly monitoring or continuous review throughout project lifecycle.	Escalate to CEO, report prepared for Audit & Strategic Finance Committee. Quarterly monitoring and review required. Risk Registers to be updated.	Executive/ Steering Committee/Project Sponsor
EXTREME	E	Risk only acceptable with effective controls and all treatment plans to be explored and implemented where possible, managed by highest level of authority and subject to continuous monitoring.	Escalate to CEO, report prepared for Audit & Strategic Finance Committee. Monthly monitoring and review required. Risk Registers to be updated.	CEO/Council/Project Sponsor

Each of the risks are reviewed with current and proposed control measures being assessed yearly to ensure industry standards and potential advancements are considered and are incorporated as required.

3.4 Legislative Requirements

The City of Cockburn has to meet many legislative requirements including Australian and State legislation and State regulations.

See (Appendix A) for the Legislative Requirements

3.5 Asset Capacity and Performance

The City of Cockburn services are generally provided to meet design and performance standards where these are available.

Locations where deficiencies in service performance are known have been identified by Road Services and are detailed in the following tables.

Table 3.5.1 Known service performance deficiencies - Roads

Location	Service Deficiency
Woodman Point	Current road condition is either 4 or 5 Not City of Cockburn jurisdiction managed by The DBCA. Upgrading of footpaths to be completed by CoC, roads yet to be resolved
Cockburn Central/Gateways Rockingham/Beeliar/Stock Rd School Zones	Traffic queuing / congestion; especially during peak / school hours to be addressed by North Lake Road and Armadale Road flyover
Utilities Contractors	Not reinstated within 5 days; however, have improved recently but ongoing with the growing expectation from residents on utilities plus continued growth

Table 3.5.2 Known service performance deficiencies - Car Parks

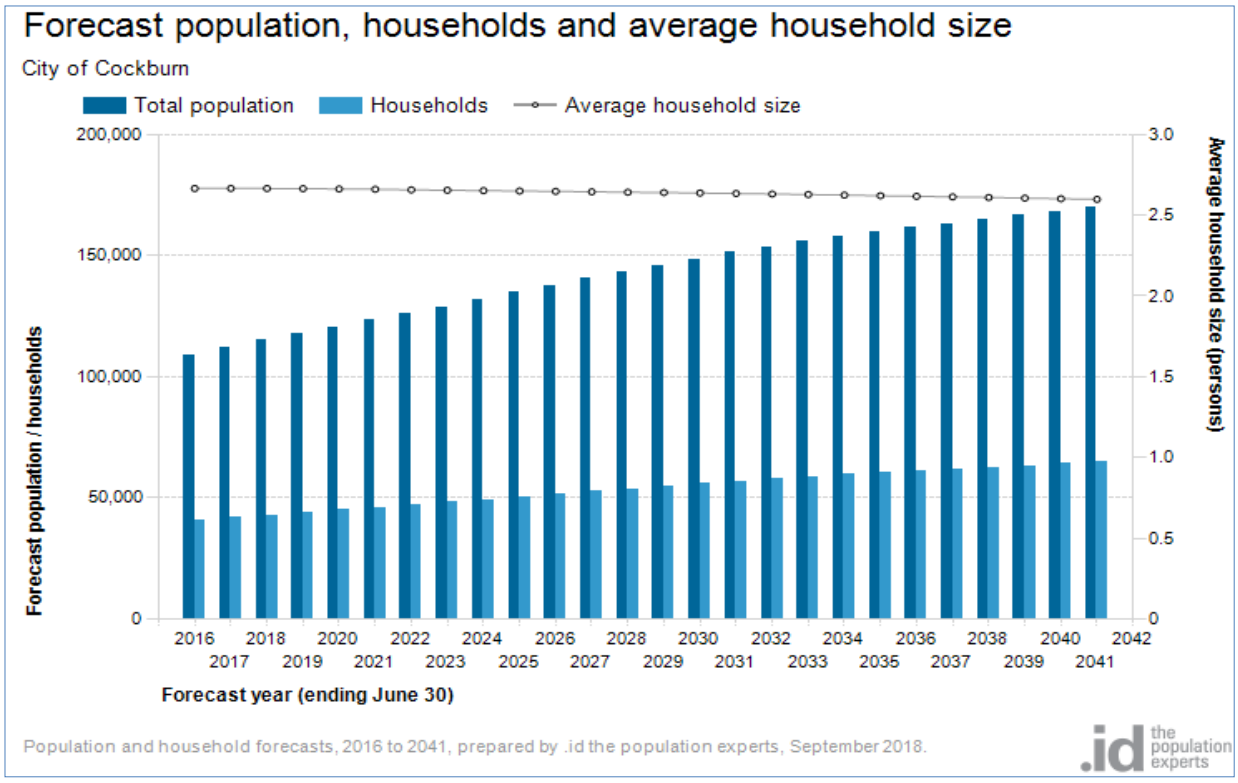
Location	Service Deficiency
Schools / Education Dept	Not built to standards; don't have to comply with council policy
Port Coogee Marina	Chieftan Esplanade; temporary carpark to be made permanent, better service provision for residents and visitors

4. Future Growth and Demand

4.1 Growth Forecast

Cockburn is one of the major Coastal Cities found in the state of Western Australia, totalling 170 square kilometres. This coastal City is renowned for its historical and tourism features along with agriculture and ship building industries.

The City of Cockburn's 2020 forecasted population and dwelling is 120,417 and 46,800 dwellings respectively. The population is forecast to reach 169,700 by 2041, an increase of 40.92%.



Growth factor trends and the impacts these have on service delivery across the City are summarised in Table 4.1.

Table 4.1 Growth - Projections and Impact on Services

Demand factor	Present position	Projection	Impact on services
Population	120,417 as at year 2020	Change between 2019 and 2041 is projected to be 52,176 a 44.4% increase at an average 2% per annum.	Increased traffic volume on roads results in additional maintenance & renewal costs & requirements for traffic calming devices.

Demand factor	Present position	Projection	Impact on services
Demographics	Aging population	Between 2016 and 2031 the age structure forecasts indicate 43% increase in the population of retirement age.	Increased bus services resulting in damage to road pavement & requirement to upgrade local roads for turning movements.
Industry	Existing industrial areas are expanding and reaching full potential	Extensive new industrial and commercial areas focused around Jandakot Airport and Latitude 32 Industrial area	Requirement for freight routes and upgrading of existing roads

An overall increase in population across the City will increase the number of vehicles on the road resulting in higher maintenance and renewal costs. As the industrial areas are developed the flow of heavier industrial traffic will also increase, this may result in road pavement surfaces wearing faster than anticipated.

4.2 Changes in Technology

Technology changes within the road construction industry are forecast to have little effect on the delivery of services covered within this plan.

4.3 Demand Management Plan

Demand management strategies provide alternatives to the creation of new assets in order to meet demand and look at ways to modify customer demands in order that the utilisation of existing assets is maximised and the need for new assets deferred or reduced. The objective of demand management is to actively seek to modify customer demands for services in order to;

- Optimise the utilisation/performance of existing assets,
- Reduce or defer the need for new assets,
- Meet organisation's strategic objectives,
- Deliver a more sustainable service, and
- Respond to changing customer needs.

The opportunities identified to date for demand management, the impact these drivers may have on future service delivery and the utilisation of these assets are shown in the Table 4.3.1.

Table 4.3.1 Demand Management Plan Summary

Service Activity	Demand Management Plan
Traffic flow	The City's network strategy aims to identify when road capacity needs to be increased, as well as measures that can be taken to maintain the efficient movement over it in the interim. As a broad design standard, the following capacities are used to guide road construction and upgrades: • Single carriageway <15,000 vehicles per day • Dual carriageway >15,000 vehicles per day Reassessment of road hierarchies Plan for the District Plan for duplication of Jandakot Road and Hammond Road

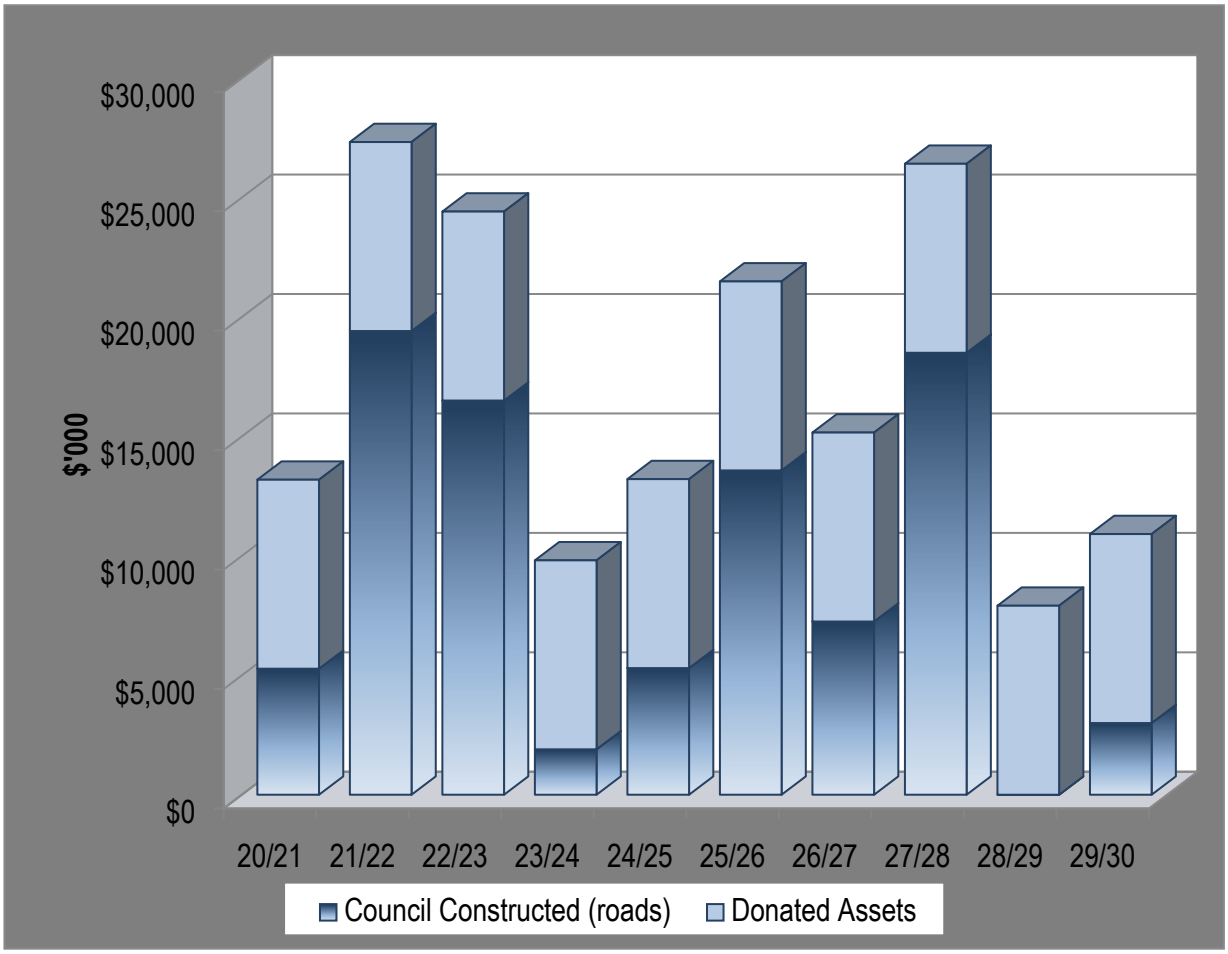
4.4 New Assets from growth

The new assets required to meet growth will be constructed by the City of Cockburn and acquired from land developments. The major road construction projects to be funded by the City are taken from The Long term Financial Plan and the budgeted capital expenditure for new and upgrade for the year 20/21. The project list is in Appendix E and shown on Graph 4.4 as Council Constructed (Roads).

The forecast for donated assets likely to be received from developers over the next 5 years has been calculated by averaging out the previous 5 years total donated assets received through subdivisions. This equates to approx. 8km of new road worth $7.8m per year.

New asset growth from council has been taken from the City's Regional & Major Roadworks 2018 - 2031 plan, projects are listed in Appendix E. It is known that there is significant construction of projects between 2021 - 2023 and no construction planned for 28/29 with donated assets remaining consistent across the ten year period. The Major Roadworks plan requires regular updates to maintain accuracy and best inform this AMP.

Graph 4.4 New Assets from Growth



These figures have been used throughout this asset management plan where growth and CPI increase has been considered.

There is no projected growth included for car parks or road items. It can however be assumed that the total figure estimated for new projects will include an amount for new road items and kerbing. There are no figures currently available to predict a growth for car parks.

5. Lifecycle Management

The lifecycle management area details how the City of Cockburn plans to manage and operate the road infrastructure assets while optimising lifecycle costs. The data is based on the City's Financial and Operational asset registers.

5.1 Asset Data

Roads will vary considerably in their role dependent upon what they are there to provide for be it efficient mobility on high volume fast moving roads or access to properties on lower volume residential roads. In order to promote effective, efficient and uniform traffic management across the state all roads are designated a road hierarchy category, these are briefly described below.

- Primary Distributor (PD)
  Provide for major regional and inter-regional traffic movement and carry large volumes of generally fast moving traffic. All are state roads and are managed by Main Roads Western Australia. These are not included or considered within this AMP.
- Regional Distributor (RD)
  Roads that are not Primary Distributors, but which link significant destinations and are designed for efficient movement of people and good within and beyond regional areas.
- District Distributor A (DA)
  Carry traffic between industrial, commercial and residential areas and generally connect to Primary Distributors. These are likely to be truck routes and provide only limited access to adjoining property.
- District Distributor B (DB)
  Perform a similar function to type A District Distributors but with reduced capacity due to flow restrictions from access to and roadside parking alongside adjoining property. These are often older roads with a traffic demand in excess of that originally intended.
- Local Distributor (LD)
  Roads that carry traffic within a cell and link District Distributors to access roads. These roads should accommodate buses but discourage trucks.
- Access Roads (AR)
  Provide access to abutting properties with amenity, safety and aesthetic aspects having priority over the vehicle movement function. These roads are bicycle and pedestrian friendly.

A map showing the road hierarchies within the City of Cockburn is shown in Appendix B. A breakdown of the road hierarchies and surface type as managed by the City is shown on Table 5.1 below.

Table 5.1 Breakdown of surface type by road hierarchy

Road Hierarchy	Surface material	Length (km)	Area (m²)	% based on area
RD	Asphalt	23.84	189,431	2.71%
	Red Asphalt	0.00	0	
	Brick	0.00	0	
DA	Asphalt	74.89	822,189	11.97%
	Red Asphalt	0.95	14,003	
	Brick	0.06	926	
DB	Asphalt	52.95	489,211	7.15%
	Red Asphalt	1.02	4,431	
	Brick	0.88	6,508	
LD	Asphalt	78.03	667,062	10.25%
	Red Asphalt	1.85	17,219	
	Brick	2.98	32,320	
AR	Asphalt	612.30	4,379,496	67.91%
	Red Asphalt	31.92	215,908	
	Brick	19.66	152,126	
TOTAL		**901.33839**	**6990827.85**	**100%**
Kerbing		**1,542**		

5.1.1 Asset Age

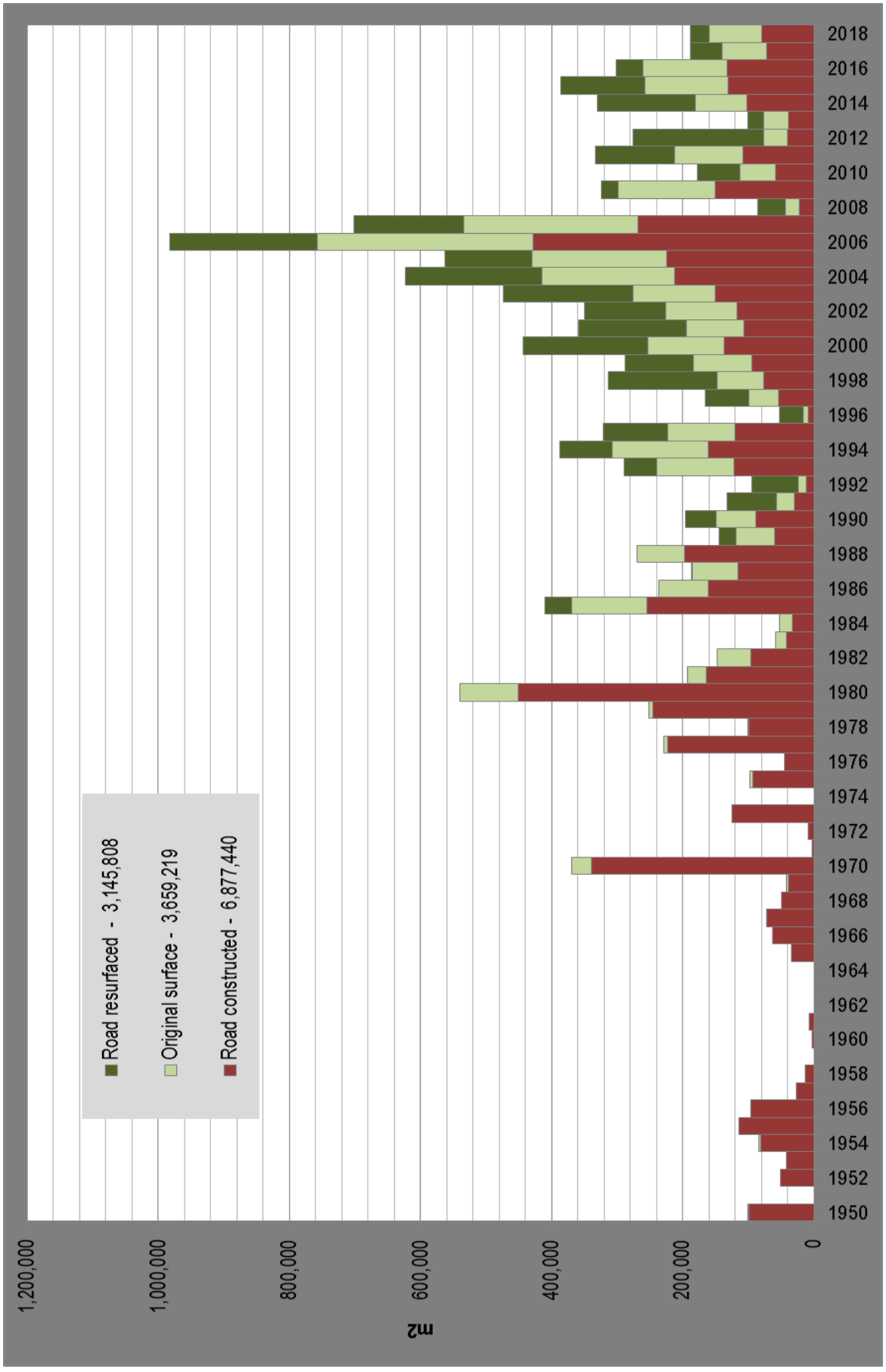
The following graph shows the age profile for roads constructed, roads where the original surface is still in-situ and roads that have been resurfaced.

It can be seen that for the year 1980, 450,374 m2 of road were constructed and that 88,833 m2 of these roads still have the original surface.

Conclusions that can be drawn from this graph include:

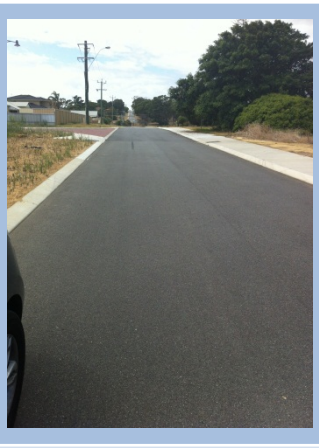
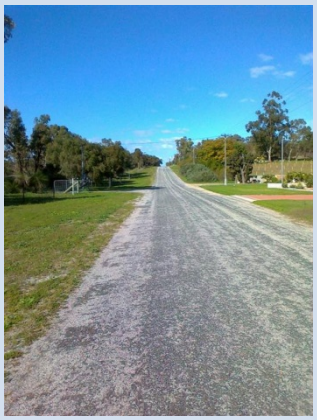
- All roads built prior to 1975 have been resurfaced.
- The oldest recorded road surface is 45 years.
- Approximately half of all roads within the City of Cockburn have been resurfaced.

Graph 5.1Age Profile - Road Surface



5.1.2 Asset Condition

The Condition profile of the City of Cockburn's road infrastructure assets is measured using a 1 to 5 rating system as outlined below.

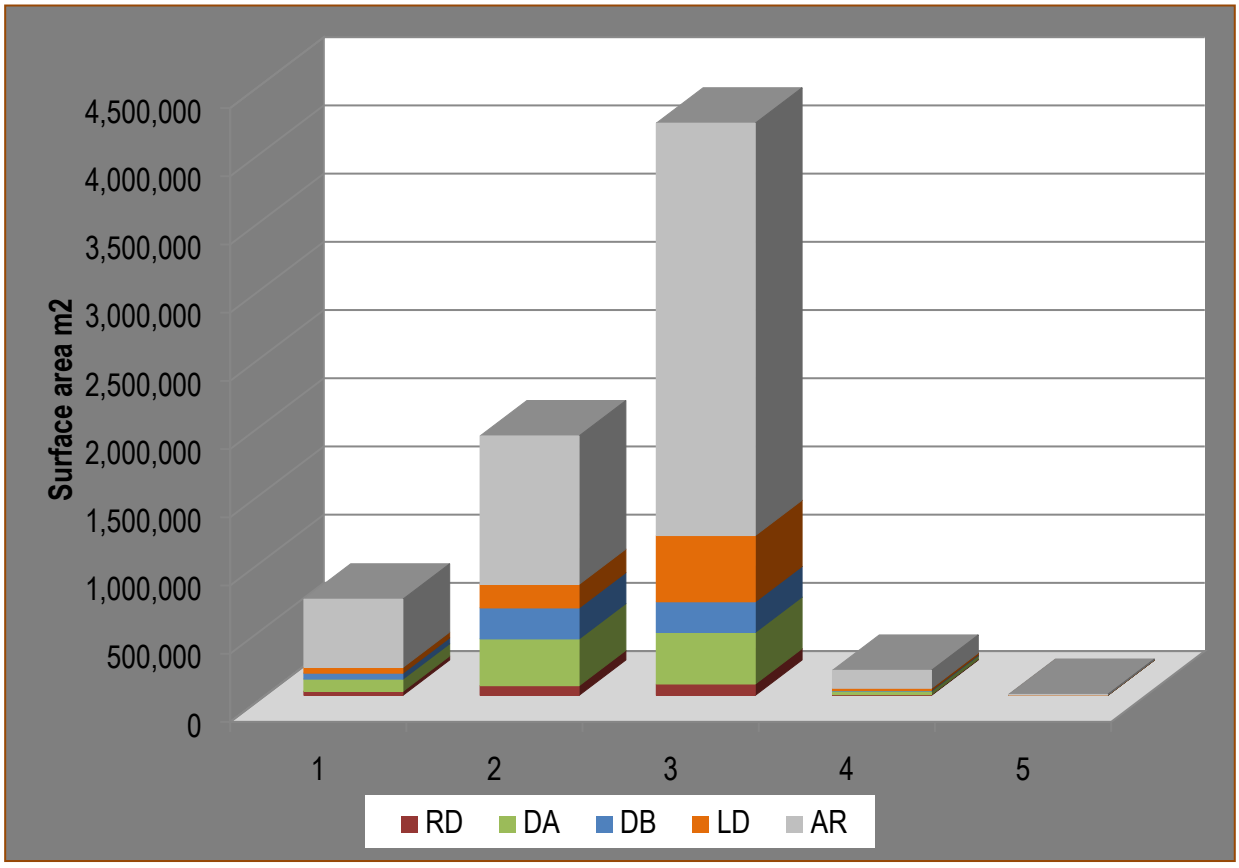
Rating	Description		
1	Excellent		A new asset or an asset in overall excellent condition with only a slight condition decline.
2	Good		An asset in an overall good condition but with minor signs of deterioration evident, serviceability may be slightly impaired. Minor maintenance is required
3	Moderate		An asset with obvious signs of deterioration. Significant maintenance is required
4	Poor		An asset in a poor condition. Condition deterioration is severe and serviceability is becoming limited. Significant renewal or upgrade is required.

