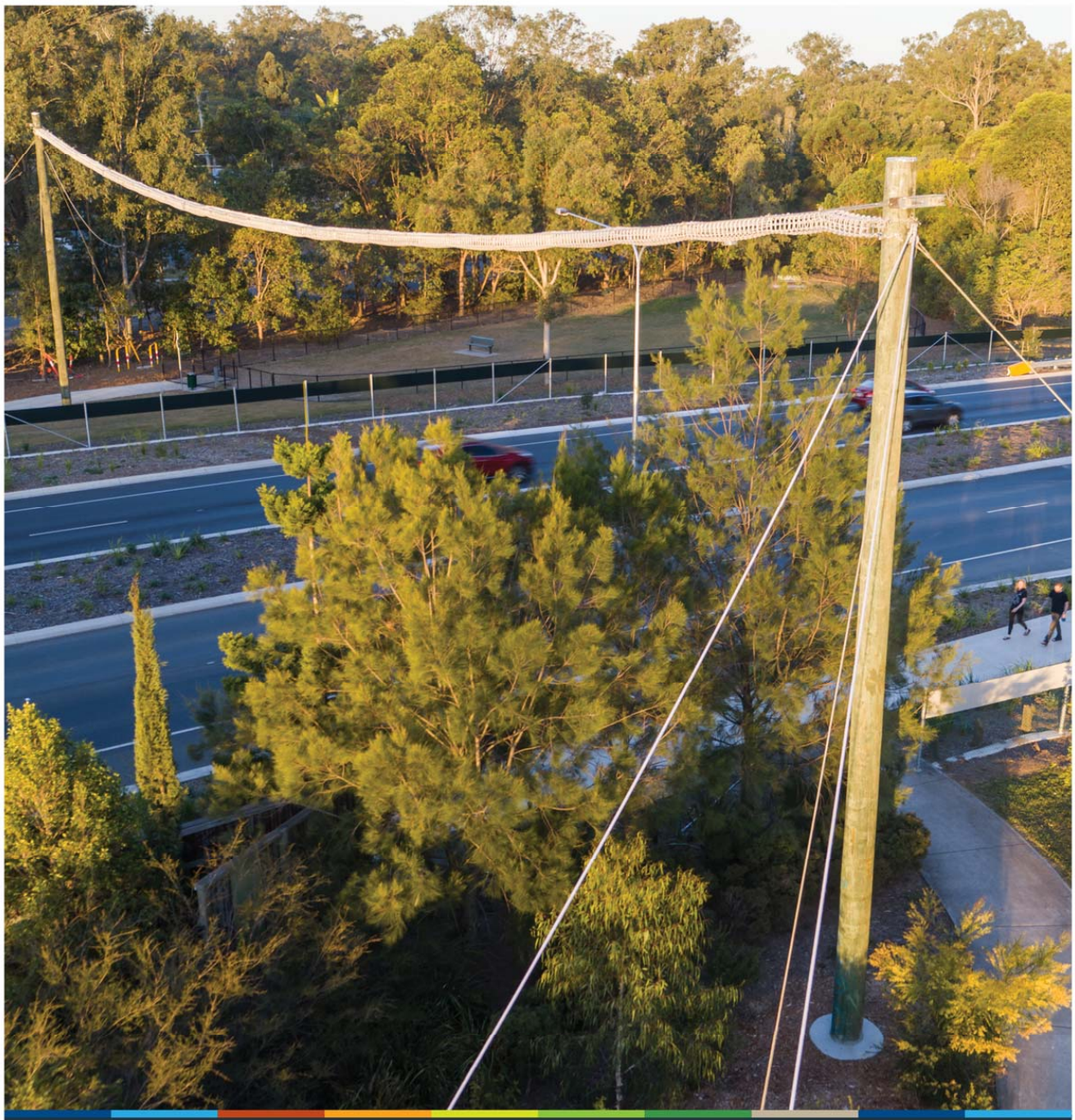
#1 Green Infrastructure Portfolio Asset Management Plan



Moreton Bay Regional Council

Green Infrastructure Portfolio Asset Management Plan

June 2021

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Moreton Bay Regional Council

Green Infrastructure Portfolio Asset Management Plan

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Draft v1	January 2019	Initial draft	J Frost	J Frost
Draft v2	April 2020	Further Review and Development	D Sunarjana	J Frost
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Definitions for Abbreviations

Term	Definition
ACR	Asset Consumption Ratio
AI	Action Item
AM	Asset Maintenance
AMP	Asset Management Plan
AMT	Asset Management Team within Infrastructure Planning
ASR	Asset Sustainability Ratio
CSR	Customer Service Request
ECM	Engineering Construction and Maintenance or; Enterprise Content Management component of Technology One
ePID	Electronic Project Identification Document for Project Prioritisation / Approval
GIN	Green Infrastructure Network
GIPAMP	Green Infrastructure Portfolio Asset Management Plan
GIS	Geographical Information System
IPWEA	Institute of Public Works Engineering Australasia
ITP	Integrated Transport Planning Team within Infrastructure Planning
LGIP	Local Government Infrastructure Plan
LTFF	Long Term Financial Forecast
MBRC	Moreton Bay Regional Council
PAMP	Portfolio Asset Management Plan
SAMP	Strategic Asset Management Plan
SIP	Strategic Infrastructure Planning Team within Infrastructure Planning
TMR	Department of Transport & Main Roads
TOMAS	MBRC's Asset Management System (based on Technology One platform)
TRV	Total Replacement Value

Executive Summary

The Green Infrastructure Portfolio Asset Management Plan (GIPAMP) outlines Moreton Bay Regional Council's (MBRC's) approach to the management of the Green Infrastructure assets located throughout the MBRC area.

The primary function of green infrastructure assets is to provide safe and ongoing movement opportunities for wildlife and to improve road safety for all road users.

Green infrastructure assets include fauna fences, escape and refuge poles, crossing ropes, crossing underpasses, wildlife stencils and nest boxes located across the region.

Figure 1 - Example of overpass, underpass and a refuge pole

Collectively the financially recognised green infrastructure assets have an estimated replacement value of $11.3M. Information on the various asset types included in this GIPAMP are presented in Table 0.1. This table also indicates the expected life of each asset type and the age range for the assets that currently make up the portfolio. Nest boxes and wildlife stencils are not financially recognised as they fall below the financial recognition threshold; but have an estimated replaced value of $353K bringing the total portfolio value to $11.7M.

Table 0.1 - Green Infrastructure Asset Types

Asset Type	Description/sub-types	Qty	Expected Useful life (Years)	Current Age Range (Years)	Current Replacement Cost
Financial Assets					
Fauna Escape Poles	Fauna escape poles are provided along fauna fences, which allow any wildlife trapped within the road corridor to escape while ensuring that wildlife within bushland cannot enter the roadway	185	20	0-14	$102K
Fauna Fencing	Fauna fences are designed to exclude wildlife from the road corridor.	80	20	0-26	$4.39M
Fauna Overpass	Fauna overpasses are provided to allow passage for wildlife above the road which in turn reduces the risk of wildlife-vehicle collisions	64	50	0-5	$6.08M
Fauna Refuge Poles	Refuge poles are supplied within the open spaces which help the wildlife by providing refuge from predators.	7	20	0-2	$3K
Fauna Underpass	Fauna underpasses provide safe passage for a range of wildlife allowing unrestricted access to habitat that has been fragmented by the construction of a road	9	40	0-5	$729K
Subtotal for Financial Assets		***345***	***-***	***-***	***$11.3M***

Asset Type	Description/sub-types	Qty	Expected Useful life (Years)	Current Age Range (Years)	Current Replacement Cost
Non-financial assets					
Nest Boxes	A nest box is an enclosure built especially for animals to nest, roost or shelter in.	55	20	0-21	$11K
Wildlife-Stencils	Road marking to alert drivers that the area is frequented by specific type of fauna.	57	5	0-3	$342K
Subtotal for Non-Financial Assets		***112***	***-***	***-***	***$353K***
Total (financial + non-financial assets)		**457**	**-**	**-**	**$11.7M**

Figure 2 and Figure 3 below shows the age profile for MBRC's Green Infrastructure assets, which indicates the number of assets and their total current replacement cost within each age band. As age reflects the year in which the assets were built, the profile also indicates the pattern in which they were acquired over time.

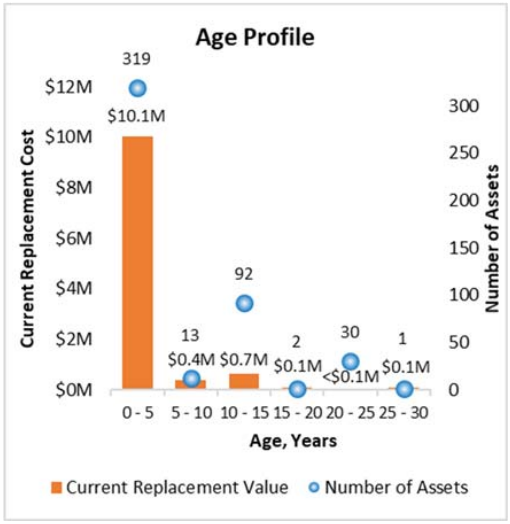

Figure 2 - Age profile

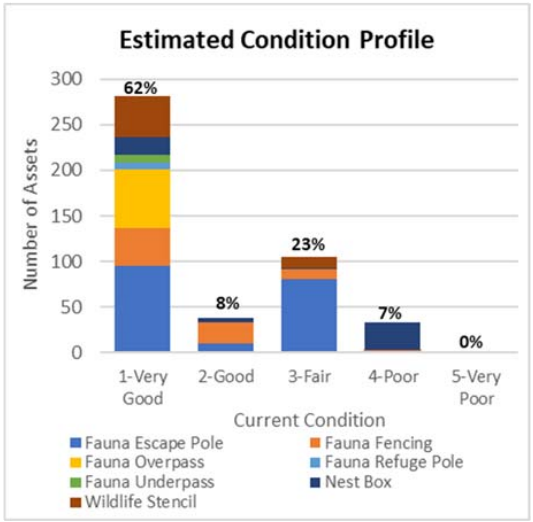

Figure 3 - Condition profile for green infrastructure

The last 10 years has seen significant growth in both the number and value of green infrastructure assets built. This aligns to a period of significant growth in industry awareness around the need to construct and install green infrastructure assets to reduce vehicle collisions with fauna and allow fauna to co-exist in the changing land terrain from a natural to a built environment. Green infrastructure assets constructed in the last 10 years account for 75% of the total number of assets and this mainly comprises of fauna overpasses, nest boxes and wildlife stencils.

The estimated condition profile indicates that the portfolio is generally (93%) in fair to very good condition. This is primarily due to the relatively young age of the assets within the portfolio. The condition assessments are currently only visual and a condition score is estimated. Inspections are timed around breeding cycles and provide an adequate level of detail for a level 1 inspection however further improvement is required to provide a more detailed condition appraisal on the assets. The action items and recommended condition inspection plan will address this issue.

Currently most of the maintenance work is carried out on a reactive basis. The long-term goal is to reduce this to less than 20% so that at least 80% of the maintenance activities are planned.

The long-term benefit of planned maintenance is that it can often be carried out more cost efficiently and it reduces risk to Council and the community.

The current levels of funding for asset maintenance, new/upgrade assets and renewals are:

- $25,000 per annum for fauna fencing materials.
- $75,000 operational budget through to FY2023 for wildlife stencilling repainting
- An average of $200,000 per annum capital budget for asset replacements
- An average of $1.1 million per annum capital budget for new/upgrade assets

A lifecycle assessment was carried out to determine the future capital cost requirements for maintaining the green infrastructure asset portfolio. The lifecycle model was extended out for a period of 50 years and the results are shown in the GIPAMP. The lifecycle analysis presented a strong case for slightly increasing the annual maintenance expenditure but maintaining the current average annual capital renewal funding for green infrastructure assets in the medium term. As part of development of this GIPAMP a maintenance and inspection plan, including both planned and reactive activities was also developed and costed in consultation with the Asset Maintenance Team.

Figure 4 summarises the results from the lifecycle modelling and the level of renewal capital expenditure projected to be required over the next 50 years. The long-term average funding required for renewal and replacement of green infrastructure assets is $561K per year, but the short-term average is much closer to the current $200K per annum spend, meaning funding allocations need to increase over the medium to long term horizon.

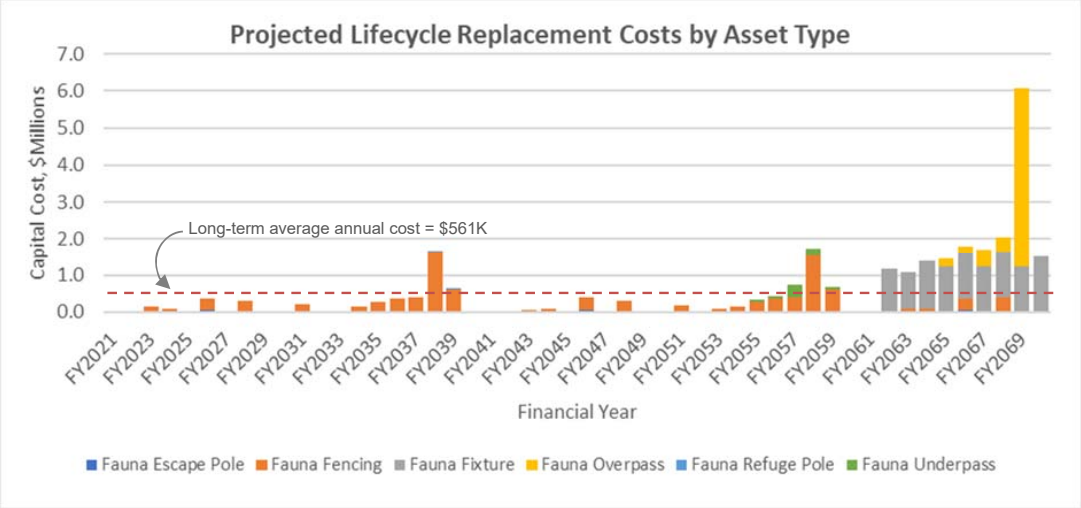

Figure 4 - Projected 50-year lifecycle replacement costs for Green Infrastructure (excludes non-financial assets)

To sustain the existing green infrastructure asset portfolio, and provide the expected community and technical levels of service described in this asset management plan, **the recommended budget allocations are outlined below**:

- **Retain the current budget of $25k per annum** for materials for green infrastructure maintenance
- **Extend the current operational budget of $75K beyond FY2023** to provide a continuous program for renewal and maintenance of wildlife stencils (road marking)
- **Allocate a new budget of $48K per annum** for inspection and maintenance of green infrastructure assets **from FY2023 onwards**
- **Allocate a new minor modifications budget of $50k per annum from FY2023 onwards**

- **Continue to invest in new Green Infrastructure** acquisitions as per the current program, and subsequent reviews, i.e**. $11.0M over the next 10 years**
- **Maintain** the current capital renewal budget (average of $200K per annum) **through to FY2054** and then **increase to $800K from FY2055 onwards (subject to future condition assessments)**

The minor modifications budget of $50k p.a. from FY2023 is recommended to assist where fauna have learned to navigate around the infrastructure. This may include additional section of fencing or exclusion infrastructure or where additional escape or refuge poles are required. With this emerging network we need reliable funding to make modifications to ensure the infrastructure functions for purpose. Sometimes these functional issues don't become apparent until the infrastructure has been installed for some time and are being used by fauna. This allocation of $50k p.a. from FY2023 will ensure the green infrastructure network continues to be fit for purpose and achieves its intended purpose.

Figure 5 and Tables 0.2 and 0.3 summarise the recommended budget requirements for the next 25 years including proposed new acquisitions which will make up a significant portion of the annual expenditure.

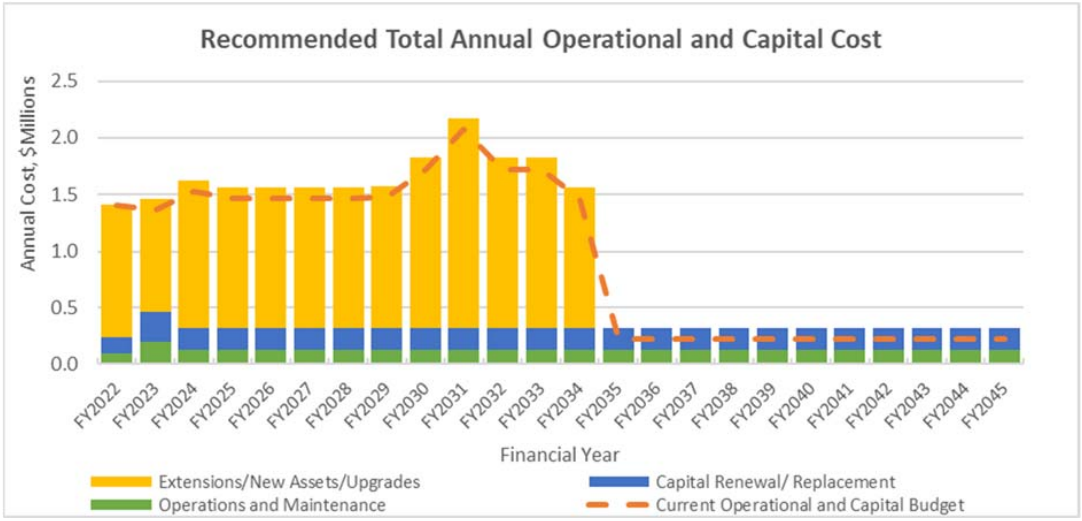

Figure 5 - Recommended total annual operational and capital budgets and comparison to current

Table 0.2 Recommended annual operational and capital budgets; FY2022-FY2033

Cost Type	Estimated Annual Cost, $000's											
	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030	FY2031	FY2032	FY2033
Maintenance	100	198	198	198	198	198	198	198	198	198	198	198
Extensions/New Assets/Upgrades	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100
Capital Renewal/ Replacement	200	200	200	200	200	200	200	200	200	200	200	200
TOTAL	1,400	1,498	1,498	1,498	1,498	1,498	1,498	1,498	1,498	1,498	1,498	1,498

Table 0.3 - Recommended annual operational and capital budgets; FY2034-FY2045

Cost Type	Estimated Annual Cost, $000's											
	FY2034	FY2035	FY2036	FY2037	FY2038	FY2039	FY2040	FY2041	FY2042	FY2043	FY2044	FY2045
Maintenance	198	198	198	198	198	198	198	198	198	198	198	198
Extensions/New Assets/Upgrades	1,100	0	0	0	0	0	0	0	0	0	0	0
Capital Renewal/ Replacement	200	200	200	200	200	200	200	200	200	200	200	200
TOTAL	1,498	398	398	398	398	398	398	398	398	398	398	398

The Green Infrastructure new/renewal/upgrade budget of $1.3 million p.a. will be reviewed from FY2035 to determine if new/upgrade portion is still required and the appropriate funding allocations. The renewal allocations of $200k p.a. is sufficient up to FY2055 where this should increase to $800k p.a.

Council has monitored the performance of select Green Infrastructure sites since 2016 and has observed a strong correlation between installation of green infrastructure and successful fauna crossing attempts. The below Table 0.4 is an excerpt from internal council analysis and shows on average an approximate 70% reduction in fauna collision events representing a very positive result.

Table 0.4 - Fauna Collision Reduction Data

Location	Date Completed	Roadkill Pre/Post	Koala Hit Pre/Post	Change	Change (%)
Old North Road, Warner (1)	August 2016	0 / 1M,1C	6 / 0	-4	-67%
Endeavour Boulevard, North Lakes	Feb 2018	1M / 0	1 / 0	-2	-100%
Discovery Drive, North Lakes	Feb 2018	2M,1T / 0	0 / 0	-3	-100%
Walkers Road, Morayfield	May 2018	1M,1P / 4M	2 / 0	0	=
Oakey Flat Road Morayfield (1) West	Apr 2018	1M / 1M	3 / 0	-3	-75%
Oakey Flat Road Morayfield (2) East	Apr 2018	1M / 1M	3 / 0	-3	-75%
Collins Road Everton Hills (1) East	May 2017	1P / 3M	1 / 1	+2	+100%
Collins Road, Everton Hills (2) West	May 2017	2M / 1M	1 / 0	-2	-67%
Kremzow Rd, Warner	Apr 2019	0 / 1P	12 / 0	-11	-92%

*Due to the close proximity of the Collins Road infrastructure one Koala hit was counted for both bridges
*Due to the close proximity of the Oakey Flat Road infrastructure, all hits were included for both
P = possum, M = macropod, C = canidae, T = brush turkey

As part of the justification for the increased maintenance spending and adjustments to the capital spend, an analysis was carried out to determine the future condition of the green infrastructure assets portfolio with the recommended budget and if the currently adopted budget were continued.

Figure 6 illustrates that with the currently adopted funding schedule the condition of the assets will decline to a point in time at around the year 2066 when the portfolio as a whole will fail to meet the required standard. The impact of this is likely to be poor quality remaining green infrastructure assets which will see the increase of vehicle collisions with fauna on roadways.

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With the recommended funding the overall portfolio is expected to continue to meet service levels and strategic objectives well into the future.

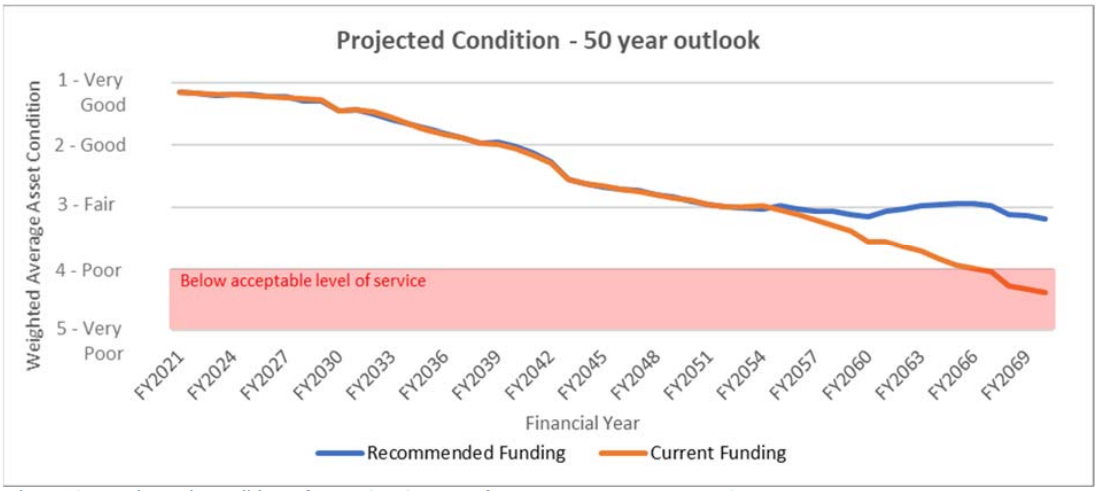

Figure 6 - Projected condition of MBRC's Green Infrastructure assets over 50 years

In Figure 7 below, the left heatmap illustrates that with the current funding level there will be a gradual increase in very poor condition assets to around FY2062 after which the number of assets in poor condition will rapidly increase.

Very poor condition (Condition 5) indicates that the asset has 0% to 6% remaining life and is used as the trigger for replacement. The right heatmap shows that with adequate funding the occurrence of very poor-quality assets will be a lot less prevalent. There will still be some assets that reach a very poor condition and often these are low value and low risk components whereby run to fail is the most economic option.

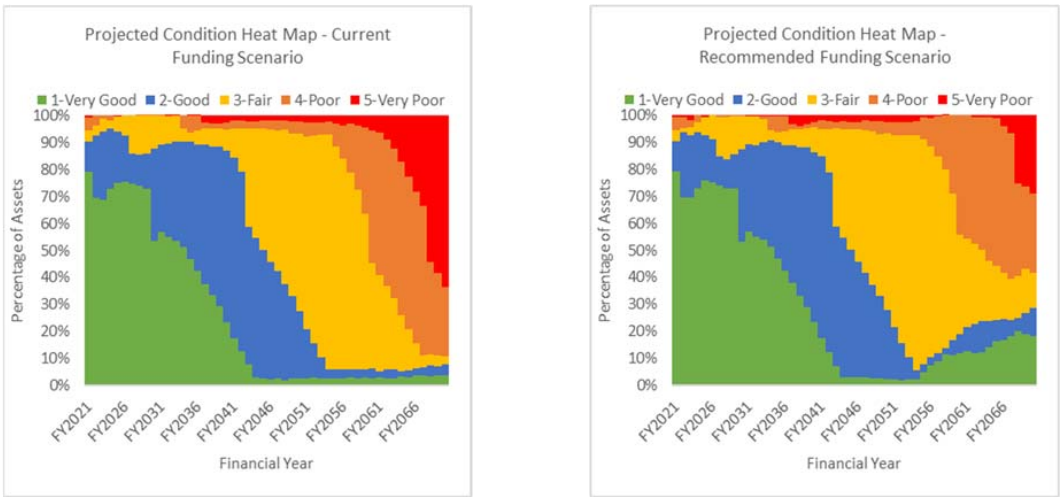

Figure 7 - Heatmaps for projected condition with current and recommended funding

The sustaining principles behind the recommended budgets are also illustrated through the following financial sustainability indicators:

- Asset sustainability ratio
- Asset consumption ratio

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Figure 8 shows the asset sustainability ratio which measures renewal and replacement capital expenditure against depreciation of the asset. The intent is for capital investment to offset depreciation to maintain the value of the portfolio, and inherently demonstrate maintaining the portfolio itself. While not particularly relevant for new asset portfolios whereby minimal capital expenditure is required early in the life of the asset, it demonstrates that the recommended funding will rapidly lead towards achieving long term sustainability.

