ASSET MANAGEMENT PLAN

Warrnambool City Council

Trees

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This Asset Management Plan may be used as a supporting document to inform an overarching Strategic Asset Management Plan.

Contents

1.0 EXECUTIVE SUMMARY

1.1 The Purpose of the Plan

Asset management planning is a comprehensive process ensuring delivery of services from infrastructure is financially sustainable.

This Asset Management Plan (AMP) details information about infrastructure assets with actions required to provide an agreed level of service in the most cost-effective manner while outlining associated risks. The plan defines the services to be provided, how the services are provided and what funds are required to provide over the 20-year planning period. The Asset Management Plan will link to a Long-Term Financial Plan which typically considers a 15-year planning period.

This plan covers the infrastructure assets that provide amenity to a steetscapes, shade, reduction of urban heat sinks, animal habitat and biodiversity corridors.

1.2 Asset Description

Council's tree portfolio comprises:

- 13,000 trees
- 77 stumps (failed assets)
- 8292 vacant sites suitable for planting

The above infrastructure assets have significant total renewal value estimated at $8.8 million

1.3 Levels of Service

Our present funding levels are sufficient to continue to provide existing services at current service levels in the medium term.

The main service consequences of the Planned Budget are:

- Low rates of planting vacant sites
- Poor growth habits due to lack of proactive maintenance
- Only urgent issues are actioned

1.4 Future Demand

The main demands for new services are created by:

- Land development / subdivisions
- Changing community values regarding the environment, its protection and enhancement
- Perceived risks to public safety

These demands will be approached using a combination of managing existing assets and providing new assets to meet demand. Demand management practices may also include insuring against risks and managing failures.

- Ensuring developments allow for the provision of open space in strategic locations that fit within the larger view of a network of biodiversity corridors.
- Identification of ongoing operational and maintenance costs to look after trees over their life.
- Frequent risk inspections for higher risk trees and providing buffers (such as mulching) around immediate high potential fall zones.

1.5 Lifecycle Management Plan

1.5.1 What does it Cost?

The forecast lifecycle costs necessary to provide the services covered by this AMP includes operation, maintenance, renewal, acquisition, and disposal of assets. Although the AMP may be prepared for a range of time periods, it typically informs a Long-Term Financial Planning period of 10 years. Therefore, a summary output from the AMP is the forecast of 15-year total outlays, which for trees is estimated as $28M or $1.8M on average per year.

1.6 Financial Summary

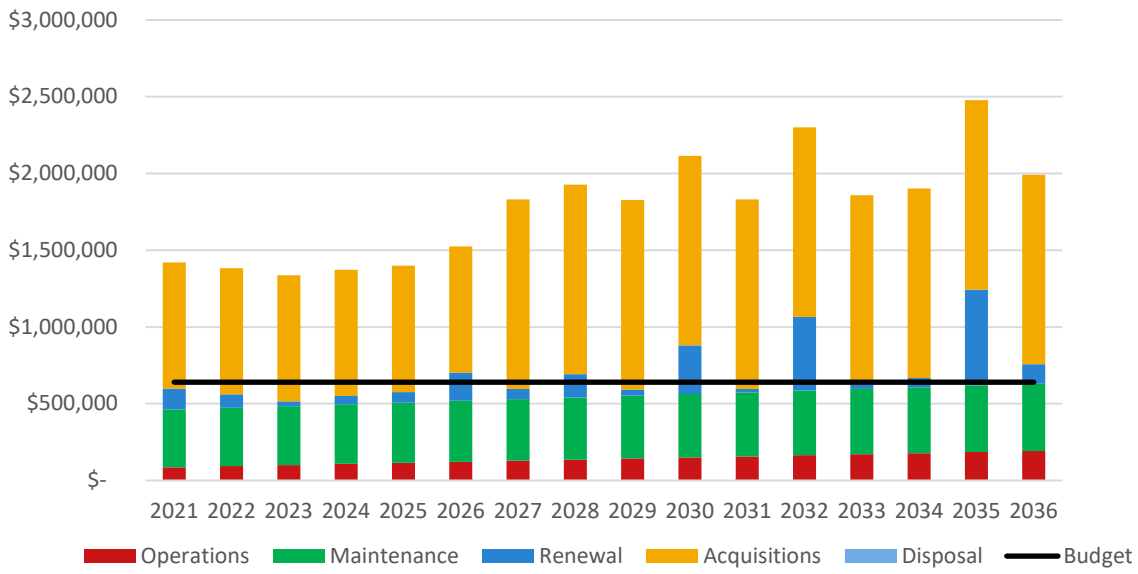
1.6.1 What we will do

Estimated available funding for the 15-year period is $10.2 million or $683,000 on average per year as per the Planned Budget. This is only 36% of the cost required to sustain the desired level of service.

The infrastructure reality is that only what is funded in the long-term financial plan can be provided. The informed decision making depends on the AMP emphasising the consequences of Planned Budgets on the service levels provided and risks.

The anticipated Planned Budget for trees leaves a shortfall of $1.2 million on average per year of the forecast lifecycle costs required to provide services in the AMP compared with the Planned Budget currently included in the Long-Term Financial Plan. This is shown in the figure below. Section 5 identifies the most significant gap is in Acquisitions.

Forecast Lifecycle Costs and Planned Budgets



All figure values are shown in current day dollars.

We plan to provide tree management services for the following:

- Operation, maintenance, renewal and infill plantings (acquisitions) of street and reserve trees to meet service levels set by in annual budgets.
- Planting of Logan's Beach Village, Riverland, Riverside, Mervue and other future developments within the 10-year planning period.

1.6.2 What we cannot do

We currently do **not** allocate enough budget to sustain these services at the proposed standard or to provide all new services being sought. Works and services that cannot be provided under present funding levels are:

- w2040 targets of 10% canopy cover for urban areas by 2026
- w2040 targets of 30% canopy cover for urban areas by 2040
- Proactive formative pruning to improve the long-term health of trees

1.6.3 Managing the Risks

Our present budget levels are sufficient to continue to manage risks in the medium term.

The main risk consequences are:

- Only urgent risk issues are actioned;
- High, medium, and low priority maintenance tasks are not actioned;
- Risk audits are done every four years;
- Trees in Kindergartens and around Playgrounds are audited annually;
- 8% of trees are dead or in poor health.

We will endeavour to manage these risks within available funding by:

- Continuing regular inspections and pruning
- Advocating for additional operational & maintenance budget in line with new acquisitions

1.7 Asset Management Practices

Our systems to manage assets include:

- Finance System: TechnologyOne
- Asset Management System: Conquest

Assets requiring renewal/replacement are identified from either the asset register or an alternative method. These methods are part of the Lifecycle Model.

- If Asset Register data is used to forecast the renewal costs this is done using the acquisition year and the useful life,
- Alternatively, an estimate of renewal lifecycle costs is projected from external condition modelling systems (such as Pavement Management Systems) and may be supplemented with, or based on, expert knowledge.

The Asset Register was used to forecast the renewal life cycle costs for this Asset Management Plan.

1.8 Monitoring and Improvement Program

The next steps resulting from this AMP to improve asset management practices are:

- Confirm the costs to achieve the community's recommended performance
- Develop, cost, and implement a New Tree Planting program
- Determine, and budget for, ongoing operational & maintenance costs associated with new plantings

2.0 Introduction

2.1 Background

Warrnambool City Council covers 120km^2 , 909ha are public open space, which includes the Thunder Point Coastal Reserve, waterways and Lake Pertobe. Another 951ha are road reserve. The community's vision is to be connected by green infrastructure and corridors of urban forests to support resilient and connected biodiversity, as outlined in the W2040 Plan.

There are currently 16,600 trees across all of these public spaces, with 450 additional trees planted each year, and around 170 gifted through subdivisions.

Trees are not valued or recognized in Council's financial statements, but still have a cost to inspect, maintain and replace. Therefore there is some importance to understanding these whole of life costs and the risks associated with these dynamic assets as they grow and change over time.

This Asset Management Plan communicates the requirements for the sustainable delivery of services through management of assets, compliance with regulatory requirements, and required funding to provide the appropriate levels of service over the long term planning period.

The Asset Management Plan is to be read with Warrnambool City Council planning documents. This should include the Asset Management Policy and Asset Management Strategy, where developed, along with other key planning documents:

- Council Plan 2021- 2025
- Warrnambool 2040 (community vision)
- Green Warrnambool 2018
- Growth Area Structure and Development Plans
- Municipal Road Management Plan
- Principal Pedestrian Network (in development)
- Road User Plan
- Site specific masterplans
- Street Tree Planting and Management Guidelines
- Street Tree Planting and Management Policy
- Warrnambool Health and Wellbeing Plan
- Warrnambool Open Space Strategy

The assets covered by this Asset Management Plan includes street trees found in the road reserve, as well as those found in parks and open spaces, the Botanic Gardens, Council properties including community facilities, playgrounds and kindergartens. For a detailed summary of the assets covered in this Asset Management Plan refer to Table in Section 5.

These assets are used to provide amenity to a steetscapes, shade, reduction of urban heat sinks, animal habitat and biodiversity corridors.

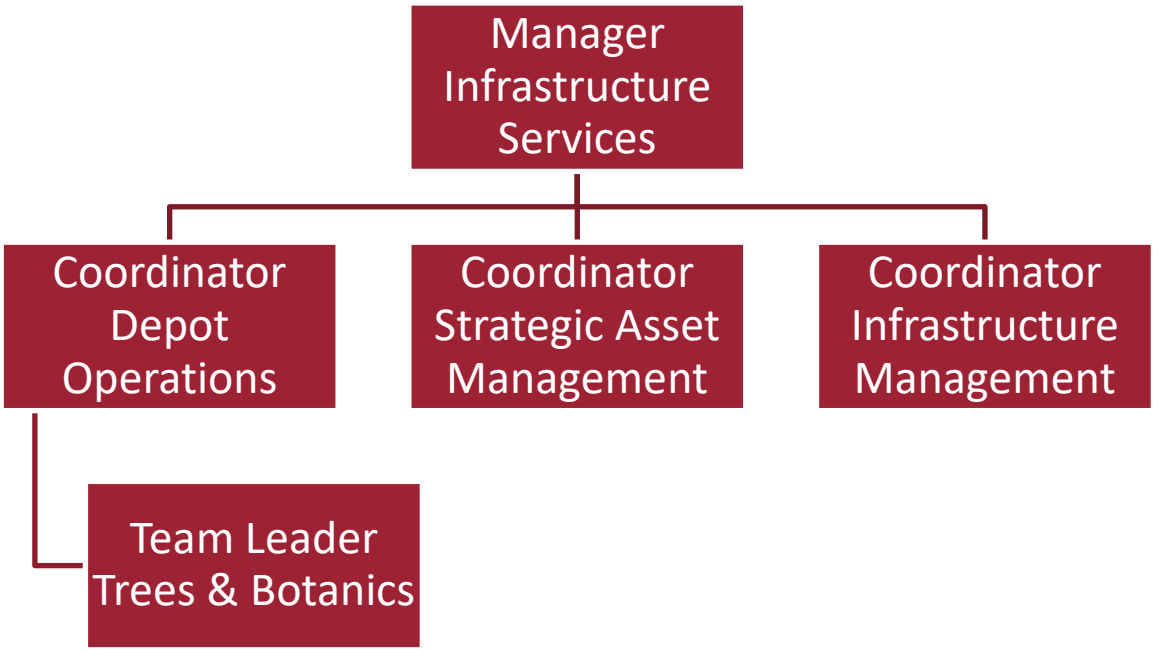
The infrastructure assets included in this plan have no value on Council's balance sheet, however have a total replacement value of $8.8 million.

