LIVINGSTONE SHIRE COUNCIL

Livingstone
SHIRE COUNCIL

ROADS

ASSET MANAGEMENT PLAN

Document Control

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Plan was produced by Darren Shepherd of Shepherd Services working in conjunction with Council staff to produce the final plan.

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1. EXECUTIVE SUMMARY

This Asset Management plan was developed using data from the recent register as at the 30/06/2014, service level modelling developed in 2015 and Council's future works program developed in 2015.

Purpose of the Plan

Council's Goal is:

Reliable, durable, cost effective infrastructure and Council assets which meet the needs and aspirations of the communities of Livingstone Shire.

Therefore the purpose of this asset management plan is to assist Council in:-

- Clearly outlining the measureable service levels and the impacts of these on the financials.
- Communicating and justify funding requirements for the future.

Asset Description

Infrastructure assets included within this Asset Management Plan are sealed (552km) and unsealed (863km) roads, carparks, footpaths (65km), stormwater drainage (204km pipes + 11336 pits) and traffic management devices (183 Street Lights & 8 Traffic Signals).

Road Infrastructure assets as at the 30/6/2015 have a gross replacement cost of $477,837,271 and a fair value of $396,309,013. This asset class makes up 44% of the total asset stock of Council.

In 2014 and 2015 the unsealed road network was visually assessed, sealed roads partially assessed, and drainage assets were assessed by sampling. Footpath assessments are completed on an annual rolling inspection program focussing on the development of a prioritised works program. Traffic management assets are inspected at varying frequencies dependant on the type of asset, Eg: Traffic Signals are inspected on a bi-monthly basis and Lighting on a bi-annual basis.

Levels of Service

Livingstone Shire have developed practical service level measures for their major asset components to ensure that services are engaged to best fit customer expectations and to optimise expenditure. These are as follows;

- Sealed roads;
    - surface renewal is programmed when greater than 30-50% of local surface defects by area occur and the average pavement roughness is less than an international roughness index of 4.8 IRI.
    - pavement renewal (including surface renewal) is programmed when the international roughness index is greater than a 5.6 IRI in urban areas and 6.4 IRI in rural areas.
- Unsealed roads;
    - surface maintenance is engaged via grading works when the international roughness index is greater than a 7 IRI.
    - pavement renewal (wet weather access) is engaged when gravel coverage is less than an average of 60% by length for high class roads and is less than 25% coverage by length for the lowest class roads.
- Footpath maintenance and renewals are based on visual inspections to identify trip and defects identification.
- Drainage structure renewals are based on structural integrity, via bi annual visual inspections of the oldest assets stock.
- Traffic Management devices are renewed in accordance with Australian standards from annual visual inspections.

Future Demand

Livingstone Shire and the Capricorn Coast in particular, is one of the fastest growing areas in the State at an average rate of 2.6% for the last ten years. It is estimated that growth will continue at an average of 2% per annum, with a population of approximately 37,000 and projected to reach around 50,000 by the year 2031.

Current PFTI analysis has identified future road corridors to improve traffic movements around Yeppoon and the surrounding areas and these are in the future works programs that have been used to develop this AMP.

Lifecycle Management Plan (What does it cost?)

The life cycle cost (maintenance plus renewals) is the average cost to maintain the asset over its life.

The *current* life cycle cost (service level projections) to provide the road asset services, is estimated at $7.3M per annum, with Council's planned (from forwards works programs) life cycle cost at $9.6M per annum, which gives a life cycle sustainability index of 1.3. Council's sustainability target is greater than .90 over the long term as per the Financial Management (Sustainability) Guideline 2013.

The *average* life cycle cost (service level projections) to provide the road asset services, is estimated at $9.3M per annum over the next 20 years, with Council's planned (from forwards works programs) life cycle expenditure average at $11.3M per annum for the next 20 years, which gives a life cycle sustainability index of 1.22. Council's sustainability target is greater than .90 over the long term as per the Financial Management (Sustainability) Guideline 2013.

Based on this index, it suggests that Council could benefit from optimising their planned spends to line up better with the service level projections.

There are currently no gaps in funding, yet the opposite, a surplus in funding, which would indicate better service levels will be delivered over the next 20 years.

Asset Management Practices

The accuracy of this plan is about 90%, due to some gaps in condition and works record information. Future plans for condition and work monitoring will assist with improving the accuracy of this plan to 98% within 1 to 2 years.

Council has also commenced developing asset management procedures to ensure that services are measured and delivered to optimise the life of assets and reduce costs.

Risk Management

Council has a risk management framework. This framework provides the necessary guidance for managing enterprise risk within Council.

Asset Specific Risks

Assessment of risks associated with service delivery for infrastructure assets will identify critical risks to Council. The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, develops a risk rating, evaluates the risk and develops a risk treatment plan for non-acceptable risks. The current risk register is available from Council's Governance section.

1.0 BACKGROUND

1.1 Physical Parameters

The assets included within this Asset Management Plan are:

CATEGORY	SUBCATEGORY2	Sum of Area	Sum of Length	Sum of Quantity
Access Roads and Carparks	Formation	159,730	2,272	
Access Roads and Carparks	Kerb		1,045	
Access Roads and Carparks	Pavement	146,644	2,276	
Access Roads and Carparks	Surface	128,750	2,606	
Pathways	Footpaths	197,756	65,305	
Pathways	Shared Pathways	24,916	8,511	
Retaining Walls		1,279	506	
Sealed Roads	Concrete Floodways	21,773	2,763	
Sealed Roads	Formation	5,028,204	543,113	
Sealed Roads	Kerb	450	357,754	
Sealed Roads	Pavement	4,617,731	551,685	
Sealed Roads	Surface	3,865,188	547,807	
Stormwater Drainage	Covers, Inlets and Outlets			11,336
Stormwater Drainage	Gross Pollutant Traps			30
Stormwater Drainage	Inter Allotment		30,592	
Stormwater Drainage	Junctions			6,993
Stormwater Drainage	Lined Open Drains	1,282	93	
Stormwater Drainage	Open Channels	28,705	4,994	
Stormwater Drainage	Pipes and Culvert		168,705	
Stormwater Drainage	Structures			16
Stormwater Drainage	Sub-Soil		76,392	
Stormwater Drainage	Water Retention Basin	38,314	1,094	
Traffic Management Devices	Guardrail		444	
Traffic Management Devices	LATMs	126		
Traffic Management Devices	Lighting			183
Traffic Management Devices	Medians	19,752		
Traffic Management Devices	Pedestrian Fencing		1,297	
Traffic Management Devices	Public Transport Surfacing	185	76	
Traffic Management Devices	Traffic Signals			8
Unsealed Roads	Concrete Floodways	65,408	12,358	
Unsealed Roads	Formation	4,112,602	867,315	
Unsealed Roads	Pavement	4,070,158	863,351	

2. LEVELS OF SERVICE

2.1 Background

2.1.1 Road Classifications

Functional Hierarchy

Council has defined its entire road network in accordance with the Austroads Functional Class hierarchy. These classes are:

National Highways	Class 1	These roads are not Council controlled, however Council may enter into maintenance and construction agreements to undertake works on these roads
State Main Roads	Class 2	These roads are not Council controlled, however Council may enter into maintenance and construction agreements to undertake works on these roads
Rural Arterial	Class 3	Roads whose main function is to form an avenue of communication for movement:
		- Between important centres and the Class 1 (highway) and Class 2 (main road) roads and/or key town; or
		- Between important centres which have a significant economic, social tourism or recreation role.
Rural Collector	Class 4a, 4b	Roads whose main function serves the purpose of collecting and distributing traffic from local areas to the wider road network, including access to abutting properties.
Rural Access	Class 5a, 5b, 5c	Roads which connect to Class 1, 2, 3 or 4 roads and whose main function is to provide access to rural residences and properties, or
		- Provide exclusively for one activity or function (e.g. access to national parks, dam access, mining and forestry roads.
Urban Arterial	Class 6a, 6b, 6c	Roads whose main function is to perform as the principal arteries for through traffic and freight movements across urban areas, provide access to major freight terminals, freight movement and access to major transport terminal, or which are extensions into urban areas of Class 2 or 3 roads.
Major Urban Collector	Class 7	Roads whose main function is to:
		- Complete the major road network across the metropolitan area and carry intra-urban traffic and/or commercial and industrial traffic; or
		- Serve as supplementary public transport corridors; or
		- Form part of a regulatory spaced road network supplementary to the principle road network.
Minor Urban Collector	Class 8	Roads whose main function services the purpose of collecting and distributing traffic from local areas to the wider road network, including access to abutting properties.
Urban Access	Class 9a, 9b	Roads which connect to Class 6, 7 or 8 roads and whose main function is to provide access to residences or properties, or
		- Provide exclusively for one activity or function

Operational Hierarchy

In addition to a Functional Road Class, Council employs an Operational Road Class to better define and manage its unsealed roads network:

Class	Traffic	Length
Pavement - Op class 10	Average traffic volume <10	153.7 km
Pavement - Op class 30	Average traffic volume 10 - 30	290.7 km
Pavement - Op class 75	Average traffic volume 30 - 75	217.0 km
Pavement - Op class 100	Average traffic volume 75 - 100	151.0 km
Pavement - Op class 125	Average traffic volume 100 - 125	17.7 km
Pavement - Op class 150	Average traffic volume 125 - 150	11.9 km
Pavement - Op class 199	Average traffic volume 150 - 199	1.4 km
Pavement - Op class Unassigned		19.7 km
TOTAL		**863.1 km**

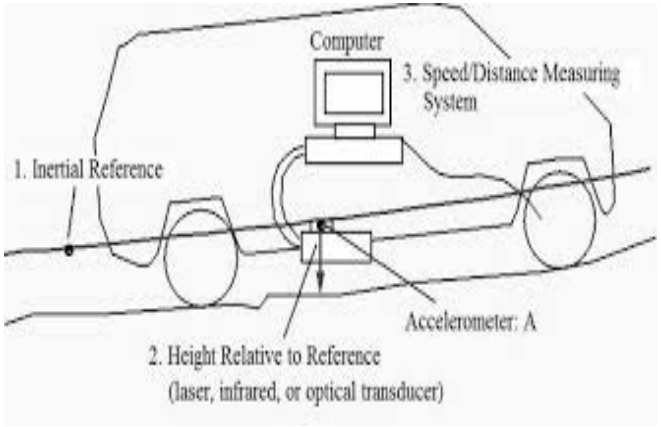
2.1.2 Roughness Measurement

There are numerous methods of defining the smoothness (or roughness) of a running surface using either electronic or visual onsite assessments. All measurements have a direct relationship to driver speed and comfort. The smoother the road the faster and safer the user can travel over the road from one location to another.

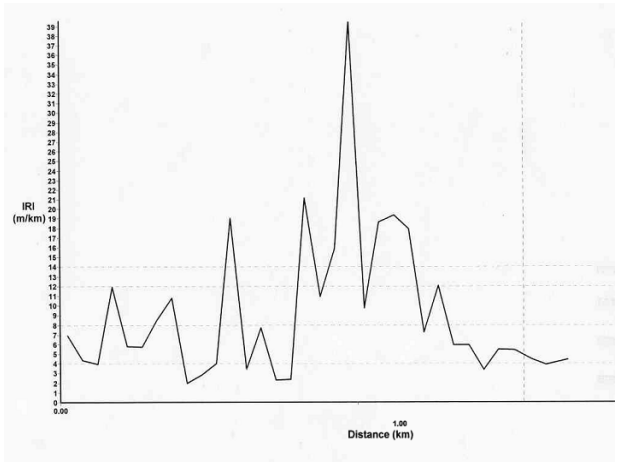
The industry standard for measuring the roughness of a road is called the international roughness index (IRI). It is a measure of the axle movements along the road.

For example, a new sealed road would normally rate an IRI of 2.

Example electronic device

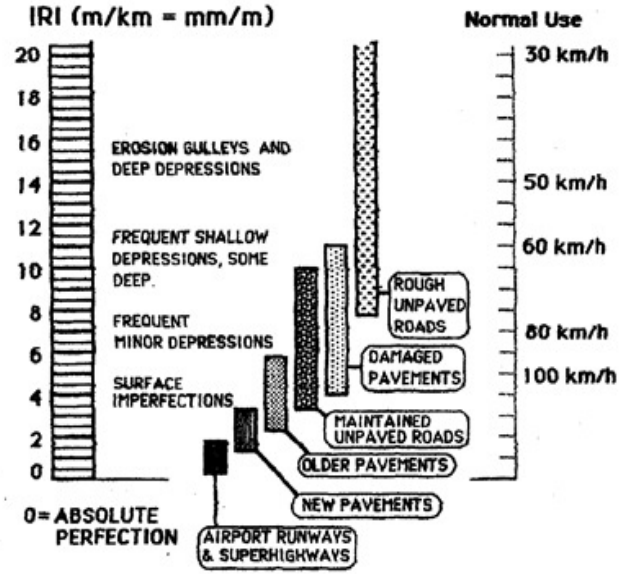


Example electronic report



There is a relationship between **IRI and speed** as shown below

Figure 2.13: The International Roughness Index (IRI) scale of road roughness



Source: Sayers, Gillespie and Paterson (1986).

2.1.1 Unsealed Roads Surface Service Level

Service Description: Unsealed roads provide a running surface that vehicles can transverse on from one location to another safely. Trip time is dependent on the smoothness of the road and geometric restraints.