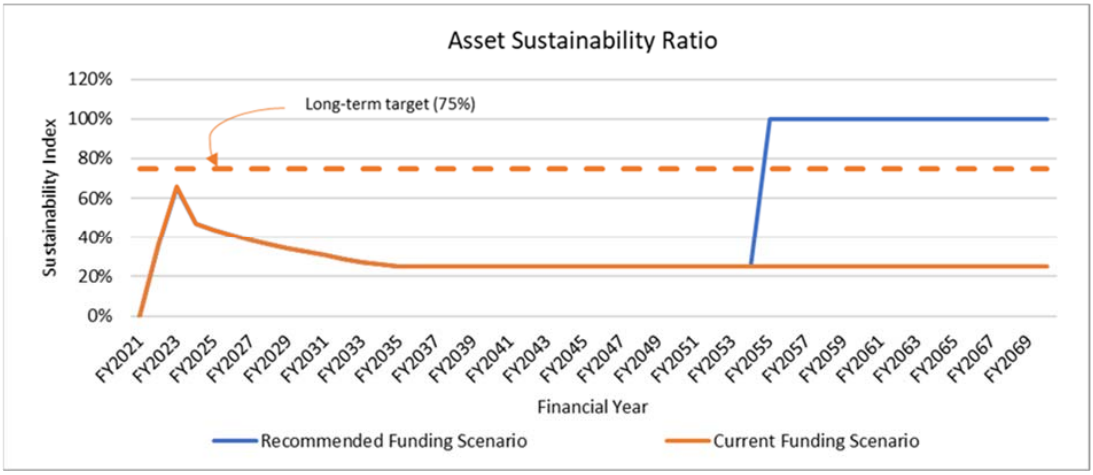

Figure 8 - Projected sustainability ratio based on current and recommended funding scenarios

The Asset Consumption Ratio is the net (depreciated) value of the infrastructure assets divided by their gross current replacement cost as illustrated in Figure 9. Council's desired range is an ACR value of between 40% to 80%. The ACR drops below 40% due to the age distribution and several high value assets nearing replacement age at a similar time. Beyond the 50-year period, and with the recommended increase in funding from FY2055 onwards, the ACR will return above 40%.

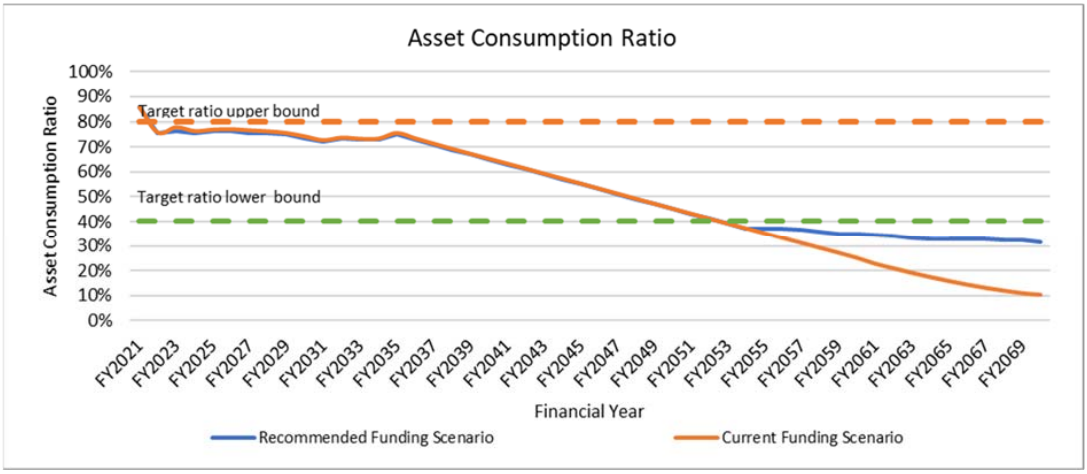

Figure 9 - Projected asset consumption ratio based on current and recommended funding scenarios

Key Issues

- Keeping the Moreton Bay Region's multiple natural green space areas connected and keeping the frequency of vehicle and wildlife accidents to a minimum relies on maintaining operability and functionality of the green infrastructure systems. Many of these systems

require a consistent level of routine and programmed maintenance to ensure the assets are fit for purpose to function as intended.

- The current renewals budget is considered to be sufficient through to FY2054, but beyond that will need to be increased to account for the ageing asset base and several high value assets needing replacement around a similar time.
- Maintenance budgets will need to be increased to account for the increasing extent of the asset portfolio. If budget allocations are not adjusted, there is an increased risk that the green infrastructure assets will not function as intended. This may result in substandard services being provided by the assets and increase in frequency of vehicle and wildlife collisions.
- The asset portfolio is relatively new, but there is need to continue to increase knowledge of the asset and its performance through systematic collection of condition data and analysis of customer services requests and performance data. Several action items have been identified to achieve improvements in these areas including an investigation into how artificial intelligence and smart systems can be utilised to improve asset knowledge and business intelligence.
- As a set of future improvements;
    - ensure that green infrastructure design guidelines for new developments result in sustainable design solutions that are acceptable to Council.
    - Consider extreme weather events and climate change effects on the network
    - Install monitoring equipment on assets and record on asset register
    - Install permanent LED awareness signage and record on asset register

As per Council's strategic asset management framework, it is imperative that Council adopts a more proactive approach to managing green infrastructure assets including planned preventative and routine maintenance.

The recommended funding adjustments, both for capital renewal/replacement and routine and planned maintenance, will allow Council to achieve its strategic asset management objectives including:

- Organizational commitment to effective asset management
- Managing risk appropriately
- Delivery of services to agreed standards
- Optimise asset performance
- Minimize asset failure through earlier intervention

Once further engineering inspections are performed, any major revisions to the renewal and maintenance budget for green infrastructure assets will be presented to Council for further consideration.

1 Purpose

The purpose of the Green Infrastructure Portfolio Asset Management Plan (GIPAMP) is to outline MBRC's approach to the management of green infrastructure assets. In accordance with MBRC's Infrastructure Asset Management Policy[1] and Strategic Asset Management Plan, the GIPAMP serves to:

- Demonstrate organisational commitment to responsible, effective and sustainable management of the assets.
- Demonstrate informed decision making and management of risk.
- Communicate and justify funding requirements
- Document service standards
- Ensure compliance with regulatory requirements
- Demonstrate continuous review and improvement of asset management processes, systems, data and technology
- Provide a high level of assurance to executive management, Councillors and the community regarding MBRC's asset management systems, processes, practices and outcomes.

This GIPAMP will be reviewed and updated on a biennial basis. MBRC's approach to asset management has been aligned to the ISO 55000 series of standards for infrastructure asset management, as outlined in Council's Strategic Asset Management Plan (SAMP).

This Asset Management Plan is to be read in conjunction with the MBRC planning documents. This should include the Asset Management Policy and Asset Management Strategy and other key planning documents including:

- Green Infrastructure Network Integration Report 2015/16 (5501116)
- Green Infrastructure Network Integration - Network Analysis 2017/18 (15326520)
- Technical Specification for Wildlife Sensitive Outdoor Lighting 2018 (18480873)
- MBRC Fauna Crossing Infrastructure Maintenance Guide 2018(17517825)
- MBRC Standard Construction Estimate Schedule - Fauna Movement Infrastructure
- MBRC Standard Drawings - Green Infrastructure (MBRC Corporate Website)
- MBRC Green Infrastructure Policy 2012 – 2031

The infrastructure assets covered by this Asset Management Plan include fauna fences, fauna fixtures, escape and refuge poles, crossing ropes, crossing underpasses, nest boxes and wildlife stencils. Green infrastructure assets are located across the region typically adjacent to major roadways that run between multiple natural green space areas. Excluded from this GIPAMP are the green network spaces the assets are typically located in. For a detailed summary of the assets covered in this GIPAMP refer to Section 2.1.

The primary function of green infrastructure assets are to provide safe and ongoing movement opportunities for wildlife and to improve road safety for all road users.

[1] Policy No.: 2150-043

2 Asset Information

This GIPAMP outlines MBRC's approach to the management of green infrastructure assets located throughout the MBRC region.

2.1 Asset Types & Hierarchy

Green infrastructure assets are provided in conjunction with other assets used in the development of land to collectively manage the native fauna throughout the Moreton Bay Region.

The primary function of green infrastructure assets is to protect and allow native fauna to co-exist within the changing landscape of the built environment. The various green infrastructure assets used allow transfer of fauna over or under busy roads. It also allows for a temporary pause in their travel by the use of fauna poles (and/or escape poles) as well as creating a new home and or refuge from predators within the nest boxes.

Table 2.1 summarises MBRC's green infrastructure assets and the narrative below it provides a detailed description of each asset type.

Table 2.1 - Green Infrastructure Asset Types

Asset Type	Description/sub-types	Qty	Expected Useful life (Years)	Current Age Range (Years)	Current Replacement Cost
Financial Assets					
Fauna Escape Poles	Fauna escape poles are provided along fauna fences, which allow any wildlife trapped within the road corridor to escape while ensuring that wildlife within bushland cannot enter the roadway	185	20	0-14	$102K
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Subtotal for Financial Assets		***345***	***-***	***-***	***$11.3M***

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Non-financial assets					
Nest Boxes	A nest box is an enclosure built especially for animals to nest, roost or shelter in.	55	20	0-21	$11K
Wildlife-Stencils	Road marking to alert drivers that the area is frequented by specific type of fauna.	57	5	0-3	$342K
Subtotal for Non-Financial Assets		***112***	***-***	***-***	***$353K***
Total (financial + non-financial assets)		**457**	**-**	**-**	**$11.7M**

The Manager Integrated Transport Planning is the nominated asset owner for green infrastructure assets and is responsible for making strategic decisions in the key stages of asset management during the asset life cycle in relation to:

- Design
- Procurement (new assets)
- Operation
- Maintenance (including inspections and condition assessment)
- Renewal/Replacement
- Upgrades
- Decommissioning or disposal

The departments or positions that are responsible or accountable for other key roles associated with the custodianship, management, operation and maintenance of the green infrastructure assets are listed in Appendix A.

A brief description of the green infrastructure assets is as follows:

Fauna Fence – Fauna fences are designed to exclude wildlife from the road corridor. This is achieved by placing metal panels at the top of the fence to stop wildlife from climbing the fence and entering the road reserve.

Figure 10 - Fauna Fencing

Figure 11 - Fauna Fixture

Fauna Fixture - Is a general term relating to funds allocated by Council for future works for either refurbishing existing green infrastructure assets or providing new green infrastructure

Figure 13 - Fauna Nest Box

Refuge Pole – Refuge poles are supplied within the open spaces which help the wildlife by providing refuge from predators. It also allows for a temporary pause in their travel.

Fauna Escape Pole - Fauna escape poles are provided along fauna fences, which allow any wildlife trapped within the road corridor to escape while ensuring that wildlife within bushland cannot enter the roadway

Figure 12 - Fauna Escape Pole

Fauna Nest Box - A fauna nest box is an enclosure built especially for animals to nest, roost or shelter in. It imitates natural hollows and provides wildlife with a comfortable and safe place to rest in and raise their young. If a tree with roosting/nesting opportunities has been removed it is important to replace it with a nest box or similar structure in a nearby suitable tree.

Figure 14 - Refuge Pole

Figure 15 - Fauna Crossing Rope

Fauna Crossing Rope – Fauna crossing ropes or fauna overpasses are used to provide passage for wildlife above the road and typically include land bridges and rope bridges. Rope bridges are designed to provide safe passage for wildlife that travel through the tree canopy such as possums and gliders.

Fauna Crossing Underpass – The fundamental aim of fauna underpasses is to allow native animals unrestricted access to habitat that has been fragmented by the construction of a road. Fauna underpasses provide passage for wildlife below that road and can include culverts, purpose built for fauna or stormwater drainage, tunnels, or a passage below bridges. Fauna infrastructure associated with underpasses includes post and rail and fauna shelves incorporated within the underpass culverts. Fauna underpasses provide safe passage for a range of wildlife including koalas, possums, kangaroos, wallabies, bandicoots, reptiles, turtles and other small native mammals and rodents.

Figure 16 - Fauna Crossing Underpass

Figure 17 - Wildlife Stencil

Wildlife Stencil - Road marking to alert drivers that the area is frequented by specific type of fauna including koalas, possums, kangaroos, wallabies and other animals.

AI-GI1	Review the list of assets known to green infrastructure and identify missing assets within financial and asset register (including permanent LED signage and wildlife monitoring equipment)

2.2 Asset Prioritisation

Green infrastructure assets complement other infrastructure assets through integration. Environmental impacts can be reduced or reversed by incorporating green infrastructure assets at design stage. Prioritisation of green infrastructure assets has not yet been completed and further investigation is required to develop a prioritisation methodology and framework for assessment.

AI-GI2	Establish a capital renewal prioritisation framework based on risk and condition matrix (SAM modelling in TechOne)

2.3 Asset Relationships

Although green infrastructure assets are predominantly stand-alone, they are usually incorporated with other assets such as roads by providing overhead passage to fauna and underground passage through stormwater drainage culverts, which may or may not have dual purpose i.e. for conveyance of stormwater runoff and fauna crossing

2.4 Asset Attributes

Asset attributes provide unique information regarding the characteristics and status of an asset type. Although green infrastructure asset capture has been undertaken, asset attribute classification has not yet been completed and further investigation is required to develop a framework for assessment. Asset attribute details are listed for green infrastructure assets in Appendix B

AI-GI3	Review green infrastructure asset attributes with stakeholders and update the asset management system
AI-GI4	Implement a process for automating the collection of attributes for new green infrastructure assets
AI-GI5	Capture missing asset attributes on all green infrastructure assets in TOMAS

3 Levels of Service

Appendix B for Council's Strategic Asset Management Plan provides definitions for Council's corporate visions, strategic priorities and associated service levels. It also provides definitions of community and technical levels of service.

The following subsections summarise the community and technical levels of services for the green infrastructure asset portfolio, including current and expected long term performance.

Customer Service Request (CSR) data is used to help assist in planning upgrades and improvements to the services provided by green infrastructure assets. There is opportunity for further analysis of CSR data and it is proposed that this is completed to inform the next iteration of the GIPAMP

Figure 18 shows the estimated yearly roadkill based on CSRs for roadkill removal for the period 2009 to 2019. The number or roadkill CSRs increased significantly between 2016 and 2019. There are many factors that may have led to increased roadkill reporting, including:

- Land development
- Climate seasonal changes (eg fauna foraging for food and water during drought)

- Increased community education and awareness of reporting roadkill and accessibility of tools/methods to report it
- Proximity of roadkill to dwellings

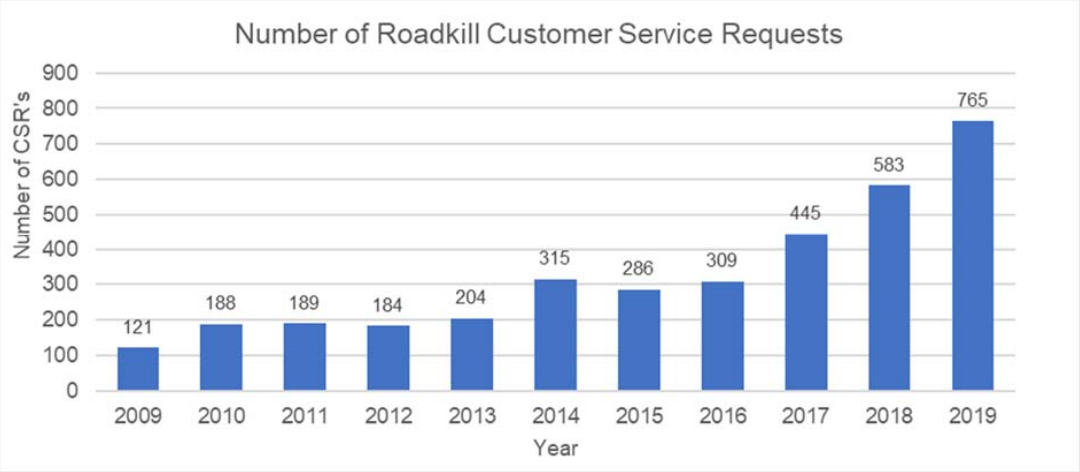


Figure 18 - Roadkill customer service requests

AI-GI6	Undertake further detailed analysis of customer service request (CSR) data to help assist in planning upgrades and improvements to the services provided by green infrastructure assets.

3.1 Community Levels of Service

The Customer Levels of Service are considered in terms of:

Quality How good is the service and what is the condition or quality of the service?

Function Is it suitable for its intended purpose, is it the right service?

Capacity/Use Is the service over or under used, do we need more or less of these assets?

At present there is no research on customer expectations for green infrastructure as a service. This aspect will be investigated for future updates of the GIPAMP on both relevance and capacity to initiate customer research for this asset portfolio.

Table 3.1- Community Levels of Service

Service attribute	Service objective	Performance measure process	Current performance	Expected Performance in 10 years (LTFF)
Quality	Green infrastructure assets are safe and do not pose risk to road users	Percentage of very poor condition assets	Low based on current age profile of assets	Gradual increase over time as assets deteriorate at end of useful life
Function	Green infrastructure assets appropriate for task and location	Percentage of green infrastructure assets being used by fauna for intended purpose	Approximately 90% based on sample set of assets	Increase to close to 100% as wildlife identifies these connection points or MBRC relocates ineffective assets

Service attribute	Service objective	Performance measure process	Current performance	Expected Performance in 10 years (LTFF)
Capacity/ Utilisation	Assets designs cater for site specific fauna requirements	Green infrastructure monitoring program to confirm the reduction of animal-vehicle collisions whilst allowing fauna access across fragmented habitat	Varies dependant on road type. Evaluation of current monitoring data suggests that animal-vehicle collisions are decreasing in areas where fauna crossings have been installed.	No expected decrease in capacity utilisation

AI-GI7	Record and analyse all monitoring observations to allow for evaluation of asset performance and determination of the adequacy or otherwise of the assets relative to the fauna species for which they are intended.

3.2 Technical Levels of Service

Technical Levels of Service measures relate to the activities and allocation of resources to best achieve the desired customer outcomes and demonstrate effective performance.

Technical service measures are linked to the activities and annual budgets covering:

- **Condition Assessment** – The inspections required to assess and record the condition of the asset and if any defects exist
- **Safety** – The way regular activities are conducted to provide services in a safe manner
- **Maintenance** – The activities necessary to retain an asset as near as practicable to an appropriate service condition. Maintenance activities enable an asset to provide service for its planned life.
- **Replacement** – The activities that return the service capability of an asset to that which it had been originally provided.

Table 3.2- Technical Levels of Service

Service attribute	Service objective	Activity measure process	Current Performance	Recommended optimum position	Agreed sustainable position
Condition Assessment	Scheduled inspections are performed to identify defects and assess asset condition	Number of Level 1 inspections (Visual only) conducted according to the specified frequency	Performed on an ad-hoc basis depending on resources present at time of inspection **No current budget allocation**	Inspections performed according to time frames as specified in Table 5.1 **$37.4K per annum (included as part of new maintenance budget below)**	Inspections performed according to time frames as specified in Table 5.1 **$37.4K per annum (included as part of new maintenance budget below)**

Green Infrastructure Portfolio Asset Management Plan

Service attribute	Service objective	Activity measure process	Current Performance	Recommended optimum position	Agreed sustainable position
Safety	Ensure safe and suitable work procedures	Incident reports	Zero recorded work-related injuries	Zero recorded work-related injuries	Zero recorded work-related injuries
Maintenance	Assets are proactively maintained to reduce the likelihood of defects and failures occurring	Percentage of medium or higher severity defects rectified within set timeframe after identification	Ad hoc – actioned work depending on resources present at time of inspection	Maintenance work performed according to time frames as specified in Table 5.5.2	Maintenance work performed according to time frames as specified in Table 5.5.2
	Implement programmed works for periodic maintenance activities in line with requirements as outlined in Table 5.5.2	Percentage of key components replaced over determined replacement frequency	Ad hoc – actioned work depending on resources present at time of inspection **$25K per annum for materials.** **Labour and plant costs are not separately budgeted or tracked.** **$75K for wildlife stencilling to FY2023 only**	Maintenance work performed according to time frames as specified in Table 5.5.2 **$25K per annum for materials.** **New budget of $98K per annum for inspection, maintenance and minor modifications.** **$75K per annum (ongoing) for wildlife stencilling**	Maintenance work performed according to time frames as specified in Table 5.5.2 **$25K per annum for materials.** **New budget of $98K per annum for inspection, maintenance and minor modifications.** **$75K per annum (ongoing) for wildlife stencilling**
Replacement	Maintain safe and functional Green Infrastructure Assets	Number of assets classed as Condition 5 based on Level 2 Inspections	Reactive with only assets of Condition 5 being renewed or replaced. Current model is run to failure **Average renewal budget of $200K per annum.**	Identify and plan renewal of Condition 4 assets before reaching deterioration level, i.e. Condition 5 **$200K per annum through to FY2054 then increase to $800K from FY2055 onwards.**	Identify and plan renewal of Condition 4 assets before reaching deterioration level, i.e. Condition 5 **$200K per annum through to FY2054 then increase to $800K from FY2055 onwards.**

AI-GI8	Develop star rating criteria and assign to all assets to assist with prioritisation of inspection, maintenance and renewal of assets.

4 Future Demand

Moreton Bay Region is one of Australia's fastest growing regions. Its regional population is forecast to grow by a further 50% to approximately 690,000[2] by 2041. That means an additional 240,000 residents over the next 25 years. In accordance with the State Government's South East Queensland Regional Plan 2017, Moreton Bay Region is also expected to deliver an additional 88,300 dwellings by this time.

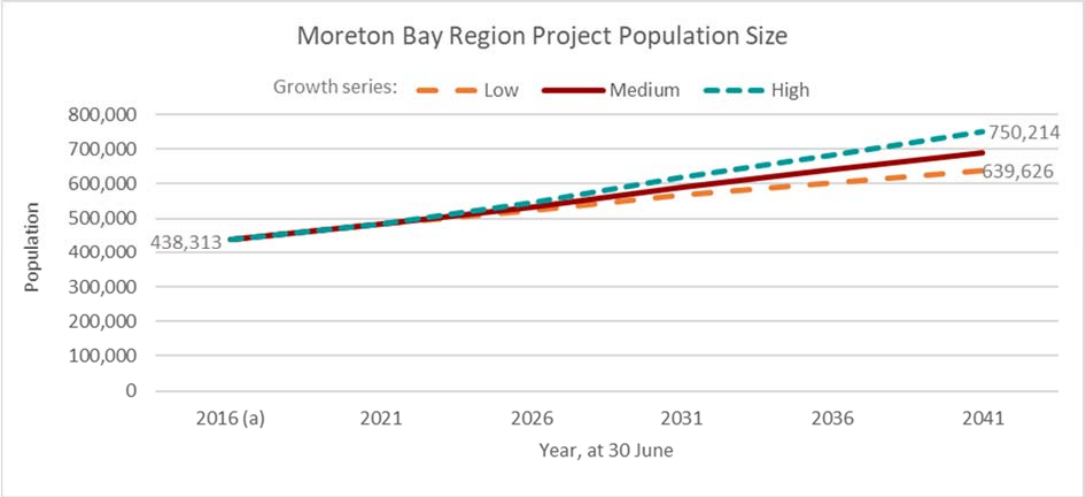


Figure 19 - Moreton Bay Region projected population growth (Source: Queensland Government)

Growth in population and expansion of the urban footprint is likely to lead to more vehicle movements in fauna populated areas and increased potential for fauna-vehicle collision.

Figure 18 in Section 3 illustrates the growth in roadkill reports between 2009 and 2019. Roadkill reporting has continuously increased over that period at a rate much faster than population growth, indicating that regional growth is likely to be only one of many factors influencing the increase in fauna-vehicle collisions and driving demand for new green infrastructure assets.

4.1 Demand Management

Demand for new services will be managed through a combination of managing existing assets, upgrading of existing and providing new assets to meet demand and management of this demand. Opportunities identified to date for demand management are shown in Table 4.1.

Table 4.1 - Demand Management Plan

Demand driver	Current position	Projection	Impact on services	Demand Management Plan
Population growth/density – Daily kilometres travelled	459,585 as of 2018	690,000 by 2041	Increase in demand for green infrastructure as risk of vehicle crashes increases	Identify high risk areas in consultation with planning scheme and include appropriate infrastructure as part of the Green Infrastructure Network (GIN) plan.