Key stakeholders in the preparation and implementation of this Asset Management Plan are shown in Table 2.1.

Table 2.1: Key Stakeholders in the AMP

Key Stakeholder	Role in Asset Management Plan
Council	■ Represent needs of community/shareholders ■ Allocate resources to meet planning objectives in providing services while managing risks ■ Ensure service sustainable
Manager Infrastructure Services	■ Demand Analysis ■ Community Engagement / Consultation ■ Determination of community levels of service
Coordinator Depot Operations	■ New Tree Plantings ■ Tree Maintenance & Operational activities ■ Development of budget estimates ■ Liaise with service partners on conceptual designs
Coordinator Strategic Asset Management	■ Maintenance of asset register ■ Condition audits and data collection ■ Analysis of asset data ■ Asset performance reporting
Coordinator Infrastructure Management	■ Approval of land development landscaping plans
Coordinator Sustainability	■ Assessment of community planting proposals of open space areas

Our organisational structure for service delivery from infrastructure assets is detailed below



2.2 Goals and Objectives of Asset Ownership

Council's goal in managing infrastructure assets is to meet the defined level of service (as amended from time to time) in the most cost-effective manner for present and future consumers. The key elements of infrastructure asset management are:

- Providing a defined level of service and monitoring performance,
- Managing the impact of growth through demand management and infrastructure investment,
- Taking a lifecycle approach to developing cost-effective management strategies for the long-term that meet the defined level of service,
- Identifying, assessing and appropriately controlling risks, and
- Linking to a Long-Term Financial Plan which identifies required, affordable forecast costs and how it will be allocated.

Key elements of the planning framework are:

- Levels of service – specifies the services and levels of service to be provided,
- Future demand – how this will impact on future service delivery and how this is to be met,
- Lifecycle management – how to manage its existing and future assets to provide defined levels of service,
- Financial summary – what funds are required to provide the defined services,
- Asset management practices – how we manage provision of the services,
- Monitoring – how the plan will be monitored to ensure objectives are met,
- Asset management improvement plan – how we increase asset management maturity.

Other references to the benefits, fundamentals principles and objectives of asset management are:

- International Infrastructure Management Manual 2015 [1]
- ISO 55000[2]

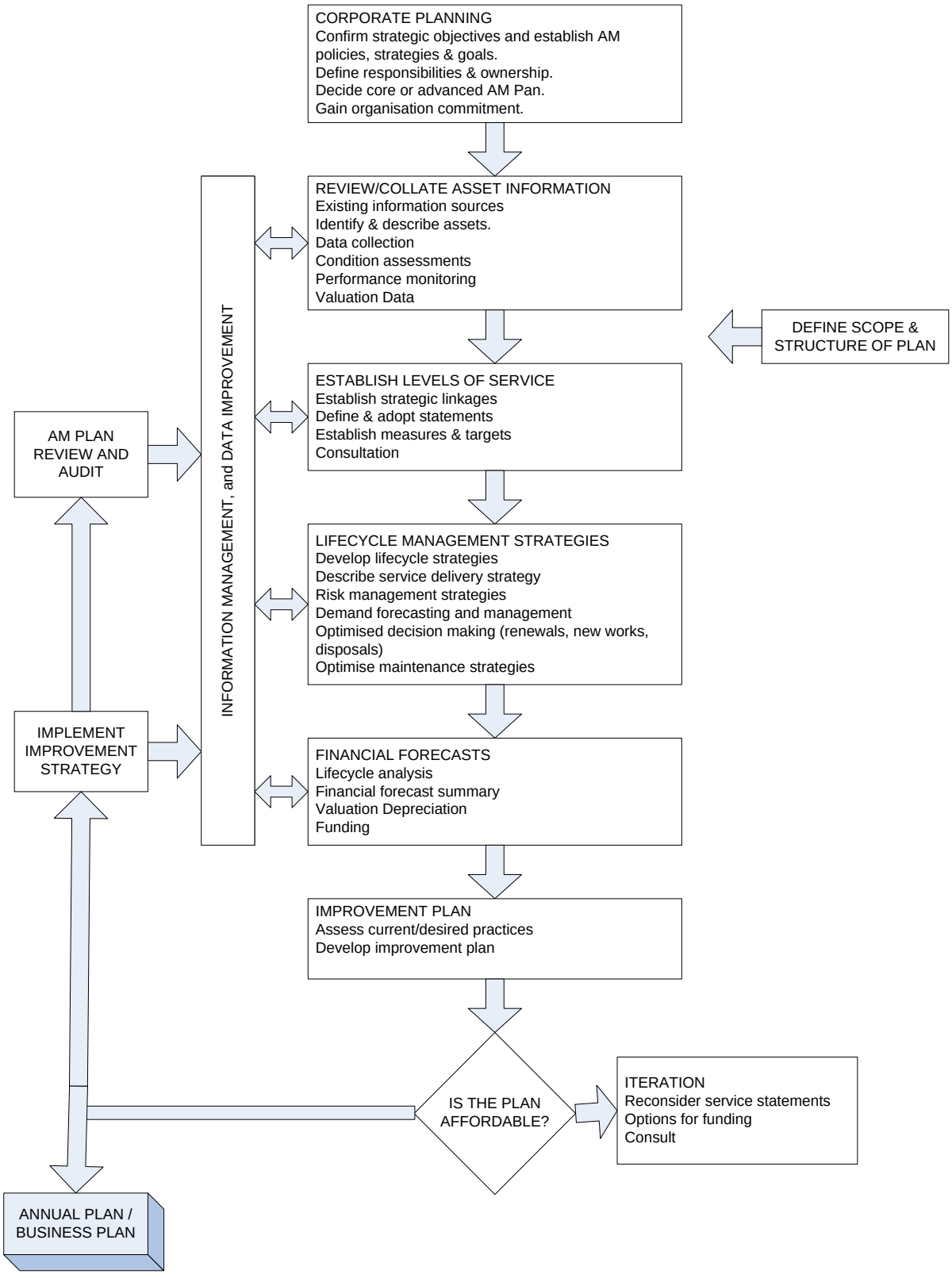
[1] Based on IPWEA 2015 IIMM, Sec 2.1.3, p 2| 13

[2] ISO 55000 Overview, principles and terminology

A road map for preparing an Asset Management Plan is shown below.

Road Map for preparing an Asset Management Plan

Source: IPWEA, 2006, IIMM, Fig 1.5.1, p 1.11



3.0 LEVELS OF SERVICE

3.1 Customer Research and Expectations

This Asset Management Plan is prepared to facilitate consultation prior to adoption of levels of service by Council. Future revisions of the Asset Management Plan will incorporate customer consultation on service levels and costs of providing the service. This will assist Council and stakeholders in matching the level of service required, service risks and consequences with the customer's ability and willingness to pay for the service.

We currently have no research on customer expectations regarding trees. This will be investigated for future updates of the Asset Management Plan. Sentiment towards opens space areas is used as a proxy in the interim.

Table 3.1 summarises the results from our Customer Satisfaction Survey.

Table 3.1: Customer Satisfaction Survey Levels

Service Area	2020	2019	2018	2017	2016
Appearance of public areas	**71/71**	**79/74**	**74/76**	**74/73**	**76/77**
Local streets and footpaths	**56/73**	**64/78**	**58/76**	**55/77**	**58/79**
Environmental sustainability	**61/72**	**61/76**	**62/73**	**63/73**	**63/71**

* Indicating Performance / Importance.

A ratio greater than 100% indicates needs are met. Service areas where Importance exceeds Performance (Net Differential) by 10 points or more, as is the case with local streets and footpaths and environmental sustainability, suggests further investigation is necessary.

Table 3.1b. Findings of various community consultation strategies

Audience/ Technique/ Date	Needs/ Comments/ Outcomes/ Issues
Rates & Services Survey (2019)	• Parks & Gardens listed 4th most important of 59 services. • Support for increasing rates for this service was high • Support for cutting this service was low to medium
W2040	• Unsurpassed access to the natural environment • Well-designed commercial, residential, cultural and recreational precincts • Significantly reduce land, water and air pollution • Restore, maintain and enhance its natural environment • Reduce the impacts of pest plants and animals and decrease damaging land uses and practices • Contribute to the amenity of the City by bringing water management and green infrastructure together
2013 Open Space Strategy Consultation	• Toohey / Marrakai Estate "flora is terrible, needs far more trees and native plants" • Payne Reserve "trees and surrounds need attention" • Russells Creek "more native trees & plants" • Lack of importance placed on trees (especially native) and shrubs in Warrnambool - in town and suburban areas • 21 / 60 responders nominated trees as what they valued most • 37 / 60 nominated the natural environment as most valued
2019 Banyan St Planting Survey	Banksia were the local residents preferred species for this street, however Norfolk Island Pines were the wider communities preferred species for this area (Council minutes 18/03/19).

Audience/ Technique/ Date	Needs/ Comments/ Outcomes/ Issues
	Locals were 58% in favour of removing Morton Bay Figs on highway, compared to only 28% of the wider community.
Lake Pertobe Masterplan Consultation	Support for removal of introduced species, poorly positioned trees, and additional plantings of natives.
Botanic Garden Masterplan Consultation	Strong support for protection of the Lone Pine
Albert Park IWM Plan	There was significant support from user groups to improve the quality of the open space with the planting of large numbers of trees, the plantings were intended to improve the amenity in sparse areas of the park and also to provide shade to keep the walking tracks cooler in summer, the other intended benefit of the trees was to significantly increase biodiversity in the park through the provision of new habitat.
Coastal Management Plan (2013)	Key issues raised included biodiversity, vegetation and remnant values of native vegetation.
Green Warrnambool (2018)	• Natural Warrnambool was second most important goal and Green Warrnambool fifth. Issues raised included: o Creation of linear vegetation corridors in streetscapes where possible to link up our gardens and reserve areas o Increase number of tree plantings per year o Protection and restoration of ecosystems and the coast o Promote environment and native species o Greening CBD/green wedges/making larger green spaces for the future
South of the Merri Precinct Plan (2020)	Natural environment was highly valued and nominated as what respondents valued most in the precinct. More trees/native vegetation was ranked as the second top improvement respondents would like to see in the area. Issues and opportunities raised included lack of indigenous vegetation, further revegetation including some dense areas for wildlife refuge, development of biodiversity/ wildlife corridor
Street Tree Planting and Management (Policy & Guidelines)	Support for only Australian natives on nature strips, and against planting palms in new areas. Suggested that plantings are prioritised in line with walkability and footpaths. Trees of significance should be identified and protected.

3.2 Strategic and Corporate Goals

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

Council's vision is:

A thriving city at the heart of coast and country

Council's pillars are:

- *Our People: Warrnambool will be a city where all people thrive*
- *Our Economy: Warrnambool will be Australia's most resilient and thriving regional economy*
- *Our Place: Warrnambool will be Australia's most liveable regional city*
- *Our Environment: Warrnambool will be Australia's most sustainable city*

Strategic objectives have been set by the Council, informed by the Community Vision. The objectives and strategies relevant to this Asset Management Plan are summarised in Table 3.2.