Key Performance Measure	Level of Service	Performance Measure Process	Performance Target	Current Performance
COMMUNITY LEVELS OF SERVICE				
Function	Enable the Movement of People and Goods in an Efficient Manner	Number of Customer Service Requests	Non Safety Matters 30/month. Safety Matter 0/month.	Under review to enable capture via Pathway codes
Safety	Safe environment	Number of reported incidents / accidents	No Incidents/Accidents caused by facilities or processes	
TECHNICAL LEVELS OF SERVICE				
Maintain an adequate running Surface Condition Cost effectively while only servicing roads when required.				
Condition Measure	Grading on Condition intervention Based on Modelling tool and IRI intervention	Roughness Intervention: >7IRI before engaging full maintenance, ie: placement on works program	85% of roads graded as per roughness intervention level of >7 IRI	Reporting mechanism under development via Work Order to assess and record condition prior to undertaking grading
Delivery Measure	Graded Km's / Road Class Based on Modelling tool and IRI intervention	Roughness Intervention: >7IRI before engaging full maintenance, ie: placement on works program	Total number of km's graded by class per annum, estimated break-up by Road Class Class 10 - 58km Class 30 -167km Class 75 -162km Class 100 -164km Class 125 - 28km Class 150 - 24km Class 199 - 4km Total = **607km / 863km** Obtained from Modelling Tool	Reporting mechanism under development via Work Order to record length graded
Delivery Measure	Cost / Road Class Measure of cost effectiveness	Roughness Intervention: >7IRI before engaging full maintenance, ie: placement on works program	Total cost of grading per class per annum, estimated break-up by Road Class Class 10 - $97k Class 30 - $367k Class 75 - $430k Class 100 - $418k Class 125 - $77k Class 150 - $67k Class 199 - $11.6k Total = **$1,468M** Obtained from Modelling Tool	Reporting mechanism under development to allow costs to be captured more accurately. Recording of road class on work orders.
Safety Measure	Remove hazards	Based on visual guideline and	Inspection, followed by planned repair	

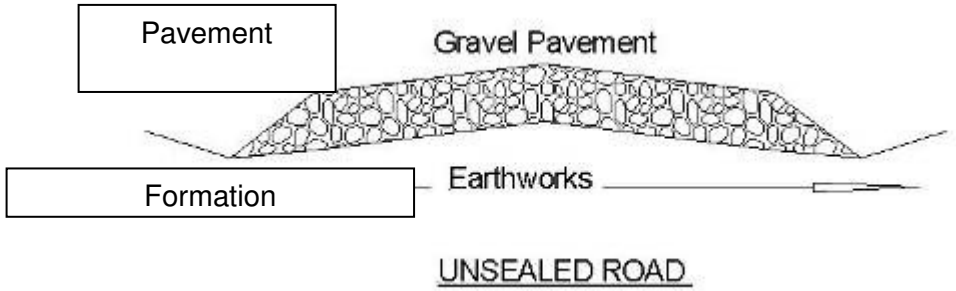
		procedure for repair timeframes		

2.1.2 Unsealed Roads Pavement Service Level

2.1.2.1 How is it Defined and Measured

Wet weather access is defined in terms to how much imported gravel or natural pavement is provided on top of the existing formation of an unsealed road.

Unsealed roads with limited gravel pavement will be at risk, after rain, for a vehicle not to be able to transverse over the road safely.



Typical Cross Section of an Unsealed Road

Below are some photo examples different amounts of gravel pavement on unsealed road.

		
No Gravel Pavement	Poor Gravel Pavement	Good Gravel Pavement

Service Description: Unsealed roads provide wet weather access via a gravel pavement so that vehicles can transverse from one location to another safely after a significant rain event within funding restraints. Trip time is depending on the gravel quality and thickness and geometric drainage restraints.

Key Performance Measure	Level of Service	Performance Measure Process	Performance Target	Current Performance
COMMUNITY LEVELS OF SERVICE				
Function	Provide sections of Gravel Pavement to assist with wet weather access when funds are available.	Number of Customer Service Requests	Non Safety Matters 30/month. Safety Matter 0/month.	Under review to enable capture via Pathway codes
Safety	Safe environment	Number of reported incidents/accidents	No Incidents/Accidents caused by facilities or processes	
TECHNICAL LEVELS OF SERVICE				
Maintain a gravel pavement for wet weather access within funding restraints.				
Condition Measure	Adequate Wet weather access	Assessed % of Gravel by Length / Class	Gravel Coverage by Length Class 10 -10% Class 30 - 25% Class 75 - 55% Class 100 - 60% Class 125 - 70% Class 150 - 75% Class 199 - 75%	Gravel Coverage by Length Class 10 - 56% Class 30 - 72% Class 75 - 66% Class 100 - 62% Class 125 - 83% Class 150 - 64% Class 199 - 78% (Data collected Dec2014-Jan2015)
Delivery Measure	Adequate Wet weather access	Gravel Volume / class / Yr	Class 10 – 955 m3 Class 30 - 5,036 m3 Class 75 -12,316 m3 Class 100 -10,677 m3 Class 125 -1832 m3 Class 150 -1565 m3 Class 199 – 261 m3 Total = **32,645 m3** Obtained from Modelling Tool	Reporting mechanism under development – capture via work orders the quantity of gravel used
Delivery Measure	Cost of Gravel by Class	Cost / Class / Yr Measure of cost effectiveness	Class 10 - $43K Class 30 - $178K Class 75 - $477K Class 100 - $415K Class 125 - $70k Class 150 - $60K Class 199 - $10k Total **= $1,285M** Obtained from Modelling Tool	Historically there has been a spend of $1.6 to $1.8M/yr. More accurate recording of costs to capture Class is required
Safety Measure	Remove hazards	Based on visual guideline and	Inspection, followed by planned repair	

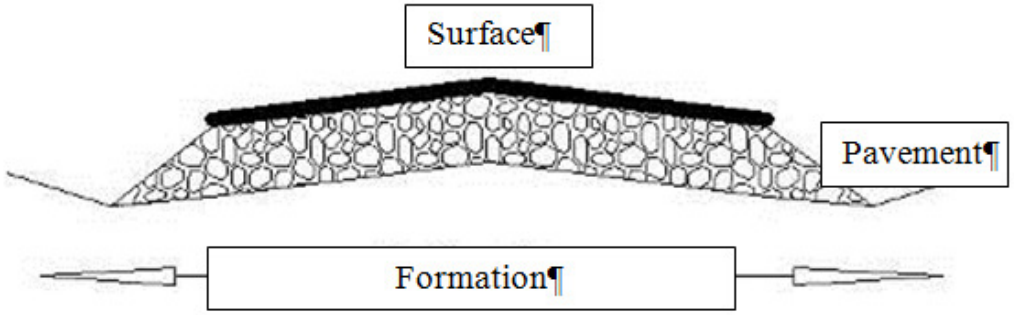
		procedure for repair timeframes		

2.1.3 Sealed Road Surfaces Service Level

Service Description: Sealed surface condition maintained to protect the underlying pavement from water infiltration and damage, within funding restraints. Provide an ascetic pleasing surface to suit the community expectations within finding restraints.

2.1.3.1 How is it Measured

Water infiltration through the sealed surface via defects causes early pavement failure. Therefore it is one of the major measurable items for this service level.



Below are common surface defect examples.

Stripping

Cracking

International Roughness Index is a measure of how smooth a surface is, yet it is also is a measure of pavement movement and therefore failure. Therefore it is used as one of the criteria for the service levels so that we don't resurface a failed pavement.

Key Performance Measure	Level of Service	Performance Measure Process	Performance Target	Current Performance
COMMUNITY LEVELS OF SERVICE				
Function	Enable the Movement of People and Goods in an Efficient Manner	Number of Customer Service Requests	No complaints	Under review to enable capture via Pathway codes
Safety	Safe environment	Number of reported incidents/accidents	No Incidents/Accidents caused by facilities or processes	
TECHNICAL LEVELS OF SERVICE				
Maintain a structurally sound running surface cost effectively while only servicing roads when required.				
Condition Measure	Sealed Surface Condition maintained to provide adequate running surface	Surface enrichment is based on the following criteria. (Must meet all 3 criteria). **Criteria A**. Age Within 80% of Life. Life 14yrs for Spray seal and Asphalt seal 25-30yr. (to avoid over servicing) **Criteria B.** % of Surface Defects >30%-505 (stripping & cracking-fix before pavement is exposed) **Criteria C.** International Roughness Counts is less than 4.8IRI (avoid resurfacing a failing pavement) A brand new road is an IRI 2.	About 6.5 - 7% of network is likely to be completed each year. This is based on the average renewal lifecycle.	In 2015, 10% of the network was meeting these criteria.
Delivery Measure	Sealed Surface Condition maintained to provide adequate running surface	Cost / Area	Total $1.53M/yr (20 year average from model) Split Rural $570K / yr Urban $960K / yr #Annually Indexed	Spend 14/15 -$900K combined Budget 15/16 $1.346 combined
	Sealed Surface Condition maintained to provide adequate running surface	Cost / m2	**Rural** Spray Seal $3.80/m2 **Urban** Spray Seal $3.80/m2 Asphalt $22.24/m2 Slurry Surface $7.94/m2 Rates are as per 2014 valuation rates	Reporting mechanism to be determined and monitored.

			#Annually Indexed	
Safety	Remove hazards	Respond to complaints	Inspection, followed by planned repair	

2.1.4 Sealed Road Pavements Service Level

2.1.4.1 How is it Measured

International Roughness Index is a measure of how smooth a surface is, yet it is also is a measure of pavement movement and therefore failure. It will be used as the major measure, as it is cheap and quick to complete with Councils own equipment.

Service Description: Maintain the structural integrity of the pavement to ensure the running surface condition is kept to standard.

Key Performance Measure	Level of Service	Performance Measure Process	Performance Target	Current Performance
COMMUNITY LEVELS OF SERVICE				
Function	Enable the Movement of People and Goods in an Efficient Manner	Number of Customer Service Requests		Covered within Sealed Surface table
Safety	Safe environment	Number of reported incidents/accidents		Covered within Sealed Surface table
TECHNICAL LEVELS OF SERVICE				
Maintain a structurally sound road pavement cost effectively while only servicing roads when required.				
Condition Measure	Sealed Surface Condition maintained to provide an adequate running surface	International Roughness Counts is greater >6.4 for Rural roads >5.6 for Urban roads	About 2.2% of network is likely to be completed each year.	In 2015, 3% of the network was meeting these criteria.
Delivery Measure	Sealed Surface Condition maintained to provide an adequate running surface	Annual Cost / Area	Total $2.040M/yr Split Rural $775K / yr Urban $1265K / yr #Annually Indexed	Spend 14/15 -$1M combined Budget 15/16 $1.765M combined. 16/17 $3.278M combined
Safety	Remove hazards	Respond to complaints	Inspection, followed by planned repair	

2.1.5 Drainage Assets Service Level

Service Description: Maintain an adequate drainage network to support the road surface condition so vehicles can pass over the road under normal weather conditions.

Key Performance Measure	Level of Service	Performance Measure Process	Performance Target	Current Performance
COMMUNITY LEVELS OF SERVICE				
Function	Maintain an adequate drainage network to support the road network	Number of Customer Service Requests	No complaints	Under review to enable capture via Pathway codes
Safety	Safe environment	Number of reported incidents/accidents	No Incidents/Accidents caused by facilities or processes	
TECHNICAL LEVELS OF SERVICE				
Condition Measure	Maintain an adequate drainage network to support the road surface condition so vehicles can pass over the road under normal weather conditions.	Structural integrity, via bi annual visual inspections of the oldest asset stock, to produce forward works program.	On average 0-0.9% of network is likely to be renewed each year. However it is dependent on the visual condition of the oldest assets inspected, yet the renewal profile suggest that no major drainage assets are due till 2040	0.58% is programmed in 2015 and 0.6% in 2016. There is some inconsistency between the service level and actual program. More monitoring is required on the renewal program.
Delivery Measure	Maintain an adequate drainage network to support the road surface condition so vehicles can pass over the road under normal weather conditions.	Annual Costs	$175k is the annual depreciation amount, yet the renewal profile suggest that no major drainage assets are due till 2040	The current program is 2015-$793,600 and 2016-$826,788. There is some inconsistency between the service level and actual program. Further investigation is required to address the inconsistencies between renewal profiles and actual spend.
Safety	Remove hazards	Respond to complaints	Inspection, followed by planned repair	

2.1.6 Footpaths Service Levels

Service Description: Council to provide accessible and safe pedestrian facilities.

Key Performance Measure	Level of Service	Performance Measure Process	Performance Target	Current Performance
COMMUNITY LEVELS OF SERVICE				
Function	Footpath enables a resident to get from point 'A' to point 'B' in a continuous and uninterrupted path of travel	Number of reported complaints	No complaints	Under review to enable capture via Pathway codes
Safety	Safe environment	Number of reported incidents/accidents	No Incidents/Accidents caused by facilities or processes	
TECHNICAL LEVELS OF SERVICE				
Condition Measure	Council to provide accessible and safe pedestrian facilities	Footpath assessments are completed on an annual rolling inspection program focussing on the development of a prioritised works program.	Annual inspection program completed	Completed annually
Delivery	Council to provide accessible and safe pedestrian facilities	Annual Cost	Average spend in service level planning is $44,993/yr.	Currently Council have no programmed works until 2019.
Safety	Remove hazards	Respond to complaints	Inspection, followed by planned repair	Historically Council spend $35,752 annually on minor maintenance repairs

2.1.7 Traffic Management Device Service Level

Service Description: Council to provide and maintain adequate traffic management devices for operation within its network.

Key Performance Measure	Level of Service	Performance Measure Process	Performance Target	Current Performance
COMMUNITY LEVELS OF SERVICE				
Function	Assist with safe operation of the network for all users.	Number of reported complaints	No complaints	Under review to enable capture via Pathway codes
Safety	Safe environment	Number of reported incidents/accidents	No Incidents/Accidents caused by facilities or processes	
TECHNICAL LEVELS OF SERVICE				
Function	Satisfactory performance and meets design standards.	Traffic management assets are inspected at varying frequencies dependant on the type of asset, Eg: Traffic Signals are inspected on a bi monthly basis and Lighting on bi annual basis.	Targets for Traffic Management Devices are as per the Traffic and Road Use Management Manual and is dependent on the individual situation.	Reporting mechanism under development
Safety	Remove hazards	Respond to complaints	Inspection, followed by planned repair	

3. FUTURE DEMAND

The draft strategic framework in the planning scheme establishes the preferred urban growth areas for the next 20 years. This growth pattern balances the efficient supply of infrastructure with the need to protect natural features and avoid areas of natural hazard risk. New development will include higher levels of infill and medium density development within existing urban areas, to consolidate the use of existing infrastructure. New urban expansion will occur mostly in existing, approved subdivisions, with longer term expansion south of Yeppoon.