[2] Medium growth series

Demand driver	Current position	Projection	Impact on services	Demand Management Plan
Number of high order high speed roads intersecting green network	10 High order high speed roads identified as requiring crossings	20 Based off planned new infrastructure build	Increase in demand for Fauna crossings as Green Network gets fragmented	Identify high risk areas in consultation with planning scheme and include appropriate infrastructure as part of the Green Infrastructure Network (GIN) plan.

AI-GI9	Review CSR data to identify hotspots in the network which may require new infrastructure

4.2 Asset Programs to meet Demand

The new assets required to meet demand may be acquired, donated or constructed. Proposed new and upgrade assets, reflecting projects currently scheduled in the ePID system, are listed in Appendix H.

The projects have been primarily identified through internal and external reviews of the Green Infrastructure Network (GIN) and identified deficiencies in the network. They have also been identified through observation of a high numbers of fauna-vehicle collisions.

The Green Infrastructure Network Integration - Network Analysis 2017/2018 report prepared by AECM supports this concept and states: "*A key principle of the Strategy is to build a strong connection between the natural, semi-natural and engineered green infrastructure to ensure linkages and networks across the Moreton Bay Region.*

MBRC's Green Infrastructure Network Delivery Program implements the Strategy by delivering wildlife crossing infrastructure such as roadside (wildlife exclusion) fencing, wildlife underpasses, rope bridges, animal refuge poles and habitat enhancement around these capital investments. This infrastructure is an important element of the Network, as it allows better movement of wildlife across the region and helps prevent wildlife-vehicle collisions."

5 Asset Lifecycle Management

5.1 Asset Capacity & Performance

Green infrastructure assets are provided in areas where there are known and frequent interactions between vehicles and fauna. These assets provide safe passage through wildlife corridors that intersect Council transport networks. Green infrastructure assets are generally provided to meet community needs and expectations and are erected/constructed to Council standards.

Council has monitored the performance of select Green Infrastructure sites since 2016 and has observed a strong correlation between installation of green infrastructure and successful fauna crossing attempts. Table 5.1 below is an excerpt from internal council analysis and shows on average an approximate 70% reduction in fauna collision events.

Table 5.1 - Fauna Collision Reduction Data

Location	Date Completed	Roadkill Pre/Post	Koala Hit Pre/Post	Change	Change (%)
Old North Road, Warner (1)	August 2016	0 / 1M,1C	6 / 0	-4	-67%
Endeavour Boulevard, North Lakes	Feb 2018	1M / 0	1 / 0	-2	-100%
Discovery Drive, North Lakes	Feb 2018	2M,1T / 0	0 / 0	-3	-100%
Walkers Road, Morayfield	May 2018	1M,1P / 4M	2 / 0	0	=
Oakey Flat Road Morayfield (1) West	Apr 2018	1M / 1M	3 / 0	-3	-75%
Oakey Flat Road Morayfield (2) East	Apr 2018	1M / 1M	3 / 0	-3	-75%
Collins Road Everton Hills (1) East	May 2017	1P / 3M	1 / 1	+2	+100%
Collins Road, Everton Hills (2) West	May 2017	2M / 1M	1 / 0	-2	-67%
Kremzow Rd, Warner	Apr 2019	0 / 1P	12 / 0	-11	-92%

*Due to the close proximity of the Collins Road infrastructure one Koala hit was counted for both bridges
*Due to the close proximity of the Oakey Flat Road infrastructure, all hits were included for both
P = possum, M = macropod, C = canidae, T = brush turkey

AI-GI10	Implement a formalised process to analyse current green infrastructure asset performance measurement practices and capture performance data

5.2 Condition & Profile

Moreton Bay Regional Council's approach to assessing the condition of its green infrastructure assets would align to the 1 to 5 grading scale used for other asset classes and is described in the summary table below.

Table 5.2 – Condition rating scale summary

Condition Score	Subjective rating	Notional Remaining Useful Life*	Description
1	**Very Good** ('as new')	90% - 100%	Free of defects with little or no deterioration evident. Only planned maintenance required.
2	**Good**	56% - 90%	Free of defects affecting structural performance, integrity and durability. Deterioration of a minor nature and only minor maintenance required plus planned maintenance.
3	**Fair**	25% - 56%	Moderate to significant deterioration. Developed defects are present but do not affect short term / medium term structural integrity. Moderate maintenance required.
4	**Poor**	6% - 25%	Significant deterioration and defects. Moderate maintenance is required. Rehabilitate / renew in the short term and flag for future part / full replacement.

5	**Very Poor**	0% - 6%	Failed or failure imminent. The asset is unserviceable and may be hazardous. Major work / replacement required

* Remaining life is expressed as a percentage of the total expected useful life.

Ninety percent of green infrastructure asset portfolio 5 years old or less, and therefore the majority of assets are relatively new and have not needed to be subjected to a routine program of inspection at this point in time. As such, there is limited condition data recorded and the asset condition profile has been estimated based on age. Council does currently undertake Level 1 inspections which monitor asset condition however a more formalised approach to recording the condition needs to be implemented.

Ideally, now that the asset portfolio is starting to age, condition assessments should be carried out preferably annually, but not later than once every 5 years as recommended by Department of Transport and Main Roads, Queensland – Technical Document: Fauna Sensitive Road Design Manual, Volume 2: Preferred Practices. The recommended inspection plan in Section 5.2.2 aims to achieve a regular scheduled inspection regime to inform subsequent revisions of the GIPAMP.

The age-based condition profile for green infrastructure assets is presented in Figure 20. It shows that 69% of the assets are likely to be in good to very good condition and 23% in fair condition, but 7% are expected to be in poor condition.

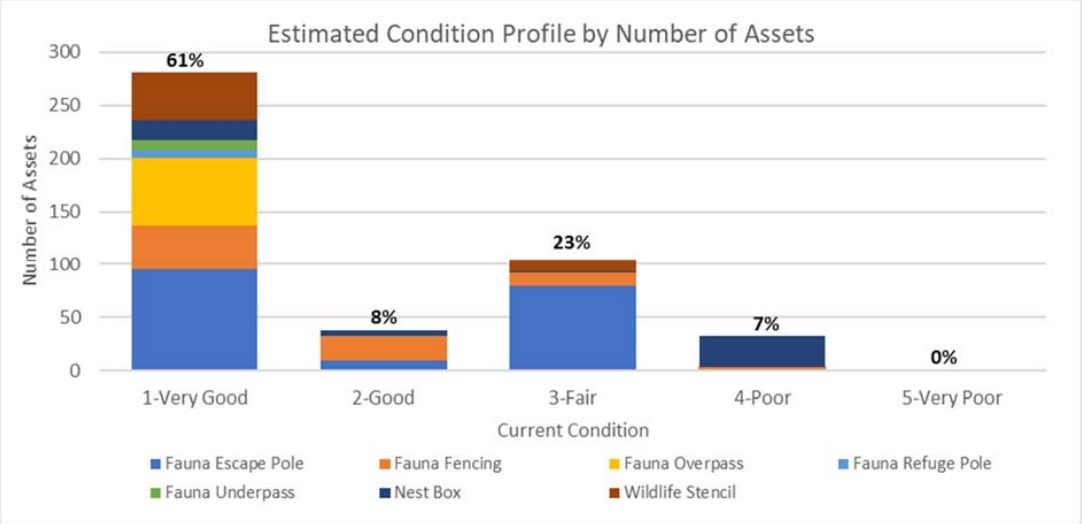


Figure 20 - Estimated condition profile

5.2.1 Current Condition Inspection Plan

The Asset Maintenance team currently undertakes Level 1 inspections in accordance with the schedule below:

- Fauna Fences
  - Structural - Scheduled to be inspected on a quarterly basis
  - Vegetation impacting performance of the fence - Inspected on a quarterly basis
- Fauna Crossing Ropes - Scheduled to be inspected by the manufacturer on a 3 yearly basis only
- Fauna Crossing Underpasses - Inspections conducted as part of road furniture
- Wildlife Stencil - Inspections conducted as part of road furniture

Fauna escape poles, refuge poles and nest boxes are not programmed for inspection on a scheduled basis

5.2.2 Recommended Condition Inspection Plan

Development and implementation of a condition inspection plan for green infrastructure assets is recommended based on the condition inspection process as outlined in Table 5.2. The condition inspection plan will ensure condition data is systematically captured and documented for all green infrastructure assets.

Table 5.2 - Recommended Condition Inspection Plan

Asset Type	Inspection type	Frequency	Resource
Fauna Fences (Structural & Vegetation)	**Level 1 Inspection (Structural)** Visual inspection & defect identification/ monitoring	Quarterly – and following flood and bush fire events	Internal – Managed by AM Maintenance
	Level 1 Inspection (Vegetation) Visual inspection & defect identification/ monitoring	Monthly and as part of vegetation plan and following flood and bush fire events	Internal – Managed by AM Maintenance
	Level 2 Inspection (Structural) AM Maintenance inspection & condition assessment	Yearly but not longer than 5 years or where triggered from level 1 inspection.	Internal – Managed by AM Maintenance
Fauna Escape Poles	**Level 1 Inspection** Visual inspection & defect identification/monitoring as per TMR SIM Manual for all poles	Annually and following bushfire or severe storm events	Internal – Managed by AM
	Level 2 Inspection AM Maintenance inspection & condition assessment as per TMR SIM Manual for poles adjacent to roads	Every 5 years or more frequently if determined necessary following inspection	External by timber specialist – Managed by AM
Fauna Refuge Poles	**Level 1 Inspection** Visual inspection & defect identification/monitoring as per TMR SIM Manual for all poles	Annually and following bushfire or severe storm events	Internal – Managed by AM
	Level 2 Inspection AM Maintenance inspection & condition assessment as per TMR SIM Manual for poles adjacent to roads	Every 5 years or more frequently if determined necessary following inspection	External by timber specialist – Managed by AM
Fauna Nest Boxes	**Level 1 Inspection** Visual inspection & defect identification	Reactive to customer service requests or automatically following bushfire or severe storm events	Internal – Managed by AM
Fauna Crossing Ropes	**Level 1 Inspection** Visual inspection & defect identification/monitoring as per TMR SIM Manual	Annually and following bushfire or severe storm events	Internal – Managed by AM
	Level 2 Inspection Manufacturer inspection & condition assessment as per TMR SIM Manual	Every 3 years or more frequently if determined necessary following inspection	External by Manufacturer – Managed by AM
Fauna Crossing Underpasses	**Level 1 Inspection** Visual inspection & defect identification/monitoring as per TMR SIM Manual	Annually and following bushfire or severe storm events	Internal – Managed by AM
	Level 2 Inspection	No longer than 5 years or where triggered from level 1 inspection.	Internal – Managed by AM

Asset Type	Inspection type	Frequency	Resource
	AM Maintenance inspection & condition assessment as per other concrete culverts		
Wildlife Stencil (*)	**Level 1 Inspection** Visual inspection & defect identification/monitoring as per TMR road marking manual	Weekly using AI and cameras mounted in vehicles. (See note *)	Internal – Managed by AM and the Innovation Team

(*) Note currently AI software incorporated in cameras mounted on garbage trucks is monitoring discolouration, imperfections in pavement and signage damage. This process is at a very early stage and will look at incorporating in future updating of the Asset Management Plan

AI-GI11	Develop a condition assessment framework for green infrastructure portfolio
AI-GI12	Implement recommended the condition inspection plan for all green infrastructure assets and load schedules into TOMAS

5.3 Defect Management

5.3.1 Current Defect Management Plan

Current process for Defect Management is captured on the work order system in TOMAS (Council's Asset Management System – based on Technology One Platform). This involves Customer Service Requests (CSRs) and targeted inspections and the resultant defect from this process will be looked at based on the severity and available resources as to when this defect will be attended to.

Defects are used to record identified issues that do not represent an immediate safety or operational risk to MBRC and are continually monitored throughout asset inspections. Defects are currently managed and prioritised according to risk.

Defect types currently recorded for green infrastructure assets and recommended repairs are presented in Table 5.3.

Table 5.3 - Current/Recommended Repair Defect Types

Asset Type	Defect Type	Description/Recommendations
Fauna Fences	Chain wires and metal ties	Fix/Replace sections of chain wire that are damaged or loose. Check after flood events and bushfires
	Metal Sheeting	Repair/Replace damaged or loose metal sheeting panels. Check after flood events and bushfires
	Steel Fence Posts	Fix/Replace when damage/corrosion threatens integrity of poles
	Fence panels	Fix/Replace where fence panel has been breached or is in a dilapidated state
	Pedestrian access gates and locks	Repair/Replace any damaged or faulty access gates and/or replace any missing or faulty locks where locks are required
	Debris	Remove any debris that has built up on the fence following flood events.
	Concrete Edging	Repair damage to concrete edging if it effects the integrity of the fence
	Vegetation	Remove any vegetation growing on or within 1m of the fence
	Graffiti	Paint over any graffiti on panels with black or green paint as appropriate (use non-toxic paint)
Fauna Escape Poles	Timber Posts	An inspection of poles and are to be graded as per Section 5.1.1 of the Asset Management Lighting Visual Inspection Standard. Raise a defect for any poles rated Grade 3 or 4 (for timber or foundations) from a detailed inspection,

Asset Type	Defect Type	Description/Recommendations
		including inspection by a timber specialist for advice and recommended action to rectify the issue
	Escape Poles	Replace/Remove damaged or missing metal sheeting around pole to ensure the pole is effective in preventing animals from getting over the fence and into the road corridor
Refuge Poles	Timber Posts	An inspection of poles and are to be graded as per Section 5.1.1 of the Asset Management Lighting Visual Inspection Standard. Raise a defect for any poles rated Grade 3 or 4 (for timber or foundations) from a detailed inspection, including inspection by a timber specialist for advice and recommended action to rectify the issue
Fauna Nest Boxes	Tree Health	Depending on how the box is attached a check on the health of the tree is to be conducted and re-erected elsewhere should the tree be showing signs of distress
	Gaps in Box	The Box should be securely sealed. Should gaps start to appear, they may be resealed using a non-toxic PVA glue
	Floor Integrity	The integrity of the floor of the box should be checked and if it is sagging, it may require replacement or bracing
	Graffiti	Remove graffiti with non-toxic solutions
Fauna Crossing Ropes	Timber Poles	An inspection of poles and to be graded as per Section 5.1.1 of the Asset Management Lighting Visual Inspection Standard. Raise a defect for any poles rated Grade 3 or 4 (for timber or foundations) from a detailed inspection, including inspection by a timber specialist for advice and recommended action to rectify the issue
	Rope ladders/cages and lead in ropes	Rope cages/ladders must be kept at least 6.5m above the road surface. Re-tension if sagging and/or fix/replace ropes or rope ladders/cages in accordance with MBRC STD DWGS GI-0560, GI-0561, GI-0562 and GI-0563
	Stays, anchors and other metal components	Repair/replace stays, anchors and or other metal components that have serious corrosion or are otherwise damaged. A specialist contractor will be required to replace these components in accordance with MBRC STD DWGS GI-0560, GI-0561, GI-0562 and GI-0563
	Vegetation	Prune any vegetation growing on the rope ladder/cage. Any vegetation growing across the rope bridge surface may increase pressure on the bridge or increase the rate of decay of the rope
	Graffiti	Remove graffiti with non-toxic solutions
Fauna Crossing Underpasses	Concrete Culverts	Inspect/Maintain as for other concrete culverts
	Debris	Remove any debris caught on or around underpass infrastructure entrance/exit
	Timber Posts, Rails and Shelving	Fix/Replace timber posts, rails and shelving with serious structural issues
	Steel fixtures and Fittings	Fix/Replace if corrosion/damage is evident which will cause serious structural issues
	Graffiti	Remove graffiti with non-toxic solutions

5.3.2 Recommended Defect Management Plan

Defects should be managed through a risk-based approach centred on defect severity and asset priority. Defects that exceed a specified acceptable level of risk should be bundled into

work packages and actioned through programmed maintenance in addition to routine maintenance activities.

Development and implementation of a defect management plan is recommended that incorporates the Green Infrastructure asset defect types as shown in Table 5.3 and Appendix C.

AI-GI13	Future defects to be recorded on the Defect Management Process (DMP)

5.4 Risk Management

5.4.1 Critical Assets

Critical assets are defined as those which have a high consequence of failure causing significant loss or reduction in service. By identifying critical assets and failure modes Council can ensure that investigative activities, condition inspection programs, maintenance and capital expenditure plans are targeted at critical assets

Critical assets have been identified and along with their typical failure mode and the impact on service delivery, are summarised in Table 5.4. Failure modes may include physical failure, collapse or essential service interruption.

Table 5.4 - Critical Assets

Critical Asset(s)	Failure Mode	Impact
Fauna Rope Crossing	Collapse of rope or rope support onto the road corridor or sagging ropes.	Can create a significant hazard to motorists and other road users, as wells as loss of effectiveness against protecting fauna.
Fauna Fence	Fence damage “Floppy top” failure	Functionality failure no longer prevents entry to corridor
Timber poles	Rot or damage to base of poles	Creates unsafe and unstable structure
Fauna underpasses	Structural collapse within the roadway.	Can create a significant hazard to motorists and other road users as well as to fauna using the underpass.

5.4.2 Risk Management Plan

Risks for green infrastructure are assessed using Council’s Enterprise Risk Management (ERM) framework to identify and evaluate the risk, scoring the likelihood and consequence and the process to eliminate or mitigate the risk. The identified risks have highlighted matters that should be considered as part of an ongoing risk management process for green infrastructure assets.

Table 5.5 summaries the key risks for the green infrastructure asset portfolio.

Table 5.5 - Green Infrastructure Risk Management Plan

Risk Category and Type	Risk	Consequences	Existing control measures	Likelihood after control measures	Final Risk Rating
Strategic - Service Delivery	Extreme weather events	Significant damage to green infrastructure assets due to extreme weather events	Inspections occur after extreme weather events in addition to	Unlikely	Low

Risk Category and Type	Risk	Consequences	Existing control measures	Likelihood after control measures	Final Risk Rating
		including flooding and bush fire during drought	scheduled inspections		
Strategic - Service Delivery	Lack of comprehensive asset register information	Assets missing from the database or missing data resulting in green assets not being managed and maintained	Review and validation of existing asset register against internal staff knowledge	Unlikely	Low
Strategic - Service Delivery	Lack of asset star rating information	Inability to appropriately prioritise inspection, maintenance and replacement of green infrastructure assets	No defined prioritisation process	Possible	Medium
Strategic - Service Delivery	Failure to install green infrastructure in the most beneficial locations.	Assets don't provide a value outcome compared to if they were in a more beneficial location	Assessment is carried out of the fauna population, traffic and local need (eg number of road kills) to enable suitable locations to be identified and prioritised.	Unlikely	Low
Operational - Service Delivery	Asset deterioration due to age or lack of maintenance	Assets fail or are otherwise not fit for purpose and fail to meet their service objectives	Routine annual inspection and maintenance as well as responsiveness to CSRs.	Possible	Medium
Operational - Health and Safety	Collapse of over or underpasses or fencing and poles.	Potential for significant road hazard and danger to road users, fauna and persons within the vicinity at time of collapse.	Routine annual asset inspections and more comprehensive 3 yearly inspections for critical structural assets.	Unlikely	Low
Community - political/ reputation	Lack of popularity within the community	The positive side of green infrastructure may not be seen by all members of the community resulting in complaints or a lack of funding and support.	Continuing development of community education program	Possible	Medium

As there has been more severe rainfall events in recent times this has the consequence of flooding large tracts of land which in turn may be detrimental to the fauna and the green infrastructure assets in the area. Also as there have been a large number of days of higher than usual temperatures this has led to severe bush fires which also are highly detrimental to fauna in the area and resulting in loss to habitat and green infrastructure assets, typically nest boxes and fauna poles (both refuge and escape poles).

As a minimum, consideration should be given to both how to manage the existing assets due to potential climate change and create resilience in any new works or acquisitions.

AI-GI14	Future green infrastructure to be provided are to be resilient against bushfires, climate change and extreme rain events

5.5 Maintenance Plan

Maintenance includes all actions necessary for retaining an asset as near as practicable to an appropriate service condition including regular ongoing day-to-day work necessary to keep assets operating. Examples of typical maintenance include clearing of debris from an underpass culvert after a significant storm event and re-erecting of a nest box after it has been dislodged from its position by significant winds from a storm.

Maintenance is performed under two categories:

- **Planned Maintenance** - Maintenance that is planned to occur based on asset type and priority with the purpose of maintaining ongoing serviceability and extending service life. Planned maintenance involves both routine maintenance activities that are performed on regular schedules and programmed maintenance activities including the actioning of defects in a cost-effective and efficient manner.
- **Reactive Maintenance** - Maintenance carried out to restore partial asset failures and is typically in response to Customer Service Requests (CSR's).

5.5.1 Current Maintenance Plan

Currently maintenance is carried out in accordance to the allocated budget for this portfolio, however, due to the substantial increase to the size of the portfolio the budget will need to increase accordingly. It's largely reactive and driven by customer service requests (CSRs) and where vegetation interacts with the asset, attendance will be based on the programmed maintenance schedule.

Current maintenance activities and expenditure for green infrastructure assets are summarised in Table 5.6 .

Table 5.6 - Current Maintenance Activities

Asset Type	Activities	Type	Frequency	Annual Budget ($)
Fauna Fences (Structural & Vegetation)	A visual inspection is conducted to check general serviceability of the structure, check for trapped debris and remove following flood events. Identify any other emerging problems and check condition of all components and where possible fix them	Planned (Routine)	Quarterly and following flood events and bushfires	25,000
		Reactive	As generated by Customer Service Requests	
Fauna Escape Poles	Inspection and maintenance	Reactive	As generated by Customer Service Requests	(see note below)
Refuge Poles	Inspection and maintenance	Reactive	As generated by Customer Service Requests	(see note below)
Fauna Nest Boxes	Inspection and maintenance	Reactive	As generated by Customer Service Requests	(see note below)

Asset Type	Activities	Type	Frequency	Annual Budget ($)
Fauna Crossing Ropes	A visual Inspection is conducted to check on the serviceability of the rope and the associated components and to ensure there is sufficient clearance between the road surface and the rope.	Planned (Routine)	Currently only a 3 year inspection by the manufacturer of the rope is performed	(see note below)
		Reactive	As generated by Customer Service Requests	(see note below)
Fauna Crossing Underpasses	A visual inspection is conducted to check on general serviceability of the underpass and clear any trapped debris.	Reactive	As generated by Customer Service Requests	(see note below)
Wildlife Stencil	A visual inspection is conducted to check on general serviceability of the stencil and if colours require freshening up	Planned (Routine)	Currently checked by AI on mounted cameras on garbage trucks There is a current program for repainting wildlife stencils.	$75,000
		Reactive	As generated by Customer Service Requests	(see note below)
Total				**$100,000**

Note: *the current labour and plant costs for existing maintenance regimes are charged to other transport general maintenance cost centres. There is a current budget of $25/annum for fauna fencing materials. It is recommended that a separate budget is created to capture all maintenance costs.*

5.5.2 Recommended Maintenance Plan

Development of a maintenance plan for Green Infrastructure Assets is recommended to address existing deficiencies and provide a mechanism for transitioning from a reactive to planned maintenance approach. Council has developed an internal Fauna Crossing Infrastructure Maintenance Guide which documents common maintenance issues and tasks associated with fauna crossings. It is recommended that this guide be included in the recommended maintenance plan going forward. The maintenance plan will incorporate the recommended maintenance activities outlined in Table 5.7 and document the following key requirements for maintenance of Green Infrastructure assets;

- Routine maintenance activities required for all Green Infrastructure asset types including scheduled frequencies based on asset priority
- Programmed maintenance activities required for Green Infrastructure assets including defect management procedures
- Roles and responsibilities for all maintenance activities performed for Green Infrastructure assets
- Workload measurement techniques to determine adequacy levels of resources required to perform planned and reactive work. Reactive work should diminish with time as planned maintenance work increases and therefore, re-allocation of resources is essential.
- Audit processes/procedures for monitoring and reviewing Contractor performance and quality of completed work.