Table 3.2: Objectives and how these are addressed in this Plan

Objective	Strategy	How Goal and Objectives are addressed in the AMP
A healthy community	• Promote healthy lifestyles • Improve health and wellbeing • Increase community connectedness	Trees along pathways encourage pedestrian movements. The risks and controls associated with trees are outlined in this document to improve public safety.
A sustainable environment	• Council will enhance open spaces to support a healthy community, wildlife, flora, fauna and biodiversity. • Protect and enhance our waterways, coast and land • Invest in climate change preparedness • Educate the community on Council's sustainability initiatives	This plan outlines the budget required to continue infill plantings and ongoing maintenance of trees to ensure their survival.
A connected, inclusive place	• Council will ensure its planning acknowledges the unique character and attributes of local places • Council will foster neighbourhood connections including the development of inclusive recreational and cultural opportunities	This plan advocates for an increase in operational and maintenance budget in line with asset acquisitions.
An effective Council	• Ensure ongoing community engagement to identify changing needs • Continue to develop a program of Council services that are delivered to the community's satisfaction. • Ensure financial sustainability through effective use of Council's resources and assets • Mitigate and manage organisational risks through sound management systems and processes	This plan aims to inform councillors, as the asset custodians, of the risks and financial liabilities when it comes to setting levels of service.

3.3 Legislative Requirements

There are many legislative requirements relating to the management of assets. Legislative requirements that impact the delivery of the tree service are outlined in Table 3.3.

Table 3.3: Legislative Requirements

Legislation	Requirement
Flora & Fauna Act (1988)	Council's management of remnant trees must guarantee that Victoria's flora and fauna can survive in accordance with this legislation
Planning & Environment Act (1987)	Council's management of environmental, heritage (section 21.10) and native vegetation (section 52.17) needs to abide by the Planning Scheme legislated under this act
Catchment and Land Protection Act (1994)	Throughout Victoria plant species can be declared as noxious weeds. They are classed as State Prohibited, Regionally Prohibited, Regionally Controlled or Restricted Weeds. Council must take all reasonable steps

	to eradicate regionally prohibited weeds, prevent growth and spread of regionally controlled weeds.
Road Management Act (2004) (and associated Regulations and Codes of Practice)	Outlines Road Authorities' responsibilities. Management of trees and vegetation near roads is undertaken in accordance with this legislation from a road user safety perspective.
Electrical Safety Act (and associated Regulations)	Council must ensure that the risk of vegetation interfering with urban electrical lines is minimised and must complete an annual Electric Line Clearance Management Plan to demonstrate compliance
Country Fire Authority Act (1958)	Tree management activities must abide by this Act and activities which could ignite a fire must not be undertaken during adverse weather conditions.
Agricultural and Veterinary Chemicals (Control of Use) Act (1992)	Use of chemicals must abide by this legislation
Occupational Health and Safety Act (2004)	Provision of a safe workplace
Heritage Act (1995)	Provides protection and conservation of places and objects of cultural heritage significance and their registration. This may include trees.
Local Government Act (2020)	Details the functions of Council in regards to the provision of services and facilities for the community as well as providing the legal framework for establishing and administering Councils.

3.4 Customer Values

Service levels are defined in three ways, customer values, customer levels of service and technical levels of service.

Customer Values indicate:

- what aspects of the service is important to the customer,
- whether they see value in what is currently provided and
- the likely trend over time based on the current budget provision

Table 3.4: Customer Values

Customer Values	Customer Satisfaction Measure	Current Feedback	Expected Trend Based on Planned Budget
Tree canopy cover to provide shade, while supporting biodiversity	Number of customer requests for new trees Increased biodiversity	Currently 16,600 trees have been planted in streets and council properties, with 8,000 vacant sites identified through the road corridor. These trees currently provide 5% canopy cover to urban streets, older areas were not designed with street trees in mind and so offer few sites to be able to retrospectively plant.	720 trees are planted each year.
Trees should not pose a risk to public safety	Number of falling limbs or failures causing injury or damage to people or property	Increasing storm events has seen more limb drops and claims for damages. High risk trees are inspected annually, while all other trees are inspected on a four yearly cycle. This assesses the health, structure and overall risk of the tree. Only preventative works with an 'Urgent' priority are undertaken.	Inspection regime is will stay the same as the increase in asset base is negligible. Low, medium, and high-risk works identified will continue to not be actioned.
Trees should be well maintained	Amount of notable defects or trees in poor health	Maintenance inspections occur in line with the Road Management Plan, and therefore only happen with regard to trees over roads and footpaths. If this infrastructure is not present, trees are not inspected under this regime. Council responds to RMP vegetation defects within the prescribed time 96% of the time.	Claims are likely to increase in line with severe weather events. Response times to RMP defects is likely to worsen as the number of trees increases, and they are not proactively maintained.
Trees should be protected from human activities	Minimal reported removals or damage to health of trees	Planning legislation protects trees within Heritage and Environmentally Significant Overlays. Criteria is being developed to identify and offer protections to other trees of significance outside of planning controls.	Additional protections will occur in the mid-term with the current level of resourcing.
No Weeds of National Significance (WONS)	Quantity of pest tree species	There is currently no program to spray or remove weeds of state or national significance.	This will not change - WONS will not be removed if identified.

Improvement Action 1 – Ensure the AMP consultation focuses on community values and levels of service

3.5 Customer Levels of Service

The Customer Levels of Service are considered in terms of:

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

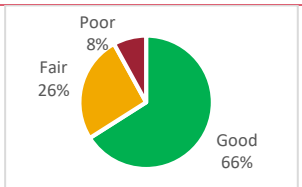
Function Is it suitable for its intended purpose …. Is it the right service?

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

In Table 3.5 under each of the service measures types (Quality, Function, Capacity/Use) there is a summary of the performance measure being used, the current performance, and the expected performance based on the current funding level.

These are measures of fact related to the service delivery outcome e.g. number of occasions when service is not available, condition %'s of Very Poor, Poor/Average/Good, Very Good and provide a balance in comparison to the customer perception that may be more subjective.

Table 3.5: Customer Level of Service Measures

Type of Measure	Level of Service	Performance Measure	Current Performance	Expected Trend Based on Planned Budget
Condition	Structural failure	Arborist inspections	0.1% with very poor or failed structure	More structures likely to fail due to lack of proactive formative pruning.
	Confidence levels		High	Low
Function	Tree is a stump	Percentage of sites which are stumps	0.5% of sites are stumps	This is likely to increase as new plantings are prioritised over replacements.
	Health of the tree	Arborist inspections		Health is likely to worsen as O&M budgets don't increase in line with acquisitions.
	Confidence levels		High	Low
Capacity	Canopy Cover	Percent of road reserve with canopy cover	5.1%	A decrease due to growth areas and the time it takes new trees to mature, offset by additional infill plantings, is likely to see no net change
	Vacant sites	Number of vacant sites suitable for street tree planting	8,000	This will reduce as developments are provided with street trees
	Confidence levels		High	Low

Improvement Action 2 – Review historic data to improve confidence of future predictions

3.6 Technical Levels of Service

Technical Levels of Service – To deliver the customer values, and impact the achieved Customer Levels of Service, are operational or technical measures of performance. These technical 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:

- **Acquisition** – the activities to provide a higher level of service (e.g. widening a road, sealing an unsealed road, replacing a pipeline with a larger size) or a new service that did not exist previously (e.g. a new library).
- **Operation** – the regular activities to provide services (e.g. opening hours, cleansing, mowing grass, energy, inspections, etc.
- **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 (e.g. road patching, unsealed road grading, building and structure repairs),
- **Renewal** – the activities that return the service capability of an asset up to that which it had originally provided (e.g. road resurfacing and pavement reconstruction, pipeline replacement and building component replacement),

Service and asset managers plan, implement and control technical service levels to influence the service outcomes.[3]

Table 3.6 shows the activities expected to be provided under the current Planned Budget allocation, and the Forecast activity requirements being recommended in this AMP.

Table 3.6: Technical Levels of Service

Lifecycle Activity	Purpose of Activity	Activity Measure	Current Performance*	Recommended Performance **
Acquisition	In fill planting of established streets	Budget Allocation	Occurs slowly, limited by the existing budget	The Acquisitions that we would like to do as per the Lifecycle Forecast
	Planting new development areas	Developer Contributions	Developers provide contributions to plant their subdivisions	Fluctuates with rate of land development
	Additional plantings to reach W2040 targets	Budget Allocation	Currently at 5% canopy cover with $0 to meet targets	Needs an annual average of $1.1M to plant the additional 65,000 trees to meet these targets
		Budget	*$134k annually*	*Planting program needs to be costed*
Operation	Watering new trees	Budget Allocation	Limited by the existing budget, affecting survival rates	This will increase due to rate of land development
	Condition & Risk Audits	Frequency	25% of trees inspected annually	Monitor suitability of this frequency
		Budget	*$55k annually*	*TBC*
Maintenance	Tree & Vegetation Maintenance	Budget Allocation	Only RMP defects and urgent risk actions are undertaken	Budget should allow programmed formative pruning and to respond to high risk actions
	Powerline Clearance	Frequency	Annual pruning	Monitor suitability of this frequency
		Budget	*$400k annually*	*Estimated $500k*
Renewal	Replacement of dead or dying trees	Budget Allocation	Currently limited by budget	That all stumps and dying trees are replaced
		Budget	*$76k annually (includes tree and stump removal costs)*	*Estimate $100k*

[3] IPWEA, 2015, IIMM, p 2|28.

Disposal	Tree Removal	Budget Allocation	None***	Remains the same
		Budget	*$0*	*$0*

Note: * Current activities related to Planned Budget.
** Forecast required performance related to forecast lifecycle costs.
*** Any removed tree is replaced, therefore they are considered renewal activities.

Improvement Action 3 – Confirm costs to achieve recommended performance

It is important to monitor the service levels provided regularly as these will change. The current performance is influenced by work efficiencies and technology, and customer priorities will change over time.

4.0 FUTURE DEMAND

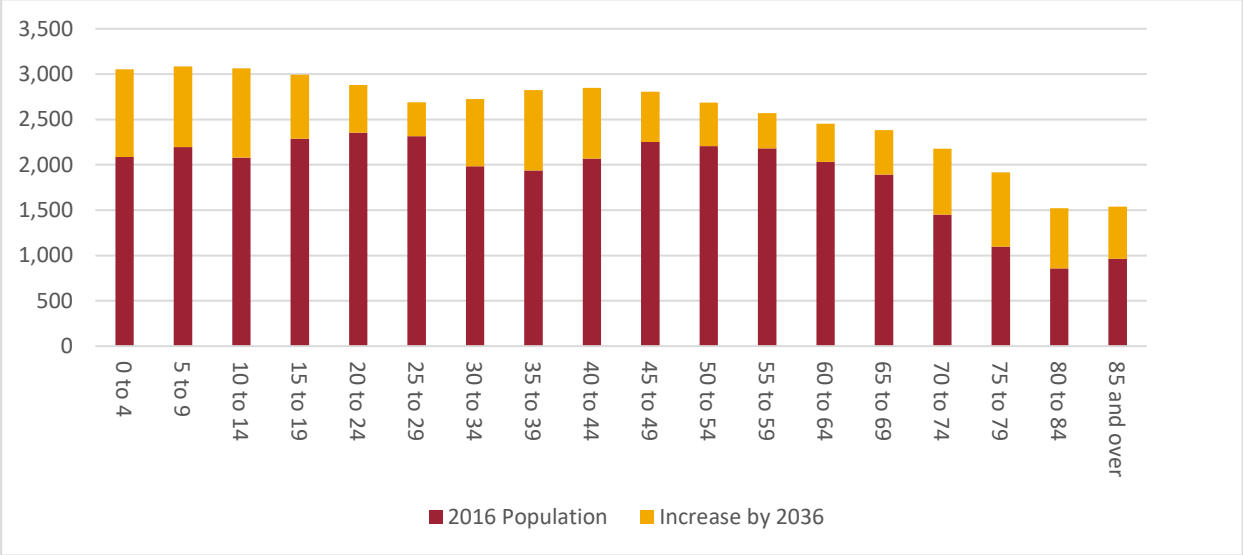
4.1 Demand Drivers

Drivers affecting demand include things such as population change, regulations, changes in demographics, seasonal factors, consumer preferences and expectations, technological changes, economic factors, agricultural practices, environmental awareness, etc.