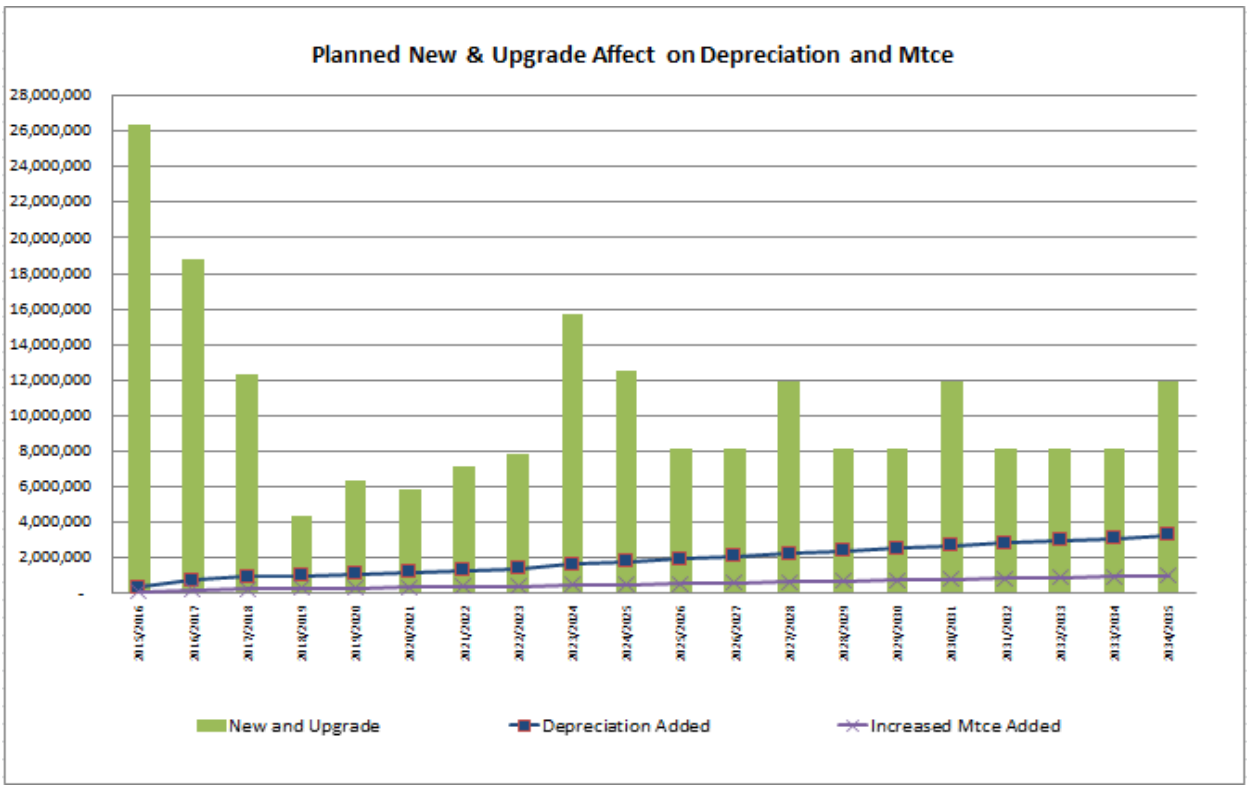
Urban growth in the strategic framework is divided broadly into four categories:

- *Urban consolidation* - redevelopment to accommodate medium density residential close to facilities, within 10 years (2015 – 2025);
- *Urban* – existing urban areas and extensions within 10 years (2015 -2025);
- *New urban* – urban development beyond 2025;
- *Future urban* - possible expansion beyond 2036

Development is expected in four main locations as indicated on the strategic framework maps:

- 2015 – 2025: Urban consolidation in Yeppoon and Emu Park centres
- 2015 – 2025: infill and small expansion areas around Yeppoon, Lammermoor, Emu Park & Zilzie
- 2025 – 2036: new urban development south of Yeppoon and infill areas in Emu Park and Great Barrier Reef International Resort;
- 2036 and beyond: future urban between the Pines and Yeppoon, Great Barrier Reef International Resort and Emu Park west.

Based on the Future Demand projections (Forward Works Program), the below chart represents the new asset growth projection.



This program will increase annual depreciation from $7.3M to $10.6M (a 45% increase) and annual maintenance from $3.8M to $4.8M (a 26% increase) respectively over the next 20 years.

4. LIFECYCLE MANAGEMENT PLAN

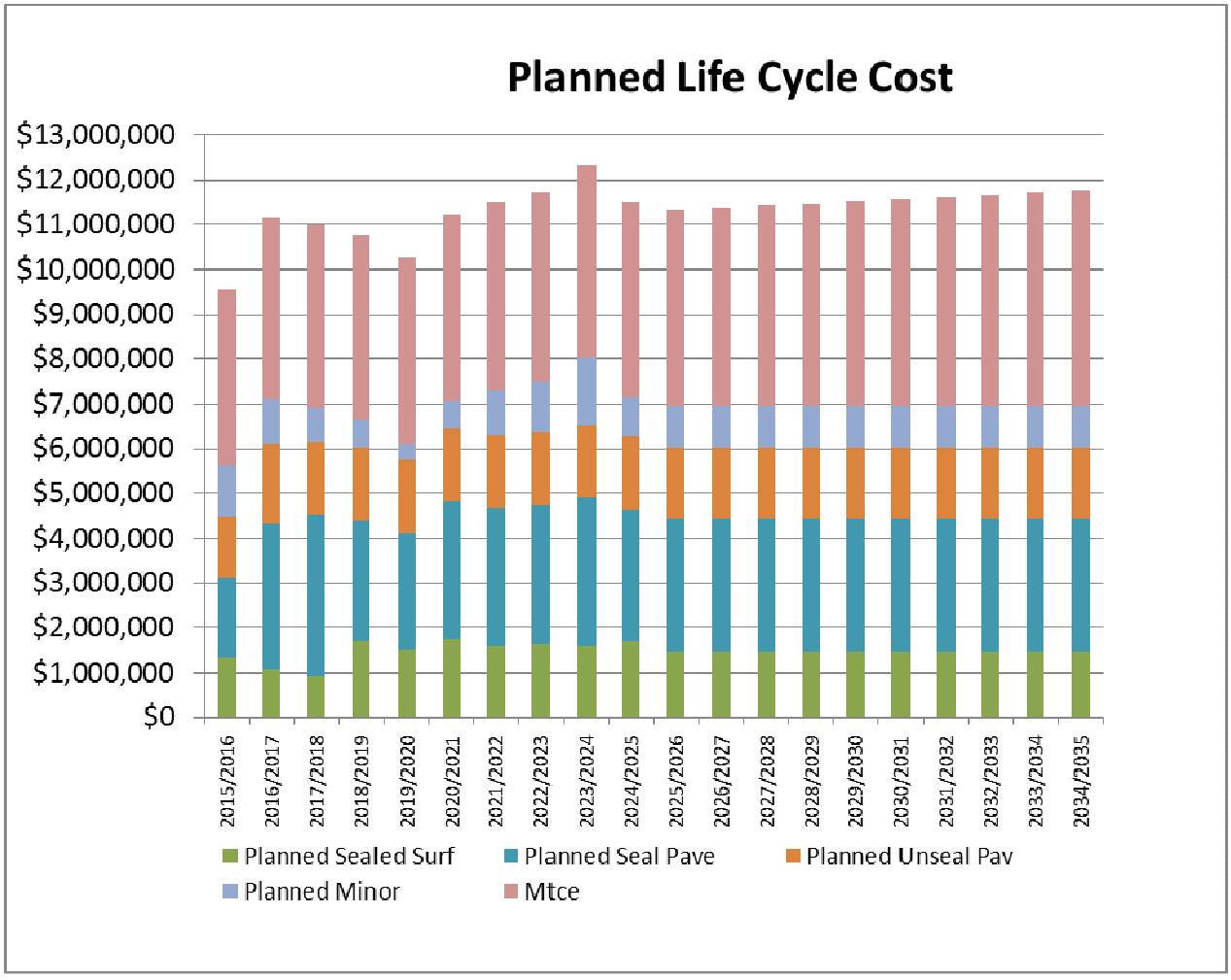
The life cycle cost (maintenance plus renewals) is the average cost to maintain the asset over its life.

The *current* life cycle cost (service level projections) to provide the road asset services, is estimated at $7.3M per annum, with Council's planned (what is in the budget) life cycle cost at $9.6M per annum, which gives a life cycle sustainability index of 1.3. Council's sustainability target is greater than .90 over the long term.

The *average* life cycle cost (service level projections) to provide the road asset services, is estimated at $9.3M per annum over the next 20 years, with Council's planned (what is in the budget) life cycle expenditure average at $11.3 M per annum for the next 20 years, which gives a life cycle sustainability index of 1.22. Council's sustainability target is greater than .90 over the long term.

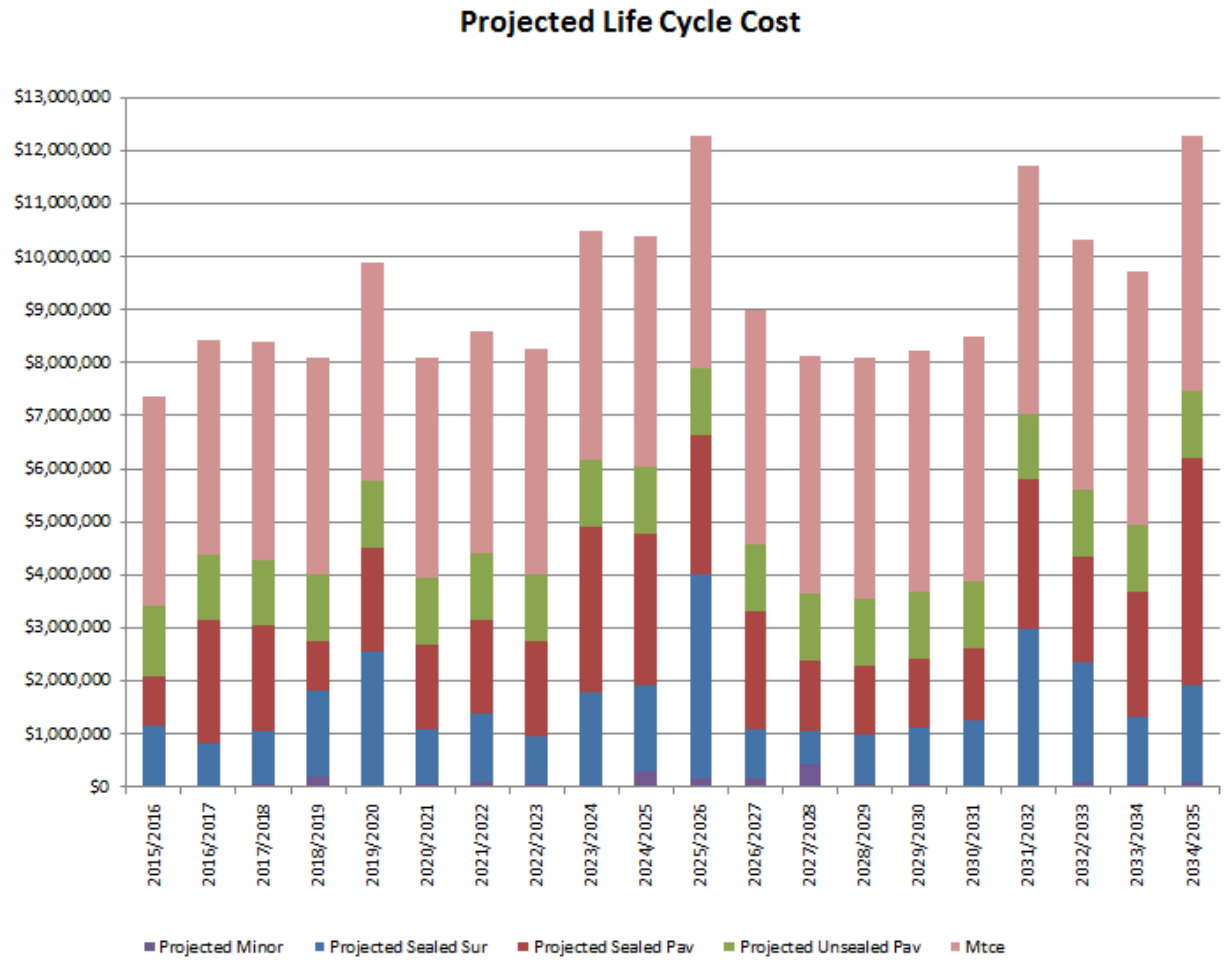
Based on this index, it seems to suggest that Council could benefit with optimising their planned spends to line up better with the service level projections.

The below chart is the **planned** annual life cycle costings for all road assets. Planned refers to expenditure currently included in Council's long term financial plan for renewal and maintenance.



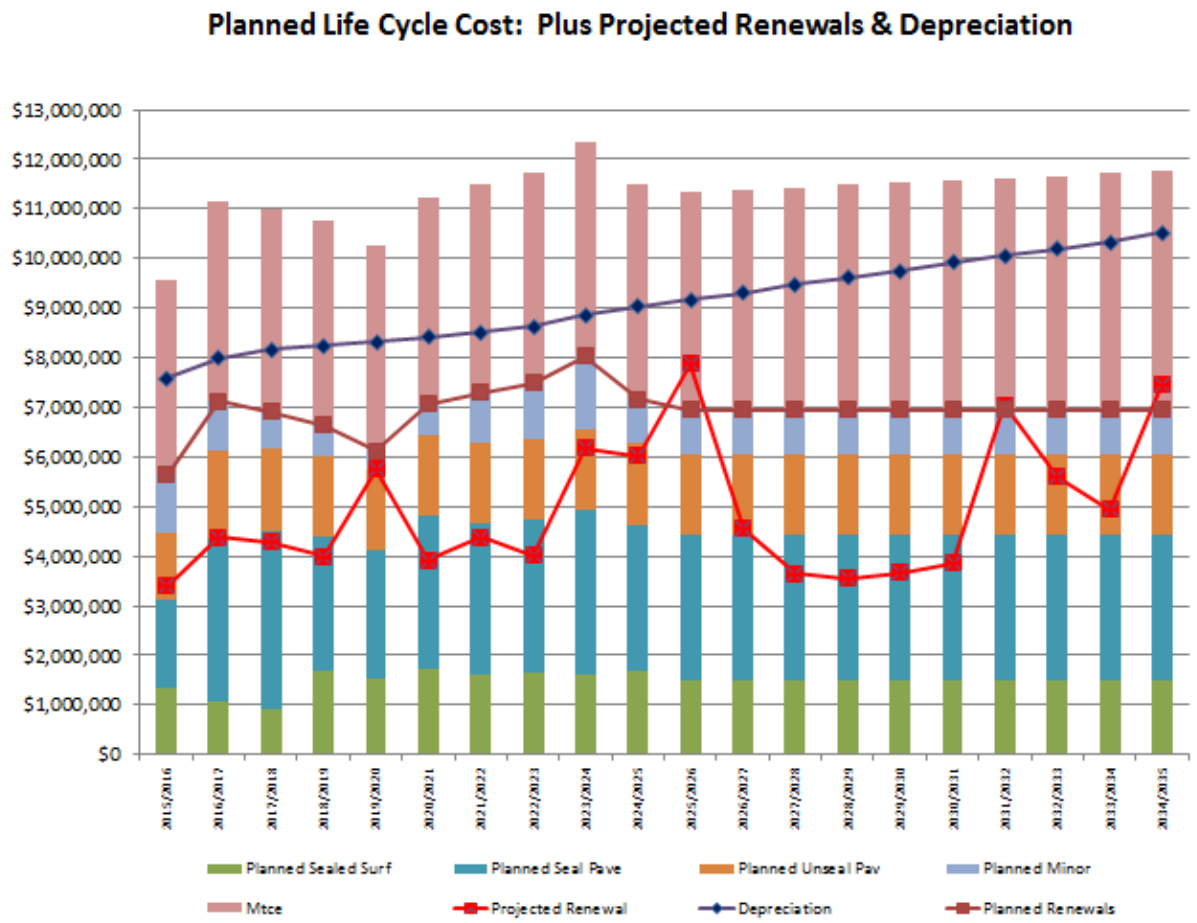
The "Planned Minor" bar in this chart represents the combined totals of asset renewals for stormwater, access roads & carparks, pathways and traffic management.