Rating	Description		
5	Very poor		An asset that has failed and is no longer serviceable. There would be a risk in leaving the asset in service. Replacement is required.

All assets in the road asset database have been visually assessed on site and given an appropriate condition rating based on the above criteria. The most recent surface condition survey was completed by Talis in 2019 for all hierarchies except access roads (AR)s. All projections, graphs and tables in this RAMP have been calculated using this data.

The condition profiles for road surface by hierarchy categories and by suburb are shown on Graph 5.1.2A and 5.1.2B below. Table 5.1.2 summarises the condition of all road infrastructure assets.

Graph 5.1.2A Condition Profile for Road Surface by Road hierarchy



Graph 5.1.2B Condition Profile for Road Surface by Suburb

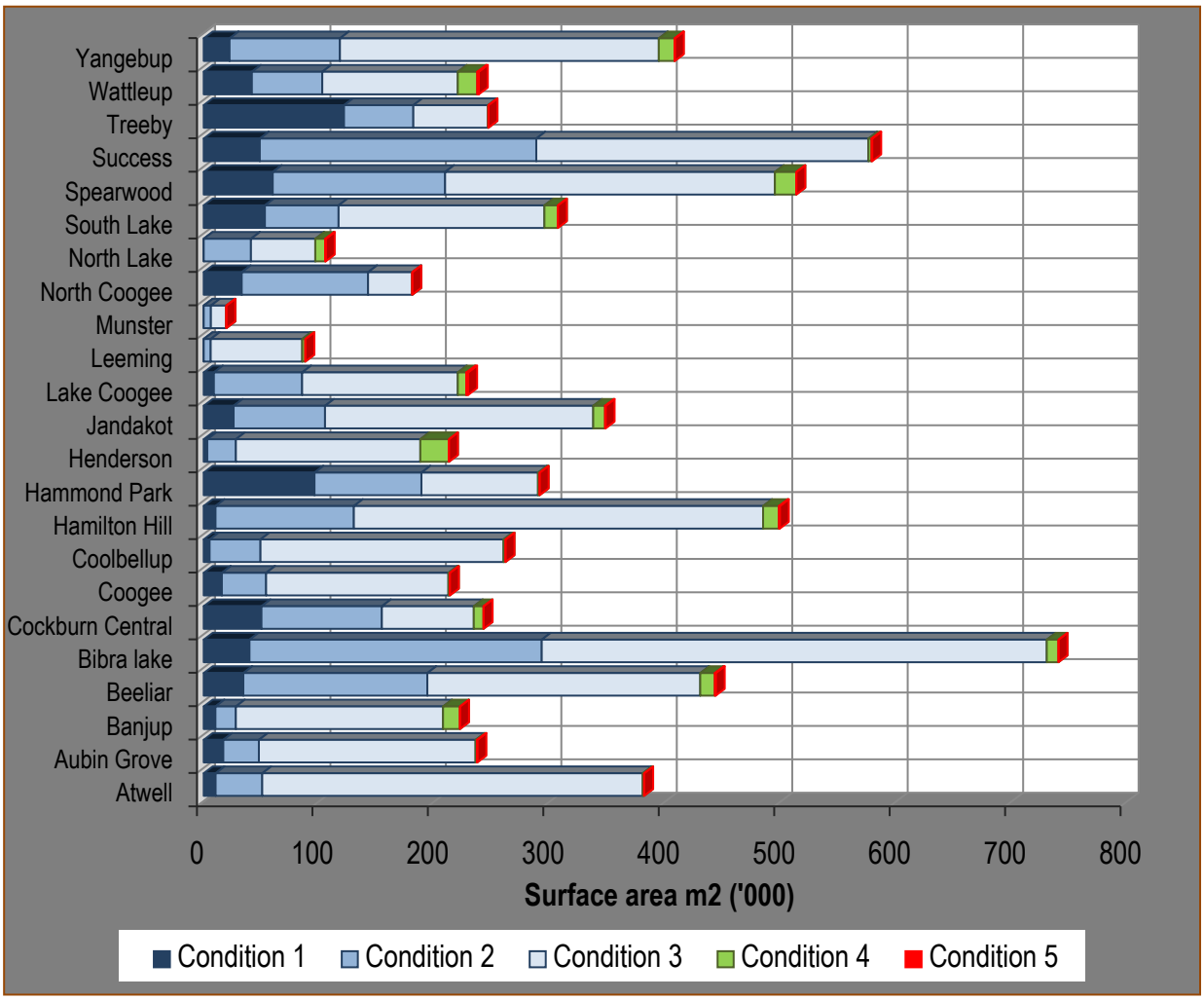


Table 5.1.2 Summary of road infrastructure assets - Condition

Condition	% of Asset Category		
	Road	Road Item	Car Park
1	10.08	32.74	37.02
2	27.20	50.43	45.88
3	60.00	14.59	12.95
4	2.62	2.10	4.16
5	0.10	0.14	0.00

From the above it can be seen that the majority of the assets have not yet reached the intervention level of condition 4. Since the last revision of the AMP, overall condition ratings across roads, road items and car parks have deteriorated.

5.1.3 Useful Life

Table 5.1.3 shows the breakdown in age and condition of the road surface by road hierarchy.

Table 5.1.3A Age and condition of road surface in m2

Condition / Hierarchy		Age of road surface (yrs)					Average age
		0 to 5	6 to 10	11 to 15	16 to 20	>20	
1	RD	29,483	0	0	0	0	2.2
	DA	73,832	7,109	6,310	0	1,913	4.7
	DB	32,614	2,914	4,273	1,127	0	5.3
	LD	32,257	3,006	5,999	0	1,309	4.0
	AR	429,366	5,764	21,628	5,043	40,831	2.9
2	RD	0	28,158	8,037	33,389	1,197	13.5
	DA	42,543	104,634	111,467	61,856	22,285	11.4
	DB	40,417	65,325	79,144	15,988	26,341	12.7
	LD	6,917	36,740	64,797	28,858	35,509	14.9
	AR	116,392	298,284	354,161	205,032	114,218	13.1
3	RD	0	4,266	1,099	31,621	46,253	23.5
	DA	13,281	36,381	100,262	184,346	43,316	16.4
	DB	5,056	55,176	44,698	57,944	61,437	17.6
	LD	979	34,964	80,722	148,022	220,980	21.1
	AR	7,144	188,051	652,844	707,428	1,467,451	21.4
4	RD	0	0	0	0	4,911	33.7
	DA	0	932	7,328	15,964	2,023	15.8
	DB	366	0	0	3,553	1,280	19.4
	LD	0	306	2,511	5,936	6,528	20.1
	AR	1,037	281	16,979	19,042	94,240	27.0
5	RD	0	0	0	0	1,017	21.0
	DA	0	0	0	399	0	20.0
	DB	0	0	0	0	0	0.0
	LD	0	0	0	0	261	24.0
	AR	1,474	0	382	683	2,542	21.56

Total m2	833,158	872,289	1,562,641	1,526,231	2,195,842	6,990,161
% of roads	11.92%	12.48%	22.35%	21.83%	31.41%	100%

KEY

Greater than 200,000 m2
Between 100,000 to 200,000 m2
Between 50,000 to 100,000 m2
Between 10,000 to 50,000 m2
Less than 10,000 m2

The graph below is based on the data shown in the above table and shows the average age for road surface against the condition rating.

The asset life can vary significantly as a result of different road hierarchies, traffic volumes, the roads function and locality. Continued analysis and reviewing of the depreciation rate and useful life has been identified as a key improvement.

Table 5.1.3B Changes to Useful Life for each road hierarchy

Road Hierarchy	RAMP 2013 -2017 (Yrs)	RAMP 2017- 20 (Yrs)	RAMP 2020 – 24 (Yrs)
DA	20	14	20
DB	20	17	22
LD	20	18	25
RD	20	19	30
AR	20	23	35

Road Item

A breakdown of the road item types is shown below. The useful life of 20 years used for bus embayment and parking areas is the same as for road surface. The useful life of 50 years as used for the other road item types has been taken from the current depreciation rate.

Table 5.1.3C Area and Useful Life of Road Item

Road Item type	Area (m^2)	Useful Life
Anti-skid surface	9,278	20
Bus Embayment	5,963	20
Median Island	299,430	50
Parking areas	69,826	30
Roundabout	38,046	50

Road Item type	Area (m²)	Useful Life
Speed Plateau	4,940	35
Splitter Island	26,266	50

Car Park

The car parks are at present managed by three different service units. This is to be assessed as part of the improvement strategy regarding asset clarification and ownership. A useful life of 30 years has been used to be consistent with roads. This will also be assessed and reviewed as part of the improvement strategy.

Table 5.1.3D Area and Useful Life of Car Park

Surface material	Jurisdiction	Area (m²)	Useful Life
Asphalt	Facilities	21,783	30
	Parks	70,193	
	Roads	49,321	
Brick	Facilities	1,212	30
	Parks	3,000	
	Roads	27,362	

5.1.4 Asset valuations

The value of assets as at 30 June 2020 covered by this asset management plan are summarised below. Assets were last revalued in August 2020 in line with current Schedule of Rates as used by Road Construction Services.

Table 5.1.4 Asset Valuations

Suburb	Road Surface $	Road Base $	Road Sub Base $	Kerb $	Road Items $	Car Parks $	TOTAL $
Atwell	10,395,715	8,097,876	10,195,178	3,698,455	4,341,620	1,393,513	**38,122,358**
Aubin Grove	6,502,972	5,065,924	6,378,283	2,281,401	2,432,336	754,282	**23,415,199**
Banjup	6,048,461	4,731,496	5,955,834	253,576	25,101	86,440	**17,100,909**
Beeliar	12,645,287	9,534,926	12,003,013	4,094,406	3,013,460	622,065	**41,913,157**
Bibra lake	23,460,823	16,278,693	20,482,076	5,817,967	2,967,534	653,887	**69,660,980**
Cockburn Central	8,046,322	5,389,891	6,780,330	1,752,955	1,496,658	676,723	**24,142,878**
Coogee	8,618,379	4,507,004	5,675,576	1,780,255	835,420	1,155,032	**22,571,665**
Coolbellup	7,195,741	5,529,753	6,963,363	2,619,317	848,106	478,681	**23,634,961**
Hamilton Hill	15,507,928	10,790,564	13,580,202	4,723,539	1,695,362	1,154,635	**47,452,230**
Hammond Park	7,844,495	6,113,743	7,700,610	2,615,550	2,193,677	1,137,509	**27,605,585**
Henderson	5,988,866	4,592,252	5,780,871	1,655,078	338,068	574,001	**18,929,137**
Jandakot	10,911,867	7,661,323	9,637,704	2,528,256	2,701,767	291,063	**33,731,980**
Lake Coogee	6,310,731	4,573,156	5,757,256	1,931,819	974,037	307,332	**19,854,331**
Leeming	2,619,157	1,865,815	2,349,302	749,123	205,579	0	**7,788,977**
Munster	610,467	431,002	542,308	110,845	21,882	0	**1,716,505**
North Coogee	4,550,369	3,780,849	4,762,117	1,589,012	1,526,231	2,881,656	**19,090,235**
North Lake	3,451,214	2,343,137	2,947,448	1,014,876	605,342	11,999	**10,374,015**
South Lake	9,155,222	6,612,042	8,322,380	2,552,185	1,086,344	655,847	**28,384,020**
Spearwood	15,674,656	11,091,011	13,960,261	4,768,242	1,344,998	2,055,928	**48,895,097**
Success	17,424,406	12,533,820	15,773,275	5,113,497	4,106,448	2,107,464	**57,058,909**
Treeby	7,213,655	5,315,050	6,691,280	1,775,073	944,873	487,373	**22,427,305**
Wattleup	7,312,595	5,243,218	6,597,488	1,123,519	81,801	208,193	**20,566,814**
Yangebup	11,462,116	8,677,969	10,925,630	3,391,807	1,394,515	318,781	**36,170,817**
TOTAL	**208,951,444**	**150,760,515**	**189,761,786**	**57,940,754**	**35,181,160**	**18,012,405**	**660,608,064**

5.2 Maintenance and Operating expenditure

Maintenance includes reactive and planned maintenance work activities.

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

Planned maintenance is work that is identified and managed through a maintenance schedule, these activities include cycleway sweeping, inspection, assessing the condition against failure/breakdown experience, prioritising, scheduling, actioning the work and reporting what was done to develop a maintenance history and improve maintenance and service delivery performance.

Maintenance expenditure trends have been taken from the Finance One database and are shown in Table 5.2. Following improvements made to the reporting structure since the last RAMP a more accurate breakdown of the maintenance figures have been obtained. These figures are for road maintenance only and do not take into account street lighting or minor infrastructure.

Operating expenditure is continuously required expenditure e.g. power, fuel, staff, security patrols, plant equipment, on-costs and overheads.

Maintenance and operating expenditure trends are shown in Table 5.2.

Table 5.2 Maintenance & Operating Expenditure Trends (OP8512)

Year	Planned $	Reactive $	Reactive %	Operating $	Budget $	Total expenditure $
2010-11	163,828	146,988	47.30	1,160,452	1,246,906	**1,471,269**
2011-12	167,390	154,567	48.00	975,521	1,320,456	**1,297,477**
2012-13	155,140	140,384	47.50	1,040,760	1,386,895	**1,336,284**
2013-14	164,726	169,067	50.70	1,048,778	1,380,322	**1,382,571**
2014-15	118,320	185,975	61.10	1,090,618	1,411,883	**1,394,913**
2015-16	104,013	208,972	66.80	1,192,618	1,339,121	**1,505,603**
2016-17	201,005	311,533	60.80	1,381,640	1,568,065	**1,894,178**
2017-18	319,696	376,257	54.10	1,457,047	2,293,513	**2,153,001**
2018-19	346,648	376,991	52.10	1,365,856	2,135,869	**2,089,497**
2019-20	362,562	283,633	43.89	1,587,203	2,378,094	**2,233,398**

Planned maintenance work for the financial year 2019-20 was 56% of the total maintenance expenditure. Maintenance expenditure levels are considered to be adequate to meet desired service levels.

The future maintenance and operating expenditure is forecast to grow in line with the value of the asset stock and this increase needs to be budgeted to ensure new road infrastructure assets are maintained to the service levels identified in section 3. This is further discussed in Section 6.1 of the Financial Analysis.

5.2.1 Standards and specifications

Maintenance, renewals and upgrade work are carried out in accordance with the Standards and Specifications listed in Appendix F.

5.2.2 Summary of future maintenance expenditures

Future maintenance expenditure is forecast to trend in line with the value of the asset stock which will increase due to new asset growth as shown previously in Graph 4.4. The forecast expenditure has been calculated as follows:

- Current Operations and Maintenance expenditure for 2019-20 per m2 of road =$0.28

- Taking into consideration total growth per year as in Graph 4.4 the average increase in maintenance per year for the next 10 years is forecast to be $119,749 per year.

- Therefore by 2029-30 Operations and Maintenance expenditure for road maintenance is expected to be around $3,528,699 including a 2% CPI increase per year.

Maintenance is funded from Council's operating budget and grants where available. This is further discussed in Section 6 Financial Analysis.

5.3 Renewal and Replacement Plan

Renewal expenditure is major work which does not increase the asset's design capacity but restores, rehabilitates, replaces or renews an existing asset to its original service potential.

The projected 10 Year Renewals first 2 year program is detailed in Appendix C & D. Renewals are incorporated into the City's capital works program. This is further explored in Section 6.2.

5.3.1 Road surface

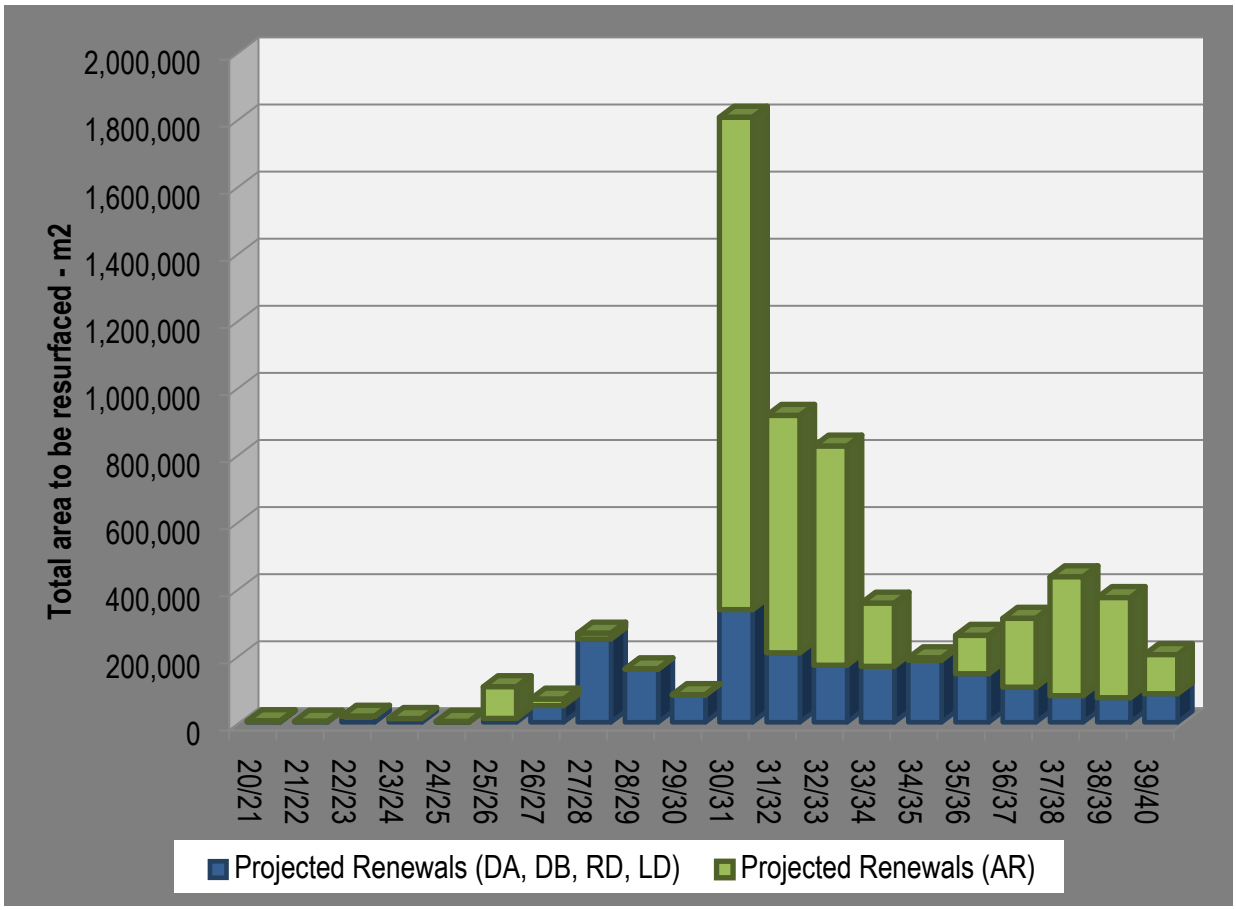
Two key parameters were established to enable the creation of the road resurfacing renewal plan:

- An asset assessed as Condition 4 and 5 is the first trigger in the evaluation to determine suitability for renewal. A number of other factors are considered in the scoping and formalisation of a renewal plan. These include evaluation of age, maintenance expenditure, customer requests information, future development in the surrounding area and finally a thorough visual assessment.

- Each road hierarchy surface has a different useful life and is defined as follows: DA 20 years, DB 22 years, LD 25 years, RD 30 years, AR 35 years.

Using the data from Table 5.1.3 and the above criteria the following renewal projections have been made. For a more detailed breakdown of the graph for 2021-22 renewal program see Appendix D

Graph 5.3.1 Projected Renewals - Road Surface



Individual surface unit rates were used to generate the $ value of the renewal program for each asset hierarchy. Renewals are to be funded from the City of Cockburn's capital works program and grants where available. This is further discussed in Section 6 Financial Analysis.

5.3.2 Road item

There are only 2.24% currently at the intervention level of condition 4. No renewal plan has therefore been considered for these road items.

5.3.3 Car Park

The car park resurfacing renewals have been based on the same criteria as the road renewal plan. There is no funding allocation currently in place for the car parks.

Car Park Number	Name	Custodian	Condition	Area/m2	Estimated Resurface Cost/$
CP_041	SOUTH COOGEE	Parks	4	2,192	57,078
CP_071	MARBAN WAY	Roads	4	1,955	50,917
CP_082	ROBB ROAD	Roads	4	765	19,915
CP_090	HOPBUSH PARK	Roads	4	302	7,863
CP_110	CLARENCE BEACH ROAD	Roads	4	2,214	57,641
CP_128	HITCHCOCK PLACE	Roads	4	315	8,192
CP_129	HITCHCOCK PLACE	Roads	4	144	3,752
CP_130	HITCHCOCK PLACE	Roads	4	90	2,355
TOTAL					**207,714**

5.4 New and Upgrade Plan

New works are those works that create a new asset that did not previously exist or works which upgrade or improve an existing asset beyond its existing capacity. They may result from growth, social or environmental needs. Assets may also be acquired at no cost to the Council from land development. These assets are detailed in Section 4.4 and shown on Graph 4.4.