4.2 Demand Forecasts

The present position and projections for demand drivers that may impact future service delivery and use of assets have been identified and documented.

Figure 4.2: Population Growth between 2016 and 2036



4.3 Demand Impact and Demand Management Plan

The impact of demand drivers that may affect future service delivery and use of assets are shown in Table 4.3.

Demand for new services will be managed through a combination of managing existing assets, upgrading of existing assets and providing new assets to meet demand and demand management. Demand management practices can include non-asset solutions, insuring against risks and managing failures.

Opportunities identified to date for demand management are shown in Table 4.3. Further opportunities will be developed in future revisions of this Asset Management Plan.

Table 4.3: Demand Management Plan

Demand driver	Current position	Projection	Impact on services	Demand Management Plan
Land Use	Dwelling density increasing	The Warrnambool City-Wide Housing Strategy recommends that housing densities should be expected to increase in many parts of Warrnambool.	Areas of increased housing density reduce the availability of open space for parkland plantings, biodiversity corridors and may reduce road reserve widths for street tree plantings	Ensure developments allow for the provision of open space in strategic locations that fit within the larger view of a network of biodiversity corridors. IDM prescribes required road corridor widths.
	City Growth and Land Development	Open space and associated landscape plans	Over the coming 20 year period, over 7000 trees are expected to be	The planning for and delivery of growth areas is managed through the

Demand driver	Current position	Projection	Impact on services	Demand Management Plan
		should be provided in accordance with Council's adopted growth area structure plans.	planted in accordance with Council's endorsed growth area structure plans and Street Tree Planting Policy and Guidelines.	planning process. As handover of assets occurs, this asset management plan, alongside Council's asset management system and processes becomes the primary means of management.
Demographics	Population growing	Warrnambool's population is currently increasing at an average rate of 1% per annum on average	An increased user base on the streetscape and open space reserves will result in a higher likelihood of risk events.	Increased monitoring frequencies for higher risk trees and areas. Provide buffers (such as mulching) around immediate high potential fall zones.
	Population aging	Population forecast indicates the largest proportional increase (relative to population size) will be in the 60 to 79 (43%) and 20 to 39 age groups (20%).	This user group may highlight the impact street trees may have on infrastructure, particularly footpaths and carparks. Trip hazards from existing root systems should be managed and future plantings should be planned within the context of the streetscape rather than as an afterthought.	Continue to monitor age trends with a focus on potential infrastructure demand effects, alongside continuing to gather pedestrian count data. RMP is reviewed regularly with community consultation to ensure service levels change in line with community needs and expectations.
Changes to Community Expectations	The current planting regime has been in used for a long time	A focus on Greening Cities and the environment is likely to increase the desire to see more trees planted or more native species used	Increase to acquisition costs and therefore other lifecycle activities. Or, poor Council image if community's LOS cannot be met.	Develop, cost, and adopt a New Tree Planting program
Technology	Technology Improvement and Utilisation	Increases in available technology for the management, planning and maintenance of trees.	Improvements in asset management capability and data analysis through drone inspections, LiDAR, aerial photogrammetry, and improved accuracy of GPS devices. Mobile data capture improves the currency of asset data and reduces the double-handling of importing spreadsheets.	Continue to monitor developments in this space such that Council may adopt available new and improved technology in a timely manner with the vision of improving this operating environment
Finance and Economics	Only the upfront costs of planting are	Funding of maintenance and operations will not increase in line with	Without an increase in recurrent budget to look after new plantings, they will either quickly perish	Operational costs such as watering and mulching in juvenile stages will be estimated and

Demand driver	Current position	Projection	Impact on services	Demand Management Plan
	considered by acquisitions	growth of asset base	or grow into non-optional structures causing ongoing and irreversible issues for the rest of its life (eg: codominance, bark intrusion)	communicated with each approved planting program.

Improvement Action 4 – Develop, cost, and adopt a New Tree Planting program
Improvement Action 5 – Determine ongoing O&M costs with new planting programs

4.4 Asset Programs to meet Demand

The new assets required to meet demand may be acquired, donated or constructed. Additional assets are discussed in Section 5.4.

Acquiring new assets will commit Council to ongoing operations, maintenance and renewal costs for the period that the service provided from the assets is required. These future costs are identified and considered in developing forecasts of future operations, maintenance and renewal costs for inclusion in the long-term financial plan (Refer to Section 5).

4.5 Climate Change and Adaption

The impacts of climate change can have a significant impact on the assets we manage and the services they provide. In the context of the Asset Management Planning process climate change can be considered as both a future demand and a risk.

How climate change will impact on assets can vary significantly depending on the location and the type of services provided, as will the way in which we respond and manage those impacts.

As a minimum we should consider both how to manage our existing assets given the potential climate change impacts, and then also how to create resilience to climate change in any new works or acquisitions.

Opportunities identified to date for management of climate change impacts on existing assets are shown in Table 4.5.1

Table 4.5.1 Managing the Impact of Climate Change on Assets

Climate Change Description	Projected Change	Potential Impact on Assets and Services	Management
Temperatures and solar radiation	Increasing average temperatures and greater extremes	A changing environment will cause stress to trees. Extremes of reduced rainfall and hotter days during summer followed by wetter winters. This may reduce the survivability of new plantings, while making mature trees susceptible to pest damage. Frequency of severe storm events also increases the likelihood of limbs falling.	Continue to monitor developments in this space such that the projected climate change and effects on infrastructure may be accurately quantified. Appropriate measures may then be taken to account for these effects in species selection, maintenance schedules and inspection programs.
Bushfires	Increasing in both frequency and intensity		
Rainfall	More severe storms but also more periods of drought between		

Additionally, the way in which we create new assets should recognise that there is opportunity to build in resilience to climate change impacts. Building resilience will have benefits:

- Assets will withstand the impacts of climate change
- Services can be sustained
- Assets that can endure may potentially lower the lifecycle cost and reduce their carbon footprint

Table 4.5.2 summarises some asset climate change resilience opportunities.

Table 4.5.2 Building Asset Resilience to Climate Change

New Asset Description	Climate Change Impact	Resilience in New Works
New subdivision plantings	Effects of climate change is unknown, therefore it is best to diversify species selection	Ensure landscape plans select drought resistant species, as well as those that can be inundated, rather than monocultures.
Infill plantings of existing built up areas		

Improvement Action 6 – The impact of climate change on assets is a new and complex discussion and further opportunities will be developed in future revisions of this Asset Management Plan.

5.0 LIFECYCLE MANAGEMENT PLAN

The lifecycle management plan details how Council plans to manage and operate the assets at the agreed levels of service (Refer to Section 3) while managing life cycle costs.

5.1 Background Data

5.1.1 Physical parameters

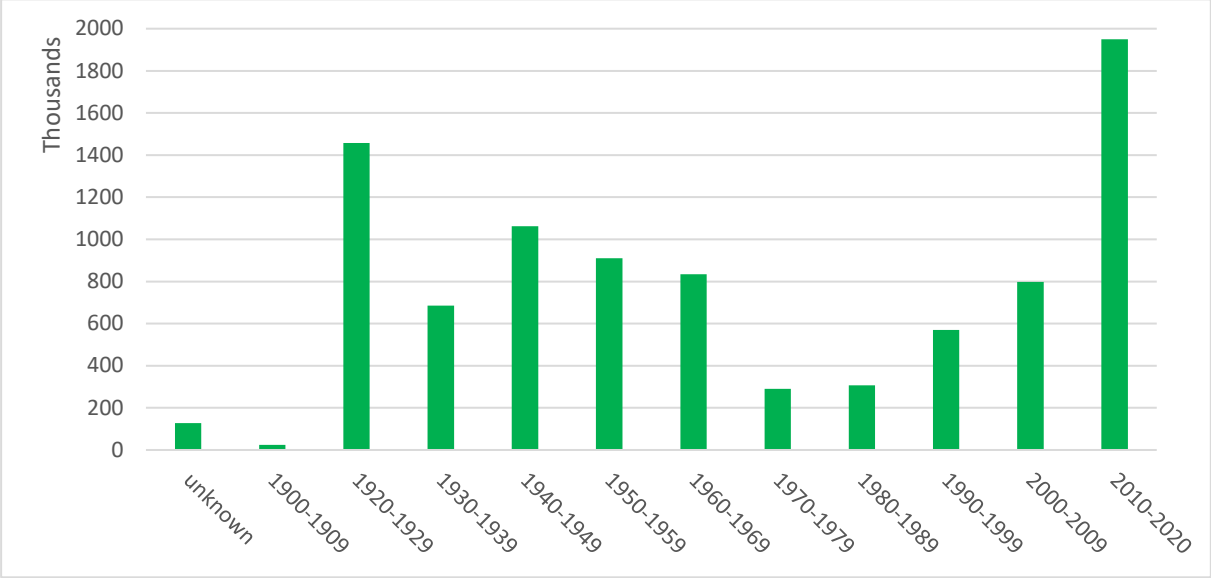
The assets covered by this Asset Management Plan are shown in Table 5.1.1. These include street trees found in the road reserve, as well as those found in parks and open spaces, the Botanic Gardens, Council properties including community facilities, playgrounds and kindergartens

The age profile of the assets included in this AMP are shown in Figure 5.1.1.

Table 5.1.1: Assets covered by this Plan

Asset Category	Quantity	Replacement Value
Street Trees	15,121	$670,464,914
Reserve Trees	1,521	$59,755,437
Stumps	57	$0
TOTAL	**16,699**	**$730,220,355**

Figure 5.1.1: Asset Age Profile



All figure values are shown in current day dollars.

The age profile of trees is more uniform than other asset classes, and their useful life can vary greatly, meaning peaks in renewal demand cannot be inferred from this information. Heritage trees that are well cared for may live for 100's of years, while juveniles that are neglected or vandalized would deteriorate and require replacement much sooner than expected.

5.1.2 Asset capacity and performance

Assets are generally provided to meet design standards where these are available. However, there is insufficient resources to address all known deficiencies. Locations where deficiencies in service performance are known are detailed in Table 5.1.2.

Table 5.1.2: Known Service Performance Deficiencies

Location	Service Deficiency
City-wide	Lack of canopy cover in urban streets, caused due to poor health, failed structures or poor species selection (tall, but small canopies)

The above service deficiencies were identified from spatial analysis of tree locations, canopy size, and road corridors.

5.1.3 Asset condition

Similarly to infrastructure that deteriorates over time, tree structures can deteriorate. Although the health of a tree may improve (eg: canopy flourishes, bugs are removed), any damage caused to the structure is generally irreversible. Therefore, healthy trees are sometimes found with poor structures due to historical trauma. These attributes are measured as part of the four-yearly QTRA risk audit, undertaken by certified arborists.

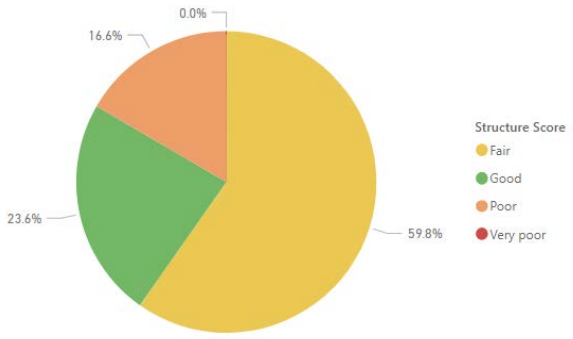
The condition of trees is reflected in their structure and measured using a 1 – 5 grading system[4] as detailed in Table 5.1.3. It is important that consistent condition grades be used in reporting various assets across an organisation. This supports effective communication. At the detailed level assets may be measured utilising different condition scales, however, for reporting in the AMP they are all translated to the 1 – 5 grading scale.