The below chart is the **projected** annual life cycle costings for all road assets. Projected refers to forecast renewals and maintenance expenditure based on the Service Levels included in this plan.



The details of the lifecycle costing can be found in Appendix 3.0.

Combined Chart of **planned and projected** values.

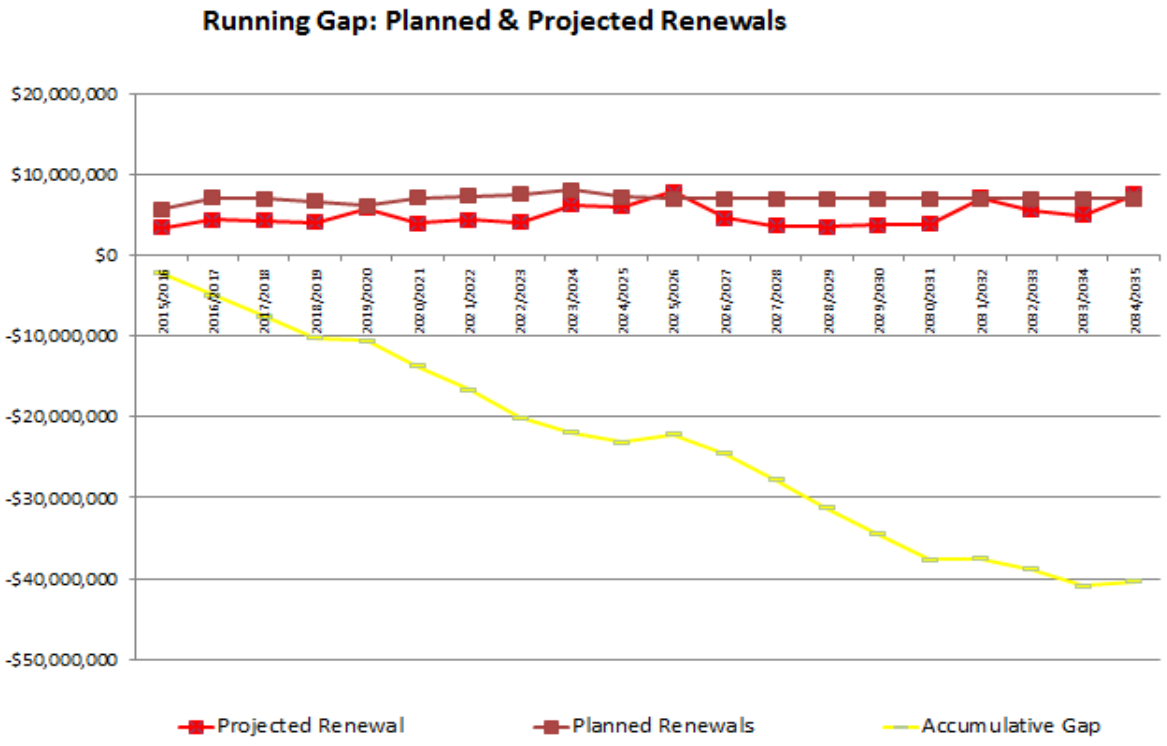


The “Planned Minor” bar in this chart represents the combined totals of asset renewals for stormwater, access roads & carparks, pathways and traffic management.

The following table provides an outline of the gap, year over year for the next 10 years.

Year End 30 Jun	Projected Capital Renewal ($)	Planned New / Upgrade Expenditure ($)	Planned Disposals ($)	Planned Capital Renewal ($)	Shortfall in Renewal Expenditure ($)	Cumulative Funding Shortfall ($)
2016	3,406,455	26,390,700	0	4,451,000	-1,044,545	-1,044,545
2017	4,389,736	18,833,188	0	6,110,199	-1,720,463	-2,765,008
2018	4,289,464	12,350,120	0	6,154,396	-1,864,932	-4,629,940
2019	3,996,161	4,330,500	0	6,024,150	-2,027,989	-6,657,929
2020	5,758,084	6,342,063	0	5,741,409	16,675	-6,641,254
2021	3,926,509	5,870,380	0	6,448,114	-2,521,605	-9,162,859
2022	4,391,061	7,180,938	0	6,297,000	-1,905,939	-11,068,798
2023	4,016,103	7,898,425	0	6,364,200	-2,348,097	-13,416,895
2024	6,171,893	15,686,956	0	6,545,087	-373,194	-13,790,089
2025	6,029,326	12,534,450	0	6,270,500	-241,174	-14,031,263

There are currently no gaps in funding. A surplus in funding, which is currently forecast indicates better service levels will be delivered over the forecast period. See graph below.



5. FINANCIAL SUMMARY

Council will be adding $210M of new assets over the next 20 years, which amounts to a 45% increase in asset stock. This will also increase annual depreciation from $7.3M to $10.6M (a 45% increase) and annual maintenance from $3.8M to $4.8M (a 26% increase) respectively over the next 20 years.

Council will spend $138M in renewing the existing assets stock of $477,837,271 over the next 20 years. The renewal percentage split outlined below is based on future planned renewal expenditure as a percentage of the replacement cost of the asset component. These percentages are 64% for sealed surfaces, 32% for sealed pavements, 340% for unsealed pavements (this is the majority of the network renewed 3 plus times) and 10% for Stormwater assets over the next 20 years.

5.1 Asset Values as at 30/6/2015

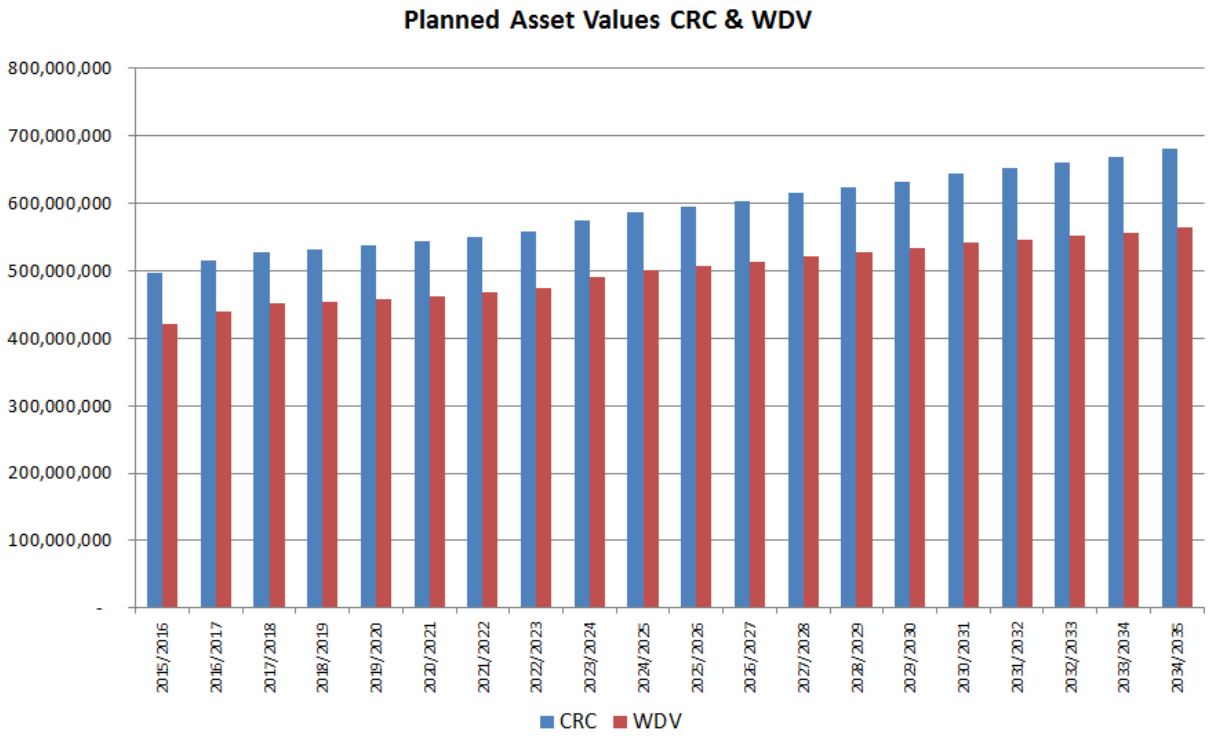
	CRV	WDV	ANN_DEP
Access Roads and Carparks	7,807,266	6,576,069	92,347
Pathways	14,719,025	12,133,905	230,407
Retaining Walls	1,894,508	1,829,766	23,673
Sealed Roads	286,744,734	234,868,361	3,924,394
Stormwater Drainage	139,744,695	119,778,325	1,224,032
Traffic Management Devices	5,878,898	5,178,081	92,931
Unsealed Roads	21,048,145	15,944,506	1,971,633
Grand Total	**477,837,271**	**396,309,013**	**7,559,417**

CRV = Gross Replacement Cost

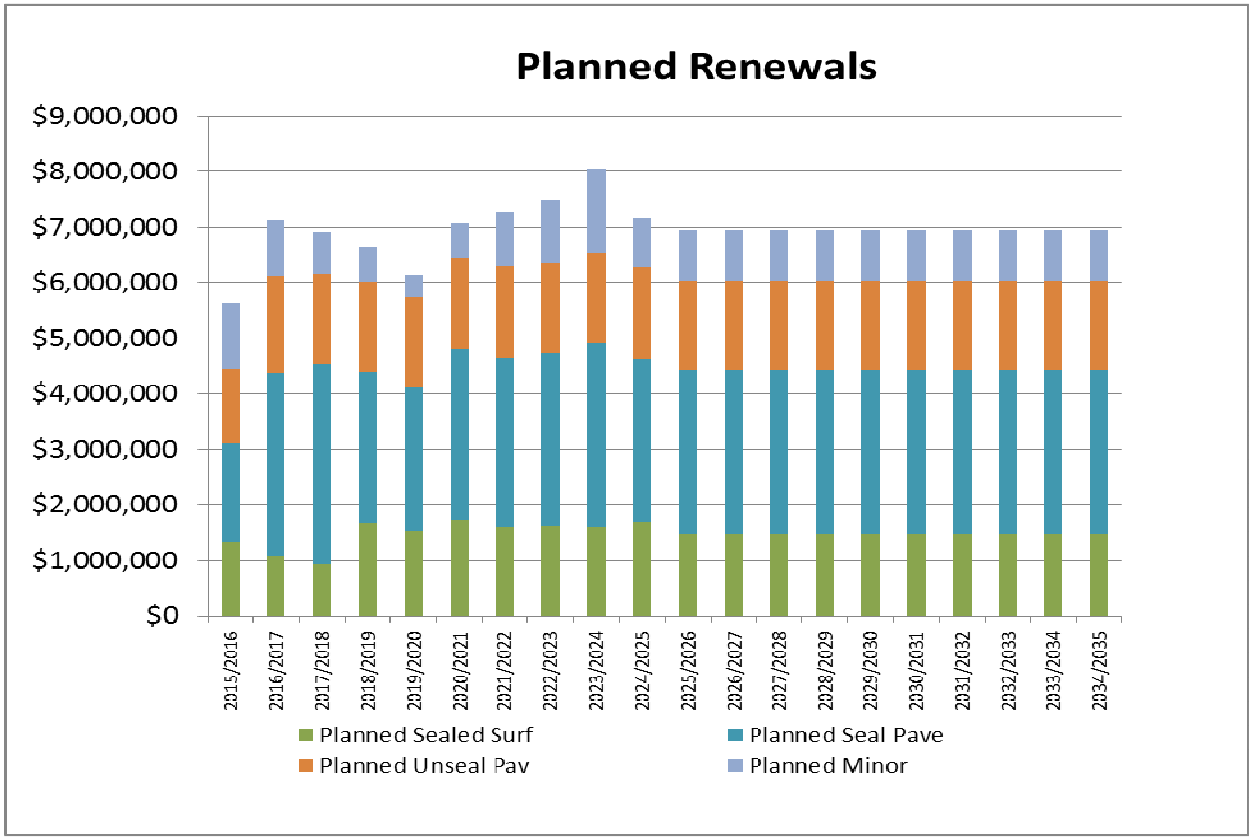
WDV = Fair Value

Ann_Dep = Annual Depreciation

5.2 Future Valuation



5.3 Planned Renewals



6.0 PLAN IMPROVEMENT AND MONITORING

This Section provides details on planning for monitoring the performance of the AM plan and any improvements to AM systems that will improve the level of confidence in the AM plan.

6.1 Improvement Programme

The Asset Management Plan can be improved in the following ways.