Table 5.7 - Recommended Maintenance Activities

Asset Type	Activities	Type	Frequency	Annual Budget
Fauna Fences (Structural & Vegetation)	Conduct visual inspection to check general serviceability of the structure, check for trapped debris and remove following flood events. Identify any other emerging problems and check condition of all components and where possible fix them	Planned (Routine)	Quarterly for structural components and vegetation and following flood events and bushfires	16,667
		Planned (Programmed)	Five (5) yearly depending on annual inspection findings	
	Repairs	Reactive	As generated by Customer Service Requests/or as generated by inspection	21,000
Fauna Escape Poles	Conduct visual inspection to check the general serviceability of the structure, particularly in relation to the safety of road users and to identify any emerging problems. An inspection of the timber poles is conducted by a timber specialist to check on the state of the timber	Planned (Routine)	Annually and following flood events and bushfires	4,818
		Planned (Programmed)	Every 5 years for the poles by a timber specialist	
	Repairs	Reactive	As generated by Customer Service Requests/or as generated by inspection	2,929
Refuge Poles	Conduct visual inspection to check the general serviceability of the structure, particularly in relation to the safety of road users and to identify any emerging problems. An inspection of the timber poles is conducted by a timber specialist to check on the state of the timber	Planned (Routine)	Annually and following flood events and bushfires	182
		Planned (Programmed)	Every 5 years for the poles by a timber specialist	
	Repairs	Reactive	As generated by Customer Service Requests/or as generated by inspection	126
Fauna Nest Boxes	Inspection and Repairs	Reactive	Asset to be totally replaced as it unlikely that it may be adequately repaired	1,021
Fauna Crossing Ropes	Conduct a visual Inspection to check on the serviceability of the rope and the associated components and to ensure there is sufficient clearance between the road surface and the rope.	Planned (Routine)	Annually and following severe storm events and bushfires	13,333
		Planned (Programmed)	Three (3) year inspection by the manufacturer of the rope	

Asset Type	Activities	Type	Frequency	Annual Budget
	Repairs	Reactive	As generated by Customer Service Requests/or as generated by inspection	8,500
Fauna Crossing Underpasses	Conduct a visual inspection to check on general serviceability of the underpass and clear any trapped debris.	Planned (Routine)	Annually and following flood events	938
		Planned (Programmed)	Five (5) yearly depending on annual inspection findings	
	Repairs	Reactive	As generated by Customer Service Requests/or as generated by inspection	667
Wildlife Stencil	Conduct a visual inspection to check on general serviceability of the underpass and clear any trapped debris.	Planned (Routine)	Annually and following flood events	1,484
	Wildlife Stencilling Program (Repainting)	Planned (Routine)	Annual	75,000
	Repairs	Reactive	As generated by Customer Service Requests/or as generated by inspection	763
Total (rounded)				**148,000**

The minor modifications budget of $50k p.a. is in addition to the planned/reactive maintenance allocations mentioned above bringing the **total maintenance allocation up to $198k p.a. from FY2023.**

Fauna fences are currently inspected to coincide with breeding schedules to prevent animals breaching unmaintained fences and being injured.

Ongoing review and increase of existing operational budget allocations is required to achieve the recommended maintenance plan. This will be reviewed further as more assets come online and further condition data becomes available.

Further details on recommended projected maintenance costs are presented in Section 7.3 and breakdown of how costs were derived is given in Appendix D.

5.6 Resource Plan

5.6.1 Current Resource Plan

Maintenance of green infrastructure assets is currently performed by internal Council staff with roles and responsibilities falling across several Council departments. The current resource plan for green infrastructure assets is outlined in Table 5.8. Appendix A provides a more detailed list of roles, responsibilities and accountabilities for management, operation and maintenance of the green infrastructure assets.

Table 5.8 - Current Resource Plan

Activity	Fauna Fences	Fauna Escape Pole	Refuge Poles	Fauna Nest Boxes	Fauna Crossing Ropes	Fauna Crossing Underpasses	Wildlife Stencil
Level 1 Inspections	Internal	Internal	Internal	Internal	Internal	Internal	Internal
Level 2 Inspections	Internal	Internal	Internal	Internal	Internal	Internal	Internal
Planned Maintenance (Routine & Programmed)	Internal quarterly (AM) 1 FTE	Internal	Internal	Internal	External Contract	Internal	Internal
Reviewing & Programming Defects	Internal	Internal	Internal	Internal	Internal	Internal	Internal
Reactive Maintenance	Internal quarterly (AM) 1 FTE	Internal	Internal	Internal	Internal	Internal	Internal
Reviewing Condition & Programming Renewals	Internal	Internal	Internal	Internal	Internal	Internal	Internal

5.6.2 Recommended Resource Plan

The recommended resource plan for maintenance of green infrastructure assets is outlined in Table 5.9. Development and implementation of a process to record maintenance activities and inspections electronically using TOMAS is recommended via e-contractor.

Table 5.9 - Recommended Resource Plan

Activity	Fauna Fences	Fauna Escape and Refuge Poles	Fauna Nest Boxes	Fauna Crossing Ropes	Fauna Crossing Underpasses	Wildlife Stencil
Level 1 Inspections	Internal - AM 1 FTE	Internal - AM 1 FTE	Internal - AM 1 FTE	Internal - AM 2 FTE	Internal - AM 1 FTE	Internal - AM 1 FTE
Level 2 Inspections	Internal - AM 1 FTE 1 x Tech Officer	Internal - AM 1 FTE 1 x Tech Officer	Internal - AM 1 FTE	External - Contract	External - Contract	Internal - AM 1 FTE 1 x Tech Officer
Level 3 Inspections	Not Required	External - Contract	Not Required	External - Contract	External - Contract	Not Required
Planned Maintenance (Routine & Programmed)	Internal -AM 1 FTE	Internal - AM 1 FTE	Internal - AM 1 FTE	External - Contract	Internal - AM 1 FTE	Internal - AM 1 FTE
Reviewing & Programming Defects	Internal - AM 1 x Tech Officer	Internal - AM 1 x Tech Officer	Internal - AM 1 x Tech Officer	Internal - AM 1 x Tech Officer	Internal - AM 1 x Tech Officer	Internal - AM 1 x Tech Officer

Activity	Fauna Fences	Fauna Escape and Refuge Poles	Fauna Nest Boxes	Fauna Crossing Ropes	Fauna Crossing Underpasses	Wildlife Stencil
Reactive Maintenance	Internal - AM 1 FTE	Internal - AM 1 FTE	Internal - AM 1 FTE	Internal - AM 2 FTE	Internal - AM 1 FTE	Internal - AM 1 FTE
Reviewing Condition & Programming Renewals	Internal - AM 1 x Tech Officer	Internal - AM 1 x Tech Officer	Internal - AM 1 x Tech Officer	Internal - AM 1 x Tech Officer	Internal - AM 1 x Tech Officer	Internal - AM 1 x Tech Officer

5.7 Renewal Plan

Renewal is major capital work which does not significantly alter the original service provided by the asset but restores, rehabilitates, replaces or renews an existing asset to its original service potential. The purpose of developing a renewal plan is to identify assets that need to be replaced to maintain the current level of service and to avoid asset failure due to deterioration.

In preparing this asset management plan, a condition-based model was prepared to determine the base annual renewal costs associated with the green infrastructure asset portfolio. The model developed for the GIPAMP has a 100-year planning horizon to capture the full lifecycle of all assets. However, the results reported in this plan generally only cover a 10, 25 or 50 year period as appropriate.

The deterioration curve used in the asset lifecycle model uses a parabolic deterioration scale and is based on the IPWEA asset deterioration profile as illustrated by Figure 22.

For example, assets in condition 1 (very good or 'as-new' condition) are expected to have a remaining useful life of 90-100% of their expected life. Assets in condition 2 (good condition) are expected to have a remaining useful life of 56-90% of their expected life. If a condition 2 asset has a 60-year life, its remaining life is estimated to be between 34 (56% x 60) and 54 (90% x 60) years.

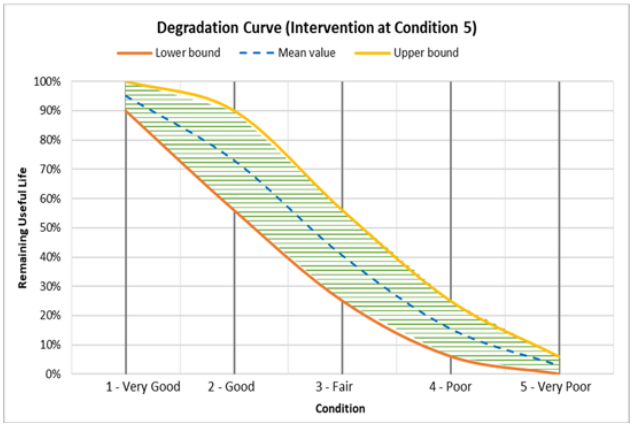


Figure 21 - Asset Deterioration Curve

For lifecycle modelling of MBRC's Green Infrastructure assets the trigger for replacement was when the asset reached condition 5 (very poor condition). This intervention level may be reviewed in future revisions of the asset management plan or, varied across different asset types to reflect the criticality and different levels of service provided by the assets.

An overview of the modelling process is provided by Figure 23 below. The model was used to project the future net value and condition of the asset portfolio for both the current funding level and recommended budget amount. Section 5.7.2 includes a comparison of the model outcomes for both the current and recommended budgets as a means of benchmarking the results and measuring the effectiveness of the recommended increased budgets. Appendix F and Appendix G demonstrate the predicted condition of the assets based on current and recommended renewal funding.

Green Infrastructure Portfolio Asset Management Plan

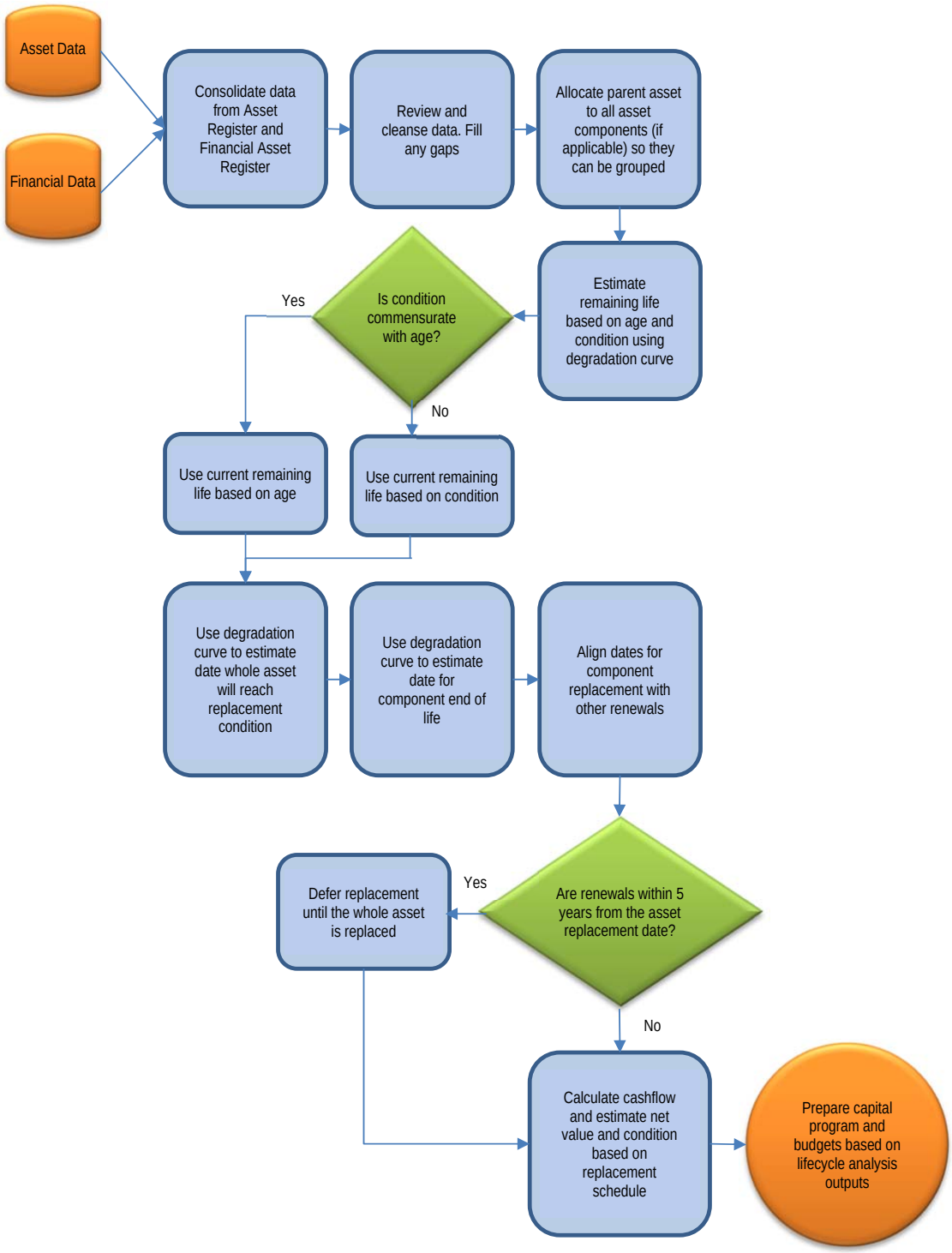


Figure 22 - Flow chart for determining lifecycle capital costs and program

5.7.1 Current Renewal Plan

The current renewal plan has an average cost of around $200K per annum and incorporates a series of projects that were previously identified as being of need or required due to poor condition assets providing a lower than expected level of service. This list was identified through the ePID system, but only covers a period of 3 years.

As part of modelling performed a series of additional projects that require treatment as a result of deterioration profiles and renewal triggers being met based on current condition and age have been identified. The recommended renewal plan included in this revision of the GIPAMP is based on the identification of the environmental area (i.e. vegetation) and the environmental corridor the asset in question is located in.

The current renewal projects are included in the 25-year renewal/replacement capital works plan in Appendix I and the total funding allocations are summarised below;

- New/Upgrade $1.1 million p.a.
- Renewals $200k p.a.

5.7.2 Recommended Renewal Plan

A recommended renewal plan for green infrastructure assets has been developed using the asset renewals currently identified through the ePID system supplemented by projects identified through lifecycle modelling.

Figure 23 and 25 summarise the results from the lifecycle modelling for the level of capital expenditure projected to be required over the next 50 years. The long-term average funding required for renewal and replacement of Green Infrastructure assets is $561K per year. However, the average renewal and replacement funding required over a shorter 5 to 10-year period is only around $150K.

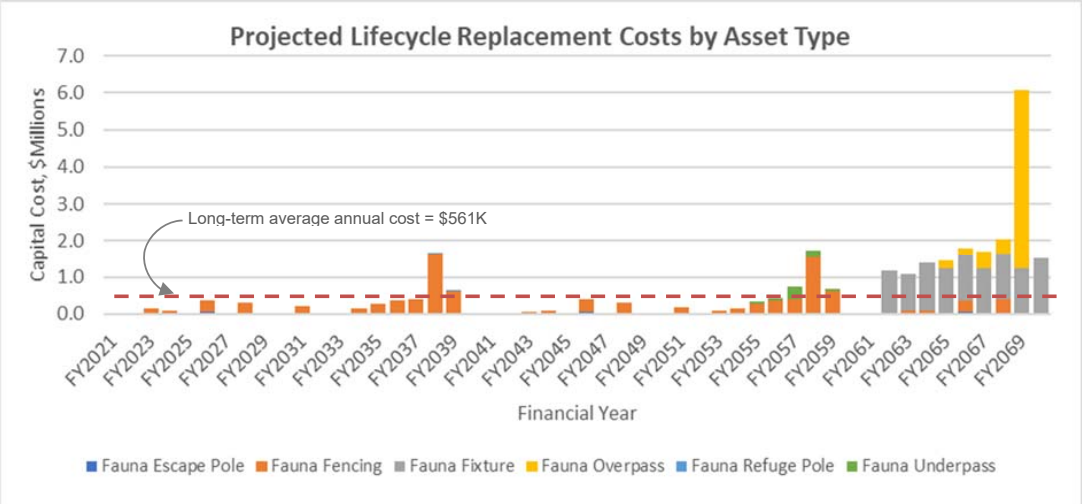


Figure 23 - Projected 50-year lifecycle replacement costs for Green Infrastructure (excludes non-financial assets)

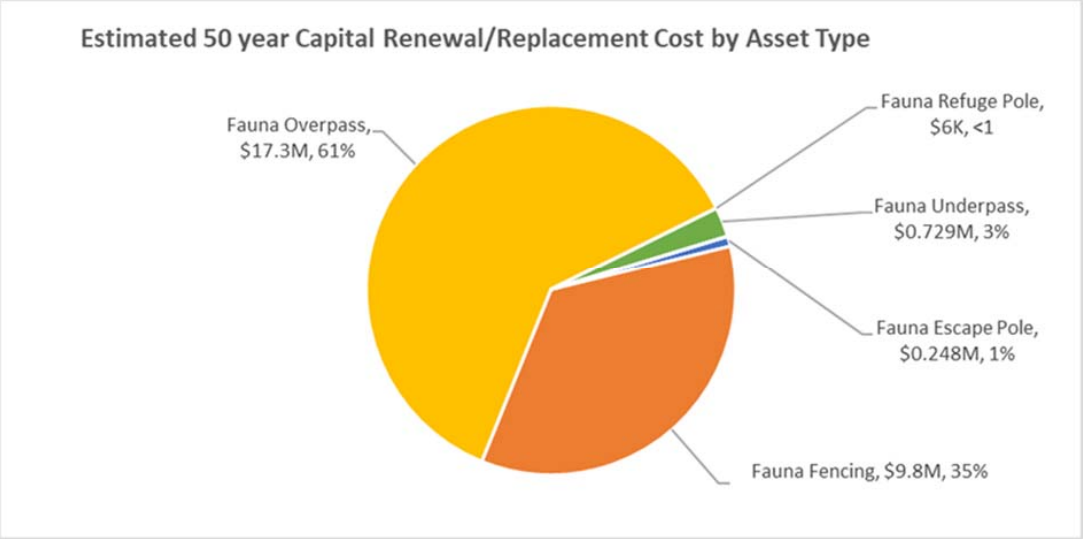


Figure 24 - 50 year estimated capital cost split by asset type (excludes non-financial assets)

The lifecycle model identified that the current capital renewal and replacement budgets is sufficient to maintain the current level of service provided by MBRC's green infrastructure assets through to FY2054. The recommended renewals are summarised below;

- New/Upgrade $1.1 million p.a. to be reviewed in FY2035 based upon demand for new/upgrade assets
- Renewals $200k p.a. to increase to $800k p.a. in FY2055 (subject to future condition assessments)

Figure 25 illustrates how the recommended capital budget (blue) is intended to meet the cumulative capital funding needs identified through the lifecycle modelling (orange) to help explain the need to increase funding over time. The lifecycle model output and recommended funding amounts have been used to develop the indicative capital works program.

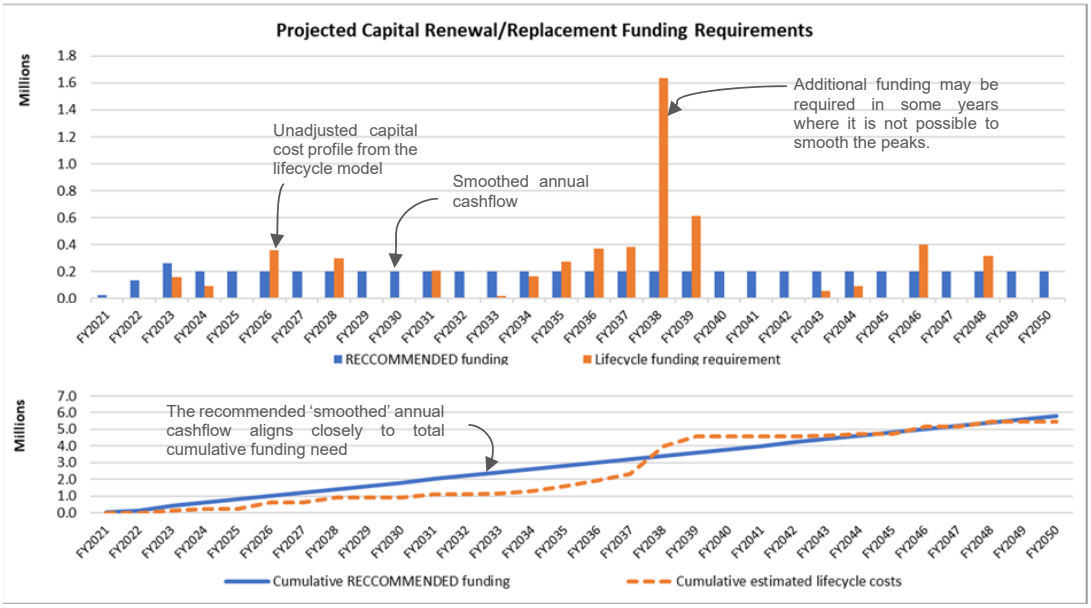


Figure 25 - Capital renewal estimated lifecycle costs and recommended funding

The recommended renewal plan funding will allow Council to achieve its strategic asset management objectives including:

- Organisational commitment to effective asset management
- Managing risk appropriately by earlier intervention and renewal strategy
- Delivery of services to agreed standards
- Optimise asset performance
- Minimise asset failure by intervening prior to assets reaching Condition 5

As further condition data becomes available the renewal allocation should be updated accordingly based on priority, condition, utilisation, star rating, criticality and remaining useful life.

It is recommended that as future improvement to this process:

- Assets should be ranked based on the environmental area and corridor located within, utilising environmental metrics
- Use of smart technology where possible to assist in the capture of asset quality monitoring and condition-based information.

AI-GI15	Implement a system that ranks environmental areas and corridors as part of the capital renewal and replacement prioritisation and planning
AI-GI16	Investigate the use of smart technologies to assist with gather condition and performance date for green assets

6 Systems

The asset management processes within MBRC are supported by a number of corporate management information systems. The corporate systems that support asset management activities are described in detail in Table 6.1 in Appendix B of the SAMP. The systems include:

- Financial information management system (Technology One)
- Asset information management system (TOMAS/Technology One)
- Performance planning and monitoring system (built on Technology One)
- Corporate electronic document system (ECM, previously RIO)
- Geographical Information System (ArcGIS)
- Geoportal (Corporate wide spatial system)

MBRC does not use a proprietary system for management of its green infrastructure asset portfolio. Modelling carried out for this GIPAMP was developed using Excel.

7 Financial Summary

7.1 Useful Life and Valuation Methodology

When assets are initially recognised, each asset is recorded with an estimated useful life which is used as a basis for determining depreciation. Table 7.1 below outlines the estimated useful life for green infrastructure assets and their valuation methodology[3].

Table 7.1 Green Infrastructure Assets Useful Lives

Asset Type	Estimated Useful Life	Valuation Methodology
Fauna Overpass	50 years	Fair Value
Fauna Underpass	40 years	Fair Value
Fauna Fence	20 years	Fair Value
Fauna Escape/Refuge Pole	20 years	Fair Value
Nest Box	20 years	Not applicable - non-financial asset
Wildlife Stencil	5 years	Not applicable - non-financial asset

7.2 Financial Statements and Ratios

7.2.1 Valuations & Depreciation

The financial asset register shows the current replacement value for the green infrastructure assets as $11.3M and the total portfolio value is around $11.7M if non-financial assets are included. Figure 26 illustrates the total value of the asset portfolio, including non-financial assets. The fauna overpasses and fencing make up around 90% of the portfolio value.

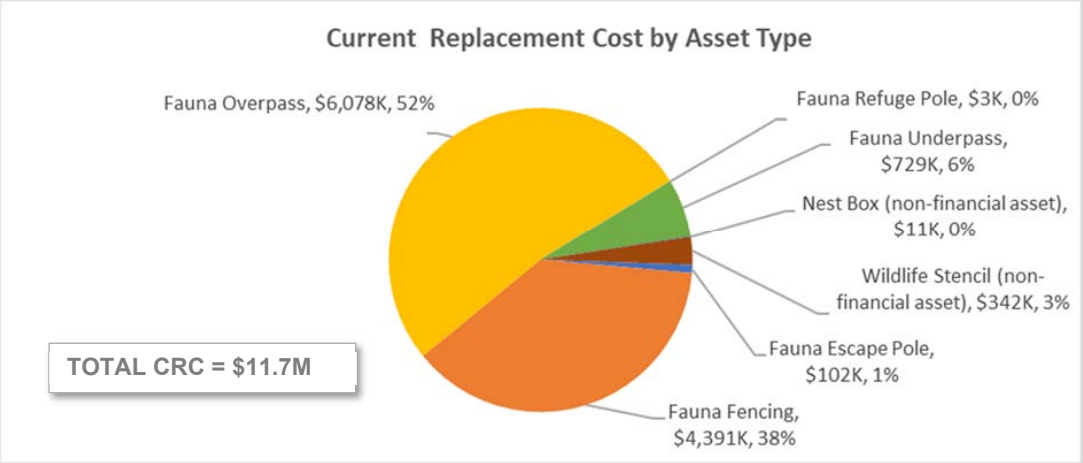


Figure 26 - Current replacement cost by asset type (includes non-financial assets as indicated)

[3] Refer also to MBRC's Non-current Asset Accounting Policy

The projected total replacement value is summarised in Table 7.2 and Table 7.3 and illustrated by Figure 27 below. It assumes that no disposals will take place over that period, all existing assets will be replaced at end of life, and that all scheduled new and improvement projects will be built by their scheduled dates.