Table 5.1.3: Simple Condition Grading Model

Condition Grading	Description of Condition
1	Good - The tree has a well-defined and balanced crown. Branch unions appear to be strong, with no defects evident in the trunk or the branches.
2	Fair - The crown may be slightly out of balance, and some branch unions or branches may be exhibiting minor structural faults. If the tree is a single trunk, it may be on a slight lean
3	Poor - Poorly structured or unbalanced crown or exhibiting large gaps. Major limbs may not be well defined. Branches may be rubbing or crossing over. Branch unions may be poor or faulty at the point of attachment. May have suffered major root damage
4	Very Poor - The crown is unbalanced or exhibits large gaps with major limbs not well defined. Branch unions may be poor or faulty. Sections of the tree may have failed or is probable in the immediate future.
5	Failed - A significant section of the tree or the whole tree has failed.

The condition (structure) profile of our assets is shown in Figure 5.1.3,

Figure 5.1.3a: Tree Condition Profile (by quantity)



Good and poor are the currently acceptable conditions, however structurally sound but dead trees may offer important habitat to birds and other fauna.

[4] IPWEA, 2015, IIMM, Sec 2.5.4, p 2|80.

Improvement Action 7 – Determine suitability of retaining dead reserve trees as habitat

Due to lack of proactive formative pruning during early years of growth, most trees are in fair condition. As structural degradation is irreversible, this is only going to worsen. Due to budget constraints, the community must accept trees in poor conditions. Those in very poor condition or which have already failed are planned for removal, while those in poor condition are only removed on reasonable request by the community.

<table>
<tr><td colspan="3">Acceptable conditions</td></tr>
<tr><td> 
Good</td><td> 
Good</td><td> 
Poor</td></tr>
<tr><td colspan="3">Unacceptable conditions</td></tr>
<tr><td> 
Stump (non-functional)</td><td> 
Very Poor</td><td> 
Failed</td></tr>
</table>

5.2 Operations and Maintenance Plan

Operations include regular activities to provide services. Examples of typical operational activities include watering and asset inspections.

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 activities include mulching, staking, pruning, powerline clearance and deadwood removal.

The trend in maintenance budgets are shown in Table 5.2.1.

Table 5.2.1: Operational & Maintenance Budget Trends

Year	Maintenance Budget $
2018-19	$444k
2019-20	$400k
2020-21	$433k

Recurrent budget levels are considered to be adequate to meet current service levels, however this is unlikely to increase in response to quantity of acquisitions. Where maintenance budget allocations are such that they will result in a lesser level of service, the service consequences and service risks have been identified and are highlighted in this AMP and service risks considered in the Infrastructure Risk Management Plan.

Reactive maintenance is carried out in accordance with response levels of service detailed in the Municipal Road Management Plan.

Improvement Action 8 – Separate budgets used for reactive RMP defects and proactive pruning to be able to cost each of these service levels.

Asset hierarchy

An asset hierarchy provides a framework for structuring data in an information system to assist in collection of data, reporting information and making decisions. The hierarchy includes the asset class and component used for asset planning and financial reporting and service level hierarchy used for service planning and delivery.

The service hierarchy is shown is Table 5.2.2.

Table 5.2.2: Asset Service Hierarchy

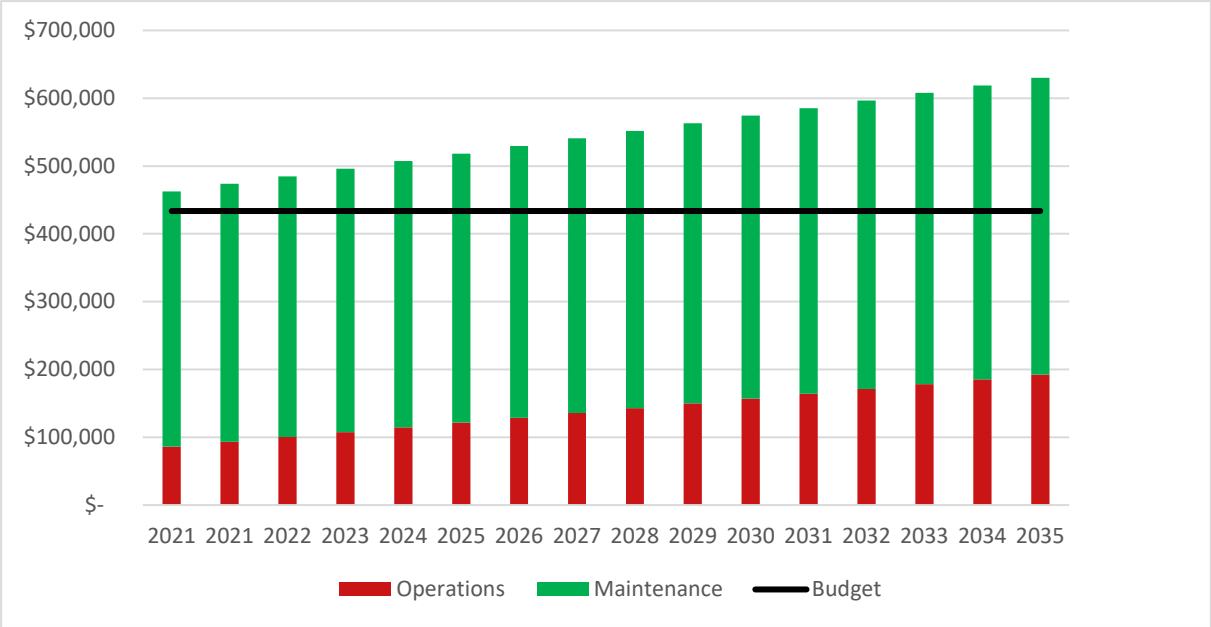
Service Hierarchy	Service Level Objective
Not applicable	Not applicable

Improvement Action 9 – Define and assign asset hierarchies to trees.

Summary of forecast operations and maintenance costs

Forecast operations and maintenance costs are expected to vary in relation to the total value of the asset stock. If additional assets are acquired, the future operations and maintenance costs are forecast to increase. If assets are disposed of the forecast operation and maintenance costs are expected to decrease. Figure 5.2 shows the forecast operations and maintenance costs relative to the proposed operations and maintenance Planned Budget.

Figure 5.2: Operations and Maintenance Summary



All figure values are shown in current day dollars.

During their juvenile years, trees are most costly to maintain, however this decreases as they mature and become more self-reliant, assuming that they have been optimally pruned in their earlier years.

Maintenance activities are undertaken to a standard that attempts to retain or returns the asset to a safe condition. In worst case scenarios the tree may need to be fully removed, at which point the site will be included on the planting schedule for the following year

It is evident through the declining condition of assets that the maintenance budgets and the resulting maintenance programs are not adequate to prevent a reduction in service level.

5.3 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.

Asset renewal generally involves the replacement of an asset at the end of its life. For trees this may be when the structural condition of the tree is identified to have failed, is structurally poor or very poor, or in poor health or dead. Renewal of trees are often not like-for-like as it is with other classes. The primary difference being that a juvenile will be planted in place of the mature or senescing tree. This opportunity also allows for the planting of a different species where appropriate.

A standard useful life of trees is difficult to apply due to the uniqueness amongst tree species, environmental effects, and operational practices, which make the useful lives of trees extremely variable. To manage this, rolling audits allow the monitoring of tree health and prediction of short term asset failures at a tree-by-tree.

The typical useful lives of assets used to develop longer term forecasts are shown in Table 5.3.

Table 5.3a: Useful Lives of Assets

Asset (Sub)Category	Long term modelling	Short term modelling
Tree	20-30 years	Individual assessment

The estimates for renewals and rates in this Asset Management Plan are based on the Asset Register information.

Table 5.3b: Standard Replacement Cost of Assets

Species	Age	Location	Replacement Cost
Figs	>40 years	Raglan Pde	$10,000
Figs	>40 years	City wide	$5,000
Norfolk Island Pine	>40 years	City Wide	$5,000
All others	any	City wide	$750

5.3.1 Renewal ranking criteria

Asset renewal is typically undertaken to either:

- Ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate
    - e.g. replacing a bridge that has a 5t load limit
    - e.g. rehabilitate a road that is extremely cracked and potholed.
- To ensure the infrastructure is of sufficient quality to meet the service requirements
    - e.g. condition of a playground.[5]

It is possible to prioritise renewals by identifying assets or asset groups that:

- Have a high consequence of failure,
- Have high use and subsequent impact on users would be significant,
- Have higher than expected operational or maintenance costs, and
- Have potential to reduce life cycle costs by replacement with a modern equivalent asset that would provide the equivalent service.[6]

The ranking criteria used to determine priority of identified renewal proposals is detailed in Table 5.3.1.

Table 5.3.1: Renewal Priority Ranking Criteria

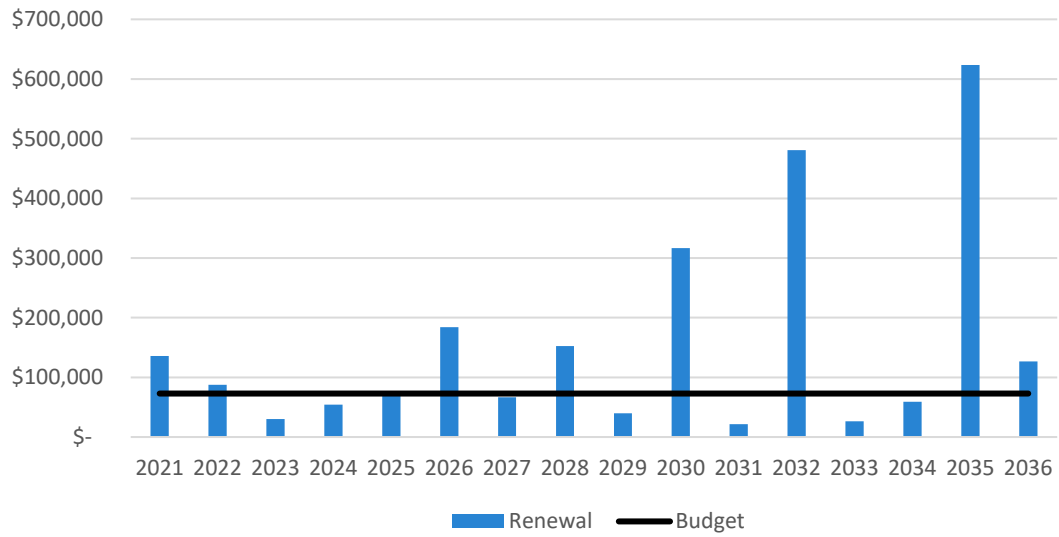
Criteria	Weighting
Condition (Structure poor or failed)	50%
Risk Rating	50%
Total	**100%**

5.4 Summary of future renewal costs

Forecast renewal costs are projected to increase over time if the asset stock increases. The forecast costs associated with renewals are shown relative to the proposed renewal budget in Figure 5.4.1. A detailed summary of the forecast renewal costs is shown in Appendix D.

[5] IPWEA, 2015, IIMM, Sec 3.4.4, p 3|91.
[6] Based on IPWEA, 2015, IIMM, Sec 3.4.5, p 3|97.

Figure 5.4.1: Forecast Renewal Costs



All figure values are shown in current day dollars.

Over the short to medium term there is only an average of $3,000 shortfall in the budget to replace all forecast trees reaching their end of life. There is confidence is the first five years of the forecast, however it is difficult to know for sure how trees will survive further into the future. This will be reviewed annually in line with new risk audit information.