Task	Timeframe	Responsibility	Resources Required
Unsealed Roads Surfaces – Work Order reporting of IRI condition over time	31/01/2015	Technical Staff	Current Resources
Unsealed Roads Surfaces – Work Order reporting of lengths completed and by class of road	31/12/2015	Technical Staff	Current Resources
Unsealed Roads Surfaces - $/km reporting added to standard KPI reporting	31/12/2015	Manager Construction & Maintenance	Current Resources
Unsealed Roads Surfaces – Complaints and Risk Repairs reported	31/12/2015	Technical & Support Services Staff	Current Resources
Unsealed Roads Pavements – Gravel Volume reporting by class of roads	31/12/2015	Technical & Support Services Staff	Current Resources
Unsealed Roads Pavements –Accounting for gravel volumes placed in maintenance gravel patching into the renewal reporting	28/02/2015	Management – Assets, Finance & Construction	Current Resources
Sealed Surfaces- IRI and % of Surface Defect Network Assessments, to Update Data for correctness	31/03/2015	Manager Assets / Technical Staff	Current Resources , Consultant
Sealed Surfaces - $/m2 treatment type cost reporting added to KPI reporting	31/12/2015	Manager Construction & Maintenance	Current Resources
Sealed Surfaces – Complaints and Risk Repairs reported	31/12/2015	Technical & Support Services Staff	Current Resources
Sealed Pavement - IRI Network Assessment to Update Data for correctness same data for sealed surfaces	31/03/2015	Manager Assets / Technical Staff	Current Resources , Consultant
Drainage – monitoring of oldest assets to assist with planned works programming	28/02/2015	Technical Staff	Current Resources

APPENDIX

Appendix 1. Condition Data

Below is a summary of the recent condition data available, that has been used in the development of the planned forward and service level works.

Unsealed Roads Pavement Condition

The unsealed pavement condition data below is the average for the class of road.

Road Class	% Gravel Pavement Maintained by Rd Class - Wet weather access
199	78%
150	64%
125	83%
100	62%
75	66%
30	72%
10	56%
Blank	0%

Data comes from onsite inspections completed in Dec 2014 to January 2015 using www.racas.com.au all data is available to review with HD imagery in the virtual racas data.

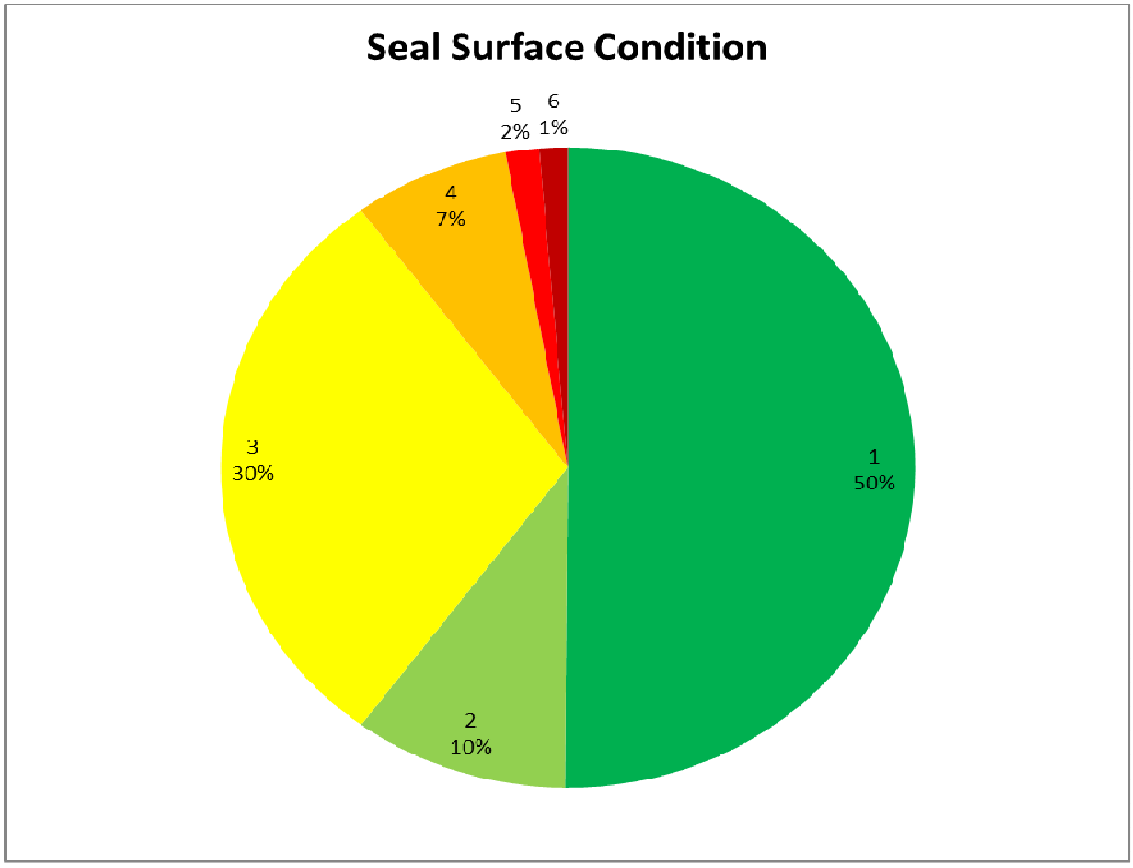
Sealed Surface Condition Rating

Below is the overall condition for the whole sealed network which was completed using both visual inspection data for the oldest assets and the PARMMS Database (road manager data collected in 2009 and 2013).

It should be noted that some of the data in the PARMMS for % of surface defect seems to have some errors in some of the sampling carried out by Shepherd Services. Where onsite data was available the measurements have been adjusted.

In the improvement plan it is suggested that RACAS should be run over the whole sealed road network to confirm all measurements again for better accuracy.

Condition	Age %	% Area Defects
1	0	0.0%
1	38%	0.5%
2	49%	5.5%
3	65%	23.7%
4	81%	52.6%
5	92%	78.3%
6	100%	100.0%



The % greater than a condition 4 (30% or more surface defects) is 10%.

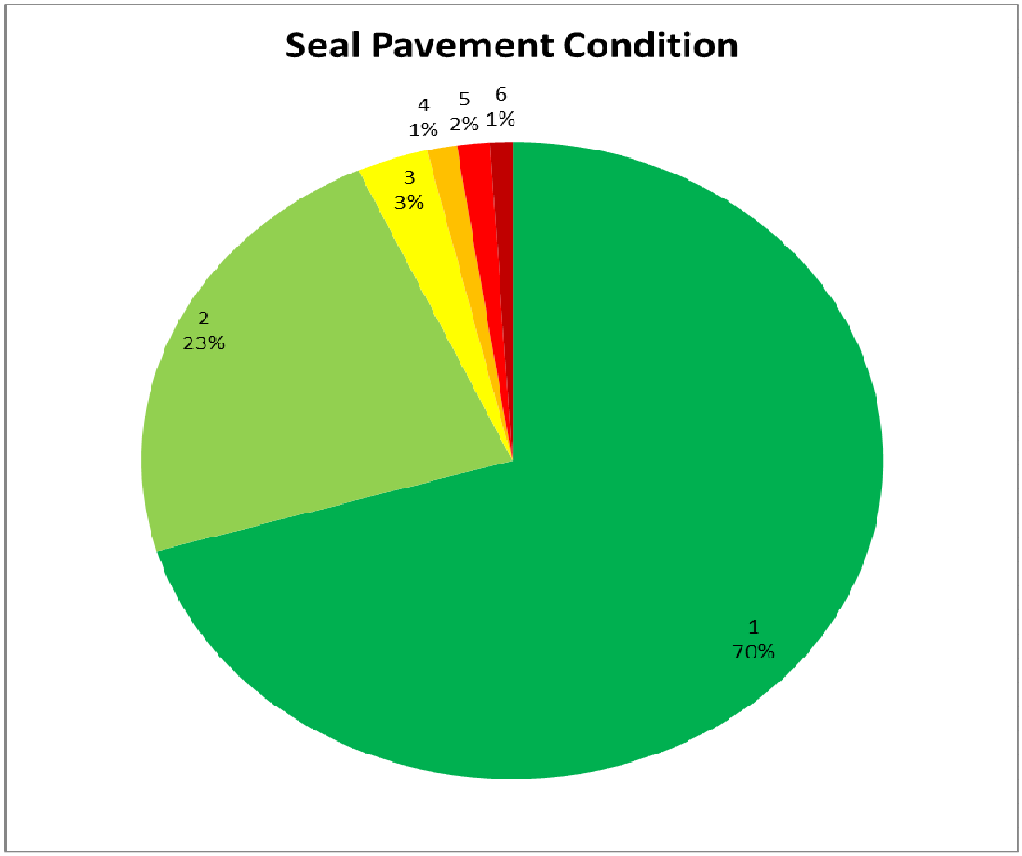
Sealed Pavement Condition Rating

Below is the overall condition for the whole sealed network which was completed using both visual inspection data for the oldest assets and the PARMMS Database (road manager data collected in 2009 and 2013).

It should be noted that some of the data in the PARMMS for % of pavement defect seems to have some errors in some of the sampling carried out by Shepherd Services. Where onsite data was available the measurements have been adjusted.

In the improvement plan it is suggested that RACAS should be run over the whole sealed road network to confirm all measurements again for better accuracy.

Condition	Age %	Roughness
1	0	50
1	40%	92
2	60%	127
3	71%	150
4	80%	170
5	89%	190
6	100%	214



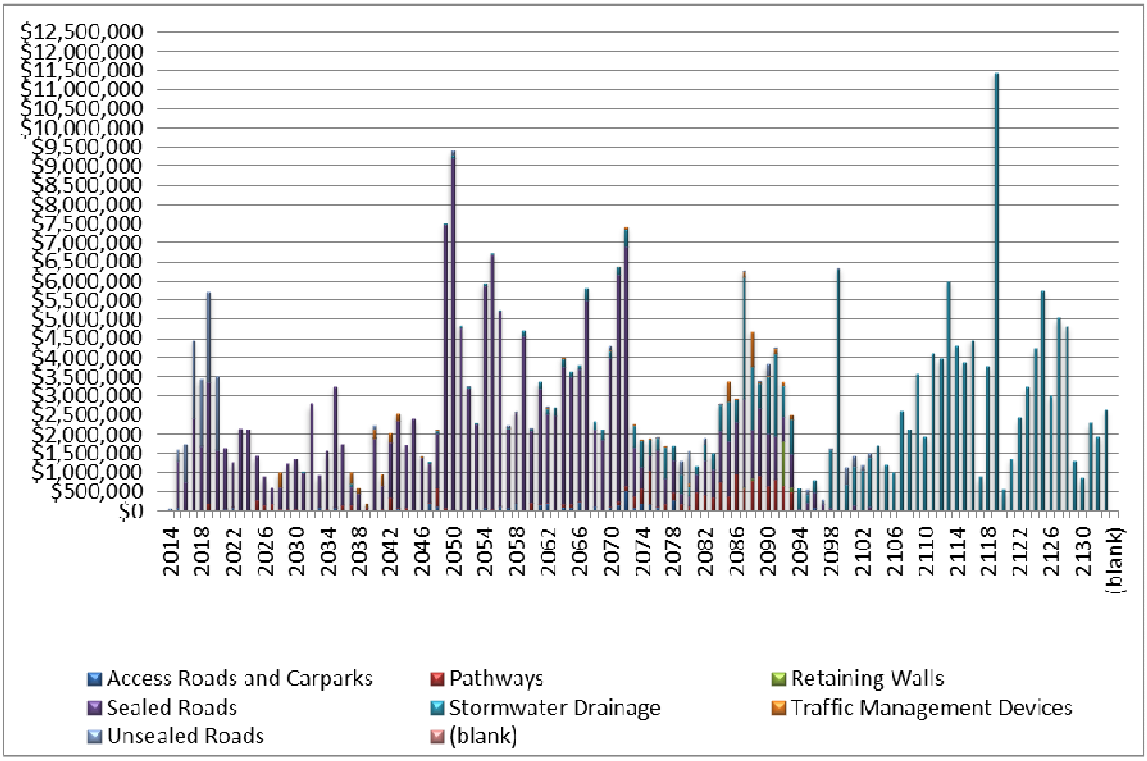
The % greater than a condition 4 (170 or more roughness count) is 3%.

Appendix 2. Asset Valuation Renewal Charts (project values)

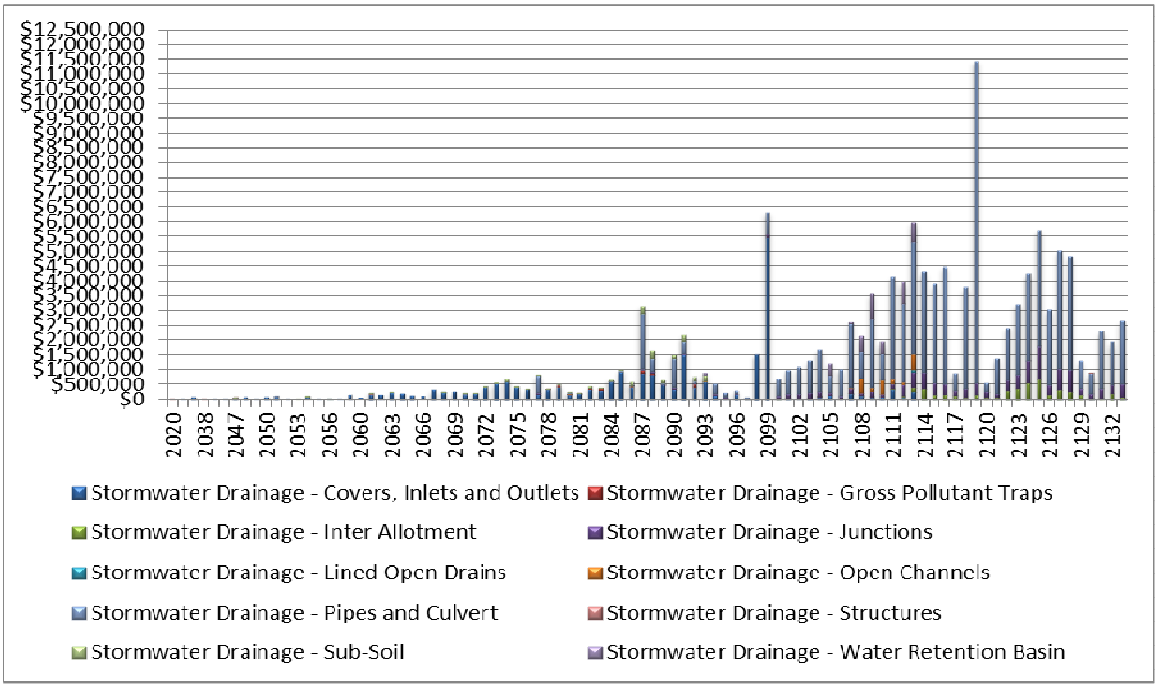
This information is used to assist with the projected renewal for assets that have longer lives.

All renewal charts are for one life cycle.