Table 7.2 - *Projected TRV, net value and depreciation including new acquisitions ($M) FY2022-FY2033*

Description	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030	FY2031	FY2032	FY2033
Current Portfolio TRV	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
Cumulative Value of Extensions/New Assets/Upgrades	1.2	2.2	3.5	4.7	6.0	7.2	8.4	9.7	11.2	13.0	14.5	16.0
Projected Total TRV	12.5	13.5	14.8	16.0	17.3	18.5	19.7	21.0	22.5	24.3	25.8	27.3
Projected Total Net Value	9.4	10.3	11.1	12.2	13.2	14.0	14.9	15.8	16.6	17.6	19.0	19.9
Projected Annual Depreciation	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7

Table 7.3 - Projected TRV, net value and depreciation including new acquisitions ($M) FY2034-FY2045

Description	FY2034	FY2035	FY2036	FY2037	FY2038	FY2039	FY2040	FY2041	FY2042	FY2043	FY2044	FY2045
Current Portfolio TRV	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
Cumulative Value of Extensions/New Assets/Upgrades	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
Projected Total TRV	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6
Projected Total Net Value	20.9	21.5	20.9	20.3	19.7	19.1	18.6	18.0	17.5	16.9	16.3	15.7
Projected Annual Depreciation	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7

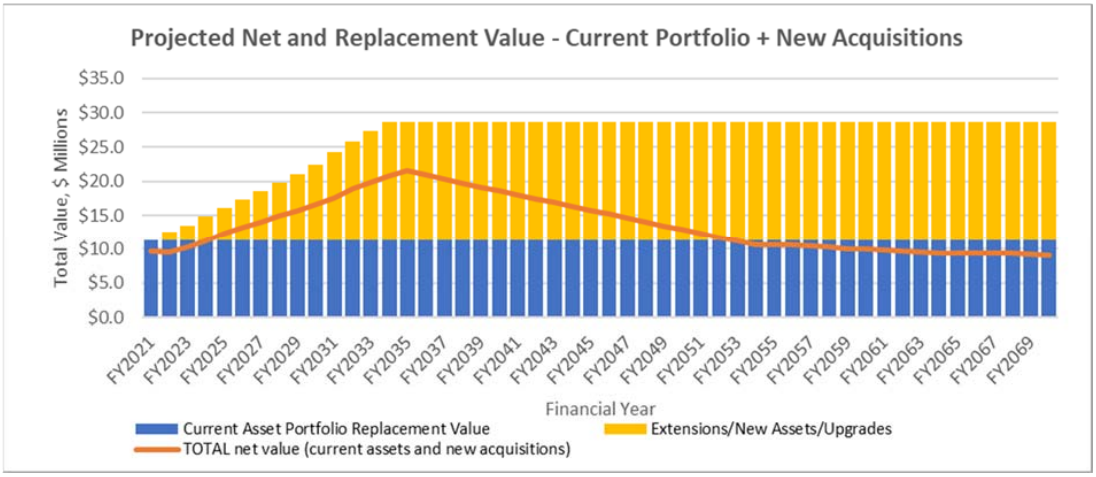


Figure 27 - Projected replacement and net value for current portfolio and new acquisitions

As part of the lifecycle modelling, a projection was also made of the future net value of the green infrastructure portfolio based on the current budget and recommended funding levels. The projected net value for both funding scenarios is illustrated by Figure 28.

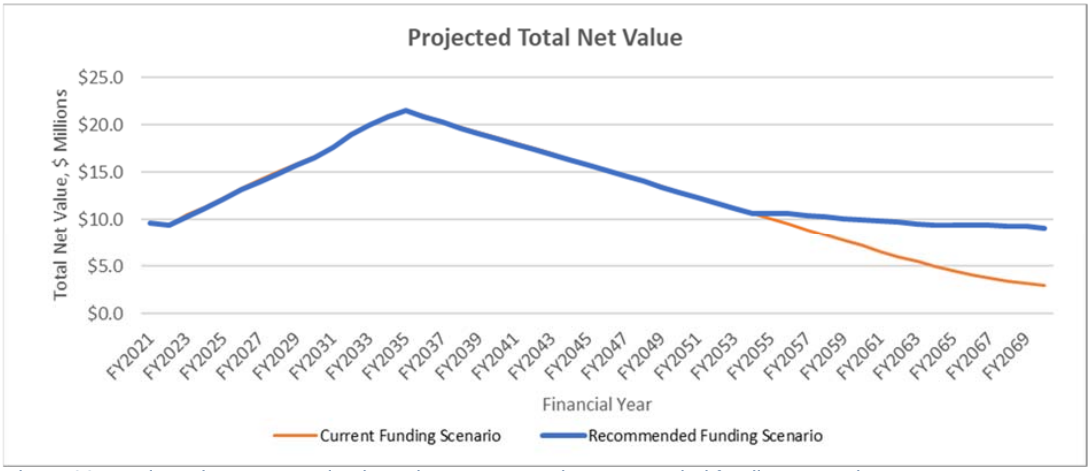


Figure 28 - Projected net asset value based on current and recommended funding scenarios

The projected net values demonstrate that the proposed renewal funding is adequate, but the current budget is not expected to provide a long-term sustainable outcome. The sustainability indicators in Section 7.2.2 provide further comparison of the outcomes from the two funding scenarios.

AI-GI17	Reconcile the Financial and Operating asset registers to ensure consistency

7.2.2 Financial Sustainability Ratios

The Asset Sustainability Ratio (ASR) demonstrates the extent to which the infrastructure assets managed by Council are being replaced as they reach the end of their useful lives. This ratio measures how much capital expenditure goes toward replacing existing assets each year relative to depreciation expense. The typical target range is approximately 90% to 110%. Being a high growth Council, Council's target range is approximately 75% which allows for balancing capital expenditure on existing assets with building of new infrastructure due to population growth.

Figure 29 shows the ASR for MBRC's Green Infrastructure asset portfolio. The intent is for capital investment to offset depreciation to maintain the value of the portfolio, and inherently demonstrate maintaining the portfolio itself. While not particularly relevant for new asset portfolios whereby minimal capital expenditure is required early in the life of the asset, it demonstrates that the recommended funding will lead towards achieving long term sustainability. Conversely, the current capital funding (orange solid line) is not sustainable.

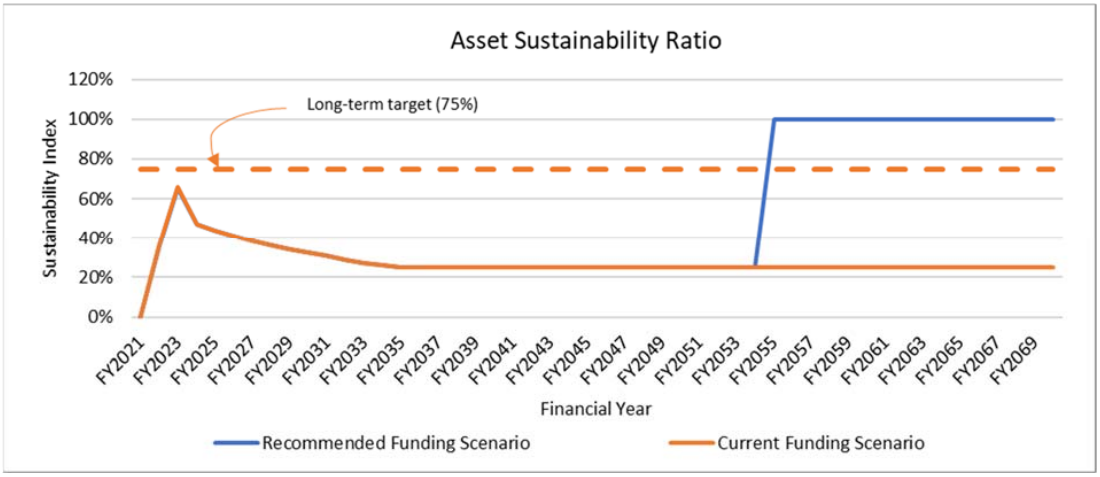


Figure 29 - Projected sustainability ratio based on current and recommended funding scenarios

The Asset Consumption Ratio (ACR) is the value of infrastructure assets divided by gross current replacement cost of infrastructure assets. This ratio seeks to highlight the extent of asset consumption. Council's desired range is between 40% to 80%.

This ACR seeks to demonstrate that the asset portfolio is being maintained within a sustainable and economic range. Figure 30 shows that if the current funding was maintained it would result in the asset portfolio deteriorating to an unacceptable level beyond FY2052, whereas the recommended funding constrains the decline in the ACR beyond FY2052. The ACR drops below 40% due to the age distribution and several high value assets nearing replacement age at a similar time. Beyond the 50-year period, and with the recommended increase in funding from FY2055 onwards, the ACR will return above 40%.

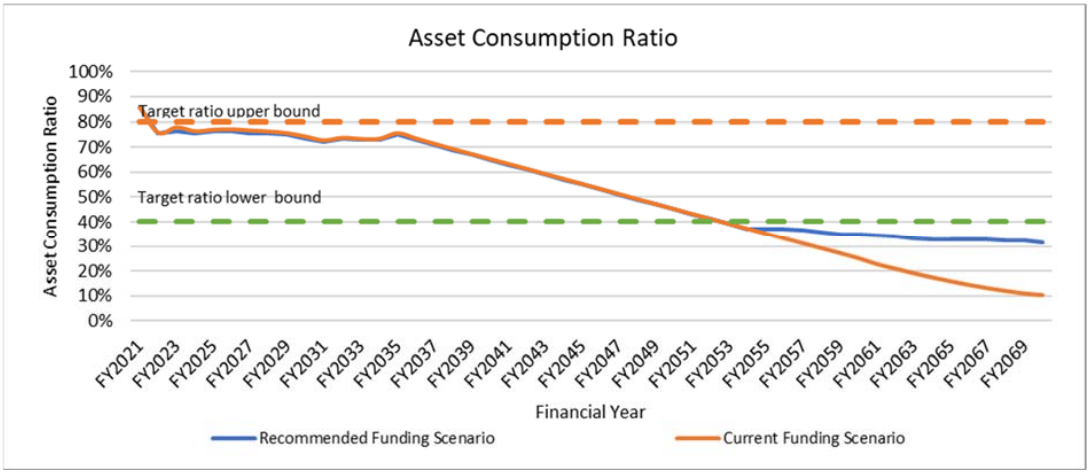


Figure 30 - Projected asset consumption ratio based on current and recommended funding scenarios

It is therefore evident that the proposed funding allocations will put Council in a much stronger financial position to maintain the green infrastructure asset portfolio as shown by these financial ratios.

7.3 Forecast costs

The age profile for MBRC's green infrastructure assets indicated that the current portfolio is very young compared to its expected life.

Section 5.5 described the justification and need for introducing planned preventative maintenance on top of the existing routine and reactive maintenance activities. Section 5.7 identified the funding that is predicted to be required for renewal or replacement of assets components over the next 50 years.

To sustain the existing green infrastructure asset portfolio, and provide the expected community and technical levels of service described in this asset management plan, the recommended budget allocations are outlined below:

- **Retain the current budget of $25k per annum** for materials for green infrastructure maintenance
- **Extend the current operational budget of $75K beyond FY2023** to provide a continuous program for renewal and maintenance of wildlife stencils (road marking)
- **Allocate a new budget of $48K per annum** for inspection and maintenance of green infrastructure assets **from FY2023 onwards**
- **Allocate a new minor modifications budget of $50k p.a. from FY2023 onwards**
- **Continue to invest in new Green Infrastructure** acquisitions as per the current program, and subsequent reviews, i.e**. $11.0M over the next 10 years**
- **Maintain** the current capital renewal budget (average of $200K per annum) **through to FY2054** and then **increase to $800K from FY2055 onwards. (subject to future condition assessments)**

The following chart and tables summarise the recommended funding need. The amounts shown for capital works align to the amounts shown in the new and upgrade capital works plan in Appendix H and the indicative renewal and replacement capital works plan in Appendix I.

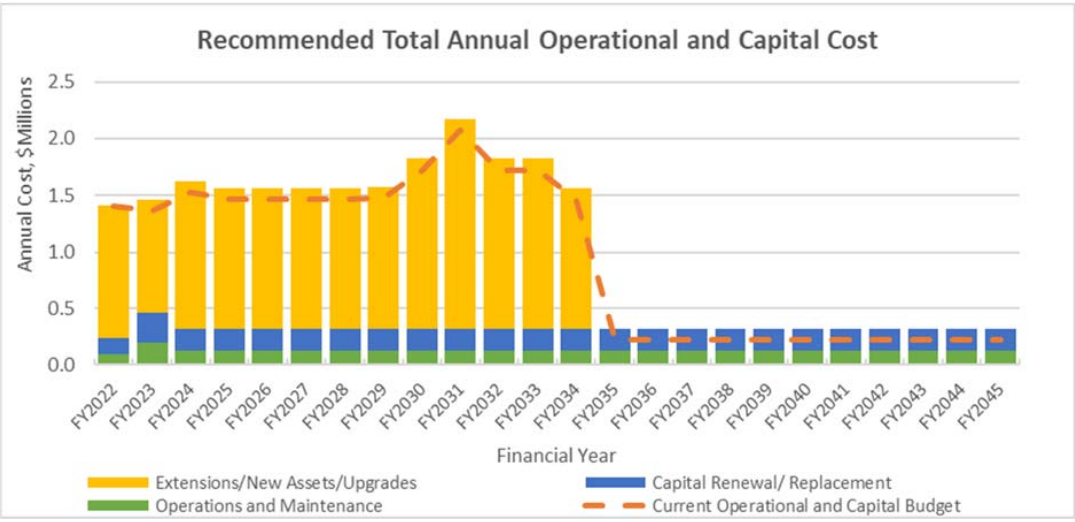


Figure 31 - Recommended total annual operational and capital budgets and comparison to current

Green Infrastructure Portfolio Asset Management Plan

Table 7.4 - Recommended annual operational and capital budgets; FY2022-FY2033

Cost Type	Estimated Annual Cost, $000's											
	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029	FY2030	FY2031	FY2032	FY2033
Maintenance	100	198	198	198	198	198	198	198	198	198	198	198
Extensions/New Assets/Upgrades	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100
Capital Renewal/ Replacement	200	200	200	200	200	200	200	200	200	200	200	200
TOTAL	1,400	1,498	1,498	1,498	1,498	1,498	1,498	1,498	1,498	1,498	1,498	1,498

Table 7.5 - Recommended annual operational and capital budgets; FY2034-FY2045

Cost Type	Estimated Annual Cost, $000's											
	FY2034	FY2035	FY2036	FY2037	FY2038	FY2039	FY2040	FY2041	FY2042	FY2043	FY2044	FY2045
Maintenance	198	198	198	198	198	198	198	198	198	198	198	198
Extensions/New Assets/Upgrades	1,100	0	0	0	0	0	0	0	0	0	0	0
Capital Renewal/ Replacement	200	200	200	200	200	200	200	200	200	200	200	200
TOTAL	1,498	398	398	398	398	398	398	398	398	398	398	398

8 Improvement and Monitoring

During the preparation of the GIPAMP the following action items have been identified as set out in Table 8.1 below.

Table 8.1 - GIPAMP Action Items

Action No.	Detail	Responsibility	Due Date
AI-GI01	Review the list of assets known to green infrastructure and identify missing assets within financial and asset register (including permanent LED signage and wildlife monitoring equipment)	AMT/Finance	Q2 22/23
AI-GI02	Establish a capital renewal prioritisation framework based on risk and condition matrix (SAM modelling in TechOne)	AMT/ITP	Q4 22/23
AI-GI03	Review green infrastructure asset attributes with stakeholders and update the asset management system	AMT/ITP/AM/ Finance	Q2 22/23
AI-GI04	Implement a process for automating the collection of attributes for new green infrastructure assets	AMT	Q2 22/23
AI-GI05	Capture missing asset attributes on all green infrastructure assets in TOMAS	AMT	Q1 23/24
AI-GI06	Undertake further detailed analysis of customer service request (CSR) data to help assist in planning upgrades and improvements to the services provided by green infrastructure assets.	AMT/ITP	Q2 22/23
AI-GI07	Record and analyse all monitoring observations to allow for evaluation of asset performance and determination of the adequacy or otherwise of the assets relative to the fauna species for which they are intended.	AMT/ITP	Q3 22/23
AI-GI08	Develop star rating criteria and assign to all assets to assist with prioritisation of inspection, maintenance and renewal of assets.	AMT/ITP/AM	Q4 22/23
AI-GI09	Review CSR data to identify hotspots in the network which may require new infrastructure	AMT/ITP/AM	Q4 22/23
AI-GI010	Implement a formalised process to analyse current green infrastructure asset performance measurement practices and capture performance data	AMT/ITP/AM	Q4 22/23
AI-GI011	Develop a condition assessment framework for green infrastructure portfolio	AMT/ITP/AM	Q3 22/23
AI-GI012	Implement recommended the condition inspection plan for all green infrastructure assets and load schedules into TOMAS	AMT/AM	Q4 22/23
AI-GI013	Future defects to be recorded on the Defect Management Process (DMP)	AMT/AM	Q4 23/24
AI-GI014	Future green infrastructure to be provided are to be resilient against bushfires and extreme rain events	AMT	Q1 23/24

AI-GI015	Implement a system that ranks environmental areas and corridors as part of the capital renewal and replacement prioritisation and planning	AMT/ITP	Q1 23/24
AI-GI016	Investigate the use of smart technologies to assist with gather condition and performance date for green assets	AMT	Q4 22/23
AI-GI017	Reconcile the Financial and Operating asset registers to ensure consistency	AMT/Finance	Q4 22/23

9 Appendices

Table 9.1 - List of Appendices

Appendices	Title	Referenced in Section
Appendix A	Green Infrastructure Asset RACI Matrix	2.1, 5.6.1
Appendix B	Green Infrastructure Asset Attributes	2.4
Appendix C	Recommended Green Infrastructure Asset Defect Types	5.3.2
Appendix D	Projected Routine Maintenance Costs	5.5.2
Appendix E	Overall Asset Type Replacement / Renewal Graphs	5.7
Appendix F	Projected condition - Overall	5.7
Appendix G	Projected condition by Asset Type	5.7
Appendix H	Indicative 25-year New/Upgrade Capital Works Plan	7.3, 4.2
Appendix I	Indicative 25-year Renewal/Replacement Capital Works Plan	7.3
Appendix J	References	-

Appendix A - Green Infrastructure Asset RACI Matrix

Asset selection:

Asset Class	**Transport**
Asset Group/s	**Green Infrastructure**
Asset Type/s	**All types**

Definitions:

- **R**esponsible parties are those who do the work to complete the task.
- **A**ccountable individuals or groups ultimately must answer for the completion of the deliverable or task.
- **C**onsulted parties are involved in making the decision or completing the task (e.g., Subject Matter Experts)
- **I**nformed individuals are kept up to date on progress (e.g., copied on email), often only on completion of the activity or decision

Table 9.2 - Green Infrastructure Asset RACI Matrix

System Requirement	Activity Group	Activity	Sub-activity	Department or Role			
				Responsible	Accountable	Consult	Inform
Governance, Policy and Strategy	Leadership and Governance	Provide leadership, direction and commitment to asset management		AMSC	CEO	SLT	IP_ITP, ECM_AMTC, IP_AMGT
		Determine organisational context for services delivered by assets		IP_ITP	CEO	COMM, ECM_AMTC	IP_AMGT
		Develop understanding of the needs and expectations of stakeholders		IP_ITP	ECM	COMM	ELCO
		Determine organisation roles, responsibilities and authorities		SLT	CEO	IP_ITP, ECM_AMTC, IP_AMGT	ELCO
		Management reviews		SLT	CEO	IP_ITP, ECM_AMTC, IP_AMGT	ELCO
	Asset Management Policy	AM Policy preparation and revision		IP_AMGT	AMSC	SLT	IP_ITP, ECM_AMTC
		AM Policy endorsement		ELCO	CEO	IP_AMGT, AMSC, SLT	FCS_G&ES
	Strategic planning	Develop MBRC consolidated Strategic Asset Management Plan		IP_AMGT	ECM_IP	IP_ITP, ECM_AMTC, FCS_ACC	AMSC, SLT
		Strategic Asset Management Plan endorsement		ELCO	CEO	IP_AMGT, AMSC, SLT	FCS_G&ES
		Develop service/network strategy and/or master plans		IP_ITP	ECM	COMM, PL_SP&P, ECM_AMTC	IP_AMGT, FCS_ACC
	Communications and engagement	Promote awareness of asset management policies and documentation		IP_AMGT	ECM_IP	IP_ITP, ECM_AMTC	AMSC
		Promote awareness of asset management activities and engage with stakeholders		IP_AMGT	ECM_IP	IP_ITP, ECM_AMTC, FCS_ACC	AMSC
	Change management	Assessment of impact of change and develop change management plan		IP_AMGT	ECM_IP	IP_ITP, ECM_AMTC, FCS_ACC	AMSC, SLT

System Requirement	Activity Group	Activity	Sub-activity	Department or Role			
				Responsible	Accountable	Consult	Inform
		Endorsement of proposed changes and change management plan		SLT	ECM	IP_AMGT	IP_ITP, ECM_AMTC, FCS_ACC
AM Resource Capacity and Capability	Asset Management Competence	Asset Management competence assessment		IP_AMGT	ECM_IP	IP_ITP, ECM_AMTC	AMSC, SLT
		Asset management training		IP_AMGT	ECM_IP	IP_ITP, ECM_AMTC	AMSC, SLT
	Resources	Internal resource capability and capacity assessment		IP_ITP, ECM_AMTC	ECM	IP_AMGT	AMSC, SLT
		Assess resource gaps and addition requirements		IP_ITP, ECM_AMTC	ECM	IP_AMGT	AMSC, SLT
		Outsourcing procurement and management		IP_ITP, ECM_AMTC	ECM	IP_AMGT	AMSC, SLT
Asset Management Systems and Data Management	Asset Management System	Develop asset management systems requirements		IP_AMGT	ECM_IP	IP_ITP, ECM_AMTC, FCS_ICT	AMSC, SLT
		Systems management		FCS_ICT	F&CS	IP_AMGT, IP_ITP, ECM_AMTC	AMSC, SLT
		Information standards and requirements documentation		IP_AMGT	ECM	IP_ITP, ECM_AMTC	FCS_ICT, PL_SP&P
		Data review and cleansing		IP_AMGT	ECM	IP_ITP, ECM_AMTC	FCS_ACC
	Non-financial asset data capture and maintenance	Spatial Data	ADAC checks	IP_AMGT	ECM_IP	PL_SP&P	PL_SP&P
			Asset data capture	IP_AMGT	ECM_IP	PL_SP&P	IP_ITP, ECM_AMTC, FCS_ACC
			Missing asset investigations and data capture	IP_AMGT	ECM_IP	IP_ITP, ECM_AMTC	FCS_ACC
		Non-spatial Data	Asset data capture	IP_AMGT	ECM_IP	IP_ITP, ECM_PM	ECM_AMTC, FCS_ACC
			Missing asset investigations and data capture	IP_AMGT	ECM_IP	IP_ITP, ECM_AMTC	FCS_ACC
	Proprietary software management	Software acquisitions		IP_AMGT	ECM_IP	IP_ITP, ECM_AMTC, FCS_ICT	AMSC
		Software management		FCS_ICT	F&CS	IP_AMGT	IP_ITP, ECM_AMTC
		Operation of software and management of outputs		IP_AMGT	ECM_IP	IP_ITP, ECM_AMTC	AMSC
Asset Management and Planning	Asset Management Plans	Prepare asset management plans		IP_AMGT	ECM	IP_ITP, ECM_AMTC, FCS_ACC	AMSC
		Asset management plan endorsement		ELCON	CEO	IP_AMGT	AMSC
	Levels of Service	Develop customer levels of service		IP_ITP	ECM	IP_AMGT, ECM_AMTC	FCS_CE

System Requirement	Activity Group	Activity	Sub-activity	Department or Role			
				Responsible	Accountable	Consult	Inform
		Develop technical levels of service		IP_ITP	ECM	IP_AMGT, ECM_AMTC, PL_SP&P	ECM_PM
		Develop and review/improve technical design standards		IP_ITP	ECM	IP_AMGT, ECM_AMTC, PL_SP&P	ECM_PM
	Condition/Defect Monitoring	Level 1 Condition Assessment	Scheduling	ECM_AMTC	ECM	IP_ITP	IP_AMGT
			Assessment and reporting	ECM_AMTC	ECM	IP_ITP	IP_AMGT
			Upload condition data to relevant AM systems	ECM_AMTC	ECM	IP_ITP, FCE_ICT	IP_AMGT
		Level 2/3 Condition Assessment	Scheduling	IP_AMGT	ECM	IP_ITP	AMSC
			Assessment and reporting	EXCON	IP_AMGT	IP_ITP	ECM_AMTC
			Upload condition data to relevant AM systems	IP_AMGT	ECM	IP_ITP, FCE_ICT	ECM_AMTC
		Defects Identification	Assessment and reporting	ECM_AMTC, EXCON	ECM	IP_ITP, IP_AMGT	ECM_AMTC
			Upload defects data to relevant AM systems	ECM_AMTC, IP_AMGT	ECM	IP_ITP, FCE_ICT	ECM_AMTC
	Lifecyle modelling	Assess asset condition and performance and review useful lives		IP_AMGT	ECM	IP_ITP, ECM_AMTC	FCE_ACC
		Develop models and determine lifecycle costs		IP_AMGT	ECM	IP_ITP, ECM_AMTC	FCE_ACC
		Project asset values and determine financial benchmarks		IP_AMGT	ECM	IP_ITP, ECM_AMTC	FCE_ACC
		Project and assess asset performance and condition under different funding scenarios		IP_AMGT	ECM	IP_ITP	AMSC
		Undertake industry benchmarking		IP_AMGT	ECM	IP_ITP	AMSC
Financial management, data capture and reporting	Financial Asset Register	Initial financial recognition		FCE_ACC	F&CS	IP_AMGT	IP_ITP
		Maintain financial asset register		FCE_ACC	F&CS	IP_AMGT	IP_AMGT
	Asset Valuations	Revaluation of financial assets		FCE_ACC	F&CS	IP_AMGT	IP_ITP
		Valuation of non-financial assets		IP_AMGT	ECM	IP_ITP	FCE_ACC
		Develop and maintain a schedule of asset replacement cost unit rates		FCE_ACC	F&CS	IP_ITP	IP_AMGT
	Budgets/ePIDS	Raise ePIDS		IP_ITP, ECM_AMTC	ECM	IP_AMGT	FCS_ACC
		Annual budget submissions		IP_ITP, ECM_AMTC	ECM	IP_AMGT	FCS_ACC
	Financial reporting	Financial management of approved budgets		FCS_ACC	F&CS	IP_ITP, ECM_AMTC	IP_AMGT
		Dashboarding and reporting of financial performance		IP_AMGT	ECM	FCS_ACC	IP_ITP, ECM_AMTC
Asset creation	New capital works	Design and specifications		IP_ITP, ECM_AMTC	ECM	IP_AMGT, PL_SP&P	EXCON
		Procurement and project management		ECM_PM	ECM	IP_ITP	IP_ITP, ECM_AMTC