5.4.1 Selection criteria

As a broad design standard, the following capacities are used to guide road construction and upgrades:

- Single carriageway <15,000 vehicles per day
- Dual carriageway >15,000 vehicles per day

The City's network strategy aims to identify when road capacity needs to be increased, as well as measures that can be taken to maintain the efficient movement over it in the interim.

5.4.2 Summary of future upgrade and new assets expenditure

The planned major road infrastructure upgrade and new capital works projects as included in the Long Term Financial Plan and shown previously in Graph 4.4 are detailed in Appendix E.

5.5 Disposal Plan

Disposal includes any activity associated with disposal of a decommissioned asset including sale, demolition or relocation. There are no disposals planned for any road infrastructure assets at this time.

6. Financial Analysis

The Financial Analysis section of this report provides the recommended financial forecasts for the next 10 years. This section brings together the various types of expenditure described throughout the previous sections of the AMP and provides recommended budgets for Council to achieve the appropriate level of service through Municipal funding.

6.1 Financial Statements and Projections

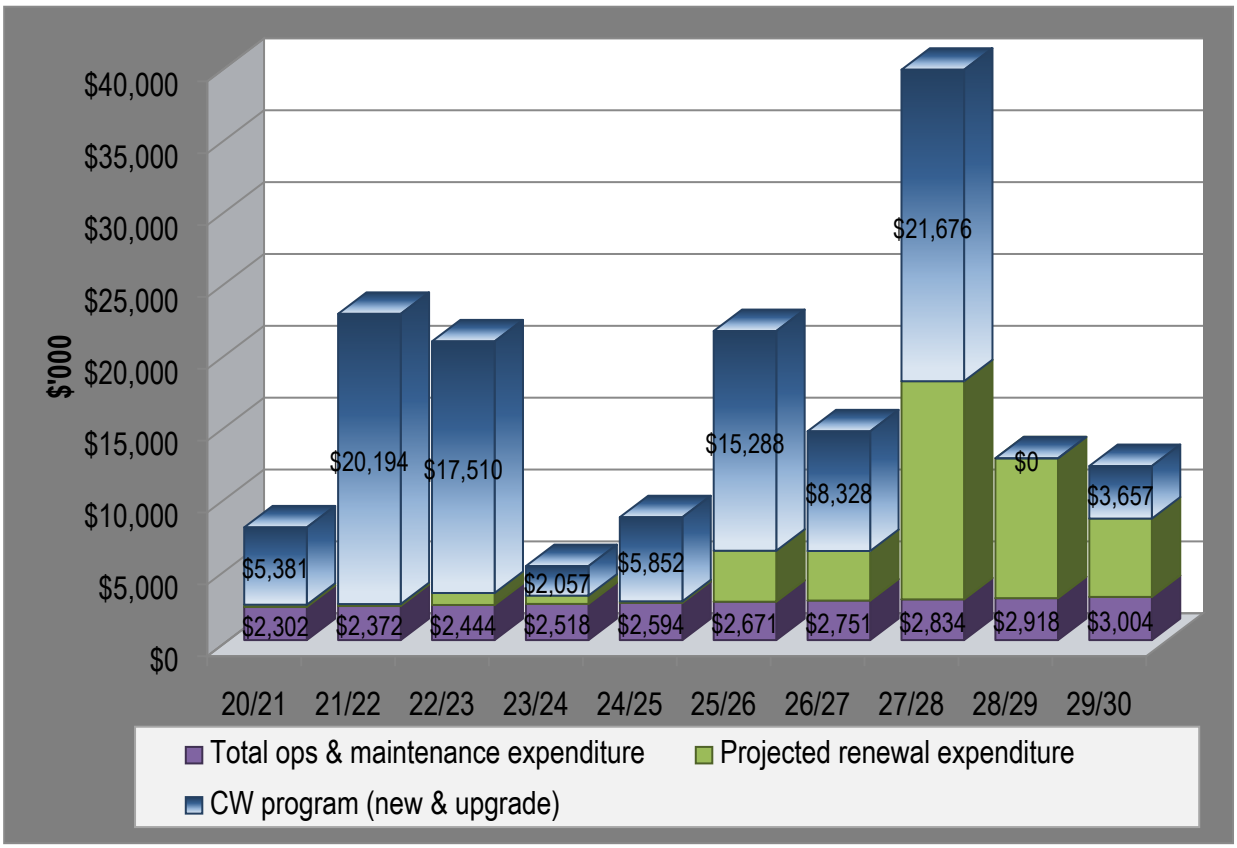
From the financial asset register, the value of assets as covered by this asset management plan are summarised in Table 6.1.1 Current Replacement Cost and Depreciation. The current replacement cost, fair value (also known as written down value or depreciated replacement cost), depreciation and the annual depreciation values are shown. Infrastructure valuation figures in this AMP are from the 2019-20.

Table 6.1.1 Current replacement cost and depreciation

Asset	Current Replacement Cost $ (CRC)	Fair Value $ (WDV)	Annual Depreciation Expense $	Annual Asset Consumption %
Road surface	208,951,444	120,689,556	7,424,146	58
Road base	150,760,515	88,122,613	1,637,966	58
Road sub base	189,761,786	110,993,664	1,897,618	58
Kerb	57,940,754	50,877,546	1,158,815	88
Road Items	35,181,160	26,140,533	1,326,861	74
Car Parks	18,012,405	13,436,590	407,026	75
Total $	**660,608,064**	**410,260,502**	**13,852,432**	

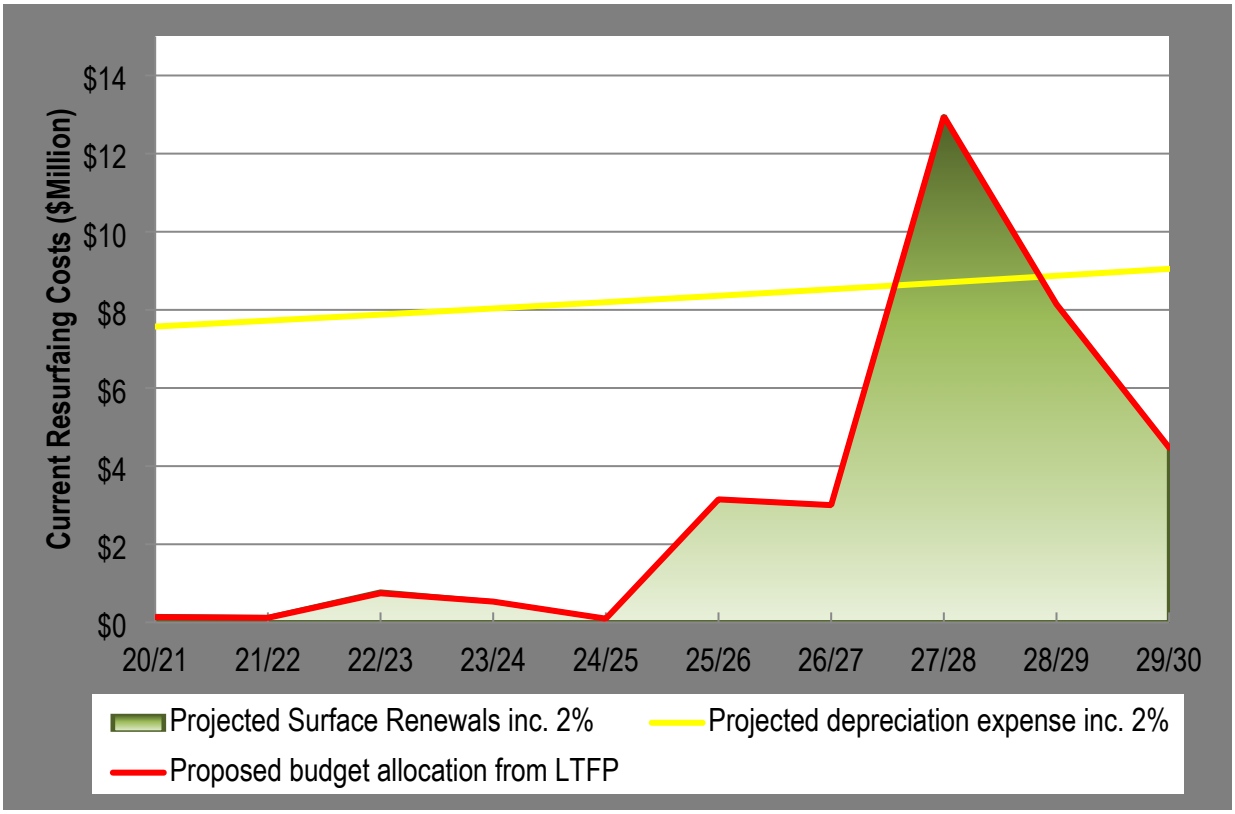
The financial projections are shown in Graph 6.1.1, for the forecasted operating (operations and maintenance) and capital expenditure (renewal and upgrade/ new assets).

Graph 6.1.1 Forecast Operating and Capital Expenditure



The costs shown are in 2019-20 dollar replacement values and also include the 2% CPI increase.

Graph 6.1.2 Projected renewal expenditure – Road surface

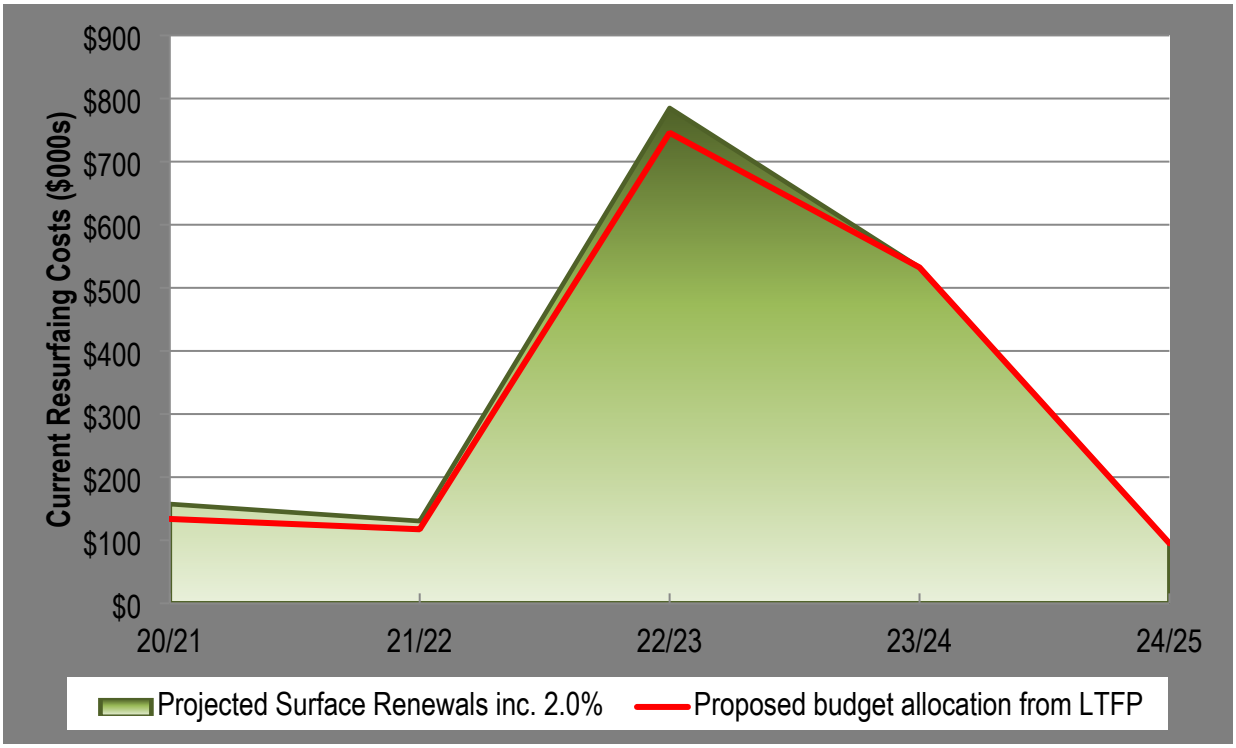


In Graph 6.1.2, data for the projected renewals are obtained as described in section 5.3.1. The detail renewal program for 2020-21 and 2021-22 are provided in Appendix C and D, the projected depreciation expense takes into account all new asset values and the budget allocation has been based on the funding for the renewals per year.

These costs are shown in 2019 dollar values and also include the 2% CPI increase per year forward.

For a more detailed breakdown of the next five years see Graph 6.1.3.

Graph 6.1.3 Projected renewal expenditure 2020-21 – 2024-25 – Road Surface



Following the review of the City's Useful Life's during the City's 2019-20 Asset Revaluation the renewals for the AR hierarchy have been prepared by resurfacing the oldest condition 5's through to 1's by age of road surface as per the table below e.g. $61,952 + CPI in Year 1. The renewals for all other road hierarchies have been calculated as per previous years.

Condition / Hierarchy		Age of road surface (yrs)				
		0 to 5	6 to 10	11 to 15	16 to 20	>20
1	AR	11,084,964	140,617	504,010	108,861	951,914
2	AR	2,929,959	7,189,853	8,353,068	5,049,841	3,146,381
3	AR	192,434	4,546,739	15,524,953	17,047,661	38,064,300
4	AR	27,201	7,495	408,965	461,382	2,352,748
5	AR	38,380	0	10,205	17,853	61,952

Increasing the Useful life has reduced the projected renewals for ARs in comparison to figures projected in previous versions of the RAMP. Project and Asset Services will conduct a network-wide condition audit (including ARs) in 2022-23 to better inform the next revision of the Roads Asset Management Plan. This approach also supports the City's implementation of a Strategic Asset Management System (SAM) which tailor renewal strategies based on various criteria such a road hierarchy.

Table 6.1.2 Projected Renewals and Budget Allocation Gap – Road Resurfacing

Year	Projected Renewals (inc 2.00% CPI)		Total Renewals	Proposed Budget Allocation from LTFP	Funding gap	Cumulative gap
	AR	DA, DB, LD, RD				
2020-21	$63,191	$94,174	$157,365	$133,760	$23,605	$23,605
2021-22	$18,574	$111,854	$130,429	$117,386	$13,043	$36,648
2022-23	$10,830	$774,177	$785,006	$745,756	$39,250	$75,898
2023-24	$0	$532,344	$532,344	$532,344	$0	$75,898
2024-25	$42,375	$52,820	$95,195	$95,195	$0	$75,898
2025-26	$2,649,576	$499,379	$3,148,955	$3,148,955	$0	$75,898
2026-27	$529,983	$2,471,891	$3,001,874	$3,001,874	$0	$75,898
2027-28	$479,168	$12,477,214	$12,956,382	$12,956,382	$0	$75,898
2028-29	$8,957	$8,135,329	$8,144,286	$8,144,286	$0	$75,898
2029-30	$33,158	$4,438,989	$4,472,147	$4,472,147	$0	$75,898
Total	**$3,835,812**	**$29,588,171**	**$33,423,982**	**$33,348,084**	**$75,898**	

Figures detailed in the LTFP Budget column were derived from the funding strategies within the LTFP and were manually distributed over the 10 year program. Please Note: All Figures within table 6.1.2 are subject to change as the City's AMP's are revised and each annual budget process is completed.

The 10 year cumulative funding gap for road resurfacing renewal works is a deficit of $75,898.

6.2 Funding Strategy

Projected expenditure identified in Section 6.1 is to be funded from the City's capital budgets. The funding strategy is detailed in the City's Long term Financial Plan 2020-2021 to 2029-2030.

In order to provide effective management of the road infrastructure asset base it is imperative that LTFP funding strategies are adequate and timely to support asset renewal projections and new projects outlined within the RAMP.

The City relies heavily on the provision of road funding from other sources including the Federal and State Governments. Additionally, under the Local Government Act (1995) the City can levy developers to provide a contribution to road funding, where this is directly linked to their development activities. The City has been receiving funds from this source for many years.

6.3 Sustainability of Service Delivery

There are three key performance indicators for financial sustainability as recommended in the Department of Local Government (LG) Asset Management National Framework and Guidelines that have been considered in the analysis of the road infrastructure financial data.

The aim of the Framework is to enhance the sustainable management of Local Government assets by encouraging 'whole of life' and 'whole of organisation' approaches and the effective identification and management of risks associated with the use of the assets.

6.3.1 Asset Consumption Ratio (ACR)

This ratio shows the written down current value of the City's depreciable road assets relative to their 'as new' value in up to date prices.

These values are calculated by dividing the fair value by the current replacement cost. These figures are shown below.

The target ratio should be between 50% and 75%. A ratio of less than 50% indicates a rapid deterioration of the asset base, whilst a ratio greater than 75% may indicate an over investment in the asset base.

Asset	Consumption Ratio %				Standard Achieved
	2012-13	2013-14	2017-18	2019-20	
Road (surface only)	69.02	68.84	54.97	57.76	Met
Kerbing	69.00	69.36	87.76	87.81	Improving
Road Item	76.53	76.82	75.21	74.30	Improving
Car Park	74.00	65.95	73.57	74.60	Improving
ALL ASSETS %	**69.87**	**69.56**	**60.91**	**68.57**	**Improving**

The All Assets category includes Road Surface, Kerb, Road Items and Car Parks.

Integrated Planning and Reporting Advisory Standard KPI targets are outlined below.

Standard is not met if ratio data cannot be identified or ratio is less than 50%.

Standard is met if ratio data can be identified and ratio is 50% or greater.

Standard is improving if this ratio is between 60% and 75%.

6.3.2 Asset Sustainability Ratio (ASR)

This ratio indicates whether assets are being replaced or renewed at the same rate that the overall asset stock is wearing out.

It is calculated by dividing the annual capital expenditure spent on replacements (reserve funding required) by the annual depreciation expense. If capital expenditure on renewing or replacing assets is at least equal to depreciation on average over time, then the value of the existing stock will be maintained. If capital expenditure on existing assets is less than depreciation then underspending on replacement of assets will occur and this is likely to result in additional maintenance costs for assets that have exceeded their useful life that may exceed the cost of renewal or replacement.

This ratio can only be measured accurately if an assessment is made of the total amount spent on capital renewal and replacement.

The target ratio should be between 90% - 110%. The forecast asset sustainability ratios shown below have been calculated on an accumulative basis.

There is no separate ratio shown for kerb, road item or car park as there is no consideration given to these assets in the capital renewal program.

Asset	Actual Sustainability Ratio %		
	2013-14	2017-18	2019-20
Road (surface only)	35	38	94

Asset	Forecast Asset Sustainability Ratio % (accumulative)									
	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Road (Surface only)	54	51	64	68	73	77	79	77	75	72

Integrated Planning and Reporting Advisory Standard KPI targets are outlined below.

Standard is not met if ratio data cannot be identified or ratio is less than 90%.

Standard is met if ratio data can be calculated and ratio is 90% or greater.

Standard is improving if this ratio is between 90% and 110%.

6.3.3 Asset Renewal Funding Ratio (ARFR)

This is an indicator as to the ability of the City to fund the projected asset renewals and replacements in the future and therefore continue to provide existing levels of service, without additional operating income or reductions in operating expenses, or an increase in net financial liabilities above that currently projected.

The ratio is calculated by dividing the planned capital expenditure (from the long term financial plan) on renewals over the next 10 years by the required (projected) capital expenditure on renewals over the same period.

The forecast asset renewal funding ratios shown below have been calculated on an accumulative basis.

Asset	Forecast Asset Renewal Funding Ratio % (accumulative)									
	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Road (Surface only)	97	95	95	96	97	98	98	98	98	99

The target ratio should be between 95% and 105% which indicates that adequate provision / expenditure is being made for the *future* renewal and replacement of assets. Overall the standard is met.

Integrated Planning and Reporting Advisory Standard KPI targets are outlined below.

Standard is not met if ratio data cannot be identified or ratio is less than 75%.

Standard is met if the ratio is between 75% and 95%.

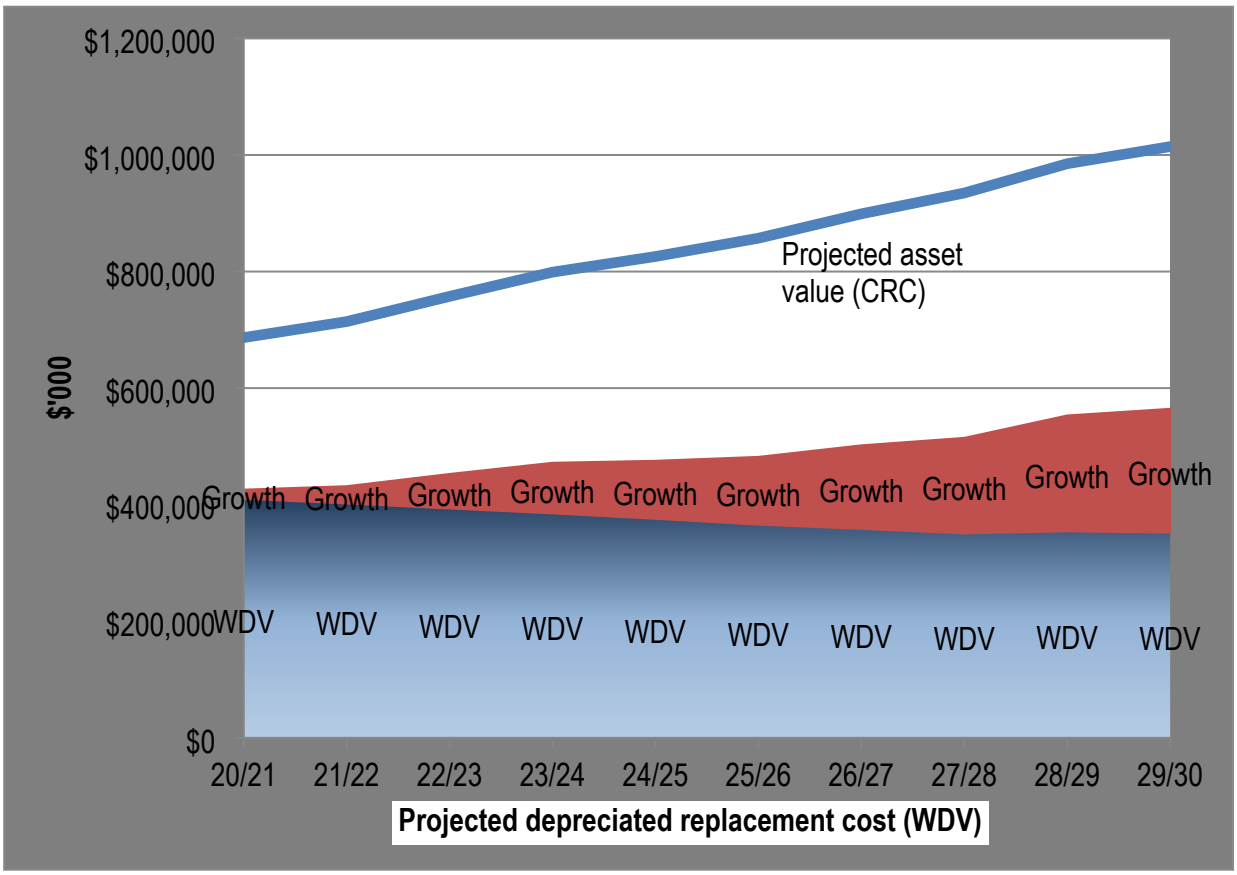
Standard is improving if this ratio is between 95% and 105% and the ASR falls within the range 90% to 110% and ACR falls within the range of 50% to 75%.