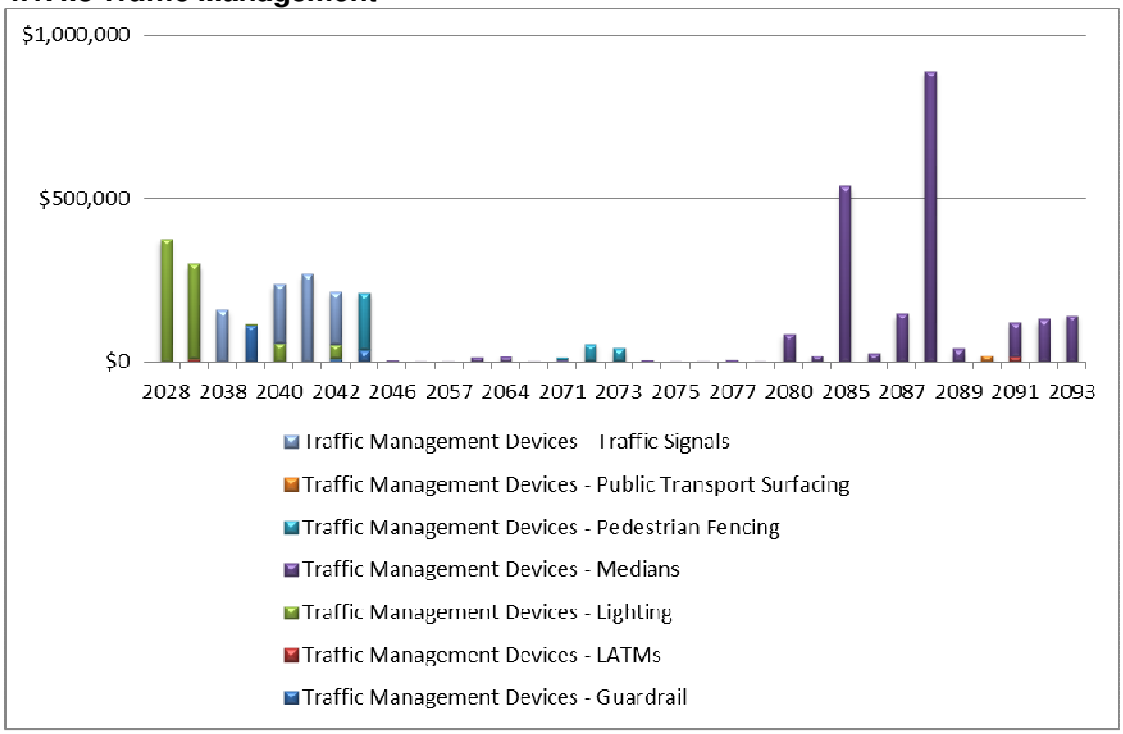
4.1.4.1 Overall Assets



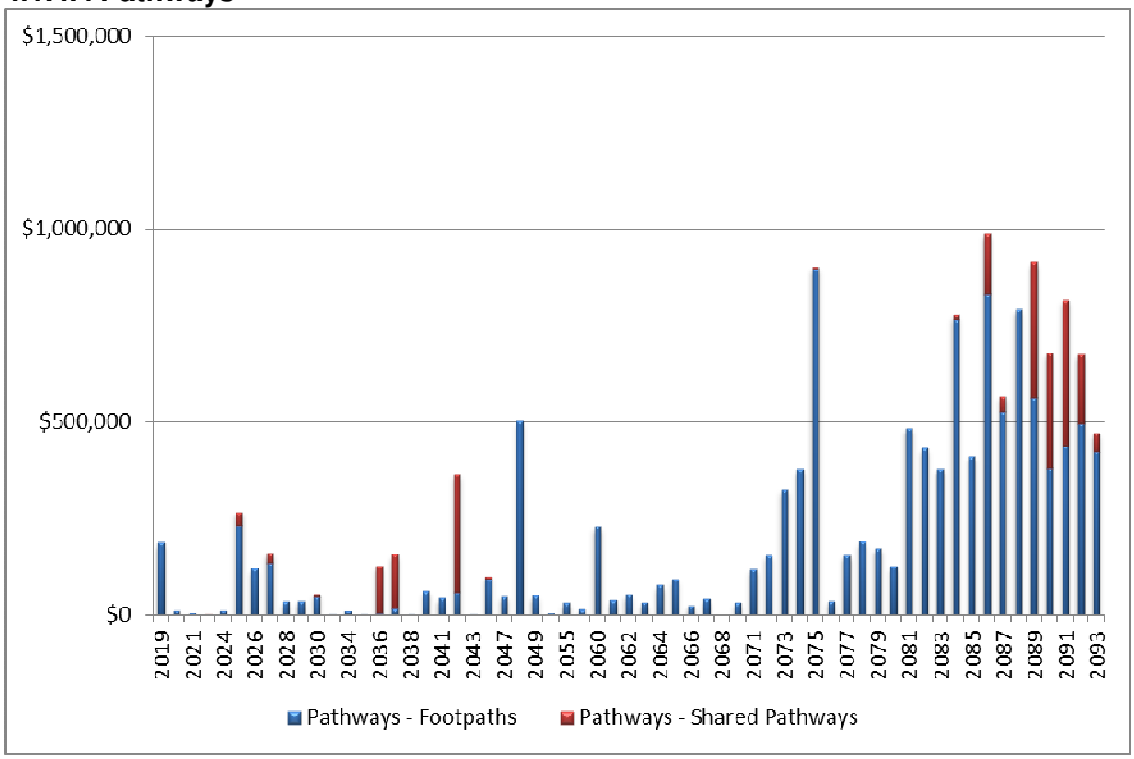
4.1.4.2 Stormwater



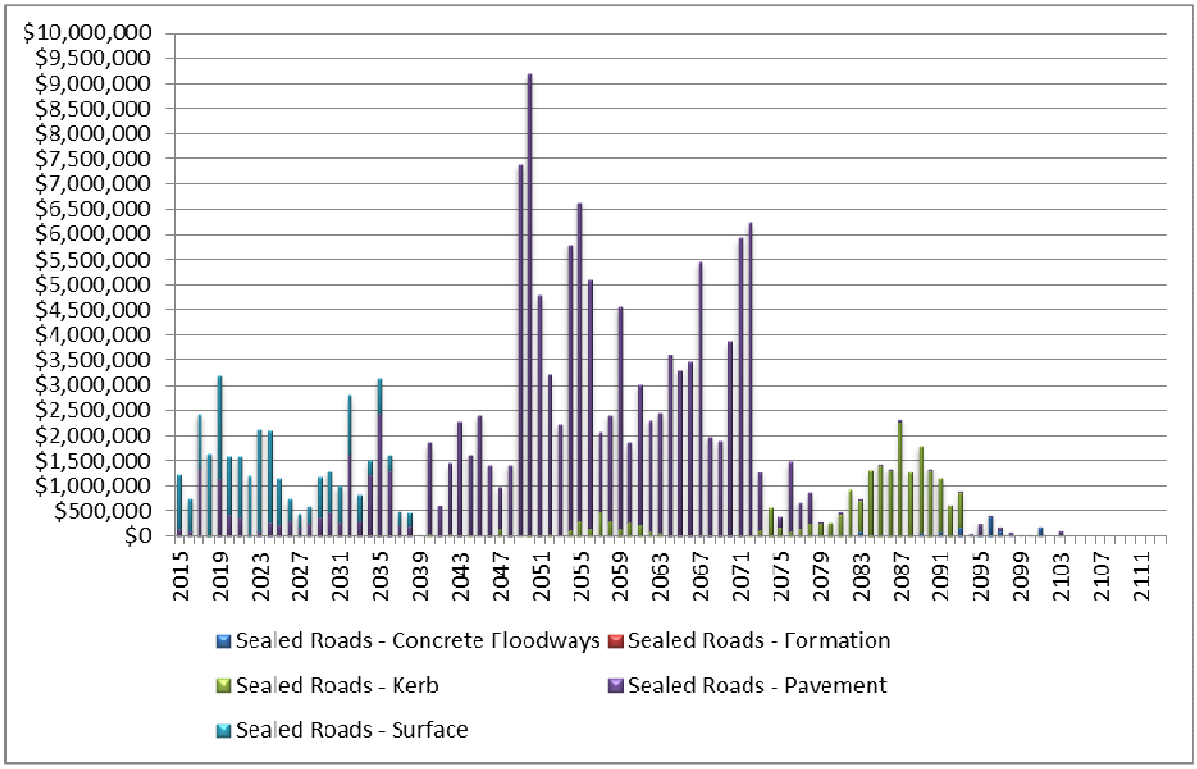
4.1.4.3 Traffic Management



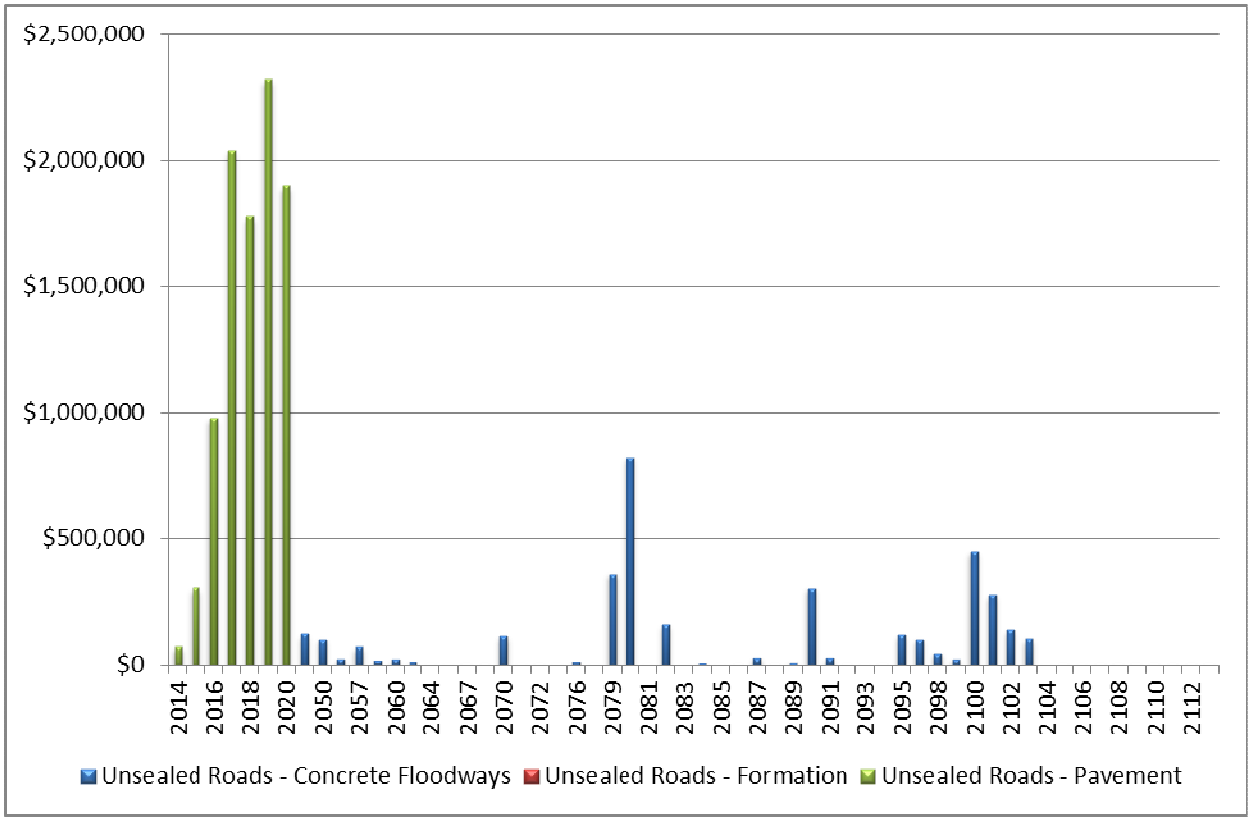
4.1.4.4 Pathways



4.1.4.5 Sealed Roads

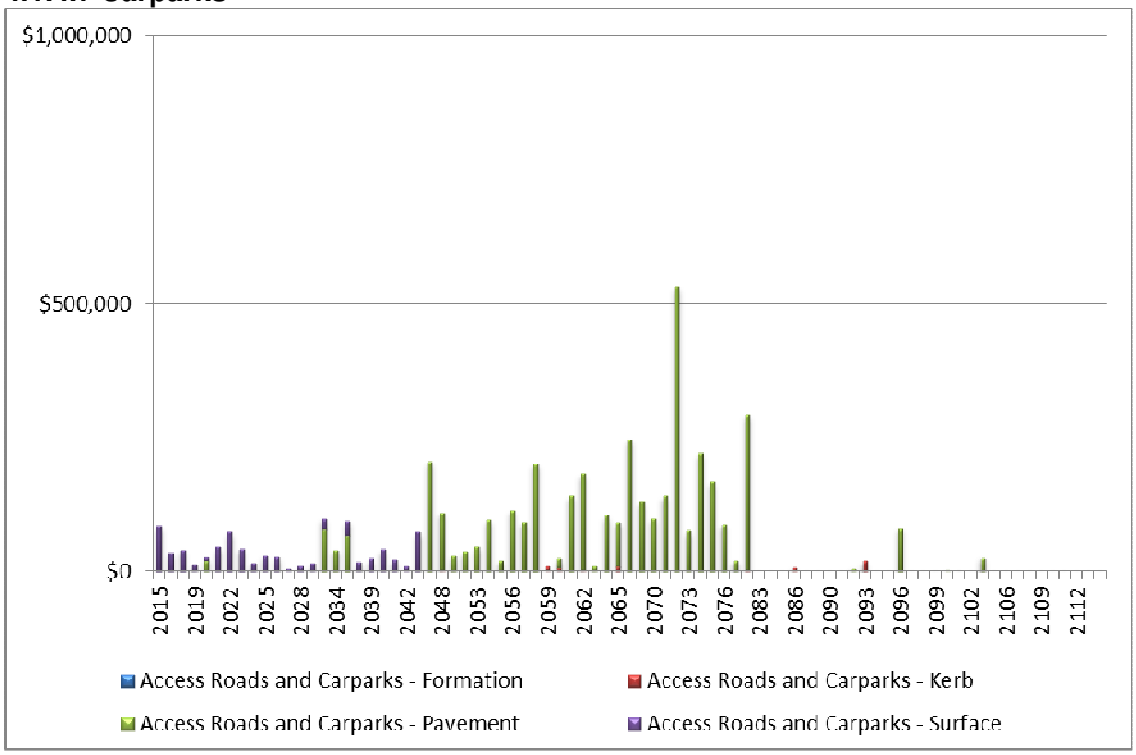


4.1.4.6 Unsealed Roads

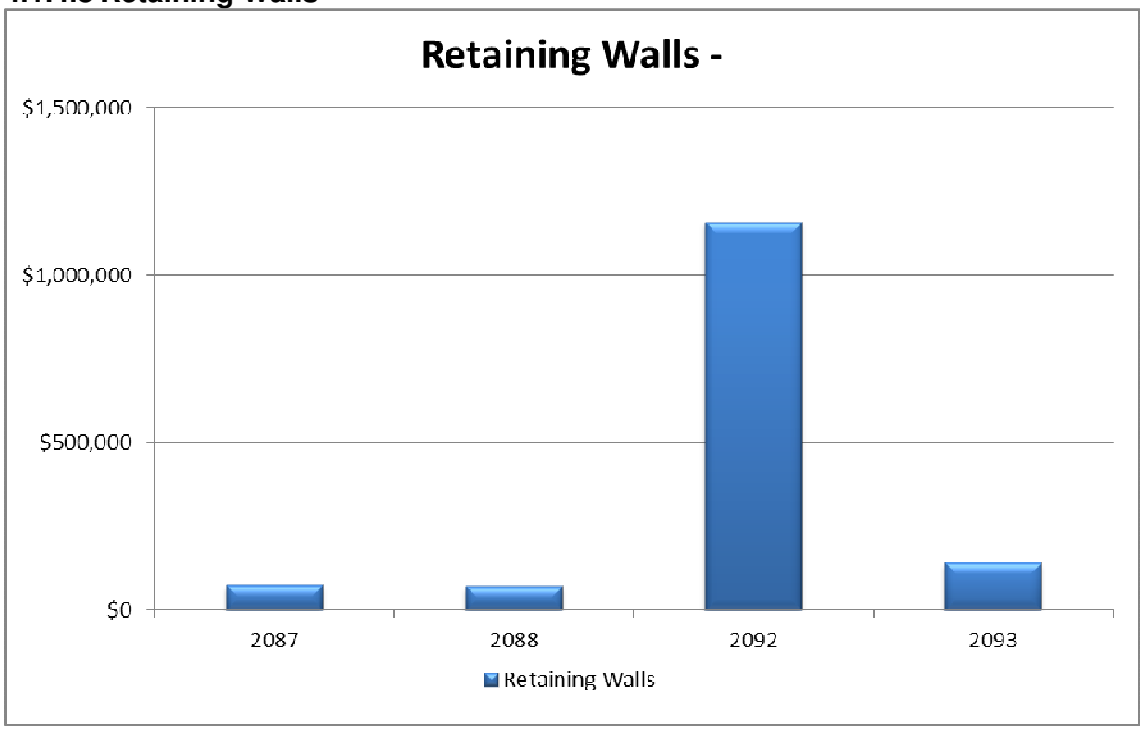


The green bars will continue on evey year, we have only represented one life cycle in this chart.