A reduction in service levels will be seen as a result of the budget shortfall, this will likely result in fallen or high-risk dead trees being removed but having stumps remain, or dead trees left in-situ if they are structurally sound.

5.5 Acquisition Plan

Acquisition reflects are new assets that did not previously exist (or works which will upgrade or improve an existing asset beyond its existing capacity). They may result from growth, demand, social or environmental needs. Assets may also be donated to Council via land developments or bequeathed from deceased estates/ philanthropics. New plantings in vacant sites are also acquisitions, resulting in additional future operations and maintenance costs.

Typically, work over and above restoring infrastructure assets to its original service potential is an upgrade - this is not applicable to trees.

5.5.1 Selection criteria

Proposed new assets are identified from various sources such as community requests, proposals identified by strategic plans or partnerships with others. Potential new works should be reviewed to verify that they are essential to Council's needs. Proposed work analysis should also include the development of a preliminary renewal estimate to ensure that the services are sustainable over the longer term. Verified proposals can then be ranked by priority and available funds and scheduled in future works programmes. A works direction hierarchy is used in place of weighted criteria, this is detailed in Table 5.4.1.

Table 5.5.1: Acquired Assets Priority Ranking Criteria

Works Direction	Priority	Weighting
Councillor Direction	1	n/a

Customer Request	2	n/a
Streets with low vacancies	3	n/a

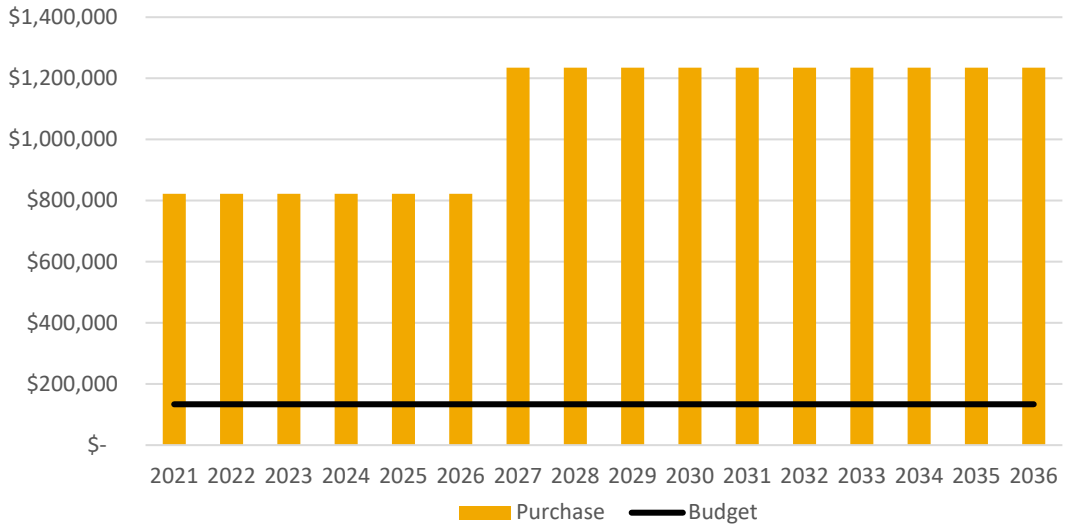
Council is in the initial stages of developing a New Tree Planting Program to improve the canopy coverage of the urban road network and will be informed by the vacant sites identified by Homewood Consulting during the street tree risk audits

Improvement Action 10 – Develop a New Tree Planting Program

Summary of future asset acquisition costs

Forecast acquisition asset costs are summarised in Figure 5.5.1 and shown relative to the proposed acquisition budget. The forecast acquisition capital works program is shown in Appendix A.

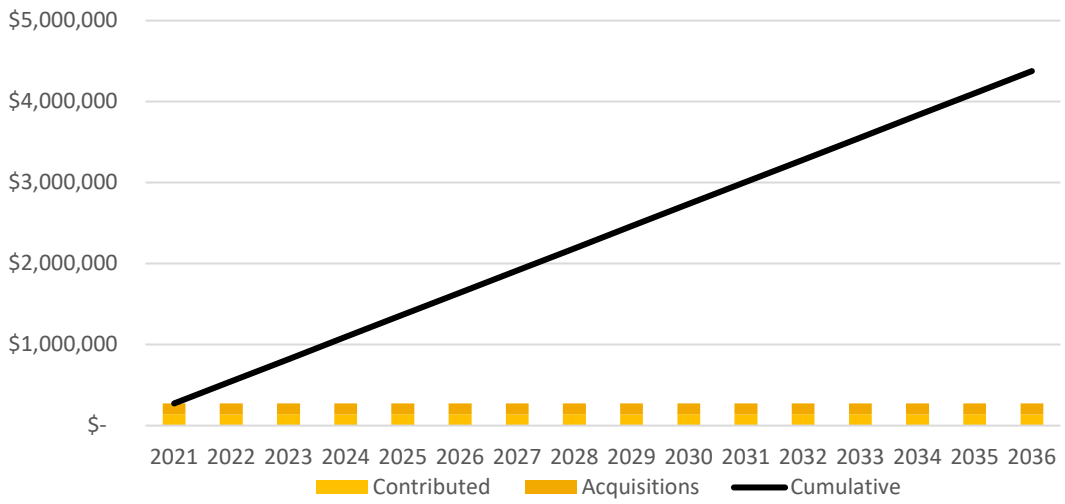
Figure 5.5.1: Acquisition (Purchase) Summary



All figure values are shown in current day dollars.

When Council commits to new assets, they must be prepared to fund future operations, maintenance and renewal costs. They must also account for future depreciation when reviewing long term sustainability. When reviewing the long-term impacts of asset acquisition, it is useful to consider the cumulative value of the acquired assets being taken on by the Entity. The cumulative value of all acquisition work, including assets that are constructed and contributed shown below in Figure 5.5.2. This is only modelling those that are currently funded, not the impact of meeting the requirements of strategic plans.

Figure 5.5.2: Acquisition Summary



All figure values are shown in current day dollars.

Expenditure on new assets and services in the capital works program will be accommodated in the long-term financial plan, but only to the extent that there is available funding.

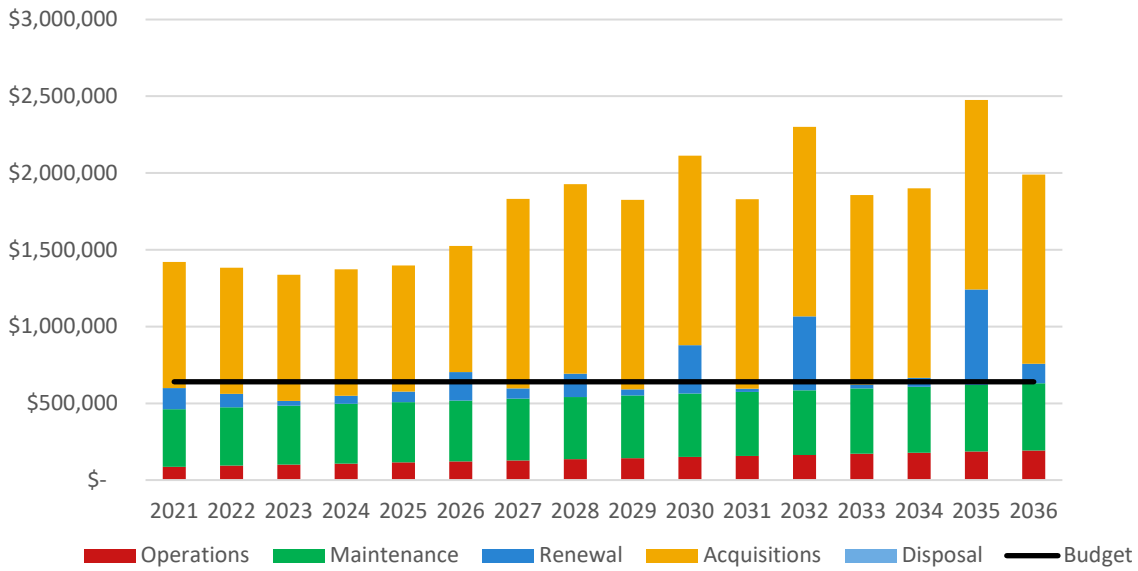
Acquiring these new assets will commit Council to fund the ongoing operations, maintenance, and renewal costs for the period that the service provided from the assets is required. Forecast acquisitions are quite low and predominantly funded by land developers, however this steady increase of juvenile trees puts pressure on the maintenance and operational budgets which have historically not been increasing in response to the asset growth.

Summary of asset forecast costs

The financial projections from this asset plan are shown in Figure 5.5.3. These projections include forecast costs for acquisition, operation, maintenance, renewal, and disposal. These forecast costs are shown relative to the proposed budget.

The bars in the graphs represent the forecast costs needed to minimise the life cycle costs associated with the service provision. The proposed budget line indicates the estimate of available funding. The gap between the forecast work and the proposed budget is the basis of the discussion on achieving balance between costs, levels of service and risk to achieve the best value outcome.

Figure 5.5.3: Lifecycle Summary



All figure values are shown in current day dollars.

The short-term level of service can be managed within the proposed budget. It should be new plantings which are deferred in preference of looking after existing juveniles however, as O&M costs increase overtime, the lack of care here is likely to see early failures and an increase in renewal costs in the longer term. There is a significant lack of investment to meet the aspirations of the Community Plan (w2040).

5.6 Disposal Plan

Disposal includes any activity associated with the disposal of a decommissioned asset including sale, demolition or relocation. Assets identified for possible decommissioning and disposal are shown in Table 5.6. A summary of the disposal costs and estimated reductions in annual operations and maintenance of disposing of the assets are also outlined in Table 5.6. Any costs or revenue gained from asset disposals is included in the long-term financial plan.

Table 5.6: Assets Identified for Disposal

Asset	Reason for Disposal	Timing	Disposal Costs	Operations & Maintenance Annual Savings
nil				

Tree removals are followed by replacement with new trees; therefore, these activities are considered renewal of the tree - as they cannot be 'renewed' in a typical infrastructure sense. True 'disposals' also result in a decrease in the asset base.

6.0 RISK MANAGEMENT PLANNING

The purpose of infrastructure risk management is to document the findings and recommendations resulting from the periodic identification, assessment and treatment of risks associated with providing services from infrastructure, using the fundamentals of International Standard ISO 31000:2018 Risk management – Principles and guidelines.

Risk Management is defined in ISO 31000:2018 as: 'coordinated activities to direct and control with regard to risk'[7].

An assessment of risks[8] associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock', reputational impacts, or other consequences. The risk assessment process identifies credible risks, the likelihood of the risk event occurring, and the consequences should the event occur. The risk assessment should also include the development of a risk rating, evaluation of the risks and development of a risk treatment plan for those risks that are deemed to be non-acceptable.

6.1 Risk Assessment

The risk management process used is shown in Figure 6.2 below.

It is an analysis and problem-solving technique designed to provide a logical process for the selection of treatment plans and management actions to protect the community against unacceptable risks.

The process is based on the fundamentals of International Standard ISO 31000:2018.