System Requirement	Activity Group	Activity	Sub-activity	Department or Role			
				Responsible	Accountable	Consult	Inform
		Delivery, testing and commissioning		EXCON	ECM	ECM_PM	IP_ITP, ECM_AMTC, IP_AMGT
	Asset replacement	Design and specifications		IP_ITP, ECM_AMTC	ECM	IP_AMGT, PL_SP&P	EXCON
		Procurement and project management		ECM_PM	ECM	IP_ITP	IP_ITP, ECM_AMTC
		Delivery, testing and commissioning		EXCON	ECM	ECM_PM	IP_ITP, ECM_AMTC, IP_AMGT
	Donated assets	Design and specifications		DEV	DEV	PL_SP&P	IP_AMGT
		Procurement and project management		DEV	DEV	PL_SP&P	IP_AMGT
		Delivery, testing and commissioning		DEV	DEV	PL_SP&P	IP_ITP, ECM_AMTC, IP_AMGT
Asset Operation and Maintenance	Asset Maintenance	Asset/facilities maintenance		ECM_AMTC	ECM	IP_ITP	IP_AMGT
		Develop asset/facilities maintenance plans		ECM_AMTC	ECM	IP_ITP	IP_AMGT
		Work order management		ECM_AMTC	ECM	IP_ITP	IP_AMGT
	Operational service delivery	Operational planning and management		ECM_AMTC	ECM	IP_ITP	IP_AMGT
		Equipment management		ECM_AMTC	ECM	IP_ITP	IP_AMGT
	Customer service requests	Monitoring and response to customer service requests		ECM_AMTC	ECM	IP_ITP	IP_AMGT
	Leasing	Procurement and management of leases		CES_PS	C&ES	IP_ITP	IP_AMGT
Risk Management	Risk management	Review, update corporate risk management plan		IP_AMGT	ECM	IP_ITP, ECM_AMTC	FCS_G&ES
		Implement risk management recommendations		IP_ITP, ECM_AMTC	ECM	IP_AMGT	FCS_G&ES
Asset Performance and Utilisation	Utilisation	Assess asset/facility utilisation		IP_ITP	ECM	ECM_AMTC	IP_AMGT
	Capacity	Assess asset/facility capacity		IP_ITP	ECM	ECM_AMTC	IP_AMGT
	Dependability	Assess asset/facility availably, reliability, criticality etc.		IP_ITP	ECM	ECM_AMTC	IP_AMGT
	Performance	Monitor, analyse and evaluate asset performance		IP_ITP	ECM	ECM_AMTC	IP_AMGT
	Non-conformance	Identify nonconformity and undertake corrective action		IP_ITP	ECM	IP_AMGT	IP_AMGT
	Optimisation	Assess network/service configuration for optimisation and value management		IP_ITP	ECM	IP_AMGT	IP_AMGT
Environment and Sustainability	Environment and Sustainability	Environmental management		IP_ITP	ECM	IP_AMGT, PL_EP&P, CES_ES	IP_AMGT
		Energy management		IP_ITP	ECM	IP_AMGT, CES_ES	IP_AMGT
		Sustainability monitoring and assessment		IP_ITP	ECM	IP_AMGT, CES_ES	IP_AMGT

System Requirement	Activity Group	Activity	Sub-activity	Department or Role			
				Responsible	Accountable	Consult	Inform
		Assess impact of climate change and appropriate actions		IP_ITP	ECM	IP_AMGT, CES_ES	IP_AMGT
Asset End of Life	Asset Disposals	Disposal planning		IP_ITP	ECM_IP	PL_SP&P	ECM_AMTC, IP_AMGT, FCS_ACC
		Design and specifications		IP_ITP	ECM	PL_SP&P	ECM_AMTC
		Disposal and site remediation		ECM_PM	ECM	ECM_AMTC, PL_SP&P	IP_AMGT, FCS_ACC
		Financial de-recognition		FCS_ACC	F&CS	IP_ITP	IP_AMGT
Review and Audit	Asset Management Review and Audit	Internal audit		INAUDT	CEO	IP_ITP, IP_AMGT, FCS_ACC	CEO, SLT
		External audit		EXAUDT	F&CS	IP_ITP, IP_AMGT, FCS_ACC	CEO, ELCO
		Asset management maturity assessment		EXCON	IP_AMGT	IP_ITP, IP_AMGT, FCS_ACC	AMSC
Innovation and improvement	Innovation	Explore and implement innovation improvements		INNO	ECM	IP_ITP, ECM_AMTC	SLT, ELCO
	Continual improvement	Planning, management and implementation of asset management improvements		IP_AMGT	ECM_IP	IP_ITP, ECM_AMTC, FCS_ACC	AMSC

Department/Role Abbreviation Descriptions:

Abbrev.	Definition
AMSC	AM Steering Committee
C&ES	Community and Environmental Services
CEO	Chief Executive Officer
CES_ES	Environmental Services
CES_PS	Property Services
COMM	Community
DEVL	Developers
ECM	Engineering, Construction and Maintenance

Abbrev.	Definition
ECM_AMTC	Asset Maintenance
ECM_IP	Infrastructure Planning
ECM_PM	Project Management
ELCO	Elected Council
EXAUDT	External Audit
EXCON	External contractor/consultant
F&CS	Finance and Corporate Services
FCS_ACC	Accounting Services
FCS_CE	Community Engagement
FCS_G&ES	Governance and Executive Services

Abbrev.	Definition
ECM_PM	Project Management
FCS_ICT	Information and Communications Technology
INAUDT	Internal Audit
INNO	Innovation Team
IP_AMGT	Asset Management
IP_ITP	Integrated Transport Planning
PL_EP&P	Environmental Planning and Policy
PL_SP&P	Strategic Planning and Placemaking
SLT	Senior Leadership Team

Appendix B - Green Infrastructure Asset Attributes

Table 9.3 - Green Infrastructure Asset Attributes

Asset Group	Asset Attribute
All	• Location (GIS) • Street Address • Install Date • Commission Date (If different to install date) • Last Inspected Date • Star Rating (1, 2, 3, 4 or 5)
Fauna Escape Poles	• Height (m) • Maintenance Access (Yes/No) • Material Type (timber/other)
Fauna Fencing	• Length (m) • Material Type (GI/other) • Manufacturer
Fauna Overpass	• Length (m) • Material Type (Rope, etc.) • Type (Ladder, Cage, single rope) • Type of supports (Stays, Ground anchors, etc.) • Height above roadway (m)
Fauna Refuge Pole	• Height (m) • Maintenance Access (Yes/No) • Material Type (timber/other)
Fauna Underpass	• Material Type (RCP, RCBC, Other) • Dimensions (Diameter or width x depth) • Entry/Exit type (treatment if any) • Fixtures on walls (Rails, etc.)
Nest Boxes	• Size (m) • Shape (A-shape, other) • Material (treated timber, other) • Height above ground (m)
Wildlife Stencil	• Wording • Colour • Width of stencil on road • Signs

Appendix C - Recommended Green Infrastructure Asset Defect Types

Table 9.4 - Fauna Escape Poles Defect Types

Defect Type	Description
Damage	Damage to the timber of pole
Vegetation	Vegetation located at base of the pole
Missing	Missing pole components
Damage Metal Sheet	Damage of metal sheeting around pole

Table 9.5 -Fauna Fencing Defect Types

Defect Type	Description
Damage	Damage to chain wire & metal ties
Damage	Damage corrosion to Steel Fence Posts
Debris	Built up debris along fence after a flood event
Damage	Damage to concrete edging affecting integrity of fence
Vegetation	Vegetation growing at base or within 1.0m of fence
Graffiti	Graffiti on panels - paint over with non-toxic paint

Table 9.6 -Fauna Overpass Defect Types

Defect Type	Description
Damage	Damage to timber poles
Sagging	Sagging of rope/ladder
Damage	Damage/replace stays, anchors and other metal components
Damage	Damage to concrete edging affecting integrity of fence
Vegetation	Vegetation growing at base or within 1.0m of fence
Graffiti	Graffiti on panels - paint over with non-toxic paint

Table 9.7 -Fauna Refuge Pole Defect Types

Defect Type	Description
Damage	Damage to timber of pole
Graffiti	Graffiti on pole - paint over with non-toxic paint
Vegetation	Vegetation located at base of the pole

Table 9.8 -Fauna Underpass Defect Types

Defect Type	Description
Damage	Damage to concrete culverts
Debris	Built up debris along fence after a flood event
Damage	Damage to timber posts, rails and shelving
Damage	Damage/corrosion to steel fixtures
Graffiti	Graffiti on panels - paint over with non-toxic paint

Table 9.9 - Nest Boxes Defect Types

Defect Type	Description
Damage	Damage to the whole nest box
Domestic pets	Restrict access to domestic pets
Leakage	Leaking due to gaps - seal with non-toxic PVA glue
Separating	Pulling away from tree
Introduced species	Introduced species would harm regular nesting wildlife

Table 9.10 - Wildlife Stencil Defect Types

Defect Type	Description
Damage	Damage to the printing
Fading	Fading of writing on road surface
Damage	Damage to street sign for stencil

Table 9.11 - Defect Entry Template

Defect Type	Description	Response
Location	Where is the defect located?	Component
Severity	How severe is the defect?	Very High - 5 - Defect has caused complete loss of asset function High - 4 - Defect has caused significant loss of asset function Moderate - 3 - Defect has caused moderate loss of asset function Low - 2 - Defect has caused minor loss of asset function Very Low - 1 - Defect has caused negligible loss of asset function
Extent	What is the extent of the defect?	How urgent is it? Is it affecting the asset's serviceability?
Task Required	Work required to rectify defect?	Work activities / specialist requirements etc.

Appendix D - Projected Routine Maintenance Costs

Green Infrastructure Routine Maintenance (Fauna Fences, Fauna Escape and Refuge Poles, Nest Boxes, Fauna Underpasses, Fauna Overpasses and Wildlife Stencilling)

Table 9.12 - Breakdown of maintenance costs for fauna fences

Fauna Fences						
Vege removal and structural inspection (Inspection per asset on a quarterly basis)						
Item	**Qty**	**Metric**	**Rate**	**Cost/Asset**	**No. Assets /annum**	**Annual Budget**
Inspection						
Plant	0.5	hr	$62.50	$31.25	320	$10,000
FTE Labour	0.5	hr	$41.67	$20.83	320	$6,667
Subtotal for Inspections					*320*	*$16,667*
Maintenance						
Plant	3	hr	$62.50	$187.50	16	$3,000
FTE Labour	3	hr	$41.67	$125.00	16	$2,000
Materials	1	each	$1,000.00	$1,000.00	16	$16,000
Subtotal for Maintenance					*16*	*$21,000*
Sub-Total for Fauna Fences						***$37,667***

Materials: Replacing fence panels & associated fasteners & assuming 20% of fences will require maintenance/repairs
Note: Using rates from ECM Civil Construction Estimate Rates 11-11-2020

Table 9.13 - Breakdown of maintenance costs for escape poles

Escape Poles						
Replace/repair damaged or missing metal sheeting around pole (Inspection per asset on an annual basis)						
Item	**Qty**	**Metric**	**Rate**	**Cost/Asset**	**No. Assets /annum**	**Annual Budget**
Inspection						
Plant	0.25	hr	$62.50	$15.63	185	$2,891
FTE Labour	0.25	hr	$41.67	$10.42	185	$1,927
Subtotal for Inspections					*185*	*$4,818*
Maintenance						
Plant	1	hr	$62.50	$62.50	19	$1,188
FTE Labour	1	hr	$41.67	$41.67	19	$792
Materials	1	each	$50.00	$50.00	19	$950
Subtotal for Maintenance					*19*	*$2,929*
Sub-Total for Escape Poles						***$7,747***

Materials: Replace metal sheeting and assuming 10% of poles require maintenance
Note: Allow $50 for metal sheets and fasteners to be used

Table 9.14 - Breakdown of maintenance costs for fauna overpasses

Fauna overpass						
Check ropes/ladders & re-tension if sagging. (Inspection per asset on an annual basis) Repair stays, anchors or other metal components Prune any vegetation on the rope/ladder cage						
Item	**Qty**	**Metric**	**Rate**	**Cost/Asset**	**No. Assets /annum**	**Annual Budget**
Inspection						
Plant	2	hr	$62.50	$125.00	64	$8,000
FTE Labour	2	hr	$41.67	$83.33	64	$5,333
Subtotal for Inspections					*64*	*$13,333*
Maintenance						
Plant	4	hr	$62.50	$250.00	6	$1,500
FTE Labour	4	hr	$41.67	$166.67	6	$1,000
Total Materials	1	each	$1,000.00	$1,000.00	6	$6,000
Subtotal for Maintenance					*6*	*$8,500*
Sub-Total for Fauna overpass						***$21,833***

Materials: Replace stays, anchors & other metal components. Assuming 10% of overpasses will require maintenance/repair/replacement
Note: Using rates from ECM Civil Construction Estimate Rates 11-11-2020

Table 9.15 - Breakdown of maintenance costs for fauna refuge pole

Fauna Refuge Pole						
(Inspection per asset on an annual basis) Check condition of timber and foundation (timber specialist to repair if required) Remove graffiti						
Item	**Qty**	**Metric**	**Rate**	**Cost/Asset**	**No. Assets /annum**	**Annual Budget**
Inspection						
Plant	0.25	hr	$62.50	$15.63	7	$109
FTE Labour	0.25	hr	$41.67	$10.42	7	$73
Subtotal for Inspections					*7*	*$182*
Maintenance						
Plant	0.25	hr	$62.50	$15.63	1	$16
FTE Labour	0.25	hr	$41.67	$10.42	1	$10
Materials	1	each	$100.00	$100.00	1	$100
Subtotal for Maintenance					*1*	*$126*
Sub-Total for Fauna Refuge Pole						***$308***

Materials: Paint & concrete to fill gaps in foundations and only 1 pole will require maintenance/repairs
Note: Allow $100 for mortar/concrete to fill gaps in foundations and any fasteners for stabilising of branches off main pole

Table 9.16 - Breakdown of maintenance costs for fauna under pass

Fauna Under Pass						
Check concrete, remove debris and remove graffiti (Attend to assets on an annual basis) Fix/replace timber posts, steel fixtures and fittings						
Item	**Qty**	**Metric**	**Rate**	**Cost/Asset**	**No. Assets /annum**	**Annual Budget**
Inspection						
Plant	1	hr	$62.50	$62.50	9	$563
FTE Labour	1	hr	$41.67	$41.67	9	$375
Subtotal for Inspections					*9*	*$938*
Maintenance						
Plant	4	hr	$62.50	$250.00	1	$250
FTE Labour	4	hr	$41.67	$166.67	1	$167
Materials	1	each	$250.00	$250.00	1	$250
Subtotal for Maintenance					*1*	*$667*
Sub-Total for Fauna Under Pass						***$1,604***

Materials: Paint, concrete to fill gaps, replace timber posts and any fittings. Assuming only 1 under pass will require maintenance/repairs
Note: Allow $250 for paint remover for graffiti, steel fixtures & fittings for posts & rail within underpass

Table 9.17 - Breakdown of maintenance costs for nest boxes

Nest Boxes						
(Inspection per asset on an annual basis) Check integrity of floor and overall box for gaps and repair as required Remove any graffiti						
Item	**Qty**	**Metric**	**Rate**	**Cost/Asset**	**No. Assets /annum**	**Annual Budget**
Inspection						
Plant	0.25	hr	$62.50	$15.63	0	$0
FTE Labour	0.25	hr	$41.67	$10.42	0	$0
Subtotal for Inspections					*0*	*$0*
Maintenance						
Plant	1	hr	$62.50	$62.50	5	$313
FTE Labour	1	hr	$41.67	$41.67	5	$208
Materials	1	each	$100.00	$100.00	5	$500
Subtotal for Maintenance					*5*	*$1,021*
Sub-Total for Nest Boxes						***$1,021***

Note: Currently no maintenance is performed on the Nest Boxes and are simply replaced when required. Assume 10% replaced per annum.

Table 9.18 - Breakdown of maintenance costs for wildlife stencilling

Wildlife Stencil						
Check integrity of colour and visibility of stencil on road (Inspection per asset on an annual basis) Freshen-up colour of stencil if required Repair/replace sign for stencil						
Item	**Qty**	**Metric**	**Rate**	**Cost/Asset**	**No. Assets /annum**	**Annual Budget**
Inspection						
Plant	0.25	hr	$62.50	$15.63	57	$891
FTE Labour	0.25	hr	$41.67	$10.42	57	$594
Subtotal for Inspections					*57*	*$1,484*
Maintenance						
Plant	0.5	hr	$62.50	$31.25	6	$188
FTE Labour	0.5	hr	$41.67	$20.83	6	$125
Total Materials	1	each	$75.00	$75.00	6	$450
Subtotal for Maintenance					*6*	*$763*
Sub-Total for Wildlife Stencil						***$2,247***

Materials: Paint and repair sign. Assuming only 10% require maintenance/repair
Note: Allow $50 for paint to touch up line marking of stencil & minor repair of sign

Table 9.19 - Summary of breakdown of maintenance costs for green infrastructure

Description	FTE (hrs)	Plant	Labour Cost	Materials	Total Annual Budget
Subtotal for Inspections	239.3	$22,500.00	$15,000.00	$0.00	$37,400.00
Subtotal for Maintenance	103.3	$6,500.00	$4,300.00	$24,300.00	$35,000.00
TOTAL (rounded)	**342.5**	**$29,000.00**	**$19,000.00**	**$25,000.00**	**$73,000.00**

Appendix E - Overall Asset Type Replacement / Renewal Graphs

Lifecycle modelling has been conducted at the asset type level to determine the future costs and timing for renewal and replacement of green infrastructure assets. The following graphs illustrate the results of the lifecycle modelling.

This appendix should also be read in conjunction with Appendices F and G that illustrate the impact of current and recommended funding on the condition of the portfolio as derived from the same models. It should also be read in conjunction with Appendix I which lists the assets identified for replacement through the lifecycle model based on their current condition.

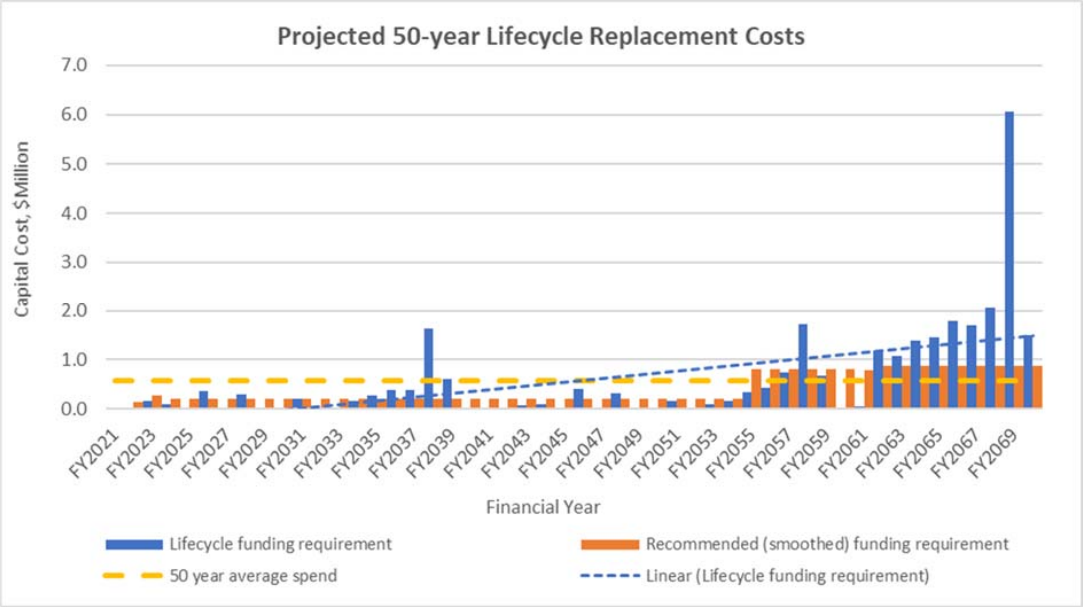


Figure 32 - Projected 50 year lifecycle capital renewal and replacement costs

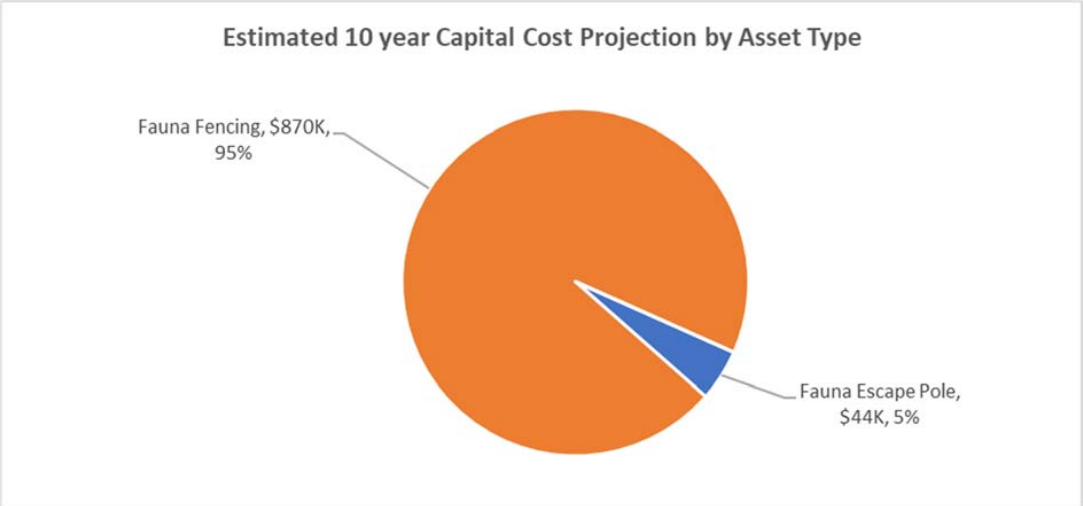


Figure 33 - Estimated total 10 year capital cost by asset type

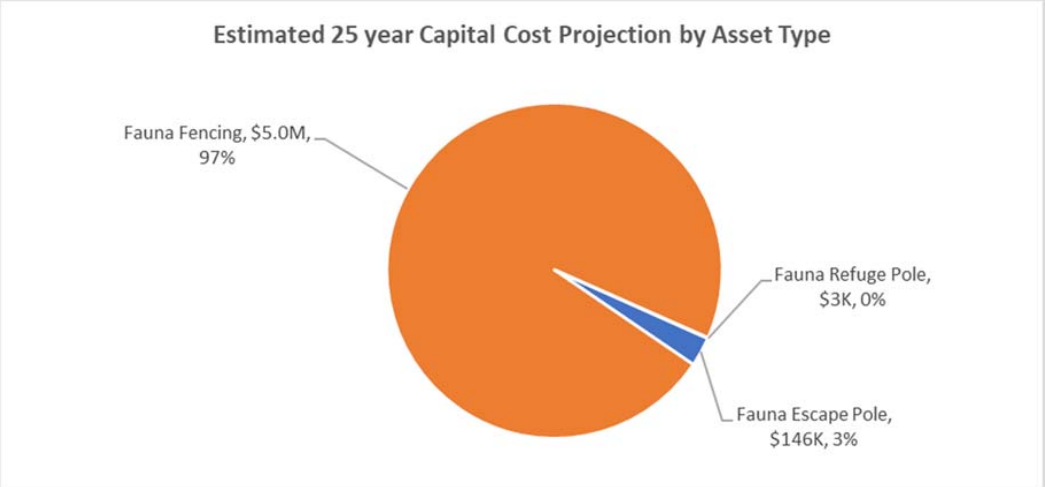


Figure 34- Estimated total 25 year capital cost by asset type

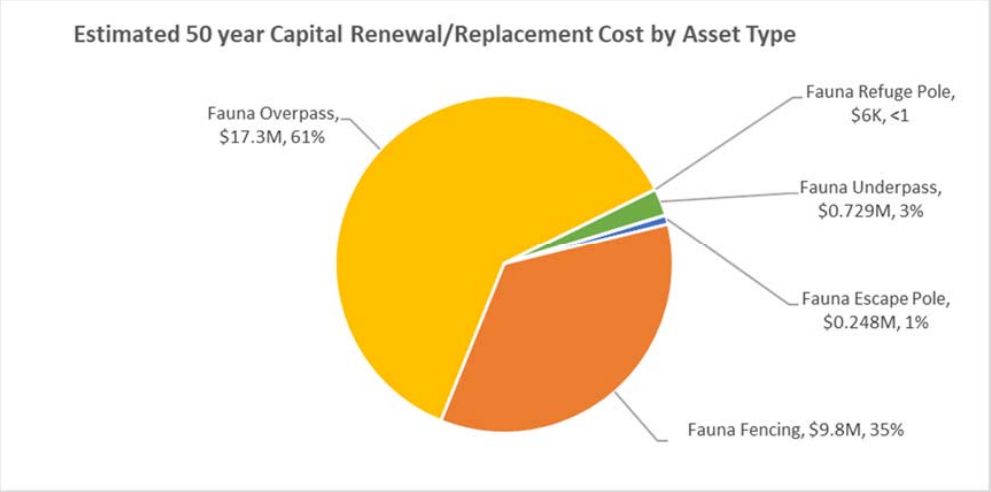


Figure 35 - Estimated total 50 year capital cost by asset type

Appendix F – Projected Condition - Overall

The projected condition of MBRC's green infrastructure assets has been determined as part of the lifecycle modelling for the current and recommended funding scenarios. The following charts illustrate the projected condition for all assets. Below condition 4 is considered to be an unacceptable level of service.