6.4 Valuation Forecasts

Asset values are forecast to increase as additional assets are added to the asset stock from construction and acquisition by Council and from assets constructed by land developers and others and donated to Council.

Graph 6.4.1 below shows the projected current replacement cost/ asset values over the next 10 years and the fair value also known as the depreciated replacement cost (WDV) is the current replacement cost less accumulated depreciation. These figures include the projected growth and capital upgrade / new as mentioned in section 6.1.

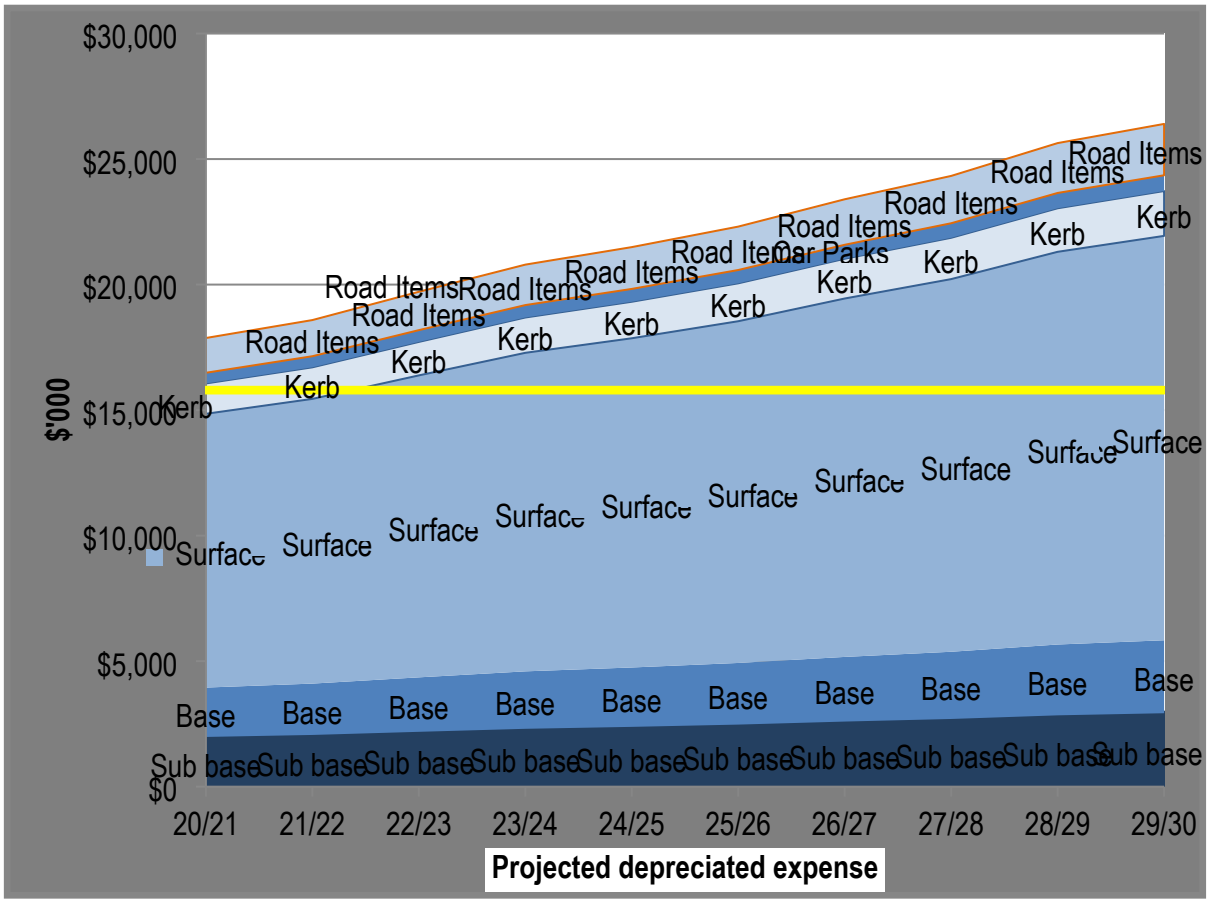
Graph 6.4.1 Projected Asset Value (CRC) and Fair Value (WDV)



The fair value will vary over the forecast period depending on the rates of addition of new assets, disposal of old assets and consumption and renewal of existing assets.

Depreciation expense values are forecast to trend in line with asset values as shown in the Graph 6.4.2. The yellow highlighted line provides the current depreciation expense. Note that all costs are shown in current 2020 dollar values and a 2% CPI increase per year forward.

Graph 6.4.2 Projected Depreciation Expense



6.5 Key Assumptions made in Financial Forecasts

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

Key assumptions made in this asset management plan are:

- The data supplied was as accurate as possible at the time of compilation of this asset management plan.
- The breakdown of the actual reactive, planned and operational expenditure is considered accurate.

7. ASSET MANAGEMENT PRACTICES

7.1 Accounting/Financial Systems

7.1.1 Summary of Accounting & Financial Systems

Technology One Financials version 11.09.19.011

7.1.2 Accountabilities and Responsibilities for Financial System

Financial Services - for the accounts and costing methodologies

7.1.3 Accounting Standards / Regulations / Guidelines

- Australian Accounting Standards including:
  - AASB116 - Property, Plant and Equipment
  - AASB13 Fair Value Measurement
  - AASB136 - Impairment of Assets
  - AASB 140 Investment Property
  - AASB 5 Non-current Assets Held for Sale and Discontinued Operations
- Local Government Act 1995
- Local Government (Financial Management) Regulations 1996
- Local Government (Functions & General) Regulations 1996

7.2 Asset Management Systems (EAM)

7.2.1 Summary of Asset Management System

Technology One Enterprise Asset Management version 11.09.19.011

Technology One Intramaps 8.1

7.2.2 Summary of how the Enterprise Asset Management System aligns to the Accounting / Financial system

The operational asset register within the Enterprise Asset Management system acts as the master asset dataset for determining renewal projections, future refurbishment.

The financial registers values are updated yearly from the operational asset register as part of Assets Services revaluation procedures.

7.2.3 Accountabilities and Responsibilities for AM System (s)

Property & Asset Services is accountable and responsible for the EAM system, with other service areas assisting with the currency and maintenance of the data sets within the system databases.

7.2.4 Changes to the Asset Management Systems resulting from the AMP

All proposed/agreed system changes will be documented in Section 8 Plan Improvement and Monitoring.

7.3 Information Flow Requirements and Processes

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

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

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

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

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

7.4 Standards and Guidelines

Asset Management Policy Statement (SC 39) 2017.

8. Plan Improvement and Monitoring

8.1 Performance Measures

The effectiveness of the asset management plan can be measured in the following ways:

- The degree to which the required cash flows identified in this asset management plan are incorporated into council's Long Term Financial Plan and Strategic Management Plan,
- The degree to which 1-5 year detailed works programs, budgets, business plans and organisational structures take into account the 'global' works program trends provided by the asset management plan, and
- The degree to which existing and projected service levels and consequences, risks and residual risks are incorporated into Council's plans.

8.2 Improvement Strategy

The improvements completed since previous RAMP are detailed in table 8.2.1

Table 8.2.1 Improvements completed

Section	Project	Responsibility	Task	Status
3.3	Monitoring performance measures against levels of service targets	Project & Asset Services	Include more detailed questions, specific to levels of service, in the customer satisfaction survey Investigate customer request configuration	Completed
4.4	Investigate improvements of recording donated assets and Council funded assets	Project & Asset Services	To be reviewed as part of the 'as constructed' drawing process (external and internal)	Completed
5.1.3	Deterioration modelling	Project & Asset Services	Develop Deterioration Strategy	Completed
5.2 5.4	Investigate recording of Operational and Capital Works expenditure.	Financial Services, Project & Asset Services	Improve reporting from Technology One to reflect reactive versus planned expenditure Alter CW program templates to identify upgrade, renewals and new	Completed

Section	Project	Responsibility	Task	Status
5.1.2	Condition assessment of road assets	Project & Asset Services, Road Services	Review data audit requirements Develop the preventative maintenance system to schedule inspections (condition based) Determine maintenance intervention level	Completed
6.2	Review Funding Strategy	Financial Services, Project & Asset Services	Report increase from 20% to 80% depreciation for renewal of assets	Addressed in LTFP 12/13 to 21/22
6.3	Dept. of LG Sustainability Ratios	Finance Services, Project & Asset Services	Improve financial reporting on renewal and upgrade expenditure	**Completed**
6.3	Sustainability Ratios Performance	Project & Asset Services, Road Services	Recommend improvements to achieve advanced status	Completed
6.4	Improve asset revaluation process	Project & Asset Services, Road Services, Financial Services	Continue to develop plan to better reflect acquisitions, renewals, upgrades and disposals Ensure the financial and operational asset registers replicate the same data	Completed

The asset management improvement plan generated from this asset management plan is shown in table 8.2.2.

Table 8.2.2 Improvement Strategy 2020 to 2024

Section	Project	Responsibility	Task	Timeline
3.3	Monitoring performance measures against levels of service targets	Property & Asset Services	Link budget allocation to levels of service Service Level Analysis workshops to review service delivery	2023-24
5.1	Clarification of asset ownership (eg. car parks, footpaths, lighting)	Property & Asset Services	As part of the integration between Tech one and Intramaps clearly define a single point of responsibility for each asset classification	2021-22

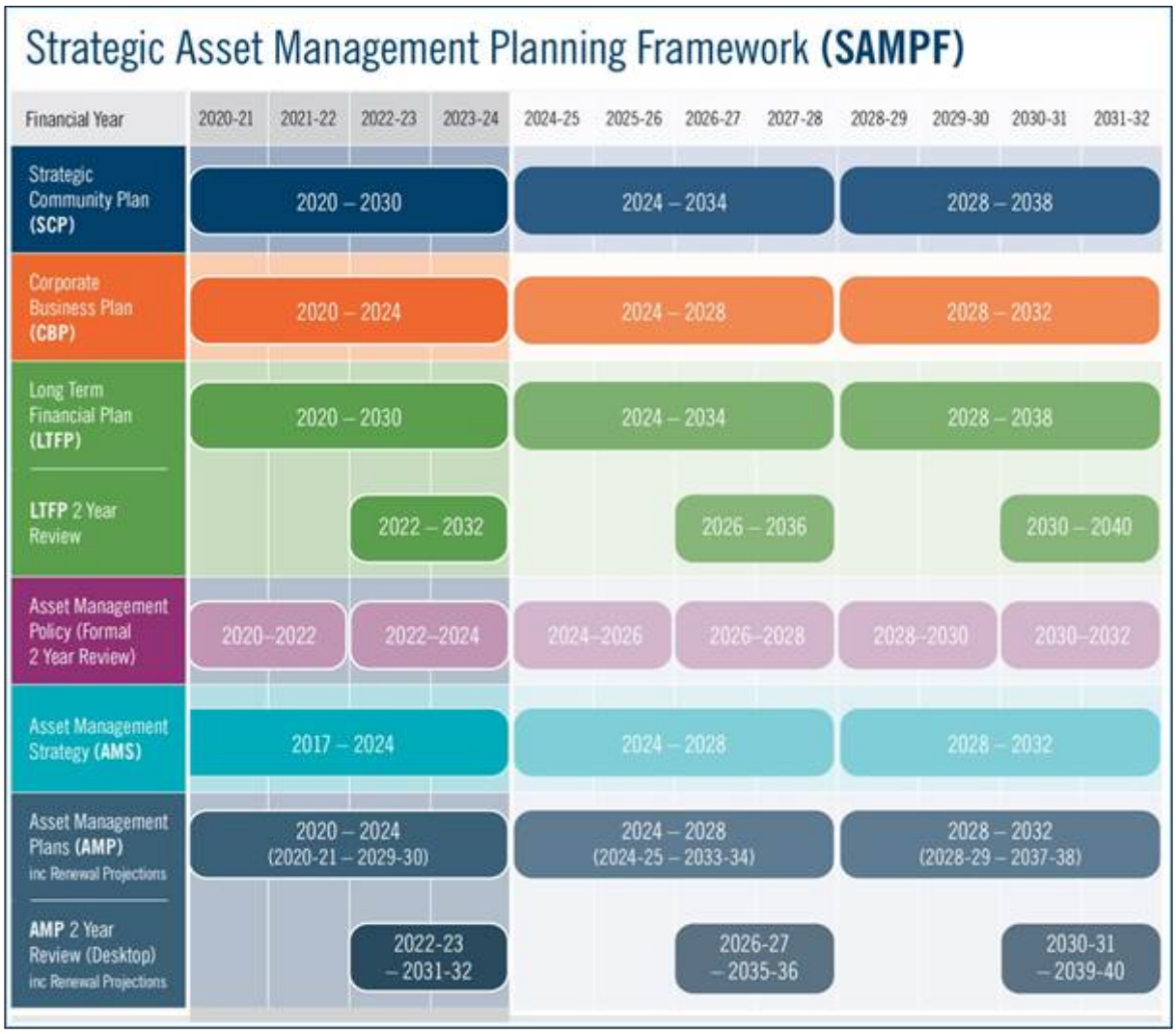
Section	Project	Responsibility	Task	Timeline
5.4	Update Regional and Major Roadworks Planning Document	Road Services, Property & Asset Services	Under review, more detail design as costings are required to effectively execute projects and planning	2022-23
6.1	Continuous improvement of roads data for next revision of the RAMP	Property & Asset Services	Network wide road surface condition audits, including ARs	2022-23

8.3 Monitoring and Review Procedures

The RAMP forms part of the City's Strategic Asset Management Planning Framework (SAMPF), covers four financial years 2020-21 to 2023-24 and acts as an informing strategy to the City's Corporate Planning Framework.

Future iterations of the RAMP will be developed every 4 years and be subject to a 2 year desktop review. The RAMP review will focus on core elements required by the LTFP, for example asset valuations, growth projections, financial analysis including operating, sustainability ratios and 10 year renewals. This will ensure that future revisions of the LTFP will be derived from a structured AMP development cycle which has received Executive and or Council approval, increasing confidence and integration of asset management data and methodologies into the City's long term financial planning.

The diagram below provides a visual representation and timelines of the Corporate Planning Frameworks Plans and Strategies.



The formalisation and alignment of the City's SAMPF (Asset Management Policy, Strategy and AMP's) within the Corporate Planning Framework reflects the City's increasing maturity and recognises the importance of Asset Management in supporting the City in delivering long term financial sustainability of services and capital asset renewal.

Supported by the relevant business area and the Asset Management Sections of the Project & Asset Service Unit, the Project & Asset Manager has overall responsibility and management for each of the Improvement Strategies identified within section 8 of the RAMP.

References

City of Cockburn – Asset Management Strategy 2017 – 2024

City of Cockburn – Strategic Community Plan 2020 – 2030

City of Cockburn – Long Term Financial Plan 2020-2021 to 2029-2030

City of Cockburn – Management Budget 2020 - 2021

City of Cockburn – Enterprise Risk Management

City of Cockburn - A Plan for the District 2010 – 2020

City of Cockburn – Regional & Major Roadworks 2018 – 2031

City of Cockburn - MARKYT – Community Scorecard 2017, 2018, 2019

City of Cockburn - MARKYT – Business Scorecard 2017, 2019

City of Cockburn – Enterprise Risk Management

City of Cockburn - Population forecast - https://forecast.id.com.au/cockburn/population-age-structure

IPWEA, 2011, 'International Infrastructure Management Manual', Institute of Public Works Engineering Australia, Sydney, www.ipwea.org.au

Government of Western Australia, Department of The Premier and Cabinet - Western Australian Legislation - Acts in force

The Local Government and Municipal Knowledge Base - LGAM Knowledge Base

Main Roads Western Australia - Welcome - Main Roads Western Australia

DVC, 2006, 'Asset Investment Guidelines', 'Glossary', Department for Victorian Communities, Local Government Victoria, Melbourne, http://www.dvc.vic.gov.au/web20/dvclgv.nsf/allDocs/RWP1C79EC4A7225CD2FCA257170003259F6?OpenDocument

Local Government of Western Australia – Asset Management Framework and Guidelines

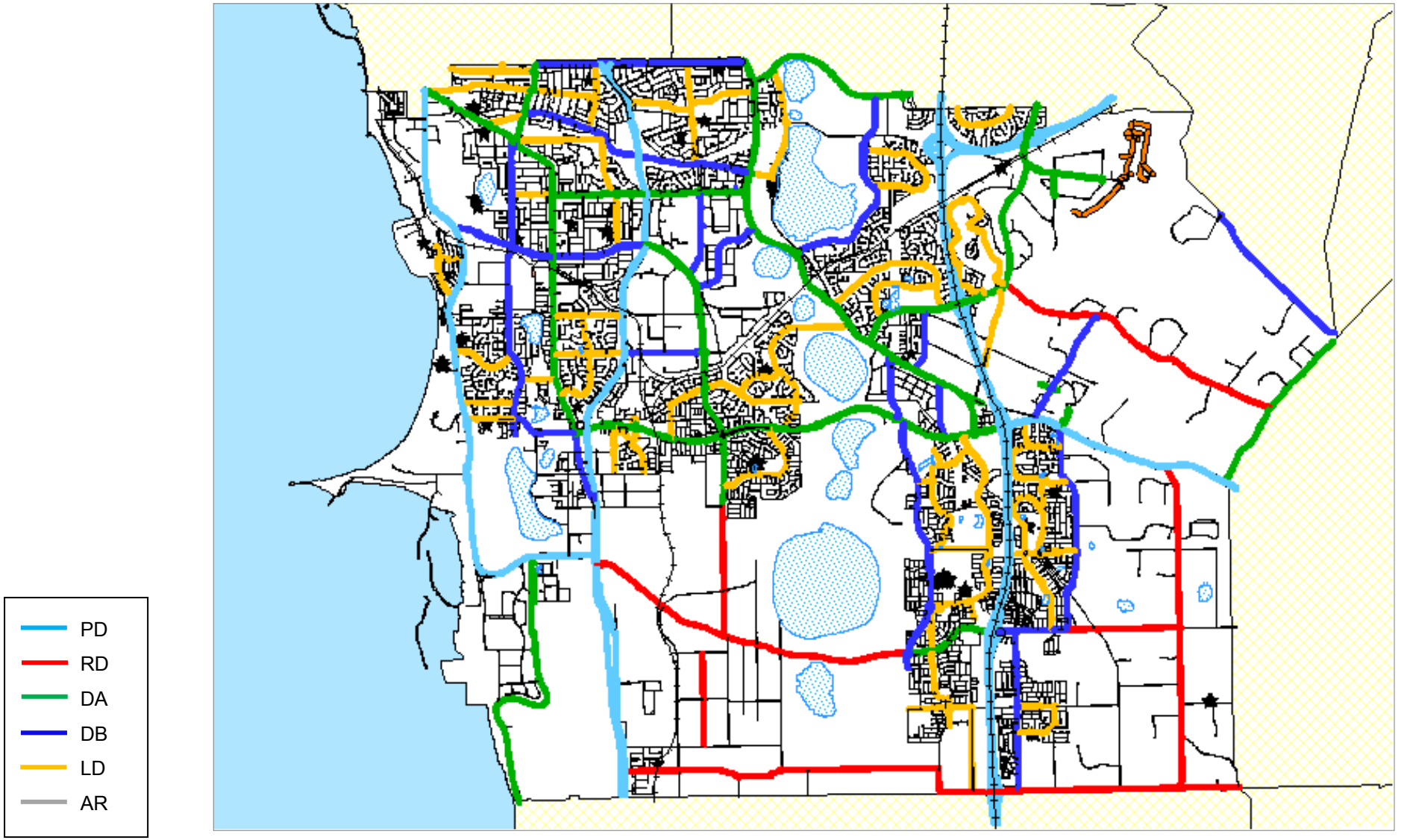
Appendices

Appendix A Legislative Requirements

Legislation	Requirement
Local Government Act 1995	Provides for a system of Local Government by describing the functions of and providing a framework for the administration and financial management of Local Governments.
Main Roads Act 1930	Consolidates and amends the law relating to and making provision for the construction, maintenance and supervision of highways, main and secondary roads, and other roads and the control of access to roads..
Main Roads WA – Code of Practice for traffic management for works on roads (April 2011)	To promote safe and consistent traffic management practice at work sites on roads in accordance with state legislation and national standards. Requires general compliance with the Australian Standard 1742.3-2009 and associated field guides, provides details of additional requirements necessary to meet WA requirements. Also outlines the competency requirements for personnel responsible for managing traffic on work sites.
Transport Co-ordination Act 1966	Provides for the co-ordination, planning and advancement of all forms of transport in WA, to provide for the review, control and licensing of transport services and for incidental and other purposes.
Planning and Development Act 2005	Provides for a system land use planning and development in the State and for related purposes.
Environmental Protection Act 1986	Provides for an Environmental Protection Authority, for the protection, control and abatement of pollution and environmental harm, for the conservation, preservation, protection, enhancement and management of the environment and for matters incidental to or connected to the foregoing.
Contaminated Sites Act 2003	Provides for the identification, recording, management and remediation of contaminated sites, to consequentially amend certain other Acts and for related purposes.
Conservation and Land Management Act 1984	Makes better provision for the use, protection and management of certain public lands and waters and the flora and fauna thereof, establishes authorities to be responsible therefore, and for incidental or connected purposes.
Soil and Land Conservation Act 1945	Relates to the conservation of soil and land resources, and to the mitigation of the effects of erosion, salinity and flooding.
Rail Safety Act 2010	Requires Local Governments to develop an Interface Agreement with the rail manager/operator for every rail/road crossing in their area of responsibility by 1 February 2014
Fire and Emergency Services Authority of WA Act 1998	Establishes an Authority with functions relating to the provision and management of emergency services, and for related purposes.