4.1.4.7 Carparks



4.1.4.8 Retaining Walls



Appendix 3. 20 Year Financial Plan

			2015/2016	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024	2024/2025	2025/2026	2026/2027	2027/2028	2028/2029	2029/2030	2030/2031	2031/2032	2032/2033	2033/2034	2034/2035
Financial Class	Type- Operational, Mtce, New or Renewal, Revenue	Asset Component	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Roads & Drainage	Maintenance	Sealed Surface	755,058	755,058	755,058	755,058	755,058	755,058	755,058	755,058	755,058	755,058	755,058	755,058	755,058	755,058	755,058	755,058	755,058	755,058	755,058	755,058
Roads & Drainage	Renewal (SL)	Sealed Surface	1,115,731	821,450	1,023,081	1,626,825	2,502,520	1,033,911	1,306,267	907,377	1,745,333	1,629,547	3,847,566	910,189	641,301	926,454	1,049,432	1,239,970	2,984,674	2,251,045	1,256,339	1,815,612
Roads & Drainage	Renewal (FWP)	Sealed Surface	1,346,000	1,081,485	931,256	1,676,900	1,524,688	1,726,604	1,612,000	1,631,200	1,611,453	1,683,000	1,482,459	1,482,459	1,482,459	1,482,459	1,482,459	1,482,459	1,482,459	1,482,459	1,482,459	1,482,459
Roads & Drainage	New (FWP)	Sealed Surface	2,440,000	1,460,000	1,080,000	-	356,000	-	4,000	-	997,480	-	633,748	633,748	633,748	633,748	633,748	633,748	633,748	633,748	633,748	633,748
Roads & Drainage	Upgrade (FWP)	Sealed Surface	2,264,000	1,650,133	925,024	836,100	494,000	1,052,476	1,040,000	912,800	869,814	1,012,000	1,105,635	1,105,635	1,105,635	1,105,635	1,105,635	1,105,635	1,105,635	1,105,635	1,105,635	1,105,635
Roads & Drainage	Depreciation	Sealed Surface	1,337,785	1,337,785	1,337,785	1,337,785	1,337,785	1,337,785	1,337,785	1,337,785	1,337,785	1,337,785	1,337,785	1,337,785	1,337,785	1,337,785	1,337,785	1,337,785	1,337,785	1,337,785	1,337,785	1,337,785
Roads & Drainage	Depreciation (From New Assets)	Sealed Surface	135,872	89,834	57,914	24,150	24,552	30,400	30,155	26,366	53,936	29,231	50,241	50,241	50,241	50,241	50,241	50,241	50,241	50,241	50,241	50,241
Roads & Drainage	Maintenance (From New Assets)	Sealed Surface	76,205	50,384	32,481	13,545	13,770	17,050	16,913	14,787	30,250	16,394	28,178	28,178	28,178	28,178	28,178	28,178	28,178	28,178	28,178	28,178
Roads & Drainage	Maintenance	Sealed Pavements	531,118	531,118	531,118	531,118	531,118	531,118	531,118	531,118	531,118	531,118	531,118	531,118	531,118	531,118	531,118	531,118	531,118	531,118	531,118	531,118
Roads & Drainage	Renewal (SL)	Sealed Pavements	916,617	2,312,621	1,969,685	915,355	1,961,943	1,586,645	1,752,856	1,811,333	3,145,326	2,849,690	2,635,883	2,225,096	1,329,454	1,317,918	1,305,161	1,348,175	2,797,419	1,995,550	2,362,830	4,289,245
Roads & Drainage	Renewal (FWP)	Sealed Pavements	1,765,000	3,278,714	3,593,140	2,717,250	2,586,721	3,091,510	3,055,000	3,103,000	3,303,634	2,957,500	2,945,147	2,945,147	2,945,147	2,945,147	2,945,147	2,945,147	2,945,147	2,945,147	2,945,147	2,945,147
Roads & Drainage	New (FWP)	Sealed Pavements	6,100,000	3,650,000	3,050,000	-	890,000	-	10,000	-	2,493,700	-	1,619,370	1,619,370	1,619,370	1,619,370	1,619,370	1,619,370	1,619,370	1,619,370	1,619,370	1,619,370
Roads & Drainage	Upgrade (FWP)	Sealed Pavements	5,660,000	4,125,332	2,592,560	2,090,250	1,235,000	2,631,190	2,600,000	2,282,000	2,174,534	3,055,000	2,844,587	2,844,587	2,844,587	2,844,587	2,844,587	2,844,587	2,844,587	2,844,587	2,844,587	2,844,587
Roads & Drainage	Depreciation	Sealed Pavements	2,271,262	2,271,262	2,271,262	2,271,262	2,271,262	2,271,262	2,271,262	2,271,262	2,271,262	2,271,262	2,271,262	2,271,262	2,271,262	2,271,262	2,271,262	2,271,262	2,271,262	2,271,262	2,271,262	2,271,262
Roads & Drainage	Depreciation (From New Assets)	Sealed Pavements	144,195	95,337	69,186	25,630	26,056	32,262	32,003	27,981	57,240	37,459	54,735	54,735	54,735	54,735	54,735	54,735	54,735	54,735	54,735	54,735
Roads & Drainage	Maintenance (From New Assets)	Sealed Pavements	33,589	22,208	16,116	5,970	6,069	7,515	7,455	6,518	13,333	8,726	12,750	12,750	12,750	12,750	12,750	12,750	12,750	12,750	12,750	12,750
Roads & Drainage	Maintenance	Sealed Formation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Roads & Drainage	Renewal (SL)	Sealed Formation																				
Roads & Drainage	Renewal (FWP)	Sealed Formation																				
Roads & Drainage	New (FWP)	Sealed Formation	976,000	584,000	432,000	-	142,400	-	1,600	-	398,992	-	253,499	253,499	253,499	253,499	253,499	253,499	253,499	253,499	253,499	253,499
Roads & Drainage	Upgrade (FWP)	Sealed Formation	905,600	660,053	370,010	334,440	197,600	420,990	416,000	365,120	347,925	404,800	442,254	442,254	442,254	442,254	442,254	442,254	442,254	442,254	442,254	442,254
Roads & Drainage	Depreciation	Sealed Formation																				
Roads & Drainage	Depreciation (From New Assets)	Sealed Formation																				
Roads & Drainage	Maintenance (From New Assets)	Sealed Formation																				
Roads & Drainage	Maintenance	Unsealed Pavements	2,027,528	2,027,528	2,027,528	2,027,528	2,027,528	2,027,528	2,027,528	2,027,528	2,027,528	2,027,528	2,027,528	2,027,528	2,027,528	2,027,528	2,027,528	2,027,528	2,027,528	2,027,528	2,027,528	2,027,528
Roads & Drainage	Renewal (SL)	Unsealed Pavements	1,340,000	1,255,398	1,255,398	1,255,398	1,255,398	1,255,398	1,255,398	1,255,398	1,255,398	1,255,398	1,255,398	1,255,398	1,255,398	1,255,398	1,255,398	1,255,398	1,255,398	1,255,398	1,255,398	1,255,398
Roads & Drainage	Renewal (FWP)	Unsealed Pavements	1,340,000	1,750,000	1,630,000	1,630,000	1,630,000	1,630,000	1,630,000	1,630,000	1,630,000	1,630,000	1,613,000	1,613,000	1,613,000	1,613,000	1,613,000	1,613,000	1,613,000	1,613,000	1,613,000	1,613,000
Roads & Drainage	New (FWP)	Unsealed Pavements	-	500,000	-	-	-	-	-	-	-	-	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
Roads & Drainage	Upgrade (FWP)	Unsealed Pavements	-	280,000	-	-	-	-	-	-	-	-	28,000	28,000	28,000	28,000	28,000	28,000	28,000	28,000	28,000	28,000
Roads & Drainage	Depreciation	Unsealed Pavements	1,691,037	1,691,037	1,691,037	1,691,037	1,691,037	1,691,037	1,691,037	1,691,037	1,691,037	1,691,037	1,691,037	1,691,037	1,691,037	1,691,037	1,691,037	1,691,037	1,691,037	1,691,037	1,691,037	1,691,037
Roads & Drainage	Depreciation (From New Assets)	Unsealed Pavements	-	140,303	-	-	-	-	-	-	-	-	14,030	14,030	14,030	14,030	14,030	14,030	14,030	14,030	14,030	14,030
Roads & Drainage	Maintenance (From New Assets)	Unsealed Pavements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Roads & Drainage	Maintenance	Stormwater	361,992	361,992	361,992	361,992	361,992	361,992	361,992	361,992	361,992	361,992	361,992	361,992	361,992	361,992	361,992	361,992	361,992	361,992	361,992	361,992
Roads & Drainage	Renewal (SL)	Stormwater				1,742												12,837				
Roads & Drainage	Renewal (FWP Minor)	Stormwater	793,600	826,788	485,005	500,520	308,751	475,283	883,600	908,960	1,143,163	750,400	707,607	707,607	707,607	707,607	707,607	707,607	707,607	707,607	707,607	707,607
Roads & Drainage	New (FWP)	Stormwater	3,472,000	1,573,000	1,124,000	50,000	1,034,800	-	3,200	-	797,984	-	805,498	805,498	805,498	805,498	805,498	805,498	805,498	805,498	805,498	805,498
Roads & Drainage	Upgrade (FWP)	Stormwater	2,389,400	2,629,506	1,075,019	748,880	658,200	1,449,981	1,457,000	1,452,240	3,675,851	5,623,600	-	-	2,115,968	-	-	2,115,968	-	-	-	2,115,968
Roads & Drainage	Depreciation	Stormwater	1,226,078	1,226,078	1,226,078	1,226,078	1,226,078	1,226,078	1,226,078	1,226,078	1,226,078	1,226,078	1,226,078	1,226,078	1,226,078	1,226,078	1,226,078	1,226,078	1,226,078	1,226,078	1,226,078	1,226,078
Roads & Drainage	Depreciation (From New Assets)	Stormwater	64,475	46,228	24,189	8,788	18,623	15,950	16,062	15,975	49,212	61,860	8,860	8,860	32,136	8,860	8,860	32,136	8,860	8,860	8,860	32,136
Roads & Drainage	Maintenance (From New Assets)	Stormwater	15,614	11,195	5,858	2,128	4,510	3,863	3,890	3,869	11,918	14,981	2,146	2,146	7,783	2,146	2,146	7,783	2,146	2,146	2,146	7,783
Roads & Drainage	Maintenance	Kerb	56,000	56,000	56,000	56,000	56,000	56,000	56,000	56,000	56,000	56,000	56,000	56,000	56,000	56,000	56,000	56,000	56,000	56,000	56,000	56,000
Roads & Drainage	Renewal (FWP Minor)	Kerb	169,800	123,446	84,377	92,070	46,406	106,981	72,600	78,360	72,436	93,900	94,038	94,038	94,038	94,038	94,038	94,038	94,038	94,038	94,038	94,038
Roads & Drainage	Renewal (SL)	Kerb	-	266	1,063	-	-	-	-	-	-	-	-	-	-	-	-	-	3,330	-	16,996	2,140
Roads & Drainage	New (FWP)	Kerb	732,000	438,000	324,000	-	106,800	-	1,200	-	299,244	-	-	-	190,124	-	-	190,124	-	-	-	190,124
Roads & Drainage	Upgrade (FWP)	Kerb	679,200	495,040	547,507	250,830	148,200	315,743	312,000	273,840	260,944	303,600	358,690	358,690	358,690	358,690	358,690	358,690	358,690	358,690	358,690	358,690
Roads & Drainage	Depreciation	Kerb	264,627	264,627	264,627	264,627	264,627	264,627	264,627	264,627	264,627	264,627	264,627	264,627	264,627	264,627	264,627	264,627	264,627	264,627	264,627	264,627
Roads & Drainage	Depreciation (From New Assets)	Kerb	18,985	12,552	11,724	3,374	3,431	4,248	4,213	3,684	7,536	4,084	4,825	4,825	7,383	4,825	4,825	7,383	4,825	4,825	4,825	7,383
Roads & Drainage	Maintenance (From New Assets)	Kerb	3,759	2,486	2,322	668	679	841	834	729	1,492	809	956	956	1,462	956	956	1,462	956	956	956	1,462
Roads & Drainage	Maintenance	Pathways	35,752	35,752	35,752	35,752	35,752	35,752	35,752	35,752	35,752	35,752	35,752	35,752	35,752	35,752	35,752	35,752	35,752	35,752	35,752	35,752
Roads & Drainage	Renewal (FWP Minor)	Pathways	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Roads & Drainage	Renewal (SL)	Pathways	-	-	-	185,757	10,854	4,974	2,772	-	10,460	266,163	118,576	160,880	34,295	35,346	54,583	2,686	-	-	10,020	2,491
Roads & Drainage	New (FWP)	Pathways	12,500	570,625	170,000	20,000	879,063	-	1,285,938	2,212,425	2,450,488	2,135,450	-	-	1,081,832	-	-	1,081,832	-	-	-	1,081,832
Roads & Drainage	Upgrade (FWP)	Pathways	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Roads & Drainage	Depreciation	Pathways	217,428	217,428	217,428	217,428	217,428	217,428	217,428	217,428	217,428	217,428	217,428	217,428	217,428	217,428	217,428	217,428	217,428	217,428	217,428	217,428