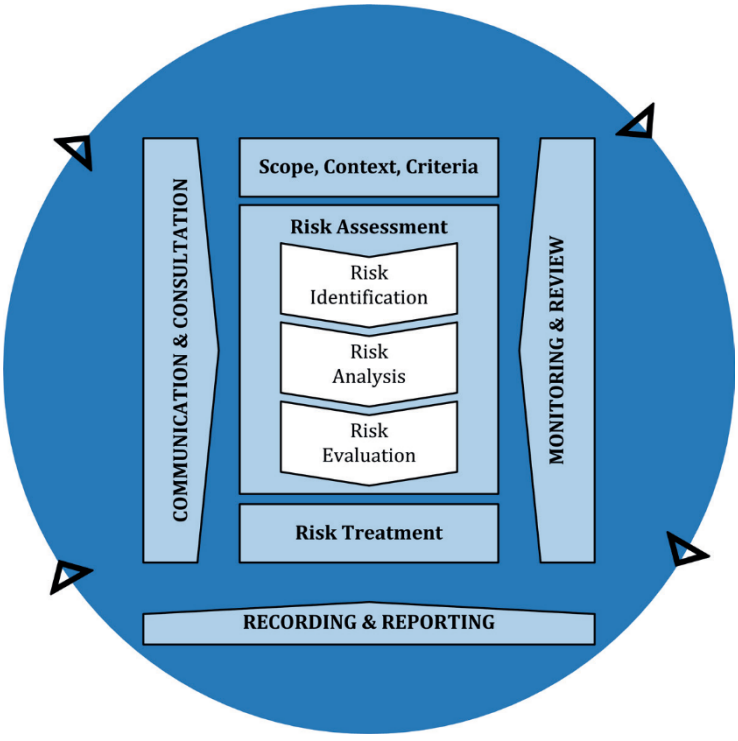


Fig 6.2 Risk Management Process – Abridged
Source: ISO 31000:2018, Figure 1, p9

[7] ISO 31000:2009, p 2
[8] REPLACE with Reference to the Corporate or Infrastructure Risk Management Plan as the footnote

The risk assessment process identifies credible risks, the likelihood of the risk event occurring, the consequences should the event occur, development of a risk rating, evaluation of the risk and development of a risk treatment plan for non-acceptable risks.

An assessment of risks associated with service delivery will identify risks that will result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock', reputational impacts, or other consequences. Council has adopted the use of a Quantified Tree Risk Assessment (QTRA) to determine the risk rating of structural failures of individual trees. An online calculator tool is available to subscribers of this method of risk assessment at https://www.qtra.co.uk/ . This assessment looks at the following factors:

- Target Occupancy: the land-user or object that is most likely to be hit, injured or damaged in an event. By valuing the Target first, the assessor is able to determine whether or not, and to what degree of rigour, a survey or inspection of the trees is required.
- Probability of Failure: determined from the tree branch most likely to fail under normal conditions
- Failure Size: the size of the branch or trunk most likely to fail

These inputs give the formula:

1 / (TO x PF x FS) = Risk Category

An accepted industry threshold of risk is generally in the order of 1/10,000 and any tree that scores less than 10,000 would be expected to be worked upon within the next twelve months. Note that a tree may be high risk due to the surrounding use, but nothing can be done to reduce it. In these cases, the asset will continued to be monitored

Risk Category	Ellison Rating	Completion of Works
Very High	< 1/ 5,000	Control the risk as soon as possible. Inspect annually.
High	1/ 5,001 to 1/ 10,000	Complete as budget allows
Moderate	1/ 10,001 to 1/ 200,000	Complete as budget allows
Low	1/ 200,001 to 1/ 5,000,000	Complete as budget allows
Very Low	> 1/ 5,000,000	Complete as budget allows

Critical risks are those assessed with 'Very High' (requiring immediate corrective action) and 'High' (requiring corrective action) risk ratings identified in the Infrastructure Risk Management Plan. The residual risk and treatment costs of implementing the selected treatment plan is shown in Table 6.2. It is essential that these critical risks and costs are reported to management and Council.

Trees identified as high or very high risk are shown in Appendix F. Failure modes may include physical failure, collapse or essential service interruption.

Table 6.2: Risks and Treatment Plans

What can Happen	Risk Rating (VH, H)	Risk Treatment Plan	Residual Risk *	Treatment Costs
Structural failure of limb or trunk	High	Regular inspections and pruning	Medium	10,000

Note * The residual risk is the risk remaining after the selected risk treatment plan is implemented.

6.2 Critical Assets

Critical assets are typically defined as those which have a high consequence of failure, such as causing significant loss or reduction of service, and costs in excess of $2M, loss of lives, investigation and potential prosecution. No single tree has been identified which would produce these consequences.

Table 6.2 Critical Assets

Critical Assets	Failure Mode	Impact
Nil		

By identifying critical assets and failure modes an organisation can ensure that investigative activities, condition inspection programs, maintenance and capital expenditure plans are targeted at critical assets.

6.3 Infrastructure Resilience Approach

The resilience of our critical infrastructure is vital to the ongoing provision of services to customers. To adapt to changing conditions we need to understand our capacity to 'withstand a given level of stress or demand', and to respond to possible disruptions to ensure continuity of service.

Resilience is built on aspects such as response and recovery planning, financial capacity, climate change and crisis leadership.

Our current measure of resilience is shown in Table 6.3 which includes the type of threats and hazards and the current measures that the organisation takes to ensure service delivery resilience.

Table 6.3: Resilience

Threat / Hazard	Current Resilience Approach
Not Assessed	Not Assessed

We do not currently measure our resilience in service delivery. This will be included in future iterations of the Asset Management Plan.

6.4 Service and Risk Trade-Offs

The decisions made in adopting this AMP are based on the objective to achieve the optimum benefits from the available resources.

6.4.1 What we cannot do

There are some operations and maintenance activities and capital projects that are unable to be undertaken within the next 15 years. These include:

- Achieving w2040 targets of 10% canopy cover for urban areas by 2026
- Proactive formative pruning to improve the long-term health of trees

6.4.2 Service trade-off

If there is forecast work (operations, maintenance, renewal, acquisition or disposal) that cannot be undertaken due to available resources, then this will result in service consequences for users. These service consequences include:

- Low rates of planting vacant sites
- Poor growth habits due to lack of formative pruning, resulting in more trees in poor condition
- More stumps that are not removed
- Reduced canopy cover

6.4.3 Risk trade-off

The operations and maintenance activities and capital projects that cannot be undertaken may sustain or create risk consequences. These risk consequences include:

- Only urgent risk issues are actioned. High, medium, and low priority maintenance tasks are not actioned.
- Claims against Council for injury or property damage from structural failures
- Risk audits are done every four years
- 8% of trees are dead or in poor health.

These actions and expenditures are considered and included in the forecast costs, and where developed, the Risk Management Plan.

7.0 FINANCIAL SUMMARY

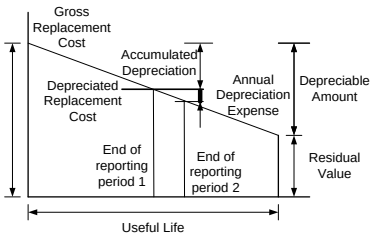
This section contains the financial requirements resulting from the information presented in the previous sections of this Asset Management Plan. The financial projections will be improved as the discussion on desired levels of service and asset performance matures.

7.1 Financial Statements and Projections

7.1.1 Asset valuations

The best available estimate of the value of assets included in this Asset Management Plan are shown below. These assets are currently valued using the Replacement Method[9], but future valuations will use the Revised Burnley Method:

Current (Gross) Replacement Cost	$8,750,910
Depreciable Amount	$0
Depreciated Replacement Cost[10]	$8,750,910
Depreciation	$0



7.1.2 Sustainability of service delivery

There are two key indicators of sustainable service delivery that are considered in the Asset Management Plan for this service area. The two indicators are the:

- asset renewal funding ratio (proposed renewal budget for the next 5 years / forecast renewal costs for next 5 years), and
- medium term forecast costs/proposed budget (over 15 years of the planning period).

Asset Renewal Funding Ratio

Asset Renewal Funding Ratio[11] 76%

The Asset Renewal Funding Ratio is an important indicator and illustrates that over the next 15 years we expect to have 76% of the funds required for the optimal renewal of assets.

The forecast renewal work along with the proposed renewal budget, and the cumulative shortfall, is illustrated in Appendix D.

Medium term – 15-year financial planning period

This Asset Management Plan identifies the forecast operations, maintenance and renewal costs required to provide an agreed level of service to the community over a 15 year period. This provides input into 15 year financial and funding plans aimed at providing the required services in a sustainable manner.

This forecast work can be compared to the proposed budget over the 15 year period to identify any funding shortfall.

The forecast operations, maintenance and renewal costs over the 15 year planning period is $703,000 on average per year.

The proposed (budget) operations, maintenance and renewal funding is $531,000 on average per year giving a 15 year funding shortfall of $172,000 per year. This indicates that 76% of the forecast costs needed to provide the services documented in this Asset Management Plan are accommodated in the proposed budget. This excludes acquired assets.

[9] https://treenet.org/resources/urban-tree-valuation/
[10] Also reported as Written Down Value, Carrying or Net Book Value.
[11] AIFMM, 2015, Version 1.0, Financial Sustainability Indicator 3, Sec 2.6, p 9.

Providing sustainable services from infrastructure requires the management of service levels, risks, forecast outlays and financing to achieve a financial indicator of approximately 1.0 for the first years of the Asset Management Plan and ideally over the 15 year life of the Long-Term Financial Plan.

7.1.3 Forecast Costs (outlays) for the long-term financial plan

Table 7.1.3 shows the forecast costs (outlays) for the 15-year long-term financial plan.

Forecast costs are shown in 2020-dollar values.

Table 7.1.3: Forecast Costs (Outlays) for the Long-Term Financial Plan

Year	Forecast Acquisition	Forecast Operation	Forecast Maintenance	Forecast Renewal	Forecast Disposal
2021	$133,676	$55,109	$399,899	$210,600	$0
2022	$133,676	$55,109	$399,899	$85,950	$0
2023	$133,676	$55,109	$399,899	$48,600	$0
2024	$133,676	$55,109	$399,899	$68,400	$0
2025	$133,676	$55,109	$399,899	$87,750	$0
2026	$133,676	$55,109	$399,899	$67,050	$0
2027	$133,676	$55,109	$399,899	$75,600	$0
2028	$133,676	$55,109	$399,899	$105,750	$0
2029	$133,676	$55,109	$399,899	$62,100	$0
2030	$133,676	$55,109	$399,899	$270,450	$0
2031	$133,676	$55,109	$399,899	$35,550	$0
2032	$133,676	$55,109	$399,899	$136,350	$0
2033	$133,676	$55,109	$399,899	$32,850	$0
2034	$133,676	$55,109	$399,899	$79,200	$0
2035	$133,676	$55,109	$399,899	$124,650	$0

7.2 Funding Strategy

The proposed funding for assets is outlined in Council's budget and Long-Term financial plan.

The financial strategy of Council determines how funding will be provided, whereas the Asset Management Plan communicates how and when this will be spent, along with the service and risk consequences of various service alternatives.

7.3 Valuation Forecasts

Asset values are forecast to increase as additional assets are added to the service.

Additional assets will generally add to the operations and maintenance needs in the longer term. Additional assets will also require additional costs due to future renewals.

7.4 Key Assumptions Made in Financial Forecasts

In compiling this Asset Management Plan, it was necessary to make some assumptions. This section details the key assumptions made in the development of this AMP and should provide readers with an understanding of the level of confidence in the data behind the financial forecasts.

Key assumptions made in this Asset Management Plan are:

- The cost to replace a tree is $450

- The standard useful life of a tree is 30 years

7.5 Forecast Reliability and Confidence

The forecast costs, proposed budgets, and valuation projections in this AMP are based on the best available data. For effective asset and financial management, it is critical that the information is current and accurate. Data confidence is classified on a A - E level scale[12] in accordance with Table 7.5.1.