Legislation	Requirement
Aboriginal Heritage Act 1972	Provision for the preservation on behalf of the community of places and objects customarily used by or traditional to the original inhabitants of Australia or their descendants
Native Title (state provisions) Act 1999	Provides for the recognition and protection of native title and to establish ways in which future dealings affecting native title may proceed.
Occupational Safety and Health Act 1984 (WA)	Provides for the promotion, coordination, administration and enforcement of Safety and Health in WA. Places emphasis on the prevention of accidents and injury
Disability Services Act 1993	An Act for the establishment of the Disability Services Commission and the Ministerial Advisory Council on Disability, for the furtherance of principles applicable to people with disabilities, for the funding and provision of services to such people that meet certain objectives, for the resolution of complaints by such people, and for related purposes.
Code of Practice Working Hours 2006	Provides guidance for employers and workers on the management of Safety and Health hazards and risks commonly associated with working hour arrangements.
Australian Standards	Standards are published documents setting out specifications and procedures designed to ensure products, services and systems are safe, reliable and consistently perform the way they were intended to. They establish a common language which defines quality and safety criteria.

Appendix B Road hierarchy map - City of Cockburn



Appendix C Capital Expenditure Renewals 2020-21 – Roads

Resurfacing Project Description	Adopted Budget $
ADRINA COURT LESSING TO CULDESAC	15,663
BERRY STREET SAWLE TO FORREST	21,090
BLACKTHORNE MASON TO HACKETTIANA	48,813
BLOODWOOD DRIVE BOULDERWOOD TO BOULDERWOOD	89,342
BOLDERWOOD DRIVE BAUREA TO BLOODWOOD EAST	87,285
DOTTEREL WAY SWAN TO OSPREY EAST	42,115
ELDERBERRY DRIVE NORTH LAKE TO HACKETTANIA	47,403
GLENISTER ROAD OFLEY TO WINFIELD	70,623
HAZLETT CLOSE	17,093
LESSING PLACE HACETTIANA TO CULDESAC	17,059
MOLLERIN PLACE SOUTH LAKE	36,714
NEWTON STREET	157,215
PECAN COURT	30,340
PLUMRIDGE WAY GLENBAWN TO SOUTH LAKE	39,919
ROCKINGHAM ROAD GOLDSMITH TO SPEARWOOD	94,269
SAWLE ROAD	67,740
SOUTHEND ROAD QUARY TO CLAYGATE	72,030
SOUTHWELL CRESCENT INTERSECTION BLACKWOOD AVENUE	17,171
TARNDALE WAY ELDERBERRY TO SOUTH LAKE	39,919
WENTWORTH PARADE REEVS TO RICHMOND	33,597
WENTWORTH PARADE RICHMOND TO BARTRAM	26,925
YANGEBUP ROAD OSREY TO PIONEER	46,260
	$1,118,585
MRRG Reconstruction	
NORTH LAKE RD INTERSCTION WITH FORREST ROAD	216,000
PHOENIX RD INTERSECTION WITH SUDLOW RD	139,900
SPEARWOOD AVE WESTBOUND WELLARD TO PORT KEMBLA	272,900
	628,800
Total Renewals 2020/21	**$1,747,385**

Appendix D Preliminary 10 Year Resurfacing - Roads

This program will be subject to change based on combining road segments within a street as a single project and proposed budget for 2021/22 after taking the renewal demand for other asset classes and funding strategy.

ASSET ID	Road Name	Start Point	End Point	Hierarchy	Condition	Age Group	Area (m2)	CRC ($)
RD_001103	BERRIGAN DRIVE	LAKES	NA	DA	5	16 to 20	398.83	23,718
RD_003840	REDMOND ROAD	BRADBURY	NA	LD	5	>20	261.11	13,194
RD_003754	WATTLEUP ROAD	MIRO	NA	RD	5	>20	332	19,744
RD_008346	WATTLEUP ROAD	WENLOCK	TOMISLAV	RD	5	>20	166.94	9,102
RD_008345	WATTLEUP ROAD	TOMISLAV	NA	RD	5	>20	517.84	26,570
RD_000037	GAEBLER ROAD	GAEBLER ROAD	CUL-DE-SAC	AR	5	>20	270.05	7,209
RD_002206	TUART PLACE	TUART PLACE	CUL-DE-SAC	AR	5	>20	309.07	8,251
RD_007044	EMILE COURT	EMILE COURT	CUL-DE-SAC	AR	5	>20	367.69	9,816
RD_008841	ALBION AVENUE	SPLASH	FAWCETT	AR	5	>20	1594.79	36,675
						TOTAL 20/21	4218.32	154,279
						TOTAL 21/22 inc CPI		157,365
RD_002343	BOYD CRESCENT	BOYD CRESCENT	CUL-DE-SAC	AR	5	16 to 20	576.7	15,016
RD_006085	VERDE DRIVE	VERDE DRIVE	CUL-DE-SAC	AR	5	16 to 20	106.29	2,838
RD_006959	CARRINGTON STREET	WINTERFOLD	NA	DA	4	>20	847.25	43,472
RD_007420	ROCKINGHAM ROAD	GOLDSMITH	NA	DA	4	>20	723.89	37,142
RD_003226	ROCKINGHAM ROAD	RESERVE	NA	DA	4	>20	452.28	26,897
						TOTAL 21/22	2706.41	125,364
						TOTAL 21/22 inc CPI		130,429
RD_002264	DALISON AVENUE	MARBAN	END	AR	5	11 to 15	382.27	10,205

ASSET ID	Road Name	Start Point	End Point	Hierarchy	Condition	Age Group	Area (m2)	CRC ($)
RD_007271	BERRIGAN DRIVE	PRINSEP	NA	DA	4	16 to 20	847.18	43,468
RD_005177	COCKBURN ROAD	ENTRANCE	COUNCIL BOUNDARY	DA	4	16 to 20	15116.47	615,993
RD_004147	WINTERFOLD ROAD	FREDERICK	NA	DB	4	>20	168.84	10,041
RD_006966	HAMILTON ROAD	KING	NA	DB	4	>20	744.37	38,193
RD_003749	ACOURT ROAD	OWSTEN	NA	DB	4	>20	367.05	21,828
						TOTAL 22/23	17626.18	739,729
						TOTAL 22/23 inc CPI		785,006
RD_002135	ROCKINGHAM ROAD	COCKBURN	HEALY	DA	4	11 to 15	565.05	30,809
RD_006950	ROCKINGHAM ROAD	HEALY	NA	DA	4	11 to 15	884.14	45,365
RD_003819	ROCKINGHAM ROAD	HAMILTON	NA	DA	4	11 to 15	583.32	29,930
RD_007414	ROCKINGHAM ROAD	SPEARWOOD	SPEARWOOD	DA	4	11 to 15	1792	80,226
RD_007261	BERRIGAN DRIVE	DEAN	JANDAKOT	DA	4	11 to 15	3503.06	156,185
RD_003350	HAMILTON ROAD	RECREATION	NA	DB	4	16 to 20	239.91	14,267
RD_000078	POLETTI ROAD	COOPER	BEELIAR	DB	4	16 to 20	1648.08	67,159
RD_008861	ROCKINGHAM ROAD	WEST CHURCHILL	KAPULA	DB	4	16 to 20	1665.35	67,863
						TOTAL 23/24	10880.91	491,804
						TOTAL 23/24 inc CPI		532,344
RD_009710	SCIANO AVENUE	HAMPSTEAD	CUL-DE-SAC	AR	5	0 to 5	638.66	16,629
RD_009889	TINDAL AVENUE	AMEER	FANCOTE	AR	5	0 to 5	835.4	21,751
RD_003991	PHOENIX ROAD	LEO	NA	DA	4	6 to 10	932.41	47,841
						TOTAL 24/25	2406.47	86,222
						TOTAL 24/25 inc CPI		95,195
RD_009130	FRANKLAND AVENUE	GAEBLER	WATTLEUP	AR	4	>20	4052.12	93,186

ASSET ID	Road Name	Start Point	End Point	Hierarchy	Condition	Age Group	Area (m2)	CRC ($)
RD_003448	BULLFINCH STREET	HEREFORD	NA	AR	4	>20	301.7	8,054
RD_003297	BULLFINCH STREET	AUMERLE	NA	AR	4	>20	269	7,181
RD_000031	GIBBS ROAD	BORONIA	OTHER JURISDICTION	AR	4	>20	1900.72	43,711
RD_000910	MURIEL COURT	SEMPLE	CUL-DE-SAC	AR	4	>20	614.24	15,993
RD_002267	ROTHWELL COURT	CUL-DE-SAC	LUCCA	AR	4	>20	300.75	8,029
RD_003797	MARBAN WAY	DEEPDENE	NA	AR	4	>20	362.11	9,667
RD_002705	MIRO STREET	WATTLEUP	VODICE	AR	4	>20	487.02	12,681
RD_003753	MIRO STREET	VODICE	NA	AR	4	>20	220.05	5,875
RD_002990	MIRO STREET	VODICE	HITCHCOCK	AR	4	>20	708.35	18,443
RD_003751	MIRO STREET	HITCHCOCK	USHER	AR	4	>20	344.04	9,185
RD_002271	HITCHCOCK PLACE	HITCHCOCK PLACE	CUL-DE-SAC	AR	4	>20	211.79	5,654
RD_003153	STAMFORD WAY	MIRO	CUL-DE-SAC	AR	4	>20	2365.27	54,394
RD_002272	STAMFORD WAY	STAMFORD WAY	CUL-DE-SAC	AR	4	>20	243.77	6,508
RD_004235	USHER PLACE	ROCKINGHAM	MIRO	AR	4	>20	696.34	18,131
RD_007063	FANSTONE AVENUE	ROCKINGHAM	WELLS	AR	4	>20	670.08	17,447
RD_002709	FANSTONE AVENUE	WELLS	JERVOIS	AR	4	>20	2008.45	46,188
RD_002276	FANSTONE AVENUE	JERVOIS	END	AR	4	>20	3191	73,383
RD_003258	ANGUS AVENUE	DENHAM	NA	AR	4	>20	269.43	7,193
RD_003296	AUMERLE WAY	BULLFINCH	NA	AR	4	>20	265.24	7,081
RD_005019	LANCASTER STREET	MACMORRIS	NA	AR	4	>20	298.16	7,960
RD_003320	SHALLOW STREET	LANCASTER	NA	AR	4	>20	299.56	7,997
RD_002324	SOUTHEND ROAD	QUARRY	CHESHAM	AR	4	>20	2246.63	51,665
RD_006976	WEAVELL STREET	OMMANNEY	NA	AR	4	>20	341.42	9,115
RD_003472	FREDERICK ROAD	DODD	NA	AR	4	>20	302.24	8,069
RD_003359	GRANDPRE CRESCENT	SNARE	NA	AR	4	>20	324.6	8,666

ASSET ID	Road Name	Start Point	End Point	Hierarchy	Condition	Age Group	Area (m2)	CRC ($)
RD_003334	GRANDPRE CRESCENT	RAMBURES	NA	AR	4	>20	216.12	5,770
RD_007508	O'CONNELL STREET	CARMODY	NA	AR	4	>20	525.38	13,679
RD_001057	SIMONS STREET	TREEBY	NA	AR	4	>20	222.64	5,944
RD_001243	ARCHIDAMUS ROAD	ANTIGONUS	NA	AR	4	>20	277.37	7,405
RD_003795	TOMISLAV PLACE	VODICE	NA	AR	4	>20	314.42	8,394
RD_002270	TOMISLAV PLACE	TOMISLAV PLACE	CUL-DE-SAC	AR	4	>20	195.98	5,232
RD_007050	WAUGH COURT	WAUGH COURT	CUL-DE-SAC	AR	4	>20	327.61	8,746
RD_003305	JAMY PLACE	MATZ	NA	AR	4	>20	263.93	7,046
RD_000453	BROADMEADOWS STREET	BROADMEADOWS STREET	CUL-DE-SAC	AR	4	>20	652.59	16,992
RD_000344	ADRINA COURT	ADRINA COURT	CUL-DE-SAC	AR	4	>20	343.04	9,158
RD_000260	PLACID COURT	PLACID COURT	CUL-DE-SAC	AR	4	>20	248.8	6,642
RD_000700	LOCHSIDE GROVE	LOCHSIDE GROVE	CUL-DE-SAC	AR	4	>20	236.45	6,312
RD_001606	BOLDERWOOD DRIVE	MEDLAR	NA	AR	4	>20	251.97	6,727
RD_001608	BOLDERWOOD DRIVE	NETTLE	NA	AR	4	>20	223.51	5,967
RD_001278	BOLDERWOOD DRIVE	PLOUGHSHARE	NA	AR	4	>20	348.17	9,295
RD_001276	BOLDERWOOD DRIVE	BLOODWOOD	NA	AR	4	>20	322.76	8,617
RD_000282	SILKPOD GARDENS	SILKPOD GARDENS	CUL-DE-SAC	AR	4	>20	331.91	8,861
RD_004198	BAUERA GLADE	BAUERA GLD	CUL-DE-SAC	AR	4	>20	386.84	10,327
RD_001597	MOONDARRA CIRCLE	TABLO	NA	AR	4	>20	227.04	6,061
RD_003622	PELICAN RAMBLE	GULL	NA	AR	4	>20	322.9	8,620
RD_003621	PELICAN RAMBLE	PIONEER	NA	AR	4	>20	282.99	7,555
RD_002211	IBIS COURT	IBIS COURT	CUL-DE-SAC	AR	4	>20	305.28	8,150
RD_003967	GULL COURT	GULL COURT	CUL-DE-SAC	AR	4	>20	318.07	8,491
RD_003678	GRASSBIRD LOOP	CRAKE	NA	AR	4	>20	312.14	8,333

ASSET ID	Road Name	Start Point	End Point	Hierarchy	Condition	Age Group	Area (m2)	CRC ($)
RD_002212	EMU PLACE	EMU PLACE	CUL-DE-SAC	AR	4	>20	286.73	7,655
RD_002207	EAGLE RISE	EAGLE RISE	CUL-DE-SAC	AR	4	>20	326.25	8,710
RD_002210	CURLEW WAY	CURLEW WAY	CUL-DE-SAC	AR	4	>20	179.15	4,783
RD_002285	TATTLER PLACE	TATTLER PLACE	CUL-DE-SAC	AR	4	>20	362.63	9,681
RD_002105	SALPIETRO STREET	SALPIETRO STREET	CUL-DE-SAC	AR	4	>20	307.3	8,204
RD_002389	PEPYS COURT	NEWTON	CUL-DE-SAC	AR	4	>20	309.02	8,250
RD_001823	PEPYS COURT	PEPYS COURT	CUL-DE-SAC	AR	4	>20	289.96	7,741
RD_001822	CAMPION CLOSE	NEWTON	CUL-DE-SAC	AR	4	>20	292.47	7,808
RD_002388	CAMPION CLOSE	CAMPION CLOSE	CUL-DE-SAC	AR	4	>20	276.66	7,386
RD_002387	BUCHAN CLOSE	BUCHAN CLOSE	CUL-DE-SAC	AR	4	>20	312.42	8,341
RD_003200	LEAVIS PLACE	IBSEN	NA	AR	4	>20	258.9	6,912
RD_003185	DRYDEN STREET	TURFAN	NA	AR	4	>20	394.68	10,537
RD_002759	POTTER COURT	GOLDSMITH	CUL-DE-SAC	AR	4	>20	786.27	20,472
RD_006932	POTTER COURT	POTTER COURT	CUL-DE-SAC	AR	4	>20	327.45	8,742
RD_004079	BUTTON STREET	FROBISHER	END	AR	4	>20	711.93	18,537
RD_002676	TUART PLACE	PLOVER	CUL-DE-SAC	AR	4	>20	841.9	21,921
RD_003937	WELLS ROAD	BRITANNIA	BRITANNIA	AR	4	>20	300.76	8,029
RD_003604	DOTTEREL WAY	TATTLER	NA	AR	4	>20	346.47	9,250
RD_003965	DOTTEREL WAY	GRASSBIRD	NA	AR	4	>20	344.88	9,207
RD_000441	YATES COURT	YATES COURT	CUL-DE-SAC	AR	4	>20	349	9,317
RD_001040	MONACO AVENUE	YATES	NA	AR	4	>20	275.12	7,345
RD_000990	MONACO AVENUE	DU MAURIER	NA	AR	4	>20	328.31	8,765
RD_000989	MONACO AVENUE	EMILE	NA	AR	4	>20	309.37	8,259
RD_000988	MONACO AVENUE	SASSOON	NA	AR	4	>20	281.97	7,528
RD_001002	MONACO AVENUE	ASCHAM	NA	AR	4	>20	300.99	8,035

ASSET ID	Road Name	Start Point	End Point	Hierarchy	Condition	Age Group	Area (m2)	CRC ($)
RD_000996	MASEFIELD AVENUE	GIDDENS	NA	AR	4	>20	248.05	6,622
RD_000992	MASEFIELD AVENUE	WYSS	NA	AR	4	>20	280.03	7,476
RD_000995	MASEFIELD AVENUE	COLERIDGE	NA	AR	4	>20	395.85	10,568
RD_000999	MASEFIELD AVENUE	POPE	MADELEINE	AR	4	>20	440.54	11,761
RD_000691	POPE MEWS	MASEFIELD	CUL-DE-SAC	AR	4	>20	285.63	7,625
RD_007527	POPE MEWS	POPE MEWS	CUL-DE-SAC	AR	4	>20	232.65	6,211
RD_000877	GIDDENS COURT	MASEFIELD	CUL-DE-SAC	AR	4	>20	890.84	23,195
RD_007052	GIDDENS COURT	GIDDENS COURT	CUL-DE-SAC	AR	4	>20	287.82	7,684
RD_000445	COLERIDGE PLACE	MASEFIELD	ASCHAM	AR	4	>20	1095.81	25,200
RD_000993	COLERIDGE PLACE	WYSS	NA	AR	4	>20	266.37	7,111
RD_007051	COLERIDGE PLACE	COLERIDGE PLACE	CUL-DE-SAC	AR	4	>20	305.15	8,146
RD_000446	WYSS LANE	COLERIDGE	MASEFIELD	AR	4	>20	589.65	15,353
RD_001571	BLACKTHORNE CRESCENT	PECAN	NA	AR	4	>20	264.34	7,057
RD_001908	MATZ COURT	MATZ COURT	CUL-DE-SAC	AR	4	>20	243.41	6,498
RD_003166	MARLOWE PLACE	MARLOWE	NA	AR	4	>20	199.8	5,334
RD_001798	BECKETT CLOSE	BECKETT	BECKETT	AR	4	>20	2391.62	55,000
RD_004243	BORONIA ROAD	BARTRAM	GIBBS	AR	4	>20	7882.19	181,265
RD_000292	EACHAM COURT	EACHAM COURT	CUL-DE-SAC	AR	4	>20	298.98	7,982
RD_000264	BINNEY RISE	BINNEY RISE	CUL-DE-SAC	AR	4	>20	308.35	8,232
RD_000257	BARRINE GARDENS	BARRINE GARDENS	CUL-DE-SAC	AR	4	>20	319.58	8,532
RD_000263	PRENTICE PLACE	PRENTICE PLACE	CUL-DE-SAC	AR	4	>20	306.61	8,185
RD_000258	EPPALOCK GROVE	EPPALOCK GROVE	CUL-DE-SAC	AR	4	>20	335.59	8,959
RD_002650	MARROW CLOSE	MARROW CLOSE	CUL-DE-SAC	AR	4	>20	311.39	8,313
RD_003589	MANBERRY WAY	COOGAN	NA	AR	4	>20	152.84	4,080

ASSET ID	Road Name	Start Point	End Point	Hierarchy	Condition	Age Group	Area (m2)	CRC ($)
RD_003190	BROWNING WAY	LAMB	NA	AR	4	>20	393.91	10,516
RD_001138	NETTLE WAY	MUDGEE	NA	AR	4	>20	266.89	7,125
RD_001143	BLOODWOOD CIRCLE	PAVONIA	NA	AR	4	>20	317.84	8,485
RD_000242	BOLWARRA HEIGHTS	BOLWARRA HEIGHTS	CUL-DE-SAC	AR	4	>20	307.06	8,197
RD_001154	BROADBENT LOOP	URLICH	NA	AR	4	>20	256.03	6,835
RD_001168	SAN MIGUEL DRIVE	PARTLON	NA	AR	4	>20	254.48	6,794
RD_003924	TURFAN WAY	ADEN	NA	AR	4	>20	340.07	9,079
RD_003183	BLONDELL DRIVE	CAESAR	NA	AR	4	>20	313.71	8,375
RD_002223	GAZANIA GROVE	GAZANIA GROVE	CUL-DE-SAC	AR	4	>20	317.21	8,468
RD_002249	IRIS PLACE	IRIS PLACE	CUL-DE-SAC	AR	4	>20	340.83	9,099
RD_003931	MAGNOLIA GARDENS	MAGNOLIA	NA	AR	4	>20	483.99	12,602
RD_007705	MAGNOLIA GARDENS	TORENIA	YANGEBUP	AR	4	>20	379.6	10,134
RD_002222	BEGONIA CLOSE	BEGONIA CLOSE	CUL-DE-SAC	AR	4	>20	335.83	8,966
RD_008060	SALVIA COURT	SALVIA COURT	CUL-DE-SAC	AR	4	>20	348.71	9,309
RD_003045	COOGAN CLOSE	COOGAN CLOSE	CUL-DE-SAC	AR	4	>20	306.05	8,171
RD_004126	AMY COURT	AMY COURT	CUL-DE-SAC	AR	4	>20	382.39	10,209
RD_003591	MILGUN DRIVE	WILLIAMBURY	NA	AR	4	>20	293.35	7,831
RD_003594	MILGUN DRIVE	BEEBIN	NA	AR	4	>20	214.5	5,726
RD_003593	MILGUN DRIVE	NYANG	NA	AR	4	>20	216.48	5,779
RD_002177	NYANG COURT	NYANG COURT	CUL-DE-SAC	AR	4	>20	302.78	8,083
RD_000201	WOODLEA CREST	WOODLEA CREST	CUL-DE-SAC	AR	4	>20	374.76	10,005
RD_003579	WILLIAMBURY DRIVE	RAPANIA	NA	AR	4	>20	240.73	6,427
RD_003585	WILLIAMBURY DRIVE	DECIDUOUS	NA	AR	4	>20	266.8	7,123
RD_003590	WILLIAMBURY DRIVE	MANBERRY	NA	AR	4	>20	280.76	7,495
RD_000578	WYALONG PLACE	WINEBERRY	CUL-DE-SAC	AR	4	>20	458.82	12,249