All Assets

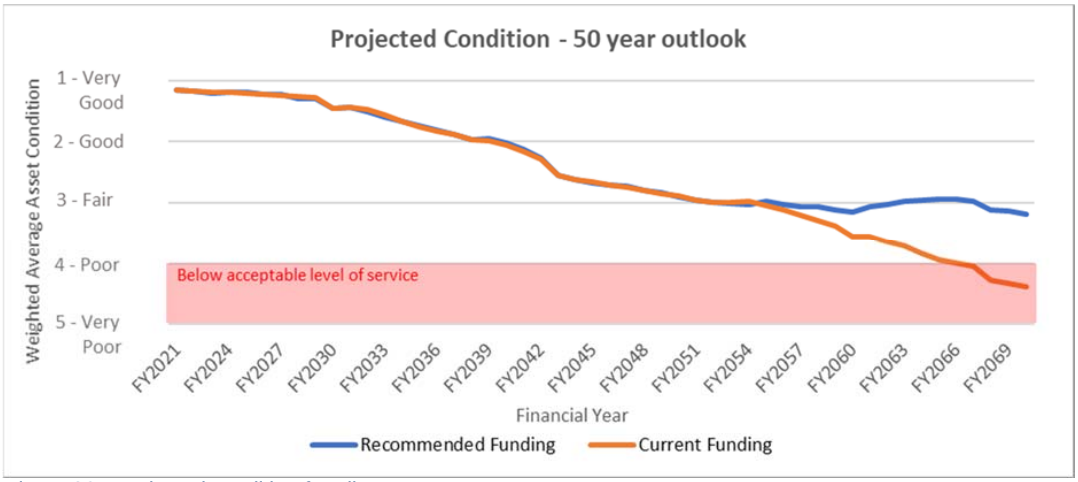
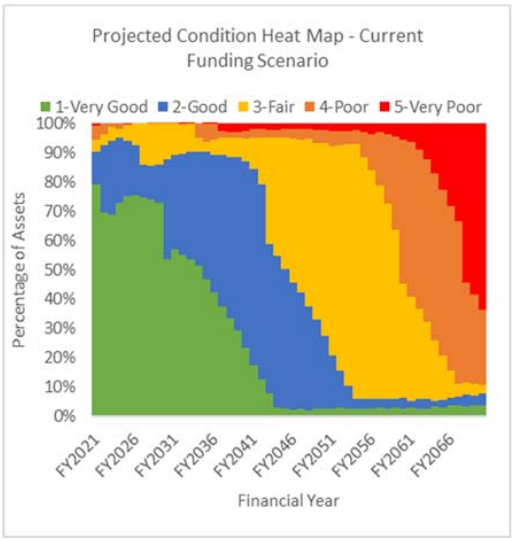


Figure 36 - Projected condition for all asset types

Current Funding:



Recommended Funding:

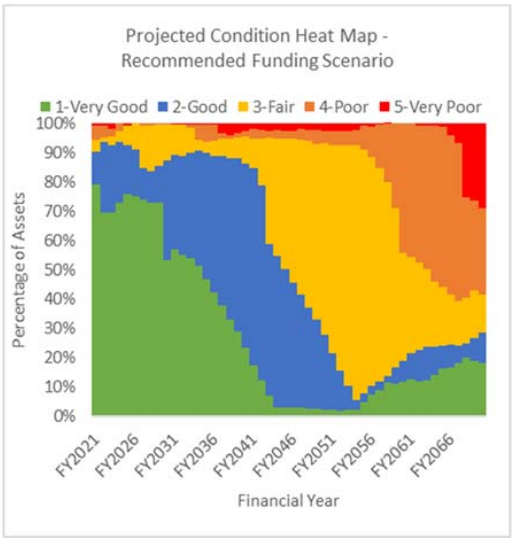


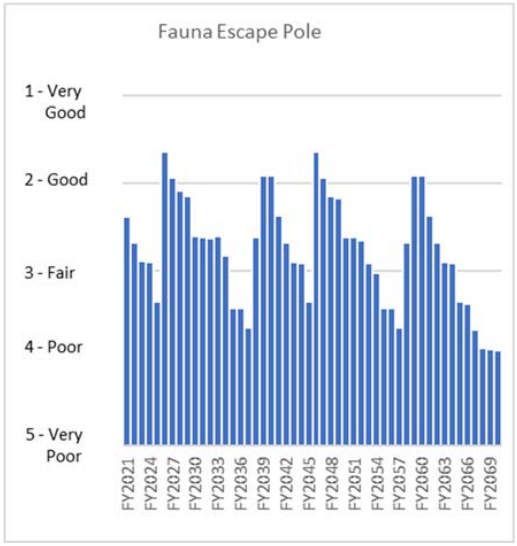
Figure 37 - Condition heat maps for all assets

Appendix G - Projected Condition by Asset Type

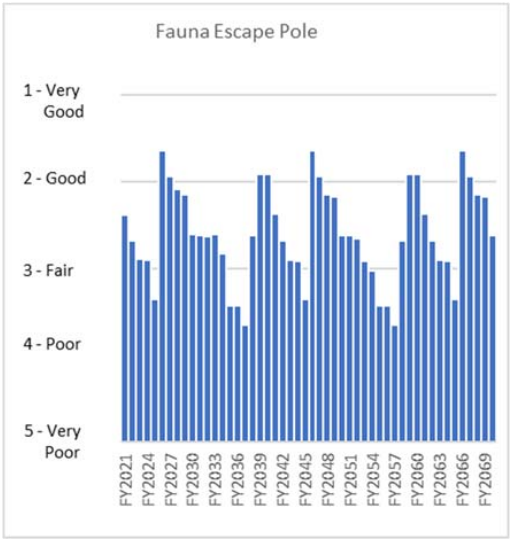
The projected condition of MBRC's green infrastructure has been determined as part of the lifecycle modelling for the current and recommended funding scenarios. The following charts illustrate the projected condition for each asset type over a 50-year period. Below condition 4 is considered to be an unacceptable level of service.

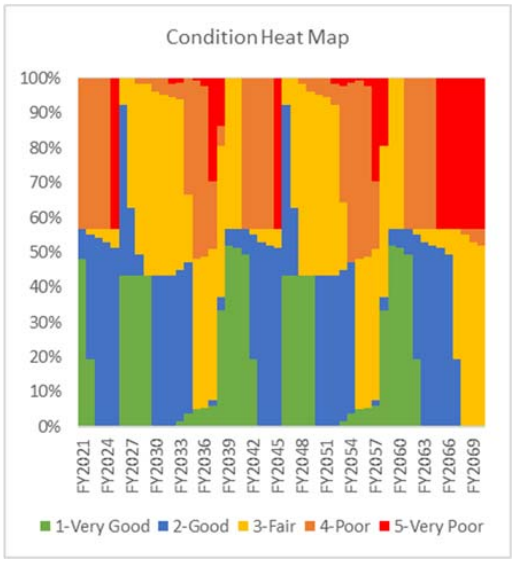
Fauna Escape Poles

Current Funding:



Recommended Funding:





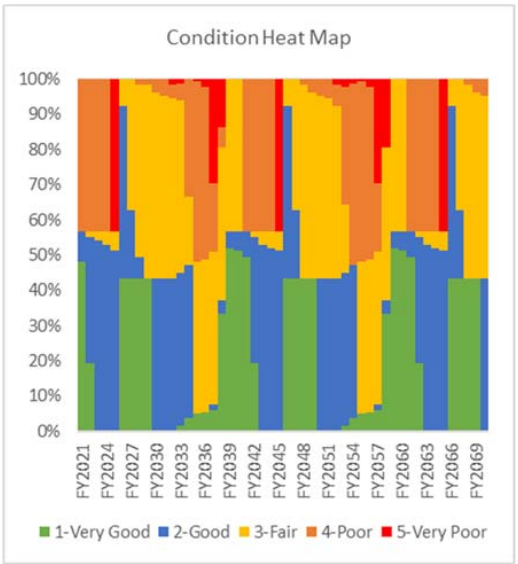
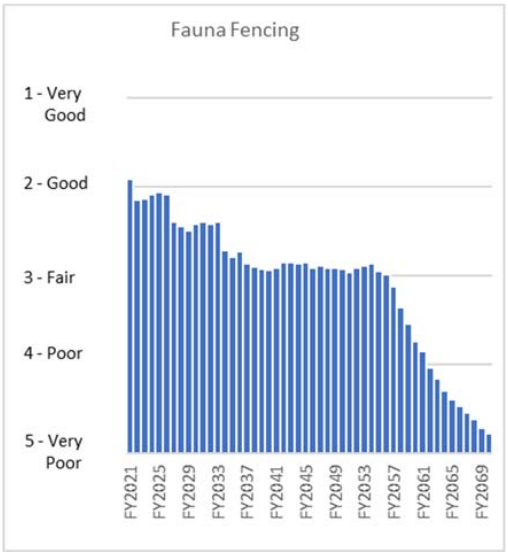


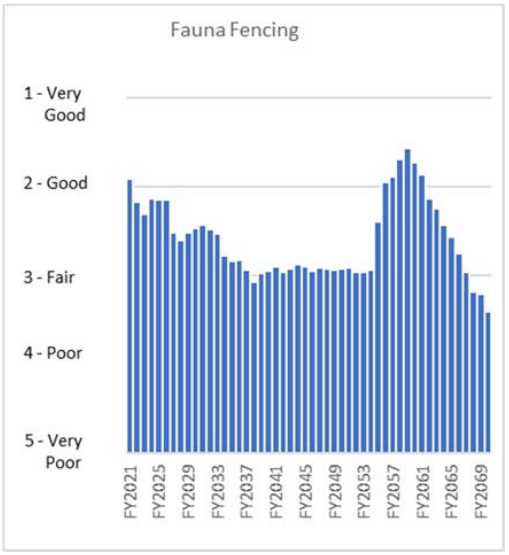
Figure 38 - Condition profiles and heat maps for Fauna Escape Poles

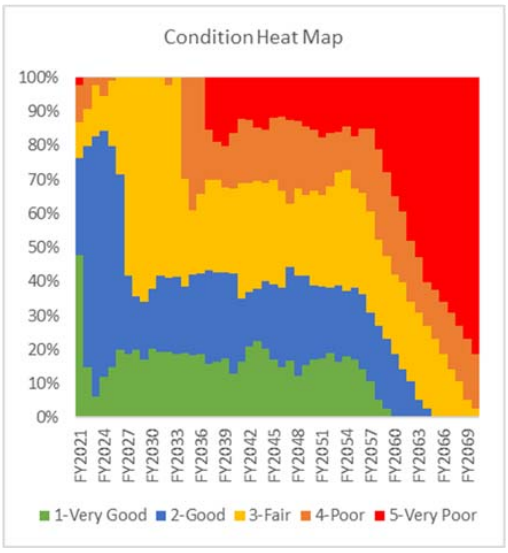
Fauna Fencing

Current Funding:



Recommended Funding:





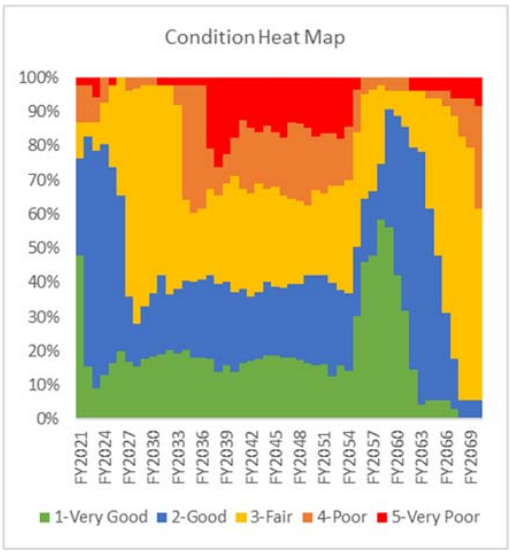
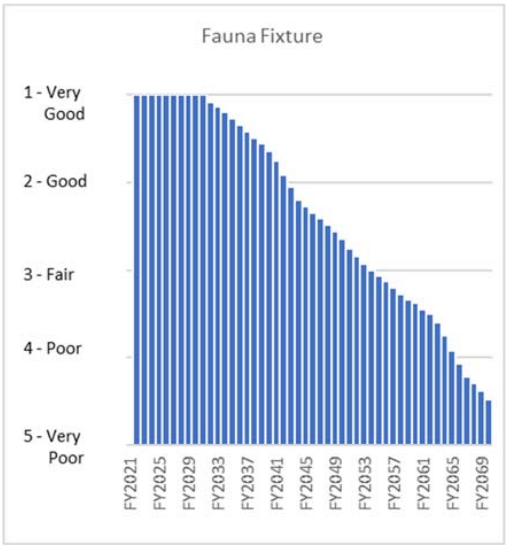


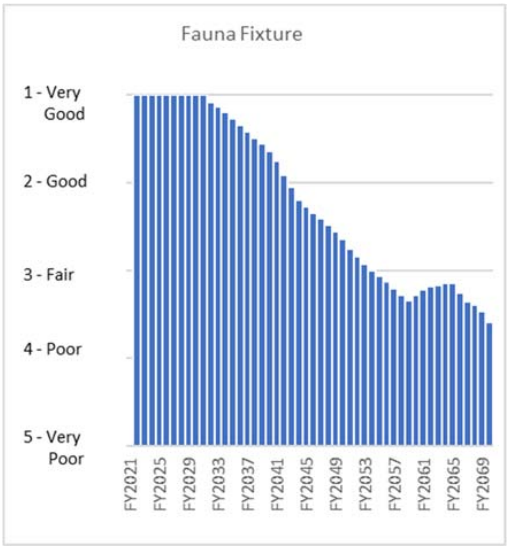
Figure 39 - Condition profiles and heat maps for Fauna Fencing

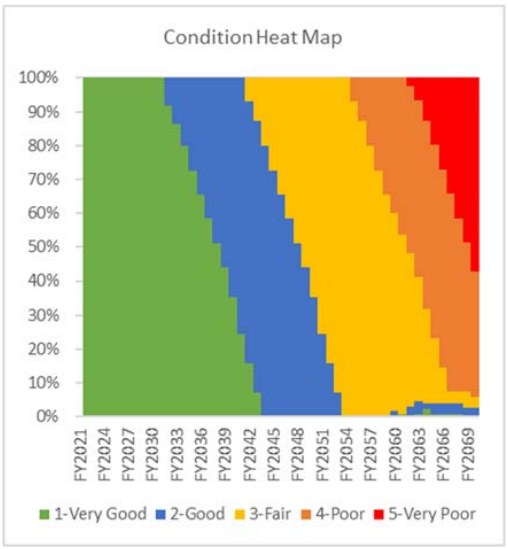
Fauna Fixtures

Current Funding:



Recommended Funding:





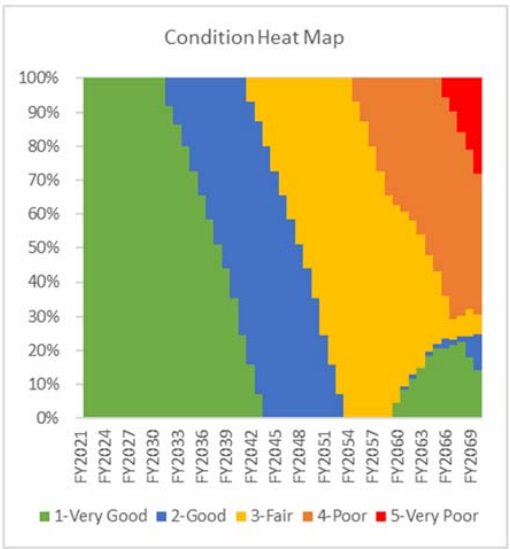
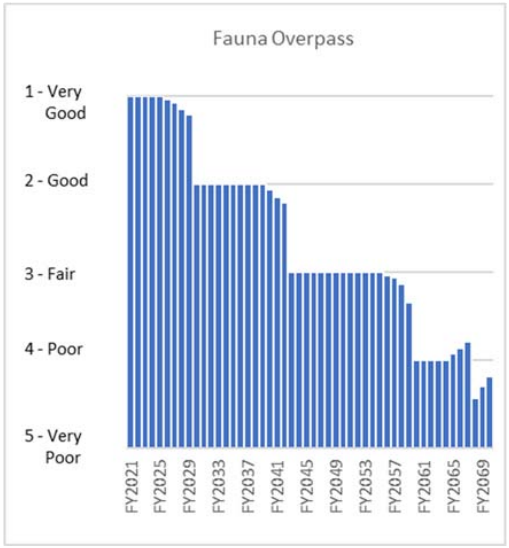


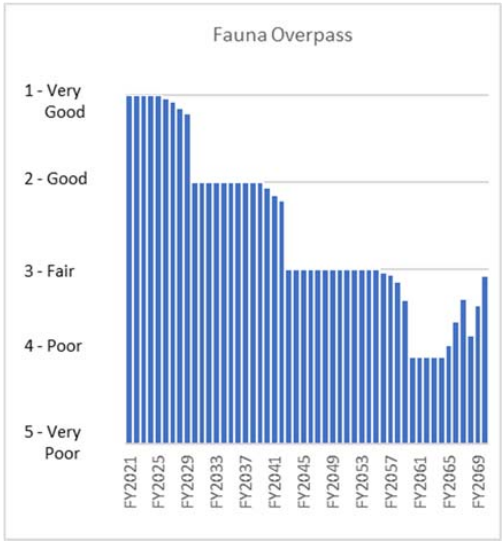
Figure 40 - Condition profiles and heat maps for Fauna Fixtures

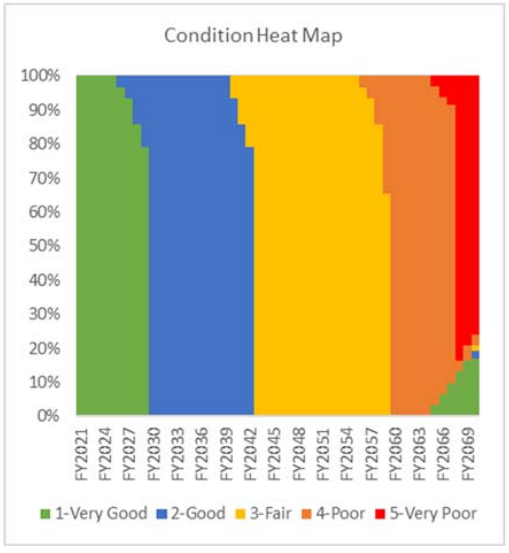
Fauna Overpass

Current Funding:



Recommended Funding:





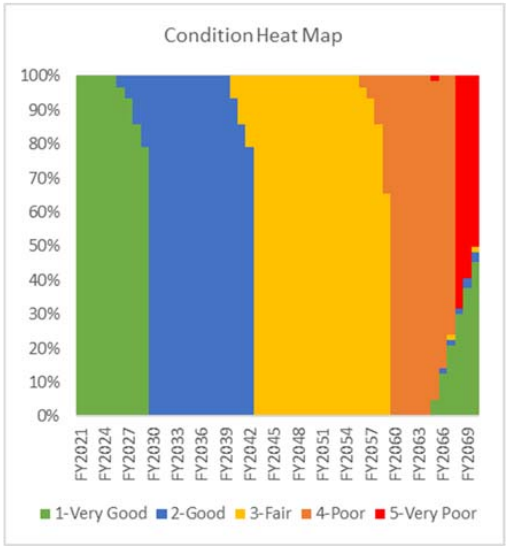
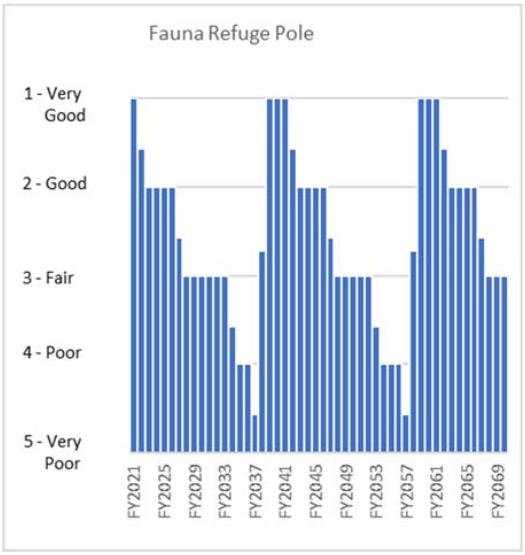


Figure 41 - Condition profiles and heat maps for Fauna Overpass

Fauna Refuge Pole

Current Funding:



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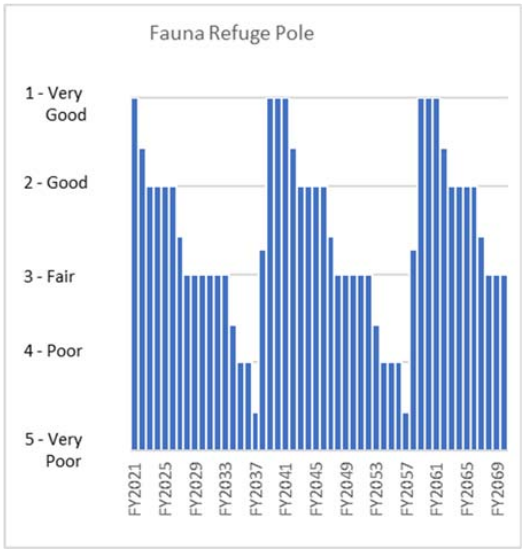
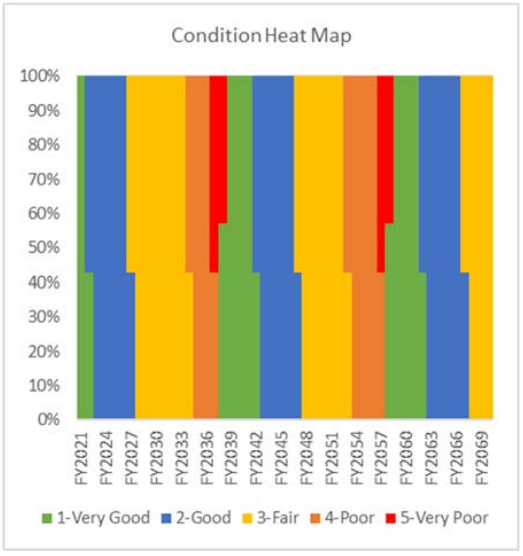




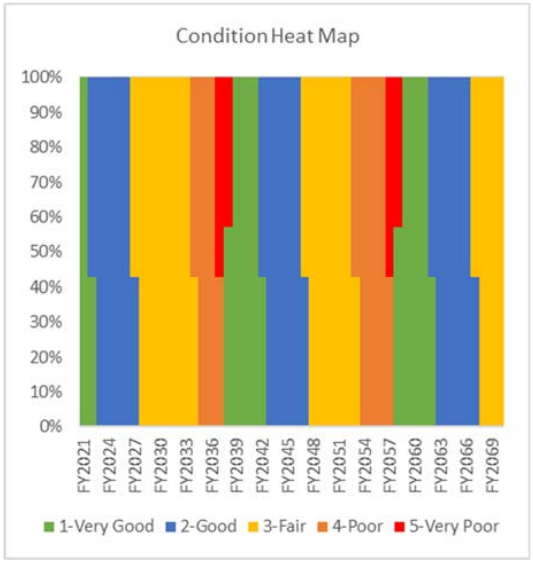
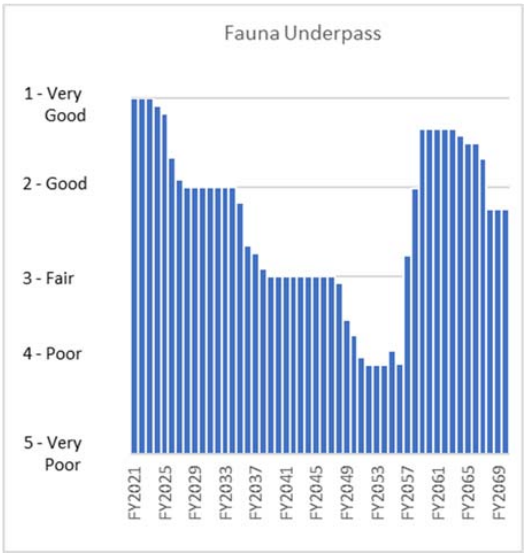