Roads & Drainage	Depreciation (From New Assets)	Pathways	213	9,701	2,890	340	14,944	-	21,861	37,611	41,658	36,303	-	-	18,391	-	-	18,391	-	-	-	18,391
Roads & Drainage	Maintenance (From New Assets)	Pathways	32	1,448	431	51	2,231	-	3,263	5,614	6,218	5,419	-	-	2,745	-	-	2,745	-	-	-	2,745
Roads & Drainage	Maintenance	Access Roads and Carparks	21,554	21,554	21,554	21,554	21,554	21,554	21,554	21,554	21,554	21,554	21,554	21,554	21,554	21,554	21,554	21,554	21,554	21,554	21,554	21,554
Roads & Drainage	Renewal (FWP Minor)	Access Roads and Carparks	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Roads & Drainage	Renewal (SL)	Access Roads and Carparks	34,107	-	40,236	12,826	25,627	45,582	73,767	41,995	15,377	28,528	26,547	5,093	9,743	14,565	-	-	-	98,232	39,156	94,363
Roads & Drainage	New (FWP)	Access Roads and Carparks	-	30,000	-	-	-	-	50,000	-	-	-	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000	40,000
Roads & Drainage	Upgrade (FWP)	Access Roads and Carparks	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Roads & Drainage	Depreciation	Access Roads and Carparks	96,640	96,640	96,640	96,640	96,640	96,640	96,640	96,640	96,640	96,640	96,640	96,640	96,640	96,640	96,640	96,640	96,640	96,640	96,640	96,640
Roads & Drainage	Depreciation (From New Assets)	Access Roads and Carparks	-	480	-	-	-	-	800	-	-	-	640	640	640	640	640	640	640	640	640	640
Roads & Drainage	Maintenance (From New Assets)	Access Roads and Carparks	-	76	-	-	-	-	127	-	-	-	102	102	102	102	102	102	102	102	102	102
Roads & Drainage	Maintenance	Traffic Management Devices	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Roads & Drainage	Renewal (FWP Minor)	Traffic Management Devices	215,000	62,500	190,000	30,000	30,000	30,000	35,000	135,000	270,000	40,000	103,750	103,750	103,750	103,750	103,750	103,750	103,750	103,750	103,750	103,750
Roads & Drainage	Renewal (SL)	Traffic Management Devices	-	-	-	-	-	-	-	-	-	-	-	-	375,037	-	-	-	-	-	-	-
Roads & Drainage	New (FWP)	Traffic Management Devices	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Roads & Drainage	Upgrade (FWP)	Traffic Management Devices	760,000	187,500	660,000	-	200,000	-	-	400,000	920,000	-	-	-	312,750	-	-	312,750	-	-	-	312,750
Roads & Drainage	Depreciation	Traffic Management Devices	91,901	91,901	91,901	91,901	91,901	91,901	91,901	91,901	91,901	91,901	91,901	91,901	91,901	91,901	91,901	91,901	91,901	91,901	91,901	91,901
Roads & Drainage	Depreciation (From New Assets)	Traffic Management Devices	15,200	3,750	13,200	-	4,000	-	-	8,000	18,400	-	-	-	6,255	-	-	6,255	-	-	-	6,255
Roads & Drainage	Maintenance (From New Assets)	Traffic Management Devices	1,929	476	1,675	-	508	-	-	1,015	2,335	-	-	-	794	-	-	794	-	-	-	794
Roads & Drainage	Maintenance	Retaining Walls	7,600	7,600	7,600	7,600	7,600	7,600	7,600	7,600	7,600	7,600	7,600	7,600	7,600	7,600	7,600	7,600	7,600	7,600	7,600	7,600
Roads & Drainage	Renewal (FWP Minor)	Retaining Walls	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Roads & Drainage	Renewal (SL)	Retaining Walls	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Roads & Drainage	New (FWP)	Retaining Walls	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Roads & Drainage	Upgrade (FWP)	Retaining Walls	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Roads & Drainage	Depreciation	Retaining Walls	18,081	18,081	18,081	18,081	18,081	18,081	18,081	18,081	18,081	18,081	18,081	18,081	18,081	18,081	18,081	18,081	18,081	18,081	18,081	18,081
Roads & Drainage	Depreciation (From New Assets)	Retaining Walls	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Roads & Drainage	Maintenance (From New Assets)	Retaining Walls	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Roads & Drainage	Maintenance	Totals	3,811,603	3,811,603	3,811,603	3,811,603	3,811,603	3,811,603	3,811,603	3,811,603	3,811,603	3,811,603	3,811,603	3,811,603	3,811,603	3,811,603	3,811,603	3,811,603	3,811,603	3,811,603	3,811,603	3,811,603
Roads & Drainage	Operational	Totals	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Roads & Drainage	Renewal (SL)	Totals	3,406,455	4,389,736	4,289,464	3,996,161	5,758,084	3,926,509	4,391,061	4,016,103	6,171,893	6,029,326	7,883,970	4,556,656	3,645,229	3,549,682	3,664,574	3,859,067	7,040,821	5,600,225	4,940,738	7,459,250
Roads & Drainage	Renewal (FWP)	Totals	4,451,000	6,110,199	6,154,396	6,024,150	5,741,409	6,448,114	6,297,000	6,364,200	6,545,087	6,270,500	6,040,605	6,040,605	6,040,605	6,040,605	6,040,605	6,040,605	6,040,605	6,040,605	6,040,605	6,040,605
Roads & Drainage	Renewal (FWP Minor)	Totals	1,178,400	1,012,734	759,382	622,590	385,157	612,264	991,200	1,122,320	1,485,599	884,300	905,395	905,395	905,395	905,395	905,395	905,395	905,395	905,395	905,395	905,395
Roads & Drainage	New (FWP)	Totals	13,732,500	8,805,625	6,180,000	70,000	3,409,063	-	1,355,938	2,212,425	7,437,888	2,135,450	3,402,116	3,402,116	4,674,072	3,402,116	3,402,116	4,674,072	3,402,116	3,402,116	3,402,116	4,674,072
Roads & Drainage	Upgrade (FWP)	Totals	12,658,200	10,027,563	6,170,120	4,260,500	2,933,000	5,870,380	5,825,000	5,686,000	8,249,068	10,399,000	4,779,165	4,779,165	7,207,883	4,779,165	4,779,165	7,207,883	4,779,165	4,779,165	4,779,165	7,207,883
Roads & Drainage	Depreciation	Totals	7,214,839	7,214,839	7,214,839	7,214,839	7,214,839	7,214,839	7,214,839	7,214,839	7,214,839	7,214,839	7,214,839	7,214,839	7,214,839	7,214,839	7,214,839	7,214,839	7,214,839	7,214,839	7,214,839	7,214,839
Roads & Drainage	Depreciation (From New Assets)	Totals	378,940	398,185	179,104	62,282	91,605	82,860	105,094	119,616	227,982	168,937	133,332	133,332	183,812	133,332	133,332	183,812	133,332	133,332	133,332	183,812
Roads & Drainage	Maintenance (From New Assets)	Totals	131,127	88,273	58,883	22,362	27,767	29,269	32,482	32,533	65,547	46,329	44,131	44,131	53,813	44,131	44,131	53,813	44,131	44,131	44,131	53,813
Planned	Renewal FWP	Summary	5,629,400	7,122,933	6,913,778	6,646,740	6,126,566	7,060,378	7,288,200	7,486,520	8,030,686	7,154,800	6,946,000	6,946,000	6,946,000	6,946,000	6,946,000	6,946,000	6,946,000	6,946,000	6,946,000	6,946,000
Projected	Renewal SL	Summary	3,406,455	4,389,736	4,289,464	3,996,161	5,758,084	3,926,509	4,391,061	4,016,103	6,171,893	6,029,326	7,883,970	4,556,656	3,645,229	3,549,682	3,664,574	3,859,067	7,040,821	5,600,225	4,940,738	7,459,250
Planned	Accumulative Renewal (FWP)	Summary	5,629,400	12,752,333	19,666,110	26,312,850	32,439,416	39,499,795	46,787,995	54,274,515	62,305,200	69,460,000	76,406,000	83,352,000	90,298,000	97,244,000	104,190,000	111,136,000	118,082,000	125,028,000	131,974,000	138,920,000
Planned	Accumulative Renewal (FWP-Minor)	Summary	1,178,400	2,191,134	2,950,516	3,573,106	3,958,263	4,570,527	5,561,727	6,684,047	8,169,646	9,053,946	9,959,340	10,864,735	11,770,129	12,675,524	13,580,919	14,486,313	15,391,708	16,297,102	17,202,497	18,107,891
Planned	Renewal FWP/Dep	Summary	78%	99%	96%	92%	85%	98%	103%	104%	111%	99%	96%	96%	96%	96%	96%	96%	96%	96%	96%	96%
Projected	Renewal SL/Dep	Summary	47%	61%	59%	55%	80%	54%	61%	56%	86%	84%	109%	63%	51%	49%	51%	53%	98%	78%	68%	103%
Planned	Accumulative Depreciation	Summary	7,593,779	7,991,964	8,171,068	8,233,350	8,324,955	8,407,815	8,512,910	8,632,526	8,860,508	9,029,444	9,162,777	9,296,109	9,479,920	9,613,253	9,746,585	9,930,396	10,063,729	10,197,061	10,330,393	10,514,205
Planned	Accumulative Maintenance	Summary	3,942,730	4,031,002	4,089,886	4,112,248	4,140,015	4,169,284	4,201,766	4,234,298	4,299,845	4,346,174	4,390,304	4,434,435	4,488,248	4,532,379	4,576,509	4,630,322	4,674,453	4,718,583	4,762,714	4,816,527
Planned	Combined New + Upgrade	Summary	26,390,700	18,833,188	12,350,120	4,330,500	6,342,063	5,870,380	7,180,938	7,898,425	15,686,956	12,534,450	8,181,281	8,181,281	11,881,955	8,181,281	8,181,281	11,881,955	8,181,281	8,181,281	8,181,281	11,881,955
Planned-Projected	Accumulative Gap	Summary	- 2,222,945	- 4,956,142	- 7,580,455	- 10,231,034	- 10,599,516	- 13,733,385	- 16,630,524	- 20,100,941	- 21,959,734	- 23,085,208	- 22,147,238	- 24,536,582	- 27,837,353	- 31,233,672	- 34,515,097	- 37,602,031	- 37,507,210	- 38,852,984	- 40,858,246	- 40,344,997
Planned	Accumulative Maintenance (new assets)	Summary	131,127	219,400	278,283	300,645	328,412	357,681	390,163	422,696	488,243	534,571	578,702	622,832	676,645	720,776	764,907	818,719	862,850	906,981	951,111	1,004,924
Planned	Accumulative Depreciation (new assets)	Summary	378,940	777,126	956,229	1,018,511	1,110,117	1,192,977	1,298,071	1,417,687	1,645,669	1,814,606	1,947,938	2,081,270	2,265,082	2,398,414	2,531,746	2,715,558	2,848,890	2,982,222	3,115,554	3,299,366
Planned	% of Asset Stock Increased (As low as possible)	Summary	5.3%	3.7%	2.3%	0.8%	1.2%	1.1%	1.3%	1.4%	2.7%	2.1%	1.4%	1.4%	1.9%	1.3%	1.3%	1.8%	1.3%	1.2%	1.2%	1.7%
Planned	% of Asset Stock Renewed (1 to 2%)	Summary	1.1%	1.4%	1.3%	1.3%	1.1%	1.3%	1.3%	1.3%	1.4%	1.2%	1.2%	1.2%	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%	1.0%	1.0%
Planned	Opening Asset Value (Opening +New)	Summary	495,838,751	514,671,939	527,022,059	531,352,559	537,694,622	543,565,002	550,745,939	558,644,364	574,331,320	586,865,770	595,047,051	603,228,332	615,110,287	623,291,568	631,472,849	643,354,804	651,536,085	659,717,366	667,898,647	679,780,602
Planned	Fair Value (Opening - Depreciation + Renewal)	Summary	397,344,338	396,475,306	395,218,016	393,631,406	391,433,017	390,085,580	388,860,870	387,714,864	386,885,042	385,010,398	382,793,621	380,443,513	377,909,592	375,242,340	372,441,755	369,457,359	366,339,630	363,088,569	359,704,177	356,135,972
Planned	Accumulated Depreciation	Summary	98,494,413	118,196,633	131,804,043	137,721,153	146,261,605	153,479,422	161,885,069	170,929,500	187,446,278	201,855,372	212,253,430	222,784,819	237,200,695	248,049,228	259,031,094	273,897,445	285,196,455	296,628,797	308,194,470	323,644,630
Planned	Asset Consumption	Summary	80%	77%	75%	74%	73%	72%	71%	69%	67%	66%	64%	63%	61%	60%	59%	57%	56%	55%	54%	52%