ASSET ID	Road Name	Start Point	End Point	Hierarchy	Condition	Age Group	Area (m2)	CRC ($)
RD_000249	WYALONG PLACE	WYALONG PLACE	CUL-DE-SAC	AR	4	>20	337.01	8,997
RD_000222	GREEN CROFT GARDENS	GREEN CROFT GARDENS	CUL-DE-SAC	AR	4	>20	388.44	10,370
RD_000577	TALLOW PLACE	WINEBERRY	CUL-DE-SAC	AR	4	>20	367.05	9,799
RD_000247	TALLOW PLACE	TALLOW PLACE	CUL-DE-SAC	AR	4	>20	314.52	8,397
RD_003913	DIAMANTIA WAY	ALACRITY	STUART	AR	4	>20	1047.87	24,098
RD_003710	ALACRITY PLACE	DIAMANTINA	NA	AR	4	>20	441.46	11,786
RD_002711	ALACRITY PLACE	DIAMANTIA	CUL-DE-SAC	AR	4	>20	637.01	16,586
RD_002280	ALACRITY PLACE	ALACRITY PLACE	CUL-DE-SAC	AR	4	>20	658.47	17,145
RD_001279	MUDGEE COURT	MUDGEE COURT	CUL-DE-SAC	AR	4	>20	439.71	11,739
RD_000164	FREMONT PLACE	FREMONT PLACE	CUL-DE-SAC	AR	4	>20	351.84	9,393
RD_007569	DIMOND COURT	FERN LEAF	NA	AR	4	>20	681.41	17,742
RD_003582	DECIDUOUS RISE	SHADY	NA	AR	4	>20	241.88	6,457
RD_003576	SOGAN RISE	ACALYPHA	NA	AR	4	>20	213.81	5,708
RD_002169	ACALYPHA VIEW	ACALYPHA VIEW	CUL-DE-SAC	AR	4	>20	308.54	8,237
RD_002168	ALLIS HEIGHTS	ALLIS HEIGHTS	CUL-DE-SAC	AR	4	>20	302.16	8,067
RD_002281	KALMIA ROAD	COCOS	COLLIBAH	AR	4	>20	751.44	19,565
RD_002172	RONSARD PLACE	RONSARD PLACE	CUL-DE-SAC	AR	4	>20	308.79	8,244
RD_003938	BRITANNIA AVENUE	BRITANNIA AVENUE	CUL-DE-SAC	AR	4	>20	250.67	6,692
RD_003969	NAPIER MEWS	NAPIER MEWS	CUL-DE-SAC	AR	4	>20	342.41	7,982
RD_001287	ZILLNER CLOSE	ZILLNER CLOSE	CUL-DE-SAC	AR	4	>20	448.67	11,978
RD_008785	KNOCK PLACE	SOLOMON	ARMADALE	AR	4	>20	3072.51	70,658
RD_000511	KENTUCKY COURT	NORTH LAKE ROAD	END	AR	4	>20	3706.54	85,239
RD_000185	TANA COURT	TANA COURT	CUL-DE-SAC	AR	4	>20	360.34	9,620
RD_002282	COROKIA WAY	BARBERRY	KALMIA	AR	4	>20	1819.01	41,831

ASSET ID	Road Name	Start Point	End Point	Hierarchy	Condition	Age Group	Area (m2)	CRC ($)
RD_003680	BARBERRY WAY	KALMIA	NA	AR	4	>20	519.14	13,517
RD_003558	BARBERRY WAY	COROKIA	NA	AR	4	>20	449.23	11,993
RD_004224	LITTLE RUSH CLOSE	LITTLE RUSH CLOSE	CUL-DE-SAC	AR	4	>20	347.59	9,280
RD_004157	ROSA PLACE	ROSA PLACE	CUL-DE-SAC	AR	4	>20	288.18	8,847
RD_004227	KOTISINA GARDENS	KOTISINA GARDENS	CUL-DE-SAC	AR	4	>20	525.84	9,598
RD_004120	YAGAN MEWS	YAGAN MEWS	CUL-DE-SAC	AR	4	>20	248.43	6,632
RD_004412	NOGGA RETREAT	NOGGA RETREAT	CUL-DE-SAC	AR	4	>20	161.33	4,953
RD_004414	QUENDA CLOSE	QUENDA CLOSE	CUL-DE-SAC	AR	4	>20	252.26	6,735
RD_003654	SENECIO LANE	DARTER	NA	AR	4	>20	141.54	3,779
RD_004410	NARCISSUS VIEW	NARCISSUS VIEW	CUL-DE-SAC	AR	4	>20	208.93	6,414
RD_008381	NASTURTIUM GARDENS	RANUNCULUS	GERANIUM	AR	4	>20	852.57	22,199
RD_003978	HYBANTHUS LOOP	MOITCH	NA	AR	4	>20	146.85	3,920
RD_003662	WAITCH LOOP	ULAK	HAVEL	AR	4	>20	248.07	2,342
RD_004151	CINCOTTA LOOP	HAGUE	NA	AR	4	>20	98.83	2,638
RD_004109	MARMAND COURT	MARMAND COURT	CUL-DE-SAC	AR	4	>20	374.7	9,974
RD_004154	HAGUE PASS	CINCOTTA	PERALDINI	AR	4	>20	419.27	12,872
RD_004231	PAR COURT	PAR COURT	CUL-DE-SAC	AR	4	>20	297.97	7,955
RD_004536	QUILL WAY	CHANNEL	NA	AR	4	>20	952.31	21,900
RD_008613	GAEBLER ROAD	LYON	CUL-DE-SAC	AR	4	>20	324.14	8,653
RD_008948	FRANKLAND AVENUE	WOODROW	WATTLEUP	AR	4	>20	540.48	14,073
RD_010374	FRANKLAND AVENUE	WOODROW	WATTLEUP	AR	4	>20	246.32	6,576
RD_010375	FRANKLAND AVENUE	WOODROW	WATTLEUP	AR	4	>20	142.33	3,800
RD_010535	MURIEL COURT	SEMPLE	CUL-DE-SAC	AR	4	>20	2483.22	57,106
RD_002088	MAYOR ROAD	COCKBURN	MARITIME	LD	4	>20	882.52	33,175
RD_003482	HEALY ROAD	CLARA	NA	LD	4	>20	319.67	16,153

ASSET ID	Road Name	Start Point	End Point	Hierarchy	Condition	Age Group	Area (m2)	CRC ($)
RD_003500	HEALY ROAD	HELEN	YOUNG	LD	4	>20	229.01	11,572
RD_001236	COOLBELLUP AVENUE	CAMILLO	NA	LD	4	>20	251.82	12,725
RD_000974	COOLBELLUP AVENUE	FLORIZEL	NA	LD	4	>20	247.16	12,489
RD_001019	COOLBELLUP AVENUE	EMILIA	NA	LD	4	>20	279.36	14,116
RD_007622	OSPREY DRIVE	HERON	NA	LD	4	>20	603.55	25,573
RD_001594	ELDERBERRY DRIVE	BOLDERWOOD	NA	LD	4	>20	309.97	15,663
RD_007135	BANINGAN AVENUE	STEINER	STEINER	LD	4	>20	977.83	20,273
RD_007575	ALABASTER DRIVE	SCIANO	NA	LD	4	>20	654.61	13,419
RD_007815	CONGDON AVENUE	IVANKOVICH	IVANKOVICH	LD	4	>20	1214.09	43,502
RD_007272	DEAN ROAD	PAR COURT	NA	LD	4	>20	558.31	8,732
RD_008347	WATTLEUP ROAD	TOMISLAV	DEEPDENE	RD	4	>20	407.3	24,222
RD_007925	WATTLEUP ROAD	DEEPDENE	MOYLAN	RD	4	>20	3718.37	151,523
RD_007340	WATTLEUP ROAD	PEARSE	NA	RD	4	>20	785.39	40,298
						TOTAL 25/26	105679.3	2,796,183
						TOTAL 25/26 inc CPI		3,148,955
RD_003834	DOOLETTE STREET	BARDOLPH	NA	AR	4	16 to 20	288.59	7,704
RD_003256	DOOLETTE STREET	FOX	NA	AR	4	16 to 20	291.62	7,785
RD_003255	DOOLETTE STREET	PISTOL	NA	AR	4	16 to 20	278.34	7,431
RD_003904	NEWTON STREET	NEWTON STREET	CUL-DE-SAC	AR	4	16 to 20	364.33	9,726
RD_001204	GIBBS ROAD	BORONIA	NA	AR	4	16 to 20	339.19	9,055
RD_001537	ANNOIS ROAD	WINDMILL	NA	AR	4	16 to 20	303.25	8,096
RD_002773	BOYD CRESCENT	COCKBURN	CUL-DE-SAC	AR	4	16 to 20	1232.64	28,347
RD_001963	LEDA STREET	ROCKINGHAM	STARLING	AR	4	16 to 20	420.52	11,226
RD_003431	CARMODY STREET	ENGLAND	NA	AR	4	16 to 20	272.78	7,282

ASSET ID	Road Name	Start Point	End Point	Hierarchy	Condition	Age Group	Area (m2)	CRC ($)
RD_003341	PAULIK WAY	HALKIN	NA	AR	4	16 to 20	149.48	3,991
RD_003345	GLENISTER ROAD	PILGRIM	NA	AR	4	16 to 20	293.55	7,837
RD_000028	MALABAR WAY	PORT KEMBLA	END	AR	4	16 to 20	843.53	21,963
RD_001073	GEELONG COURT	BROADMEADOWS	NA	AR	4	16 to 20	611.97	15,934
RD_002094	HOWE STREET	HOWE STREET	CUL-DE-SAC	AR	4	16 to 20	126.11	3,367
RD_002577	HOWE STREET	CUL-DE-SAC	ROCKINGHAM	AR	4	16 to 20	311.95	8,328
RD_003667	PIONEER DRIVE	IBIS	NA	AR	4	16 to 20	317.95	8,488
RD_001860	BUKTENICA COURT	BUKTENICA COURT	CUL-DE-SAC	AR	4	16 to 20	302.6	8,078
RD_002340	MARRYAT COURT	MARRYAT COURT	CUL-DE-SAC	AR	4	16 to 20	460.54	12,295
RD_004473	REGINA COURT	REGINA COURT	CUL-DE-SAC	AR	4	16 to 20	276.01	7,369
RD_003683	QUARIMOR ROAD	PARK	NA	AR	4	16 to 20	421.28	11,247
RD_001901	BELLIER PLACE	BELLIER PLACE	CUL-DE-SAC	AR	4	16 to 20	284.99	7,608
RD_001545	BLUEBELL WAY	HAMLET	NA	AR	4	16 to 20	227.01	6,060
RD_000568	HAMLET COURT	HAMLET COURT	CUL-DE-SAC	AR	4	16 to 20	337.32	9,005
RD_001546	STYLE COURT	BLUEBELL	NA	AR	4	16 to 20	310.12	8,279
RD_001269	STYLE COURT	STYLE COURT	CUL-DE-SAC	AR	4	16 to 20	346.48	9,250
RD_000241	STYLE COURT	STYLE COURT	CUL-DE-SAC	AR	4	16 to 20	338.87	9,047
RD_002127	PARK PLACE	PARK PLACE	CUL-DE-SAC	AR	4	16 to 20	565.52	14,725
RD_004247	SPRINGFIELDS CLOSE	OXLEY	CUL-DE-SAC	AR	4	16 to 20	2982.24	68,582
RD_000478	OXLEY ROAD	SPRINGFIELDS	CUL-DE-SAC	AR	4	16 to 20	1564.84	35,986
RD_004168	IMLAH COURT	PRINSEP	THE LAKES	AR	4	16 to 20	1917.98	44,107
RD_005785	GERANIUM RETREAT	NASTURTIUM	RANUNCULUS	AR	4	16 to 20	489.6	7,872
RD_004229	HILLBERG RISE	HILLBERG RISE	CUL-DE-SAC	AR	4	16 to 20	520.79	8,582
RD_007163	MINERVA LOOP	REEVES	NA	AR	4	16 to 20	662.55	11,043
RD_004760	MINERVA LOOP	MINERVA	MINERVA	AR	4	16 to 20	126.37	3,374

ASSET ID	Road Name	Start Point	End Point	Hierarchy	Condition	Age Group	Area (m2)	CRC ($)
RD_007198	JACKADDER AVENUE	ASHENDON	NA	AR	4	16 to 20	461.19	12,312
RD_007892	CARRINGTON STREET	WINTERFOLD	CLONTARF	DA	3	>20	1151.52	39,089
RD_007893	CARRINGTON STREET	CLONTARF	DODD	DA	3	>20	592.99	30,426
RD_006962	CARRINGTON STREET	CLONTARF	DODD	DA	3	>20	646.56	33,175
RD_006979	CARRINGTON STREET	DODD	HEALY	DA	3	>20	2508.13	102,206
RD_003993	PHOENIX ROAD	ROCKINGHAM	GRANDPRE	DA	3	>20	547.5	29,852
RD_003996	PHOENIX ROAD	BOURBON	NA	DA	3	>20	372.44	22,149
RD_003995	PHOENIX ROAD	GRANDPRE	BOURBON	DA	3	>20	2039.11	83,093
RD_003999	PHOENIX ROAD	BOURBON	GERALD	DA	3	>20	681.27	31,700
RD_007660	PHOENIX ROAD	DELLER	NA	DA	3	>20	1038.62	37,489
RD_007661	PHOENIX ROAD	DELLER	PORT KEMBLA	DA	3	>20	1157.91	39,678
RD_001686	PHOENIX ROAD	STOCK	DELLER	DA	3	>20	1539.63	62,740
RD_007669	PHOENIX ROAD	SUDLOW	SUDLOW	DA	3	>20	1980.21	88,652
RD_008167	PHOENIX ROAD	HORUS	NORTH LAKE	DA	3	>20	1591.89	64,869
RD_008169	PHOENIX ROAD	HORUS	NORTH LAKE	DA	3	>20	1615.09	65,815
RD_007701	SPEARWOOD AVENUE	YANGEBUP	TINDAL	DA	3	>20	1608.45	65,544
RD_007946	ROCKINGHAM ROAD	LANCASTER	KENT	DA	3	>20	4564.48	204,260
RD_007400	ROCKINGHAM ROAD	KENT	NA	DA	3	>20	627.69	32,206
RD_007401	ROCKINGHAM ROAD	KENT	COLEVILLE	DA	3	>20	391.8	22,928
RD_007402	ROCKINGHAM ROAD	COLEVILLE	NA	DA	3	>20	507.91	26,061
RD_007403	ROCKINGHAM ROAD	COLEVILLE	SPEARWOOD	DA	3	>20	4449.37	199,109
RD_002599	ROCKINGHAM ROAD	SPEARWOOD	EDELINE	DA	3	>20	1246.75	58,011
RD_003265	ROCKINGHAM ROAD	EDELINE	NA	DA	3	>20	442.37	26,307
RD_007419	ROCKINGHAM ROAD	EDELINE	GOLDSMITH	DA	3	>20	424.27	23,133
RD_001836	ROCKINGHAM ROAD	GOLDSMITH	RESERVE	DA	3	>20	2390.93	97,430

ASSET ID	Road Name	Start Point	End Point	Hierarchy	Condition	Age Group	Area (m2)	CRC ($)
RD_007482	BEELIAR DRIVE	POLETTI	NA	DA	3	>20	2509.23	112,336
RD_008161	PHOENIX ROAD	SUDLOW	SELKIS	DA	3	>20	1142.25	53,149
RD_008166	PHOENIX ROAD	SELKIS	HORUS	DA	3	>20	2046.65	83,401
RD_008163	PHOENIX ROAD	SELKIS	NA	DA	3	>20	1649.82	73,861
RD_007737	BEELIAR DRIVE	ROCKINGHAM	STOCK	DA	3	>20	1851.05	75,430
RD_001547	BIBRA DRIVE	STYLE	NA	DB	4	0 to 5	365.6	21,742
RD_007703	YANGEBUP ROAD	MIGUEL	NA	LD	4	16 to 20	1159.74	41,554
RD_007520	COUNSEL ROAD	HARGREAVES	LEAR	LD	4	16 to 20	422.68	19,268
RD_003209	NEWTON STREET	PEPYS	NA	LD	4	16 to 20	283.62	14,331
RD_003207	NEWTON STREET	CAMPION	NA	LD	4	16 to 20	367.21	18,555
RD_003235	NEWTON STREET	GALSWORTHY	NA	LD	4	16 to 20	239.61	12,108
RD_003234	NEWTON STREET	GOLDSMITH	NA	LD	4	16 to 20	306.24	15,474
RD_002393	NEWTON STREET	GOLDSMITH	IONESCO	LD	4	16 to 20	692.83	26,045
RD_006933	NEWTON STREET	IONESCO	NA	LD	4	16 to 20	472.78	23,890
RD_007000	OSPREY DRIVE	DOTTEREL	NA	LD	4	16 to 20	513.47	21,756
RD_007532	PROGRESS DRIVE	HOPE	NA	LD	4	16 to 20	987.06	32,332
RD_007053	PROGRESS DRIVE	MASEFIELD	NA	LD	4	16 to 20	490.32	20,775
						TOTAL 26/27	68659.15	2,613,312
						TOTAL 26/27 inc CPI		3,001,874
RD_003780	PEARSE ROAD	DALISON	NA	AR	4	11 to 15	509.29	13,260
RD_003779	PEARSE ROAD	MORTIMER	NA	AR	4	11 to 15	350.49	9,357
RD_003764	MOYLAN ROAD	McLEOD	NA	AR	4	11 to 15	264.94	7,073
RD_001297	THOMAS STREET	NORTH LAKE	SYCAMORE	AR	4	11 to 15	1595.73	36,697
RD_001628	THOMAS STREET	SYCAMORE	NA	AR	4	11 to 15	324.33	5,938

ASSET ID	Road Name	Start Point	End Point	Hierarchy	Condition	Age Group	Area (m2)	CRC ($)
RD_003701	EAST CHURCHILL AVENUE	WATSON	NA	AR	4	11 to 15	300.34	8,018
RD_003700	EAST CHURCHILL AVENUE	JERVOIS	NA	AR	4	11 to 15	240.53	6,421
RD_008081	EAST CHURCHILL AVENUE	CONGDON	EAST CHURCHILL	AR	4	11 to 15	1045.26	24,038
RD_004136	EAST CHURCHILL AVENUE	EAST CHURCHILL AVENUE	CUL-DE-SAC	AR	4	11 to 15	190.29	5,080
RD_001853	EDELINE STREET	ROCKINGHAM	ANGUS	AR	4	11 to 15	309.89	8,273
RD_007417	EDELINE STREET	ANGUS	NA	AR	4	11 to 15	520.97	13,565
RD_001843	EDELINE STREET	ANGUS	DENHAM	AR	4	11 to 15	1823.39	41,932
RD_003830	EDELINE STREET	DENHAM	NA	AR	4	11 to 15	317.21	8,468
RD_001842	EDELINE STREET	DENHAM	GERALD	AR	4	11 to 15	335.58	8,959
RD_007416	EDELINE STREET	GERALD	NA	AR	4	11 to 15	823.09	21,431
RD_003251	EDELINE STREET	COBINE	NA	AR	4	11 to 15	280.89	7,499
RD_003252	EDELINE STREET	FOX	NA	AR	4	11 to 15	335.34	8,952
RD_003253	EDELINE STREET	FOX	ROSS	AR	4	11 to 15	217.62	5,810
RD_003325	BOLINGBROKE STREET	SCROOP	NA	AR	4	11 to 15	315	8,409
RD_002277	POSSNER WAY	SPARKS	SPARKS	AR	4	11 to 15	4607.61	105,960
RD_003709	STUART DRIVE	DIAMANTINA	NA	AR	4	11 to 15	612.64	15,951
RD_003798	DALISON AVENUE	MARBAN	NA	AR	4	11 to 15	243.78	6,508
RD_005325	HYBANTHUS LOOP	HYBANTHUS	NA	AR	4	11 to 15	148.23	3,957
RD_005917	SUNFLOWER ROAD	GRENADA	NA	AR	4	11 to 15	175.64	4,689
RD_005857	WISELY COURT	WISELY COURT	CUL-DE-SAC	AR	4	11 to 15	591.06	9,376
RD_006322	STOWE GARDENS	MAJORELLE	CUL-DE-SAC	AR	4	11 to 15	341.74	9,123
RD_006781	ZEST LANE	VALOUR	NA	AR	4	11 to 15	158.02	4,219
RD_003135	CARRINGTON STREET	HEALY	MORTLOCK	DA	3	16 to 20	2068.19	84,278

ASSET ID	Road Name	Start Point	End Point	Hierarchy	Condition	Age Group	Area (m2)	CRC ($)
RD_003418	CARRINGTON STREET	MORTLOCK	NA	DA	3	16 to 20	382.35	22,738
RD_002491	CARRINGTON STREET	MORTLOCK	STRATTON	DA	3	16 to 20	905.14	42,116
RD_007466	CARRINGTON STREET	STRATTON	NA	DA	3	16 to 20	439.53	26,138
RD_004001	PHOENIX ROAD	GERALD	LEO	DA	3	16 to 20	1767.96	72,044
RD_004004	PHOENIX ROAD	SOUTHWELL	DOOLETTE	DA	3	16 to 20	510.01	27,808
RD_004008	PHOENIX ROAD	DOOLETTE	BULLFINCH	DA	3	16 to 20	1467.66	59,807
RD_004010	PHOENIX ROAD	QUICKLY	NA	DA	3	16 to 20	217.97	12,962
RD_004009	PHOENIX ROAD	BULLFINCH	QUICKLY	DA	3	16 to 20	448.04	24,429
RD_007369	SPEARWOOD AVENUE	PORT KEMBLA	WELLARD	DA	3	16 to 20	5831.6	226,637
RD_007355	SPEARWOOD AVENUE	SUDLOW	MIGUEL	DA	3	16 to 20	5610.58	228,630
RD_007915	SPEARWOOD AVENUE	YANGEBUP	NA	DA	3	16 to 20	2255.48	100,976
RD_008606	NORTH LAKE ROAD	PHOENIX	DISCOVERY	DA	3	16 to 20	2173.03	88,551
RD_008605	NORTH LAKE ROAD	PHOENIX	DISCOVERY	DA	3	16 to 20	2428.31	98,953
RD_007007	NORTH LAKE ROAD	RIMMINGTON	NA	DA	3	16 to 20	1317.77	58,995
RD_003782	WARTON ROAD	JANDAKOT	MASON	DA	3	16 to 20	626.84	32,163
RD_000155	WARTON ROAD	JANDAKOT	ACKWORTH	DA	3	16 to 20	3536.8	144,124
RD_003784	WARTON ROAD	ACKWORTH	NA	DA	3	16 to 20	544.61	27,944
RD_002935	WARTON ROAD	ACKWORTH	HYBRID	DA	3	16 to 20	2571.62	104,793
RD_004431	WARTON ROAD	HYBRID	NA	DA	3	16 to 20	483.09	24,787
RD_003087	WARTON ROAD	HYBRID	HEBE	DA	3	16 to 20	1827.65	74,476
RD_004430	WARTON ROAD	HEBE	NA	DA	3	16 to 20	470.2	27,962
RD_002618	WARTON ROAD	HEBE	NICHOLSON (GOSNELLS)	DA	3	16 to 20	3442.18	140,268
RD_007926	ROCKINGHAM ROAD	PHOENIX	PHOENIX	DA	3	16 to 20	1607.71	71,976
RD_007927	ROCKINGHAM ROAD	PHOENIX	LANCASTER	DA	3	16 to 20	2611.43	116,861