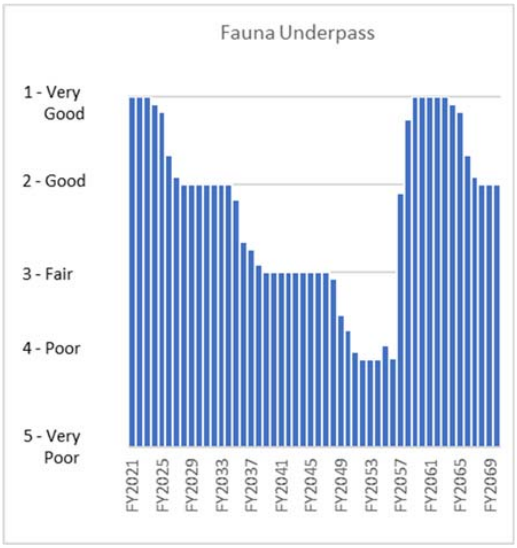
Figure 42 - Condition profiles and heat maps for Refuge Poles

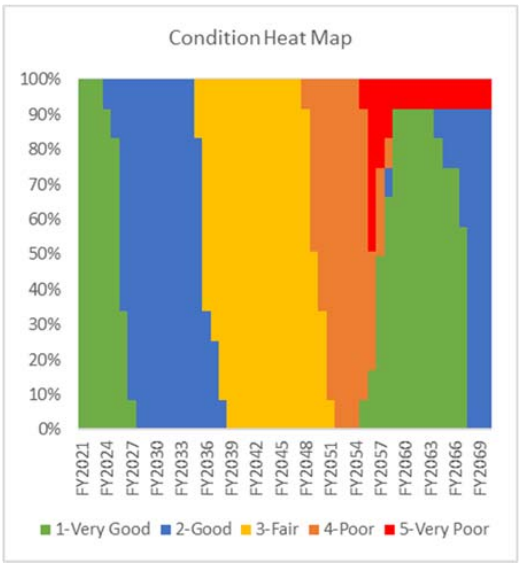
Fauna Underpass

Current Funding:



Recommended Funding:





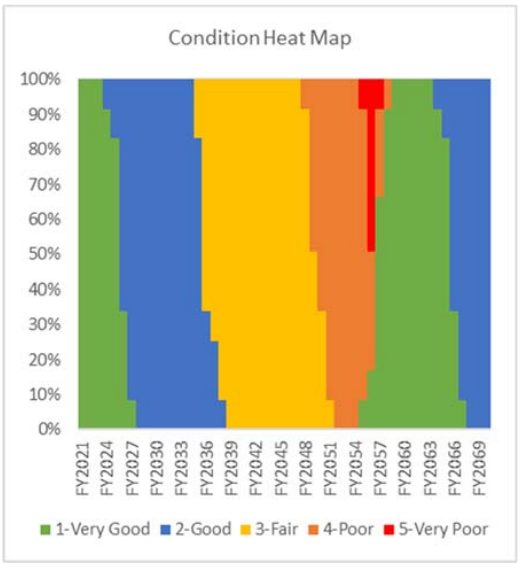


Figure 43 - Condition profiles and heat maps for Fauna Underpasses

Appendix H – Indicative 25-year New/Upgrade Capital Works Plan

The table below summaries currently scheduled new and upgrade capital works as extracted from the ePID system. The projects have been primarily identified through internal and external reviews of the Green Infrastructure Network (GIN) and identified deficiencies in the network, or as a result of a high number of wildlife-vehicle collisions occurring. All costs are in 2021 dollar terms and do not include allowance for escalation, inflation or GST. The program of works is subject to review and change as further condition data becomes available.

Table 9.20 - Indicative 25-year New/Upgrade Capital Works Plan

Project Number	Location	Asset Type	Total Cost
New/Upgrade Capital Works for FY2022			
105274	Lawnton - Gympie Road	Fauna Crossing Infrastructure	270,000
111001	Bray Park – Old North Roads	Fauna Crossing Infrastructure Installations	40,000
104809	Joyner - Samsonvale Road	Fauna Crossing Infrastructure Installations	30,000
104813	Bunya - Bunya Road	Fauna Crossing Infrastructure Installations	20,000
104923	Ferny Hills - Samford Road	Fauna Crossing Infrastructure Installation	350,000
107643	Everton Hills - Collins Road	Fauna Infrastructure Installation	50,000
107642	Narangba - Roberts Road	Fauna Infrastructure Installation	10,500
PN104801	Burpengary, O'Brien Road	Fauna Crossing Infrastructure Installation	290,000
111002	Fauna Crossing Infrastructure Minor Upgrades	Fauna Crossing Infrastructure	113,700
		Total for FY2022	***1,174,200***
New/Upgrade Capital Works for FY2023			
110452	Caboolture - Market Drive	Fauna Crossing Infrastructure Installations	20,000
110485	Caboolture – Central Springs Parades	Fauna Crossing Infrastructure Installations	20,000
104813	Bunya - Bunya Road	Fauna Crossing Infrastructure Installations	185,000
104923	Ferny Hills - Samford Road	Fauna Crossing Infrastructure Installation	350,000
111004	Albany Creek – Old Northern Road & Collins Roads	Fauna Crossing Infrastructure Installations	240,000
107642	Narangba - Roberts Road	Fauna Infrastructure Installation	19,800
104800	Morayfield - Hauton Road	Fauna Crossing Infrastructure Installation	20,000
111002	Fauna Crossing Infrastructure Minor Upgrades	Fauna Crossing Infrastructure	152,660
		Total for FY2023	***1,007,460***
New/Upgrade Capital Works for FY2024			
110452	Caboolture - Market Drive	Fauna Crossing Infrastructure Installations	200,000
110485	Caboolture – Central Springs Parades	Fauna Crossing Infrastructure Installations	250,000
104808	North Lakes - Diamond Jubilee Way	Fauna Crossing Infrastructure Installation	45,000
104820	North Lakes - North Ridge Circuit	Fauna Crossing Infrastructure Installations	20,000
104817	Bray Park/Strathpine - Samsonvale Road	Fauna Crossing Infrastructure Installation	20,000
104809	Joyner - Samsonvale Road	Fauna Crossing Infrastructure Installations	300,000
111004	Albany Creek – Old Northern Road & Collins Roads	Fauna Crossing Infrastructure Installations	220,000

Green Infrastructure Portfolio Asset Management Plan

Project Number	Location	Asset Type	Total Cost
104800	Morayfield - Hauton Road	Fauna Crossing Infrastructure Installation	245,000
		Total for FY2024	***1,300,000***
New/Upgrade Capital Works for FY2025			
104805	Narangba - Old Gympie Road	Fauna Crossing Infrastructure Installations 1	25,000
105061	Narangba - Old Gympie Road	Fauna Infrastructure Installation 2	60,000
110452	Caboolture - Market Drive	Fauna Crossing Infrastructure Installations	200,000
110485	Caboolture – Central Springs Parades	Fauna Crossing Infrastructure Installations	260,000
104820	North Lakes - North Ridge Circuit	Fauna Crossing Infrastructure Installations	370,000
107680	MBRL - Petrie to Redcliffe Rail Corridor	Fauna Movement Infrastructure	25,000
111002	Fauna Crossing Infrastructure Minor Upgrades	Fauna Crossing Infrastructure	301,940
		Total for FY2025	***1,241,940***
New/Upgrade Capital Works for FY2026			
104808	North Lakes - Diamond Jubilee Way	Fauna Crossing Infrastructure Installation	270,000
104817	Bray Park/Strathpine - Samsonvale Road	Fauna Crossing Infrastructure Installation	490,000
111000	Samsonvale – Mt Samson Roads	Fauna Crossing Infrastructure Installations	35,000
111003	Dayboro – Mt Samson Roads	Fauna Crossing Infrastructure Installations	25,000
107680	MBRL - Petrie to Redcliffe Rail Corridor	Fauna Movement Infrastructure	120,000
111002	Fauna Crossing Infrastructure Minor Upgrades	Fauna Crossing Infrastructure	301,940
		Total for FY2026	***1,241,940***
New/Upgrade Capital Works for FY2027			
104805	Narangba - Old Gympie Road	Fauna Crossing Infrastructure Installations 1	175,000
105061	Narangba - Old Gympie Road	Fauna Infrastructure Installation 2	350,000
104808	North Lakes - Diamond Jubilee Way	Fauna Crossing Infrastructure Installation	270,000
107680	MBRL - Petrie to Redcliffe Rail Corridor	Fauna Movement Infrastructure	120,000
111002	Fauna Crossing Infrastructure Minor Upgrades	Fauna Crossing Infrastructure	326,290
		Total for FY2027	***1,241,290***
New/Upgrade Capital Works for FY2028			
104805	Narangba - Old Gympie Road	Fauna Crossing Infrastructure Installations 1	175,000
105061	Narangba - Old Gympie Road	Fauna Infrastructure Installation 2	350,000
111003	Dayboro – Mt Samson Roads	Fauna Crossing Infrastructure Installations	275,000
111036	Samford – Gibbons Road	Fauna Crossing Infrastructure Installations	25,000
105273	Caboolture - Caboolture River Road	Fauna Crossing Infrastructure Installation	20,000
109277	Burpengary - Rowley Road	Fauna Crossing Infrastructure Installations	25,000
111002	Fauna Crossing Infrastructure Minor Upgrades	Fauna Crossing Infrastructure	370,120
		Total for FY2028	***1,240,120***
New/Upgrade Capital Works for FY2029			
104818	Margate - Duffield Road	Fauna Crossing Infrastructure Installation	170,000
111000	Samsonvale – Mt Samson Roads	Fauna Crossing Infrastructure Installations	470,000
111003	Dayboro – Mt Samson Roads	Fauna Crossing Infrastructure Installations	300,000
105273	Caboolture - Caboolture River Road	Fauna Crossing Infrastructure Installation	260,000
111002	Fauna Crossing Infrastructure Minor Upgrades	Fauna Crossing Infrastructure	48,700

Green Infrastructure Portfolio Asset Management Plan

Project Number	Location	Asset Type	Total Cost
		Total for FY2029	***1,248,700***
New/Upgrade Capital Works for FY2030			
104818	Margate - Duffield Road	Fauna Crossing Infrastructure Installation	350,000
104815	Samsonvale - Mt Samson Road (North of Gold Scub Lane)	Fauna Crossing Infrastructure Installations	50,000
111000	Samsonvale – Mt Samson Roads	Fauna Crossing Infrastructure Installations	470,000
111037	Samsonvale – Mt Samson & Kreisch Roads	Fauna Crossing Infrastructure Installations	30,000
105273	Caboolture - Caboolture River Road	Fauna Crossing Infrastructure Installation	465,000
109277	Burpengary - Rowley Road	Fauna Crossing Infrastructure Installations	135,000
		Total for FY2030	***1,500,000***
New/Upgrade Capital Works for FY2031			
111038	Burpengary East – Moreton Bay Boulevard	Fauna Crossing Infrastructure Installation	20,000
104818	Margate - Duffield Road	Fauna Crossing Infrastructure Installation	350,000
111096	Bunya – The Jinker Tracks (2)	Crossing Infrastructure Installations (2)	100,000
104815	Samsonvale - Mt Samson Road (North of Gold Scub Lane)	Fauna Crossing Infrastructure Installations	520,000
111036	Samford – Gibbons Road	Fauna Crossing Infrastructure Installations	320,000
111037	Samsonvale – Mt Samson & Kreisch Roads	Fauna Crossing Infrastructure Installations	280,000
109277	Burpengary - Rowley Road	Fauna Crossing Infrastructure Installations	135,000
111095	Regional – Eatons Crossing Road	Fauna Crossing Infrastructure Installations	125,000
		Total for FY2031	***1,850,000***

Appendix I – Indicative 25-year Renewal/Replacement Capital Works Plan

The table below represents an indicative renewal and replacement capital works plan, derived from undertaking lifecycle cost modelling using current condition and asset data. All costs are in 2021 dollar terms and do not include allowance for escalation, inflation or GST. The program of works is subject to review and change as further condition data becomes available.

Table 9.21 - Indicative 25-year Renewal/Replacement Capital Works Plan

Asset Number	Location	Summary Group	Total Cost
Renewal/Replacement Works for FY2022			
A00807036	Roberts Road, Narangba	Fauna Fencing	15,000
A00807566	Roberts Road, Narangba	Fauna Fencing	18,500
A00807567	Roberts Road, Narangba	Fauna Fencing	1,500
A00807595	Collins Road, Everton Hills	Fauna Fencing	33,333
A00807598	Collins Road, Everton Hills	Fauna Fencing	33,333
A00807779	Collins Road, Everton Hills	Fauna Fencing	33,333
		Total for FY2022:	***135,000***
Renewal/Replacement Works for FY2023			
A00807036	Roberts Road, Narangba	Fauna Fencing	15,000
A00807566	Roberts Road, Narangba	Fauna Fencing	11,110
A00807567	Roberts Road, Narangba	Fauna Fencing	8,390
A00807592	Roberts Road, Narangba	Fauna Fencing	31,500
A00920303	Old North Road, Warner	Fauna Fencing	34,000
A00922194	Dohles Rocks Road	Fauna Fencing	100,000
A00922195	Dohles Rocks Road	Fauna Fencing	60,000
		Total for FY2023:	***260,000***
Renewal/Replacement Works for FY2024			
A00891877	New Settlement Road, Burpengary	Fauna Fencing	44,018
A00920300	Dohles Rocks Road, Murrumba Downs	Fauna Fencing	60,883
A00920301	Dohles Rocks Road, Murrumba Downs	Fauna Fencing	34,953
A00920302	Kinsellas Road East, Mango Hill	Fauna Fencing	60,148
		Total for FY2024:	***200,000***
Renewal/Replacement Works for FY2025			
A00658018	Old North Road, Warner	Fauna Fencing	26,953
A00658030	Old North Road Reserve, Warner	Fauna Fencing	105,388
A00658034	Kremzow Road, Warner	Fauna Fencing	13,178
A00891877	New Settlement Road, Burpengary	Fauna Fencing	54,483
		Total for FY2025:	***200,000***
Renewal/Replacement Works for FY2026			
Various	Various (80) locations	Fauna Escape Pole	44,000
A00658017	Old North Road, Brendale	Fauna Fencing	93,555
A00807598	Collins Road, Everton Hills	Fauna Fencing	4,945

Asset Number	Location	Summary Group	Total Cost
A00807779	Collins Road, Everton Hills	Fauna Fencing	57,500
		Total for FY2026:	***200,000***
Renewal/Replacement Works for FY2027			
A00807567	Roberts Road, Narangba	Fauna Fencing	4,195
A00807592	Roberts Road, Narangba	Fauna Fencing	15,750
A00807595	Collins Road, Everton Hills	Fauna Fencing	78,750
A00807598	Collins Road, Everton Hills	Fauna Fencing	101,305
		Total for FY2027:	***200,000***
Renewal/Replacement Works for FY2028			
A00657843	Old North Road Reserve, Warner	Fauna Fencing	166,500
A00807036	Roberts Road, Narangba	Fauna Fencing	15,000
A00807566	Roberts Road, Narangba	Fauna Fencing	18,500
		Total for FY2028:	***200,000***
Renewal/Replacement Works for FY2029			
A00583015	Fence, Caboolture	Fauna Fencing	45,767
A00583016	Brown Street, Caboolture	Fauna Fencing	72,208
A00583017	Brown Street, Caboolture	Fauna Fencing	7,173
A00583018	Fence, Caboolture	Fauna Fencing	11,410
A00657843	Old North Road Reserve, Warner	Fauna Fencing	1,750
A00664400	Grace Court, Mango Hill	Fauna Fencing	15,000
A00664460	Brays Road, Murrumba Downs	Fauna Fencing	9,500
A00664474	Petrie Street, Petrie	Fauna Fencing	14,000
A00799985	Bunya Road, Draper	Fauna Fencing	1,370
A00799986	Bunya Road, Draper	Fauna Fencing	4,465
A00811309	The Jinker Track	Fauna Fencing	17,358
		Total for FY2029:	***200,000***
Renewal/Replacement Works for FY2030			
A00583015	Fence, Caboolture	Fauna Fencing	24,601
A00658015	Old North Road, Brendale	Fauna Fencing	114,967
A00658016	Old North Road, Brendale	Fauna Fencing	20,138
A00658029	Kremzow Road, Warner	Fauna Fencing	27,183
A00658035	Kremzow Road, Warner	Fauna Fencing	13,113
		Total for FY2030:	***200,000***
Renewal/Replacement Works for FY2031			
A00634700	Centurion Circuit, Warner	Fauna Fencing	71,000
A00658012	Old North Road, Brendale	Fauna Fencing	23,385
A00658015	Old North Road, Brendale	Fauna Fencing	4,483
A00807782	McClintock Drive, Murrumba Downs	Fauna Fencing	41,632
A00807784	McClintock Drive, Murrumba Downs	Fauna Fencing	31,000
A00807790	McClintock Drive, Murrumba Downs	Fauna Fencing	28,500
		Total for FY2031:	***200,000***

Asset Number	Location	Summary Group	Total Cost
Renewal/Replacement Works for FY2032			
A00659729	Brays Road, Murrumba Downs	Fauna Fencing	20,020
A00659730	Brays Road, Murrumba Downs	Fauna Fencing	89,495
A00659740	Onyx Drive, Murrumba Downs	Fauna Fencing	11,618
A00664453	Onyx Drive, Murrumba Downs	Fauna Fencing	50,000
A00807782	McClintock Drive, Murrumba Downs	Fauna Fencing	28,868
		Total for FY2032:	***200,000***
Renewal/Replacement Works for FY2033			
Various	Various (3) locations	Fauna Escape Pole	1,650
A00659729	Brays Road, Murrumba Downs	Fauna Fencing	68,756
A00807802	Walkers Road, Morayfield	Fauna Fencing	39,595
A00807826	Walkers Road, Morayfield	Fauna Fencing	8,000
A00807961	Oakey Flat Road, Narangba	Fauna Fencing	17,000
A00807962	Oakey Flat Road, Narangba	Fauna Fencing	14,250
A00808038	Oakey Flat Road, Burpengary	Fauna Fencing	19,750
A00808039	Oakey Flat Road, Narangba	Fauna Fencing	31,000
		Total for FY2033:	***200,000***
Renewal/Replacement Works for FY2034			
Various	Various (4) locations	Fauna Escape Pole	2,200
A00799987	Bunya Road, Draper	Fauna Fencing	15,355
A00799988	Bunya Road, Draper	Fauna Fencing	47,826
A00799989	Bunya Road, Draper	Fauna Fencing	48,318
A00801015	Newlands Road, Wamuran	Fauna Fencing	29,158
A00801016	Newlands Road, Wamuran	Fauna Fencing	26,738
A00807794	Walkers Road, Morayfield	Fauna Fencing	11,500
A00807798	Walkers Road, Morayfield	Fauna Fencing	15,250
A00807802	Walkers Road, Morayfield	Fauna Fencing	3,656
		Total for FY2034:	***200,000***
Renewal/Replacement Works for FY2035			
Various	Various (2) locations	Fauna Escape Pole	1,100
A00799984	Bunya Road, Draper	Fauna Fencing	39,863
A00799987	Bunya Road, Draper	Fauna Fencing	17,125
A00842841	Dayboro Road, Dayboro	Fauna Fencing	43,413
A00891877	New Settlement Road, Burpengary	Fauna Fencing	98,500
		Total for FY2035:	***200,000***
Renewal/Replacement Works for FY2036			
A00668534	Rob Akers Reserve - Sports Complex, Strathpine	Fauna Escape Pole	550
A00842841	Dayboro Road, Dayboro	Fauna Fencing	133,591
A00920303	Old North Road, Warner	Fauna Fencing	18,896
A00920304	Old North Road, Warner	Fauna Fencing	19,163
A00920305	Old North Road, Warner	Fauna Fencing	27,800

Asset Number	Location	Summary Group	Total Cost
		Total for FY2036:	***200,000***
Renewal/Replacement Works for FY2037			
Various	Various (4) locations	Fauna Escape Pole	2,200
A00889594	Kremzow Road, Warner	Fauna Fencing	54,926
A00889595	Kremzow Road	Fauna Fencing	90,780
A00920303	Old North Road, Warner	Fauna Fencing	52,094
		Total for FY2037:	***200,000***
Renewal/Replacement Works for FY2038			
Various	Various (55) locations	Fauna Escape Pole	30,250
A00840448	New Settlement Road, Burpengary	Fauna Fencing	95,900
A00889593	New Settlement Road	Fauna Fencing	49,400
A00920299	Old North Road, Brendale	Fauna Fencing	22,650
Various	Various (4) locations	Fauna Refuge Pole	1,800
		Total for FY2038:	***200,000***
Renewal/Replacement Works for FY2039			
Various	Various (36) locations	Fauna Escape Pole	19,800
A00910963	Bunyaville Close Reserve, Arana Hills	Fauna Fencing	22,250
A00910964	Bunyaville Close Reserve, Arana Hills	Fauna Fencing	35,500
A00910965	Bunyaville Close Reserve, Arana Hills	Fauna Fencing	2,750
A00910966	Bunyaville Close Reserve, Arana Hills	Fauna Fencing	3,675
A00914308	Arthur Drewett Drive, Burpengary East	Fauna Fencing	58,716
A00914309	Arthur Drewett Drive, Burpengary East	Fauna Fencing	33,422
A00917086	Moreton Bay Central Sports Complex, Burpengary	Fauna Fencing	3,750
A00920299	Old North Road, Brendale	Fauna Fencing	18,787
Various	Various (3) locations	Fauna Refuge Pole	1,350
		Total for FY2039:	***200,000***
Renewal/Replacement Works for FY2040			
A00844830	Buchanan Park, Burpengary	Fauna Fencing	95,597
A00920299	Old North Road, Brendale	Fauna Fencing	104,403
		Total for FY2040:	***200,000***
Renewal/Replacement Works for FY2041			
A00842726	Dayboro Road, Dayboro	Fauna Fencing	31,114
A00842940	Old Northern Road, Albany Creek	Fauna Fencing	54,085
A00844830	Buchanan Park, Burpengary	Fauna Fencing	114,801
		Total for FY2041:	***200,000***
Renewal/Replacement Works for FY2042			
A00842479	Dayboro Road, Whiteside	Fauna Fencing	53,934
A00842726	Dayboro Road, Dayboro	Fauna Fencing	146,066
		Total for FY2042:	***200,000***
Renewal/Replacement Works for FY2043			

Asset Number	Location	Summary Group	Total Cost
A00842475	Dayboro Road, Whiteside	Fauna Fencing	68,758
A00842479	Dayboro Road, Whiteside	Fauna Fencing	71,095
A00920302	Kinsellas Road East, Mango Hill	Fauna Fencing	60,148
		Total for FY2043:	***200,000***
Renewal/Replacement Works for FY2044			
A00842475	Dayboro Road, Whiteside	Fauna Fencing	33,409
A00920300	Dohles Rocks Road, Murrumba Downs	Fauna Fencing	60,883
A00920301	Dohles Rocks Road, Murrumba Downs	Fauna Fencing	34,953
A00922195	Dohles Rocks Road	Fauna Fencing	70,756
		Total for FY2044:	***200,000***
Renewal/Replacement Works for FY2045			
A00913349	Pumicestone Road, Caboolture	Fauna Fencing	8,425
A00913350	Pumicestone Road, Caboolture	Fauna Fencing	43,636
A00922194	Dohles Rocks Road	Fauna Fencing	122,375
A00922195	Dohles Rocks Road	Fauna Fencing	25,564
		Total for FY2045:	***200,000***
Renewal/Replacement Works for FY2046			
Various	Various (80) locations	Fauna Escape Pole	44,000
A00664400	Grace Court, Mango Hill	Fauna Fencing	15,000
A00664460	Brays Road, Murrumba Downs	Fauna Fencing	9,500
A00664474	Petrie Street, Petrie	Fauna Fencing	14,000
A00913347	Pumicestone Road, Caboolture	Fauna Fencing	13,281
A00913348	Pumicestone Road, Caboolture	Fauna Fencing	46,756
A00913349	Pumicestone Road, Caboolture	Fauna Fencing	57,463
		Total for FY2046:	***200,000***

Appendix J – References

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