Table 7.5.1: Data Confidence Grading System

Confidence Grade	Description
A. Highly reliable	Data based on sound records, procedures, investigations and analysis, documented properly and agreed as the best method of assessment. Dataset is complete and estimated to be accurate ± 2%
B. Reliable	Data based on sound records, procedures, investigations and analysis, documented properly but has minor shortcomings, for example some of the data is old, some documentation is missing and/or reliance is placed on unconfirmed reports or some extrapolation. Dataset is complete and estimated to be accurate ± 10%
C. Uncertain	Data based on sound records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolated from a limited sample for which grade A or B data are available. Dataset is substantially complete but up to 50% is extrapolated data and accuracy estimated ± 25%
D. Very Uncertain	Data is based on unconfirmed verbal reports and/or cursory inspections and analysis. Dataset may not be fully complete, and most data is estimated or extrapolated. Accuracy ± 40%
E. Unknown	None or very little data held.

The estimated confidence level for and reliability of data used in this AMP is shown in Table 7.5.2.

Table 7.5.2: Data Confidence Assessment for Data used in AMP

Data	Confidence Assessment	Comment
Demand drivers	B	Change in demographics is known, but impact of climate change is yet to be understood.
Growth projections	A	Based on census data and analysis from profile.id
Acquisition forecast	C	Determined by land development, therefore timing is not accurate
Operation forecast	D	Budget driven not service driven, requirement to be confirmed
Maintenance forecast	D	Budget driven not service driven, requirement to be confirmed
Renewal forecast - Asset values	D	Replacement cost and value of mature trees are assumed
- Asset useful lives	B	Remaining useful life estimated within 5 years by qualified arborist
- Condition modelling	B	All trees have been condition assessed on a rolling program; oldest data is 5 years old.
Disposal forecast	n/a	Not applicable

The estimated confidence level for and reliability of data used in this AMP is considered to be C.

[12] IPWEA, 2015, IIMM, Table 2.4.6, p 2|71.

Improvement Action 11 – Determine optimal operational and maintenance allowances to maintain healthy trees as this will improve the certainty of the overall investment forecasts

8.0 PLAN IMPROVEMENT AND MONITORING

8.1 Status of Asset Management Practices[13]

8.1.1 Accounting and financial data sources

This Asset Management Plan does not use accounting and financial data. Cost estimates for the replacement program are provided by the Development team.

8.1.2 Asset management data sources

This Asset Management Plan also utilises asset management data. The source of the data is Conquest, with spatial data made available through Exponare.

8.2 Improvement Plan

It is important that an entity recognise areas of their Asset Management Plan and planning process that require future improvements to ensure effective asset management and informed decision making. The improvement plan generated from this Asset Management Plan is shown in Table 8.2.

Table 8.2: Improvement Plan

Action	Section	Task	Responsibility	Resources Required	Timeline
1	3.4	Ensure the AMP consultation focuses on community values and levels of service	Coordinator Strategic Asset Management		Medium-term
2	3.5	Review historic data to improve confidence of future predictions	Coordinator Strategic Asset Management		Medium-term
3	3.6	Confirm costs to achieve recommended performance	Coordinator Depot Operations		Short-term
4	4.3	Develop, cost, and adopt a New Tree Planting program	Coordinator Strategic Asset Management		Short-term
5	4.3	Determine ongoing O&M costs with new planting programs	Coordinator Depot Operations		Short-term
6	4.5	Develop opportunities for climate change resilience	Coordinator Depot Operations		Long-term
7	5.1	Determine suitability of retaining dead reserve trees as habitat	Coordinator Natural Environment		Long-term
8	5.2	Separate budgets used for reactive RMP defects and proactive pruning	Coordinator Depot Operations		Medium-term
9	5.2	Define and assign asset hierarchies to trees	Coordinator Strategic Asset Management		Medium-term
10	5.5	Develop a New Tree Planting Program	Coordinator Strategic Asset Management		Medium-term
11	6.3	Assess resilience in service delivery.	Manager Infrastructure Services		Long-term
12	7.5	Determine optimal operational and maintenance requirements to maintain healthy trees	Coordinator Depot Operations		Medium-term

[13] ISO 55000 Refers to this the Asset Management System

8.3 Monitoring and Review Procedures

This Asset Management Plan will be reviewed during the annual budget planning process and revised to show any material changes in service levels, risks, forecast costs and proposed budgets as a result of budget decisions.

The AMP will be reviewed and updated annually to ensure it represents the current service level, asset values, forecast operations, maintenance, renewals, upgrade/new and asset disposal costs and proposed budgets. These forecast costs and proposed budget are incorporated into the Long-Term Financial Plan or will be incorporated into the Long-Term Financial Plan once completed.

The AMP has a maximum life of 4 years and is due for complete revision and updating every 4 years from the date of adoption.

8.4 Performance Measures

The effectiveness of this Asset Management Plan can be measured in the following ways:

- The degree to which the required forecast costs identified in this Asset Management Plan are incorporated into the long-term financial plan,
- The degree to which the 1-5 year detailed works programs, budgets, business plans and corporate structures take into account the 'global' works program trends provided by the Asset Management Plan,
- The degree to which the existing and projected service levels and service consequences, risks and residual risks are incorporated into the Strategic Plan and associated plans,
- The Asset Renewal Funding Ratio achieving the Organisational target (this target is often 1.0).

9.0 REFERENCES

- IPWEA, 2006, 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/IIMM
- IPWEA, 2008, 'NAMS.PLUS Asset Management', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/namsplus.
- IPWEA, 2015, 2nd edn., 'Australian Infrastructure Financial Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/AIFMM.
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- IPWEA, 2012 LTFP Practice Note 6 PN Long-Term Financial Plan, Institute of Public Works Engineering Australasia, Sydney
- ISO, 2018, ISO 31000:2018, Risk management – Guidelines
- Council Plan 2021- 2025
- Warrnambool City Council Annual Budget
- Infrastructure Design Manual

10.0 APPENDICES

Appendix A Acquisition Forecast

A.1 – Acquisition Forecast Assumptions and Source

Half of tree acquisitions arise from developer contributions. The rate of land development and associated contributions to trees and open space is variable, an average has been assumed for the forecast.

A.2 – Acquisition Project Summary

The projects included in the lifecycle forecast include:

Project	Timing
Merriviews Stage 4	Short term
Mervue Stage 3	Short term
Russells Creek Stage 4	Short term
Wollaston Way Stage 5	Short term
Hopkins Ridge Stage 3	Mid term
North Edge Stage 1&2	Mid term
Riverland Stage 1	Mid term
Merriviews Stage 5	Long term

A.3 – Acquisition Forecast Summary

Table A3 - Acquisition Forecast Summary

Year	Constructed	Contributed	Planned Budget
2021	$133,676	$139,878	$133,676
2022	$133,676	$139,878	$133,676
2023	$133,676	$139,878	$133,676
2024	$133,676	$139,878	$133,676
2025	$133,676	$139,878	$133,676
2026	$133,676	$139,878	$133,676
2027	$133,676	$139,878	$133,676
2028	$133,676	$139,878	$133,676
2029	$133,676	$139,878	$133,676
2030	$133,676	$139,878	$133,676
2031	$133,676	$139,878	$133,676
2032	$133,676	$139,878	$133,676
2033	$133,676	$139,878	$133,676
2034	$133,676	$139,878	$133,676
2035	$133,676	$139,878	$133,676

Appendix B Operation Forecast

B.1 – Operation Forecast Assumptions and Source

The additional operation forecast is 1% of the value of new plantings - both Council and Developer funded.

B.2 – Operation Forecast Summary

Table B2 - Operation Forecast Summary

Year	Operation Forecast	Additional Operation Forecast	Total Operation Forecast
2021	$55,109	$2,736	$57,845
2022	$55,109	$5,471	$60,580
2023	$55,109	$8,207	$63,316
2024	$55,109	$10,942	$66,051
2025	$55,109	$13,678	$68,787
2026	$55,109	$16,413	$71,522
2027	$55,109	$19,149	$74,258
2028	$55,109	$21,884	$76,993
2029	$55,109	$24,620	$79,729
2030	$55,109	$27,356	$82,465
2031	$55,109	$30,091	$85,200
2032	$55,109	$32,827	$87,936
2033	$55,109	$35,562	$90,671
2034	$55,109	$38,298	$93,407
2035	$55,109	$41,033	$96,142

Appendix C Maintenance Forecast

C.1 – Maintenance Forecast Assumptions and Source

The additional maintenance forecast is 1% of the value of new plantings - both Council and Developer funded.

C.2 – Maintenance Forecast Summary

Table C2 - Maintenance Forecast Summary

Year	Maintenance Forecast	Additional Maintenance Forecast	Total Maintenance Forecast
2021	$399,899	$2,736	$402,635
2022	$402,634	$2,736	$405,370
2023	$405,370	$2,736	$408,106
2024	$408,105	$2,736	$410,841
2025	$410,841	$2,736	$413,577
2026	$413,576	$2,736	$416,312
2027	$416,312	$2,736	$419,048
2028	$419,047	$2,736	$421,783
2029	$421,783	$2,736	$424,519
2030	$424,518	$2,736	$427,254
2031	$427,254	$2,736	$429,990
2032	$429,989	$2,736	$432,725
2033	$432,725	$2,736	$435,461
2034	$435,461	$2,736	$438,197
2035			

Appendix D Renewal Forecast Summary

D.1 – Renewal Forecast Assumptions and Source

A rate of $450/tree is used for renewal forecasting. This is the amount imposed on developers who bond their works.

D.2 – Renewal Project Summary

Trees are replaced individual as required, there are no large replacement projects to be summarised.

D.3 – Renewal Forecast Summary

Table D3 - Renewal Forecast Summary

Year	Renewal Forecast	Renewal Budget	Cumulative Renewal Gap
2021	$210,600	$75,932	$134,668
2022	$85,950	$75,932	$144,686
2023	$48,600	$75,932	$117,354
2024	$68,400	$75,932	$109,822
2025	$87,750	$75,932	$121,640
2026	$67,050	$75,932	$112,758
2027	$75,600	$75,932	$112,426
2028	$105,750	$75,932	$142,244
2029	$62,100	$75,932	$128,412
2030	$270,450	$75,932	$322,930
2031	$35,550	$75,932	$282,548
2032	$136,350	$75,932	$342,966
2033	$32,850	$75,932	$299,884
2034	$79,200	$75,932	$303,152
2035	$124,650	$75,932	$351,870

D.4 –Renewal Plan

Refer to Council's Asset Management System for the full 15-year renewal plan

Appendix E Budget Summary by Lifecycle Activity

Table F1 – Budget Summary by Lifecycle Activity

Year	Acquisition	Operation	Maintenance	Renewal	Disposal	Total
2020	$133,676	$55,109	$399,899	$75,932	$0	$664,616
2021	$133,676	$55,109	$399,899	$75,932	$0	$664,616
2022	$133,676	$55,109	$399,899	$75,932	$0	$664,616
2023	$133,676	$55,109	$399,899	$75,932	$0	$664,616
2024	$133,676	$55,109	$399,899	$75,932	$0	$664,616
2025	$133,676	$55,109	$399,899	$75,932	$0	$664,616
2026	$133,676	$55,109	$399,899	$75,932	$0	$664,616
2027	$133,676	$55,109	$399,899	$75,932	$0	$664,616
2028	$133,676	$55,109	$399,899	$75,932	$0	$664,616
2029	$133,676	$55,109	$399,899	$75,932	$0	$664,616
2030	$133,676	$55,109	$399,899	$75,932	$0	$664,616
2031	$133,676	$55,109	$399,899	$75,932	$0	$664,616
2032	$133,676	$55,109	$399,899	$75,932	$0	$664,616
2033	$133,676	$55,109	$399,899	$75,932	$0	$664,616
2034	$133,676	$55,109	$399,899	$75,932	$0	$664,616

Appendix F Critical Tree Locations