ASSET ID	Road Name	Start Point	End Point	Hierarchy	Condition	Age Group	Area (m2)	CRC ($)
RD_001835	ROCKINGHAM ROAD	RESERVE	RIGBY	DA	3	16 to 20	775.14	36,067
RD_003225	ROCKINGHAM ROAD	RIGBY	NA	DA	3	16 to 20	619.54	31,788
RD_002401	ROCKINGHAM ROAD	RIGBY	TODD	DA	3	16 to 20	348.29	18,990
RD_003224	ROCKINGHAM ROAD	TODD	NA	DA	3	16 to 20	358.35	21,311
RD_006941	ROCKINGHAM ROAD	TODD	NEWTON	DA	3	16 to 20	3894.06	158,682
RD_006939	ROCKINGHAM ROAD	NEWTON	NA	DA	3	16 to 20	678.04	34,790
RD_002799	ROCKINGHAM ROAD	NEWTON	BARRETT	DA	3	16 to 20	3434.02	139,936
RD_003204	ROCKINGHAM ROAD	BARRETT	NA	DA	3	16 to 20	478.63	24,558
RD_003902	ROCKINGHAM ROAD	BARRETT	GEROVICH	DA	3	16 to 20	538.68	29,371
RD_007765	ROCKINGHAM ROAD	GEROVICH	NA	DA	3	16 to 20	729.93	29,942
RD_007767	ROCKINGHAM ROAD	GEROVICH	BARRINGTON	DA	3	16 to 20	1265.38	51,564
RD_007766	ROCKINGHAM ROAD	BARRINGTON	NA	DA	3	16 to 20	920.23	33,325
RD_007768	ROCKINGHAM ROAD	BARRINGTON	TROODE	DA	3	16 to 20	3505.8	142,861
RD_007769	ROCKINGHAM ROAD	TROODE	NA	DA	3	16 to 20	735.09	37,717
RD_007770	ROCKINGHAM ROAD	TROODE	MARVELL	DA	3	16 to 20	2042.82	83,245
RD_003169	ROCKINGHAM ROAD	OKRA	NA	DA	3	16 to 20	539.59	27,686
RD_002361	ROCKINGHAM ROAD	OKRA	ASQUITH	DA	3	16 to 20	495.64	27,025
RD_003172	ROCKINGHAM ROAD	BACICH	NA	DA	3	16 to 20	554.44	28,448
RD_007736	ROCKINGHAM ROAD	BACICH	MAYOR	DA	3	16 to 20	1168.66	54,378
RD_008711	ROCKINGHAM ROAD	BEELIAR	MAYOR	DA	3	16 to 20	1005.67	45,023
RD_007060	FARRINGTON ROAD	BIBRA	NA	DA	3	16 to 20	2260.16	101,185
RD_007016	BERRIGAN DRIVE	KWINANA	THE LAKES	DA	3	16 to 20	2495.43	101,688
RD_007020	BERRIGAN DRIVE	TURNBURY PARK	NA	DA	3	16 to 20	1077.7	48,248
RD_007017	BERRIGAN DRIVE	THE LAKES	NA	DA	3	16 to 20	1536.29	68,778
RD_007022	BERRIGAN DRIVE	TURNBURY	PRINSEP	DA	3	16 to 20	3831.59	156,137

ASSET ID	Road Name	Start Point	End Point	Hierarchy	Condition	Age Group	Area (m2)	CRC ($)
RD_007270	BERRIGAN DRIVE	PRINSEP	JANDAKOT	DA	3	16 to 20	1424.41	58,044
RD_000527	BERRIGAN DRIVE	JANDAKOT	GLENDALE	DA	3	16 to 20	4470.06	200,121
RD_001104	BERRIGAN DRIVE	GLENDALE	NA	DA	3	16 to 20	438.17	26,058
RD_000752	BERRIGAN DRIVE	GLENDALE	LAKES	DA	3	16 to 20	2217.1	90,346
RD_000892	BERRIGAN DRIVE	LAKES	GLENDALE	DA	3	16 to 20	2588.95	105,499
RD_001105	BERRIGAN DRIVE	GLENDALE	NA	DA	3	16 to 20	339.37	20,182
RD_001108	BERRIGAN DRIVE	LAKES	NA	DA	3	16 to 20	2043.51	91,486
RD_007742	BERRIGAN DRIVE	LAKES	HOPE	DA	3	16 to 20	4422.28	180,207
RD_007451	BEELIAR DRIVE	LAKERIDGE	NA	DA	3	16 to 20	1369.61	43,715
RD_007611	BEELIAR DRIVE	KEMP	BEELIAR	DA	3	16 to 20	12649.16	515,451
RD_007784	BEELIAR DRIVE	SPEARWOOD	TINDAL	DA	3	16 to 20	2150.21	87,621
RD_007783	BEELIAR DRIVE	TINDAL	NA	DA	3	16 to 20	1449.47	64,891
RD_004647	BEELIAR DRIVE	TINDAL	BIRCHLEY	DA	3	16 to 20	826.54	42,409
RD_007810	BEELIAR DRIVE	DURNIN	DURNIN	DA	3	16 to 20	2757.97	123,472
RD_005285	COCKBURN ROAD	SUCCESS	NA	DA	3	16 to 20	621.49	20,314
RD_008365	COCKBURN ROAD	SUCCESS	JESSIE LEE	DA	3	16 to 20	2039.01	83,089
RD_008366	COCKBURN ROAD	JESSIE LEE	NA	DA	3	16 to 20	829.52	42,562
RD_008364	COCKBURN ROAD	JESSIE LEE	ZEDORA	DA	3	16 to 20	6064.31	247,119
RD_008363	COCKBURN ROAD	ZEDORA	NA	DA	3	16 to 20	822.58	42,206
RD_007236	COCKBURN ROAD	ZEDORA	QUIL	DA	3	16 to 20	8195.77	333,976
RD_007238	COCKBURN ROAD	QUILL	NA	DA	3	16 to 20	2068.24	92,593
RD_007243	COCKBURN ROAD	QUILL	STUART	DA	3	16 to 20	5546.49	226,018
RD_007244	COCKBURN ROAD	STUART	NA	DA	3	16 to 20	1846.81	82,680
RD_007242	COCKBURN ROAD	STUART	ENTRANCE	DA	3	16 to 20	13340.85	537,898
RD_008603	NORTH LAKE ROAD	PHOENIX	PHOENIX	DA	3	16 to 20	1295.96	58,019

ASSET ID	Road Name	Start Point	End Point	Hierarchy	Condition	Age Group	Area (m2)	CRC ($)
RD_008604	NORTH LAKE ROAD	PHOENIX	PHOENIX	DA	3	16 to 20	1162	52,022
RD_008607	NORTH LAKE ROAD	SOBEK	NA	DA	3	16 to 20	2675.74	119,790
RD_009193	BEELIAR DRIVE	TINDAL	BIRCHLEY	DA	3	16 to 20	1802.34	73,445
RD_009192	BEELIAR DRIVE	TINDAL	BIRCHLEY	DA	3	16 to 20	2311.13	94,178
RD_010507	BERRIGAN DRIVE	JANDAKOT	GLENDALE	DA	3	16 to 20	2529.53	103,078
RD_010521	BERRIGAN DRIVE	PRINSEP	JANDAKOT	DA	3	16 to 20	1153.02	53,650
RD_010523	SPEARWOOD AVENUE	BARRINGTON STREET	YANGEBUP ROAD	DA	3	16 to 20	4508.82	183,734
RD_010524	SPEARWOOD AVENUE	BARRINGTON STREET	YANGEBUP ROAD	DA	3	16 to 20	5550.81	226,194
RD_006960	WINTERFOLD ROAD	CARRINGTON	SIMMS	DB	3	>20	717.29	22,825
RD_006961	WINTERFOLD ROAD	SIMMS	NA	DB	3	>20	298.28	17,738
RD_006983	WINTERFOLD ROAD	SIMMS	FREDERICK	DB	3	>20	1195.46	55,625
RD_004143	WINTERFOLD ROAD	FREDERICK	JOYCE	DB	3	>20	453.82	24,744
RD_004145	WINTERFOLD ROAD	JOYCE	NA	DB	3	>20	224	13,321
RD_004141	WINTERFOLD ROAD	JOYCE	DAVON	DB	3	>20	423	23,064
RD_004148	WINTERFOLD ROAD	DAVON	NA	DB	3	>20	157.92	9,391
RD_007901	WINTERFOLD ROAD	DAVON	GREENSLADE	DB	3	>20	458.47	24,998
RD_007902	WINTERFOLD ROAD	GREENSLADE	NA	DB	3	>20	200.28	11,910
RD_004142	WINTERFOLD ROAD	GREENSLADE	ABERLE	DB	3	>20	414.75	22,614
RD_004146	WINTERFOLD ROAD	ABERLE	NA	DB	3	>20	210.34	12,509
RD_004144	WINTERFOLD ROAD	ABERLE	REDMOND	DB	3	>20	406.85	22,183
RD_006985	WINTERFOLD ROAD	REDMOND	NA	DB	3	>20	340.75	20,264
RD_006986	WINTERFOLD ROAD	REDMOND	STOCK	DB	3	>20	377.24	20,569
RD_004026	SPEARWOOD AVENUE	GOWER	NA	DB	3	>20	289.15	17,195
RD_002104	SPEARWOOD AVENUE	SPEARWOOD	SPEARWOOD	DB	3	>20	898.29	41,797
RD_004032	SPEARWOOD AVENUE	BULLFINCH	SPEARWOOD	DB	3	>20	1082.13	50,352

ASSET ID	Road Name	Start Point	End Point	Hierarchy	Condition	Age Group	Area (m2)	CRC ($)
RD_007729	MAYOR ROAD	HAMILTON	HAMILTON	DB	3	>20	875.2	44,906
RD_002583	HAMILTON ROAD	OCEAN	MELL	DB	3	>20	2199.94	89,647
RD_007908	HAMILTON ROAD	MELL	NA	DB	3	>20	454.94	26,512
RD_002914	HAMILTON ROAD	MELL	KING	DB	3	>20	1150.37	53,527
RD_006952	HAMILTON ROAD	CRANBERRY	NA	DB	3	>20	353.45	12,940
RD_002600	HAMILTON ROAD	AMITY	BRAMSTON	DB	3	>20	790.89	36,800
RD_007739	HAMILTON ROAD	BRAMSTON	NA	DB	3	>20	700.77	35,956
RD_002921	HAMILTON ROAD	BRAMSTON	FAVAZZO	DB	3	>20	478.58	26,094
RD_003732	HAMILTON ROAD	FAVAZZO	NA	DB	3	>20	344.58	20,492
RD_002545	HAMILTON ROAD	FAVAZZO	TUNIS	DB	3	>20	1486.85	60,589
RD_003760	HAMILTON ROAD	TUNIS	NA	DB	3	>20	412.06	15,615
RD_007752	HAMILTON ROAD	TUNIS	TROODE	DB	3	>20	139.13	7,586
RD_007753	HAMILTON ROAD	TROODE	NA	DB	3	>20	579.72	29,745
RD_002601	HAMILTON ROAD	TROODE	GUMINA	DB	3	>20	1132.88	52,713
RD_003757	HAMILTON ROAD	GUMINA	NA	DB	3	>20	424.34	25,235
RD_007744	HAMILTON ROAD	GUMINA	FAIRBAIRN	DB	3	>20	1545.1	62,963
RD_007745	HAMILTON ROAD	FAIRBAIRN	NA	DB	3	>20	872.74	44,780
RD_007743	HAMILTON ROAD	FAIRBAIRN	CARRELLO	DB	3	>20	850.39	39,569
RD_003510	HAMILTON ROAD	CARRELLO	NA	DB	3	>20	444.69	26,445
RD_007749	HAMILTON ROAD	CARRELLO	KOTISINA	DB	3	>20	486.98	17,572
RD_003883	HAMILTON ROAD	KOTISINA	MAYOR	DB	3	>20	486.08	26,503
RD_000130	TAPPER ROAD	NANCARROW	HARPER	DB	3	>20	1619.46	65,993
RD_000419	TAPPER ROAD	HARPER	BARTRAM	DB	3	>20	3467.89	141,316
RD_007424	SOLOMON ROAD	ARMADALE	KNOCK	DB	3	>20	409.45	21,569
RD_007425	SOLOMON ROAD	KNOCK	KNOCK	DB	3	>20	794.92	40,787

ASSET ID	Road Name	Start Point	End Point	Hierarchy	Condition	Age Group	Area (m2)	CRC ($)
RD_005690	SOLOMON ROAD	MONASH	CHULLORA	DB	3	>20	1281.67	52,228
RD_005692	SOLOMON ROAD	CHULLORA	NA	DB	3	>20	599.9	30,781
RD_005691	SOLOMON ROAD	CHULLORA	VERDE	DB	3	>20	432.94	23,606
RD_005002	SOLOMON ROAD	VERDE	CUTLER	DB	3	>20	1224.06	56,956
RD_007252	SOLOMON ROAD	CUTLER	CUTLER	DB	3	>20	873.95	44,842
RD_001222	SOLOMON ROAD	PEPPWORTH	NA	DB	3	>20	635.46	32,605
RD_007956	ROCKINGHAM ROAD	HOWE	MAGNET	DB	3	>20	555.14	33,741
RD_002619	ACOURT ROAD	NICHOLSON (GOSNELLS)	OWSTEN	DB	3	>20	6278.99	255,868
RD_004228	ACOURT ROAD	OWSTEN	MERRITT	DB	3	>20	187.49	11,150
RD_008590	SUDLOW ROAD	HORUS	NA	DB	3	>20	1004.48	44,970
RD_008592	SUDLOW ROAD	AMBITIOUS	PHOENIX	DB	3	>20	2404.91	98,000
RD_009826	HAMILTON ROAD	OCEAN	MELL	DB	3	>20	1225.66	57,030
RD_009903	ACOURT ROAD	OWSTEN	MERRITT	DB	3	>20	8744.78	356,348
RD_009904	ACOURT ROAD	OWSTEN	MERRITT	DB	3	>20	5337.68	217,509
RD_003391	HEALY ROAD	GORDON	NA	LD	4	11 to 15	522.5	22,139
RD_003433	REDMOND ROAD	CARMODY	NA	LD	4	11 to 15	250.92	12,679
RD_007055	PROGRESS DRIVE	PROGRESS	NA	LD	4	11 to 15	655.7	27,783
RD_007399	BARTRAM ROAD	BRENCHLEY	BEENYUP	LD	4	11 to 15	1081.92	38,766
						TOTAL 27/28	265272.6	11,058,147
						TOTAL 27/28 inc CPI		12,956,382
RD_003611	PLOVER DRIVE	TUART	NA	AR	4	6 to 10	280.73	7,495
RD_007789	SPEARWOOD AVENUE	BLUEBUSH	BLUEBUSH	DA	3	11 to 15	1267.94	56,765
RD_005528	SPEARWOOD AVENUE	BEELIAR	BLUEBUSH	DA	3	11 to 15	1141.46	53,112
RD_007066	SPEARWOOD AVENUE	THE GRANGE	NA	DA	3	11 to 15	1251.6	56,033

ASSET ID	Road Name	Start Point	End Point	Hierarchy	Condition	Age Group	Area (m2)	CRC ($)
RD_007047	NORTH LAKE ROAD	FARRINGTON	NA	DA	3	11 to 15	2152.44	79,299
RD_007868	NORTH LAKE ROAD	GWILLIAM	FORREST	DA	3	11 to 15	4618.05	206,746
RD_007674	NORTH LAKE ROAD	PHOENIX	NA	DA	3	11 to 15	3570.35	83,925
RD_007952	NORTH LAKE ROAD	DISCOVERY	NA	DA	3	11 to 15	2160.67	96,731
RD_007899	NORTH LAKE ROAD	BIBRA	OMEO	DA	3	11 to 15	6147.72	250,518
RD_005527	NORTH LAKE ROAD	RIMMINGTON	THOMAS	DA	3	11 to 15	919.73	42,795
RD_009000	RUSSELL ROAD	HAMMOND	BRUSHFOOT	DA	3	11 to 15	5793.84	236,098
RD_007207	RUSSELL ROAD	BRUSHFOOT	MACQUARIE	DA	3	11 to 15	2953.74	132,236
RD_008595	FORREST ROAD	CARRINGTON	CARRINGTON	DA	3	11 to 15	1680.81	64,331
RD_008093	ROCKINGHAM ROAD	HEALY	CARDIGAN	DA	3	11 to 15	2217.24	90,352
RD_003402	ROCKINGHAM ROAD	CARDIGAN	NA	DA	3	11 to 15	628.68	32,257
RD_008094	ROCKINGHAM ROAD	CARDIGAN	BELLION	DA	3	11 to 15	2544.24	103,677
RD_003401	ROCKINGHAM ROAD	BELLION	NA	DA	3	11 to 15	521.85	26,776
RD_002107	ROCKINGHAM ROAD	BELLION	DAVILAK	DA	3	11 to 15	1194.02	55,558
RD_003400	ROCKINGHAM ROAD	DAVILAK	NA	DA	3	11 to 15	351.69	20,915
RD_003080	ROCKINGHAM ROAD	DAVILAK	STARLING	DA	3	11 to 15	2159.11	87,983
RD_008571	ROCKINGHAM ROAD	STARLING	NA	DA	3	11 to 15	794.8	40,781
RD_007458	ROCKINGHAM ROAD	STARLING	LEDA	DA	3	11 to 15	1317.09	53,671
RD_007459	ROCKINGHAM ROAD	LEDA	NA	DA	3	11 to 15	932.47	47,844
RD_008088	ROCKINGHAM ROAD	LEDA	ANNEAN	DA	3	11 to 15	616.65	33,623
RD_008087	ROCKINGHAM ROAD	ANNEAN	LUCIUS	DA	3	11 to 15	1006.95	46,853
RD_008998	ROCKINGHAM ROAD	LUCIUS	FORREST	DA	3	11 to 15	108.33	5,907
RD_007468	ROCKINGHAM ROAD	FORREST	NA	DA	3	11 to 15	966.45	43,267
RD_002487	ROCKINGHAM ROAD	FORREST	STRODE	DA	3	11 to 15	1097.13	51,050
RD_003379	ROCKINGHAM ROAD	STRODE	NA	DA	3	11 to 15	381.17	22,668

ASSET ID	Road Name	Start Point	End Point	Hierarchy	Condition	Age Group	Area (m2)	CRC ($)
RD_002849	ROCKINGHAM ROAD	STRODE	BAILEY	DA	3	11 to 15	1522.36	62,036
RD_003378	ROCKINGHAM ROAD	BAILEY	NA	DA	3	11 to 15	405.86	24,136
RD_007473	ROCKINGHAM ROAD	BAILEY	HAMILTON	DA	3	11 to 15	1907.94	77,748
RD_007475	ROCKINGHAM ROAD	CARRINGTON	MARRYAT	DA	3	11 to 15	2008.89	81,862
RD_003370	ROCKINGHAM ROAD	MARRYAT	NA	DA	3	11 to 15	478.73	24,563
RD_001939	ROCKINGHAM ROAD	MARRYAT	PAULIK	DA	3	11 to 15	2883.63	117,507
RD_003363	ROCKINGHAM ROAD	PAULIK	NA	DA	3	11 to 15	369.76	21,989
RD_002838	ROCKINGHAM ROAD	PAULIK	PACKHAM	DA	3	11 to 15	695.46	32,360
RD_003362	ROCKINGHAM ROAD	PACKHAM	NA	DA	3	11 to 15	361.75	21,513
RD_003360	ROCKINGHAM ROAD	SNARE	NA	DA	3	11 to 15	374.35	22,262
RD_007642	ROCKINGHAM ROAD	SNARE	PHOENIX	DA	3	11 to 15	4566.34	186,077
RD_007048	FARRINGTON ROAD	NORTH LAKE	PROGRESS	DA	3	11 to 15	3689.94	146,533
RD_007049	FARRINGTON ROAD	PROGRESS	NA	DA	3	11 to 15	771.27	31,430
RD_007019	BERRIGAN DRIVE	THE LAKES	TURNBURY	DA	3	11 to 15	1397.97	56,967
RD_007288	KAREL AVENUE	BERRIGAN	NA	DA	3	11 to 15	1302.47	58,310
RD_009016	KAREL AVENUE	BERRIGAN	TRAINING	DA	3	11 to 15	882.34	41,055
RD_007567	KAREL AVENUE	TRAINING	NA	DA	3	11 to 15	1224.47	54,818
RD_009013	KAREL AVENUE	TRAINING	ROE HIGHWAY	DA	3	11 to 15	585.82	31,942
RD_007565	KAREL AVENUE	ROE HIGHWAY WEST	ROE HIGHWAY WEST	DA	3	11 to 15	1236.48	53,314
RD_009011	KAREL AVENUE	ROE HIGHWAY	ROE HIGHWAY	DA	3	11 to 15	569.77	31,067
RD_007564	KAREL AVENUE	ROE HIGHWAY EAST	ROE HIGHWAY EAST	DA	3	11 to 15	1351.23	59,375
RD_000048	BEELIAR DRIVE	POLETTI	LAKERIDGE	DA	3	11 to 15	3941.08	160,598
RD_000047	BEELIAR DRIVE	POLETTI	LAKERIDGE	DA	3	11 to 15	3320	135,289
RD_007690	BEELIAR DRIVE	DUNRAVEN	NA	DA	3	11 to 15	1182.99	52,353
RD_005679	VERDE DRIVE	SOLOMON	CHIFLEY	DA	3	11 to 15	136.12	7,422

ASSET ID	Road Name	Start Point	End Point	Hierarchy	Condition	Age Group	Area (m2)	CRC ($)
RD_006084	VERDE DRIVE	CHIFLEY	CUL-DE-SAC	DA	3	11 to 15	512.88	27,965
RD_008086	ROCKINGHAM ROAD	ANNEAN	NA	DA	3	11 to 15	419.49	24,947
RD_007850	KAREL AVENUE	BERRIGAN	ORION	DA	3	11 to 15	7345.5	299,328
RD_008374	SPEARWOOD AVENUE	FANCOTE	NA	DA	3	11 to 15	847.54	43,487
RD_007754	KAREL AVENUE	MARRIOT	NA	DA	3	11 to 15	2959.87	132,511
RD_009014	KAREL AVENUE	TRAINING	ROE HIGHWAY	DA	3	11 to 15	398.9	21,750
RD_010144	VERDE DRIVE	CHIFLEY	CUL-DE-SAC	DA	3	11 to 15	114.22	6,228
RD_001684	WINTERFOLD ROAD	THORSAGER	NA	DB	3	16 to 20	341.85	20,329
RD_004149	WINTERFOLD ROAD	HARGREAVES	NA	DB	3	16 to 20	374.67	22,281
RD_008369	WINTERFOLD ROAD	ROCKE	HARGREAVES	DB	3	16 to 20	1860.64	75,821
RD_008022	WINTERFOLD ROAD	HARGREAVES	COOLBELLUP	DB	3	16 to 20	2054.81	83,733
RD_007877	WINTERFOLD ROAD	COOLBELLUP	NA	DB	3	16 to 20	545.16	13,060
RD_007878	WINTERFOLD ROAD	COOLBELLUP	HERMIONE	DB	3	16 to 20	497.96	27,151
RD_007038	WINTERFOLD ROAD	HERMIONE	ANTIGONUS	DB	3	16 to 20	1376.27	56,083
RD_007897	WINTERFOLD ROAD	ANTIGONUS	NA	DB	3	16 to 20	221.08	13,147
RD_007905	WINTERFOLD ROAD	ANTIGONUS	DOHERTY	DB	3	16 to 20	2525.3	102,905
RD_007904	WINTERFOLD ROAD	DOHERTY	NA	DB	3	16 to 20	331.25	19,699
RD_007727	MAYOR ROAD	FAWCETT	MAYOR ROAD	DB	3	16 to 20	3973.36	161,914
RD_006320	LYON ROAD	DEAKIN	CAPE LE GRAND	DB	3	16 to 20	1079.17	50,214
RD_006748	LYON ROAD	CAPE LE GRAND	VIENNA	DB	3	16 to 20	1124.92	42,302
RD_003342	HAMILTON ROAD	OWEN	NA	DB	3	16 to 20	354.94	21,108
RD_007587	HAMILTON ROAD	OWEN	DERINTON	DB	3	16 to 20	1796.35	73,201
RD_003337	HAMILTON ROAD	DERINTON	NA	DB	3	16 to 20	366.17	21,776
RD_007589	HAMILTON ROAD	OFFLEY	NA	DB	3	16 to 20	459.55	27,329
RD_007590	HAMILTON ROAD	PHOENIX	NA	DB	3	16 to 20	768.91	39,452

ASSET ID	Road Name	Start Point	End Point	Hierarchy	Condition	Age Group	Area (m2)	CRC ($)
RD_003284	HAMILTON ROAD	AZELIA	NA	DB	3	16 to 20	402.31	23,925
RD_007591	HAMILTON ROAD	AZELIA	DANE	DB	3	16 to 20	691.64	32,182
RD_003282	HAMILTON ROAD	DANE	NA	DB	3	16 to 20	325.38	19,350
RD_007592	HAMILTON ROAD	DANE	GORHAM	DB	3	16 to 20	1598.43	65,136
RD_003263	HAMILTON ROAD	GORHAM	NA	DB	3	16 to 20	490.38	25,161
RD_003837	HAMILTON ROAD	GORHAM	KENT	DB	3	16 to 20	537.32	27,570
RD_007764	HAMILTON ROAD	KENT	SPEARWOOD	DB	3	16 to 20	2073.16	84,481
RD_007953	HAMILTON ROAD	SPEARWOOD	SPEARWOOD	DB	3	16 to 20	1207.03	54,038
RD_001187	TAPPER ROAD	HARPER	NA	DB	3	16 to 20	430.39	25,595
RD_008578	TAPPER ROAD	SEDGE	NA	DB	3	16 to 20	1003.52	10,563
RD_005724	TAPPER ROAD	SEDGE	BEENYUP	DB	3	16 to 20	2518.83	102,642
RD_007411	TAPPER ROAD	BEENYUP	BEENYUP	DB	3	16 to 20	862.45	44,252
RD_005722	TAPPER ROAD	BEENYUP	HARMONY	DB	3	16 to 20	1712.81	69,797
RD_005723	TAPPER ROAD	TAPPER	TAPPER	DB	3	16 to 20	1107.72	55,973
RD_004906	TAPPER ROAD	HARMONY	NA	DB	3	16 to 20	427.57	25,427
RD_005721	TAPPER ROAD	TAPPER	TAPPER	DB	3	16 to 20	449.17	26,285
RD_006213	GIBBS ROAD	ALLIANCE	NA	DB	3	16 to 20	598.41	30,704
RD_006930	GIBBS ROAD	SALUTE	NA	DB	3	16 to 20	234.09	10,516
RD_006926	GIBBS ROAD	ALLIANCE	SALUTE	DB	3	16 to 20	99.15	5,406
RD_006866	GIBBS ROAD	VALOUR	NA	DB	3	16 to 20	204.03	9,640
RD_006867	GIBBS ROAD	ESSENCE	VALOUR	DB	3	16 to 20	116.57	6,356
RD_006869	GIBBS ROAD	VALOUR	ELEMI	DB	3	16 to 20	54.17	2,954
RD_007461	FORREST ROAD	IVERMEY	CLARA	DB	3	16 to 20	1280.29	36,727
RD_007469	FORREST ROAD	CLARA	NA	DB	3	16 to 20	534.28	27,414
RD_007462	FORREST ROAD	CLARA	FORTINI	DB	3	16 to 20	658.69	24,879

ASSET ID	Road Name	Start Point	End Point	Hierarchy	Condition	Age Group	Area (m2)	CRC ($)
RD_007501	FORREST ROAD	FORTINI	NA	DB	3	16 to 20	397.5	23,639
RD_007504	FORREST ROAD	FORTINI	LORRAINE	DB	3	16 to 20	477.12	24,481
RD_007499	FORREST ROAD	LORRAINE	WHEELER	DB	3	16 to 20	892.05	40,668
RD_007502	FORREST ROAD	WHEELER	NA	DB	3	16 to 20	606.87	31,138
RD_007500	FORREST ROAD	WHEELER	FREDERICK	DB	3	16 to 20	325.18	12,134
RD_007503	FORREST ROAD	FREDERICK	NA	DB	3	16 to 20	547.83	28,109
RD_007498	FORREST ROAD	FREDERICK	HYAM	DB	3	16 to 20	400.1	11,405
RD_007957	ROCKINGHAM ROAD	MAGNET	YERILLA	DB	3	16 to 20	881.33	41,008
RD_008736	ROCKINGHAM ROAD	HOWE	YINDI	DB	3	16 to 20	673.11	22,957
RD_007958	ROCKINGHAM ROAD	MAGNET	NA	DB	3	16 to 20	513.03	18,612
RD_001065	BIBRA DRIVE	WATTLE	NA	DB	3	16 to 20	314.46	18,701
RD_001639	POLETTI ROAD	BUCKLEY	NA	DB	3	16 to 20	403.83	24,015
RD_000152	POLETTI ROAD	BUCKLEY	SPENCER	DB	3	16 to 20	895.08	41,648
RD_001640	POLETTI ROAD	SPENCER	NA	DB	3	16 to 20	313.81	18,662
RD_000089	POLETTI ROAD	DAVISON	COOPER	DB	3	16 to 20	1841.12	75,025
RD_000092	POLETTI ROAD	COOPER	NA	DB	3	16 to 20	656.54	33,687
RD_007406	TAPPER ROAD	BARTRAM	NA	DB	3	16 to 20	803.47	44
RD_006865	GIBBS ROAD	ESSENCE	NA	DB	3	16 to 20	452.5	18,762
RD_005363	ROCKINGHAM ROAD	YERILLA	WEST CHURCHILL	DB	3	16 to 20	534.73	29,156
RD_003505	ROCKINGHAM ROAD	WEST CHURCHILL	WEST CHURCHILL	DB	3	16 to 20	554.17	28,434
RD_008863	ROCKINGHAM ROAD	KAPULA	BUTTON	DB	3	16 to 20	1207.49	56,185
RD_007062	ROCKINGHAM ROAD	BUTTON	NA	DB	3	16 to 20	1596.25	71,463
RD_010678	ROCKINGHAM ROAD	MAYOR	HOWE	DB	3	16 to 20	2039.91	83,126
RD_010680	ROCKINGHAM ROAD	MAYOR	HOWE	DB	3	16 to 20	581.71	29,847
RD_010679	ROCKINGHAM ROAD	MAYOR	HOWE	DB	3	16 to 20	365.08	19,906

ASSET ID	Road Name	Start Point	End Point	Hierarchy	Condition	Age Group	Area (m2)	CRC ($)
RD_001615	SOUTH LAKE DRIVE	PLUMRIDGE	NA	LD	4	6 to 10	306.29	15,477
						TOTAL 28/29	158793.1	6,814,774
						TOTAL 28/29 inc CPI		8,114,286
RD_003274	MARCH STREET	ORLEANS	NA	AR	4	0 to 5	297.93	7,954
RD_007013	LABYRINTH WAY	BRIGGS	LABYRINTH	AR	4	0 to 5	739.23	19,247
RD_007650	PHOENIX ROAD	SOUTHWELL	NA	DA	3	6 to 10	978.18	43,792
RD_004007	PHOENIX ROAD	BULLFINCH	NA	DA	3	6 to 10	325.59	19,362
RD_007715	SPEARWOOD AVENUE	MAINSAIL	NA	DA	3	6 to 10	1914.32	85,702
RD_007354	SPEARWOOD AVENUE	DISCOVERY	NA	DA	3	6 to 10	2467.11	108,182
RD_008585	BARRINGTON STREET	SPEARWOOD	SPEARWOOD	DA	3	6 to 10	3338.74	147,696
RD_007014	BERRIGAN DRIVE	SEMPLE	NA	DA	3	6 to 10	1472.87	65,939
RD_006219	BEELIAR DRIVE	KWINANA	LINKAGE	DA	3	6 to 10	1820.61	74,190
RD_007676	BEELIAR DRIVE	THE GRANGE	NA	DA	3	6 to 10	1609.02	59,871
RD_008772	SPEARWOOD AVENUE	BARRINGTON	HOWSON	DA	3	6 to 10	10462.07	426,327
RD_008775	SPEARWOOD AVENUE	COCOS	NA	DA	3	6 to 10	2719.8	120,420
RD_008778	SPEARWOOD AVENUE	COCOS	HOWSON	DA	3	6 to 10	2349.28	95,733
RD_008773	SPEARWOOD AVENUE	HOWSON	NA	DA	3	6 to 10	2214.78	99,154
RD_008776	SPEARWOOD AVENUE	SUDLOW	COCOS	DA	3	6 to 10	4708.79	191,882
RD_008593	WINTERFOLD ROAD	MCCOMBE	ROCKE	DB	3	11 to 15	881	42,837
RD_008728	RUSSELL ROAD	HAMMOND	ROPER	DB	3	11 to 15	2964.5	132,718
RD_006068	HAMMOND ROAD	BUCKLEY	SPENCER	DB	3	11 to 15	389.96	21,262
RD_006065	HAMMOND ROAD	HAMMOND	SPENCER	DB	3	11 to 15	179.54	9,789
RD_006060	HAMMOND ROAD	SPENCER	NA	DB	3	11 to 15	314.97	18,731
RD_006058	HAMMOND ROAD	SPENCER	TICHBORNE	DB	3	11 to 15	935.98	43,551

ASSET ID	Road Name	Start Point	End Point	Hierarchy	Condition	Age Group	Area (m2)	CRC ($)
RD_001087	HAMMOND ROAD	TICHBORNE	NA	DB	3	11 to 15	306.84	18,247
RD_006061	HAMMOND ROAD	TICHBORNE	HAMMOND	DB	3	11 to 15	211.95	11,557
RD_006057	HAMMOND ROAD	HAMMOND	NA	DB	3	11 to 15	314.37	18,695
RD_006064	HAMMOND ROAD	HAMMOND	BLACKLY	DB	3	11 to 15	414.48	22,599
RD_007585	HAMMOND ROAD	COOPER	YANGEBUP	DB	3	11 to 15	1068.03	47,815
RD_001307	HAMMOND ROAD	COOPER	HAMMOND	DB	3	11 to 15	1747.94	71,228
RD_008915	LYON ROAD	GIBBS	GIBBS	DB	3	11 to 15	1752.6	78,462
RD_006736	LYON ROAD	GIBBS	DEACON ENTRANCE	DB	3	11 to 15	683.24	31,791
RD_007079	LYON ROAD	TWILIGHT	NA	DB	3	11 to 15	550.13	21,967
RD_005881	LYON ROAD	TALISKER	GAEBLER	DB	3	11 to 15	421.32	22,972
RD_007295	LYON ROAD	GAEBLER	GAEBLER	DB	3	11 to 15	1151.09	51,533
RD_005853	HAMILTON ROAD	MAYOR	SENNA	DB	3	11 to 15	379.76	20,706
RD_005850	HAMILTON ROAD	SENNA	KATSURA	DB	3	11 to 15	67.92	3,703
RD_005847	HAMILTON ROAD	KATSURA	NA	DB	3	11 to 15	335.93	12,087
RD_005849	HAMILTON ROAD	KATSURA	NAWA	DB	3	11 to 15	97.97	5,342
RD_005842	HAMILTON ROAD	NAWA RISE	NA	DB	3	11 to 15	296.23	10,327
RD_005843	HAMILTON ROAD	NAWA RISE	END	DB	3	11 to 15	555.44	30,285
RD_007025	SEMPLE COURT	MURIEL	BOOGALLA	DB	3	11 to 15	941.69	48,318
RD_000954	SEMPLE COURT	MURIEL	THOMAS	DB	3	11 to 15	598.48	32,632
RD_007026	SEMPLE COURT	THOMAS	NA	DB	3	11 to 15	689.9	35,398
RD_000506	SEMPLE COURT	THOMAS	NORTH LAKE	DB	3	11 to 15	2223.42	90,604
RD_007111	TAPPER ROAD	GIBBS	NA	DB	3	11 to 15	339.48	11,631
RD_007110	GIBBS ROAD	AURORA	NA	DB	3	11 to 15	546.16	19,069
RD_008594	FORREST ROAD	CARRINGTON	WHEELER	DB	3	11 to 15	663.55	28,072
RD_007472	FORREST ROAD	WHEELER	NA	DB	3	11 to 15	518.66	26,612

ASSET ID	Road Name	Start Point	End Point	Hierarchy	Condition	Age Group	Area (m2)	CRC ($)
RD_007470	FORREST ROAD	WHEELER	IVERMEY	DB	3	11 to 15	488.01	25,040
RD_007913	FORREST ROAD	ARTHUR	NA	DB	3	11 to 15	505.48	25,936
RD_007912	FORREST ROAD	BERRY	NA	DB	3	11 to 15	471.77	28,056
RD_007493	FORREST ROAD	REDMOND	NA	DB	3	11 to 15	524.66	26,920
RD_007491	FORREST ROAD	REDMOND	SAWLE	DB	3	11 to 15	478.86	24,570
RD_007490	FORREST ROAD	ENGLAND	NA	DB	3	11 to 15	443.28	26,361
RD_007492	FORREST ROAD	BLACKWOOD	NA	DB	3	11 to 15	908.07	46,593
RD_007509	FORREST ROAD	BLACKWOOD	BLACKWOOD	DB	3	11 to 15	797.94	40,942
RD_005364	ROCKINGHAM ROAD	YERILLA	NA	DB	3	11 to 15	413.82	17,312
RD_007345	DISCOVERY DRIVE	ASPIRATION	ASPIRATION	DB	3	11 to 15	1249.23	55,927
RD_005960	DISCOVERY DRIVE	ASPIRATION	AMBITIOUS	DB	3	11 to 15	2443.1	99,556
RD_005947	DISCOVERY DRIVE	AMBITIOUS	NA	DB	3	11 to 15	485.15	24,893
RD_005950	DISCOVERY DRIVE	AMBITIOUS	HYDRO	DB	3	11 to 15	600.37	32,735
RD_005949	DISCOVERY DRIVE	HYDRO	NA	DB	3	11 to 15	505.4	25,932
RD_005952	DISCOVERY DRIVE	HYDRO	TIDAL	DB	3	11 to 15	950.81	44,241
RD_005951	DISCOVERY DRIVE	TIDAL WAY	NA	DB	3	11 to 15	521.53	26,759
RD_005957	DISCOVERY DRIVE	TIDAL WAY	THERMAL	DB	3	11 to 15	349.44	19,053
RD_005954	DISCOVERY DRIVE	THERMAL	NA	DB	3	11 to 15	555.76	28,516
RD_005955	DISCOVERY DRIVE	THERMAL	SOLAR	DB	3	11 to 15	338.36	18,449
RD_006252	DISCOVERY DRIVE	SOLAR	NA	DB	3	11 to 15	640.46	32,862
RD_006258	DISCOVERY DRIVE	SOLAR	EFFICIENCY	DB	3	11 to 15	485.27	26,459
RD_006257	DISCOVERY DRIVE	EFFICIENCY	NA	DB	3	11 to 15	745.83	38,268
RD_006261	DISCOVERY DRIVE	EFFICIENCY	RENEWABLE	DB	3	11 to 15	1938.74	79,003
RD_008193	LYON ROAD	GENEVA	NA	DB	3	11 to 15	257.67	11,206
RD_008197	LYON ROAD	COLORADO	GENEVA	DB	3	11 to 15	479.72	24,614

ASSET ID	Road Name	Start Point	End Point	Hierarchy	Condition	Age Group	Area (m2)	CRC ($)
RD_008284	LYON ROAD	AUBIN GROVE	DEAKIN	DB	3	11 to 15	673.22	31,325
RD_007441	LYON ROAD	DEAKIN	NA	DB	3	11 to 15	603.08	30,944
RD_008394	LYON ROAD	AUBIN GROVE	NA	DB	3	11 to 15	398.16	14,210
RD_008194	LYON ROAD	GENEVA	PEPPERMINT GARDENS	DB	3	11 to 15	191.67	10,451
RD_008337	LYON ROAD	PEPPERMINT	NA	DB	3	11 to 15	592.69	21,170
RD_008195	LYON ROAD	PEPPERMINT	ROWLEY	DB	3	11 to 15	83.75	4,566
RD_008188	SUDLOW ROAD	HATHOR	NA	DB	3	11 to 15	903.62	46,364
RD_008764	GIBBS ROAD	SANCTITY	NA	DB	3	11 to 15	629.42	24,858
RD_010117	SEMPLE COURT	MURIEL	THOMAS	DB	3	11 to 15	263.55	15,673
RD_010118	SEMPLE COURT	MURIEL	THOMAS	DB	3	11 to 15	237.69	12,960
						TOTAL 29/30	**82116.43**	**3,668,718**
						TOTAL 29/30 Inc CPI		**4,472,147**

Appendix E Preliminary 10 year Major Road Infrastructure Projects

Project	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Rockingham Road and Phoenix Roundabout	1,175									
Karel Avenue - Berrigan to Farrington	2,000									
Rockingham Road Phoenix Rd to Spearwood Av	500	3,500								
Farrington and North Lake Road intersection (SBS)	900									
Traffic management (8 Projects)	700									
Rockingham Road - Beeliar Dr to Fancote Ave (Construct 2nd c/w)					2,500					
North Lake Road - Kentucky Court to Kwinana Freeway (construct 2 c/w)		1,000								
North Lake Road - Discovery Drive Intersection		1,000	1,000							
North Lake Road - Farrington Road Intersection				1,200						
Jandakot Road Widening - Solomon Rd to Berrigan Dr		5,850								
Jandakot Road Widening - Fraser Rd to Warton Dr						3,275				
Rowley road/ Lyon Road Intersection								1,400		
Hammond Road Widening - Branch Circus to Bertram Rd		4,000	4,000							
Henderson Road - Fancote Ave to Russell Rd (widen & upgrade 1 c/w)						2,500				
Midgegooroo Avenue - Beeliar Drive to North Lake Rd (reduce to 2 lanes)							1,000			
Poletti Road - Beeliar Dr to North Lake Rd (Construct 2 c/w & Traffic Signals)						5,000				
Semple Court - North Lake Road to Jindabyne Heights (land/construct & realign c/w)		3,360								
Muriel Court - Semple Court to North Lake Road (land/re-align construct & traffic signals)		700	700	700	700	700	950			
Hammond Road - Gaebier Rd to Frankland Ave (construct 1 c/w)			3,800							
Hammond Road - Frankland Av to Rowley Rd (construct 1 c/w)								5,800		

Project	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30
Hammond Road - Beeliar Drive to North Lake Road (construct 2nd c/w)			3,000							
Pilatus Street - Berrigan Drive to airport boundary (construct 2nd c/w)										3,000
Russell Road - Hamond Rd to Henderson Rd (land & construct 2 c/w)					2,100	2,100				
Russell Road - Henderson Rd to Rockingham Rd (land & construct 2 c/w)								8,200		
Rowley Road - Hammond Rd to Kwinana Freeway (land & construct 1 c/w)							5,300			
Rowley Road - Hammond Rd to 1.2 Km west of Hammond Rd								3,100		
Rollinson Road - Rockingham Rd to Cockburn Rd (construct 1 c/w)			4,000							
TOTAL FOR YEAR (000)	5,275	19,410	16,500	1,900	5,300	13,575	7,250	18,500	0	3,000

The above table is based on Annual budget 2020/21 figures and LTFP pages 32-33, and subject to change with the next update to the Major Regional Roads Plan (Version 13 - March 2020) document.

Appendix F Standards and Specifications

- City of Cockburn road construction and maintenance service specification
- City of Cockburn road construction and maintenance service standards
- City of Cockburn road construction and maintenance service unit action plan
- Road Services: Standards, procedures and checklists manual
- Road Services: Best practice manual for road asset management
- Road Services Unit: Code of Practice - Local road asset and risk management system
- Code of Practice: Footpath risk management policy
- Pavement condition definitions manual
- Public Utilities Code of Practice 2000
- Restoration and Reinstatement Specification for Local Government 2002
- City of Cockburn - Excavation Reinstatement Standards 2003
- AS 1742 – Australian Standard Manual of uniform traffic control devices
- AS 1428 – Parts 1 & 2 Access and Mobility and Part 4 – Tactile ground surface indicators
- AS/NZS 1158 – Lighting for roads and public spaces
- Austroads Guide to Traffic Engineering Practice Parts 1 & 15
- Austroads design vehicles and turning path templates
- Austroads guide to Road Design
- Main Roads WA – Standard Drawings and Documentation

9 Coleville Crescent, Spearwood WA 6163
PO Box 1215, Bibra Lake DC WA 6965
T 08 9411 3444 | **E** customer@cockburn.wa.gov.au

cockburn.wa.gov.au

This information is available in alternative formats upon request.

Paper from responsible sources.