

# Infrastructure Asset Management Plan

Version Control			
Version No	Date	Details	Author
1.0	May 2017	Endorsement of Infrastructure Asset Management Plan	Asset Management Working Group
2.0	May 2017	Review of Infrastructure Asset Management Plan (Buildings & Roads)	Asset Management Working Group
3.0	May 2018	Review of Infrastructure Asset Management Plan (footpaths, drainage, bridges, parks and waterways)	Asset Management Working Group
4.0	May 2020	Consolidation of information – Infrastructure Asset Management Plan to include general information relevant to all asset classes. Asset-specific plans to be tailored to the specific asset class.	Asset Management Working Group

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# 1. Executive Summary

The Shire of Murray is located in the centre of the Peel Region of Western Australia, approximately 80 kilometres south of Perth and has a total land area of approximately 1,700 square kilometres. A historically rural local government area, the Shire is currently experiencing pressure for new urban growth areas. This growth will place significant demand on existing community infrastructure available within the Shire and will require the provision of additional infrastructure to meet the needs of a growing community.

The Shire of Murray is responsible for providing a number of community focused services and in doing so must ensure that its infrastructure assets and community facilities are maintained in accordance with well-developed asset management program's and strategic forward plans to enable these services to meet community needs. Asset management is recognised as a practicable and financially responsible means of managing Council's assets by ensuring that the assets continue to provide a specified level of service delivery to defined standards over their entire life.

The Shire of Murray Infrastructure Asset Management Plan provides the framework to deliver optimum operational performance of Council's infrastructure assets in the most cost-effective manner. The plan aims to provide a more formalised and transparent approach to asset management. It provides mechanisms to clearly define its asset renewal and asset maintenance practices and to mitigate risk.

The Infrastructure Asset Management Plan has been prepared in accordance with the Shire of Murray's Strategic Community Plan 'Murray 2030' and has also been compiled to comply with Local Government Regulatory requirements, including the Integrated Planning and Reporting Framework.

The Infrastructure Asset Management Plan is intended to provide advice to Council on the financial requirements for long-term sustainability of each asset class. This means understanding the impact of any funding 'gap' and a plan to manage that gap where it exists.

The Infrastructure Asset Management Plan is supported by asset management plans relating to the Shire's individual asset classes. These are:

- Appendix A – Buildings
- Appendix B – Roads and Kerbs
- Appendix C – Bridges
- Appendix D – Footpaths
- Appendix E – Drainage
- Appendix F – Parks
- Appendix G - Waterways

## 1.1. Overview

The Shire of Murray owns and is responsible for the management, operation and maintenance of a diverse asset portfolio that provides services to the community. The Infrastructure Asset Management Plan has been developed to ensure that Council continues to provide effective, comprehensive and sustainable management of its infrastructure and asset portfolios.

Council plans to operate and maintain its asset portfolio to achieve the following objectives:

- Communicate the current condition of all Shire infrastructure and review the budgets/practices used to operate and maintain them
- Undertake financial planning by adopting a life cycle approach to asset budgeting
- Develop cost effective management strategies for the long term
- Define a level of service for infrastructure assets to meet community needs
- Understand and meet the demands of growth through demand management and infrastructure investment
- Avoid disruptions to services by managing risk associated with asset failures

Asset Management is a key component of the Integrated Planning and Reporting Framework, as it clearly links to the Strategic Community Plan, Corporate Business Plan and Annual Report, enabling these documents to be influenced by the development of integrated planning elements such as the Infrastructure Asset Management Plan.

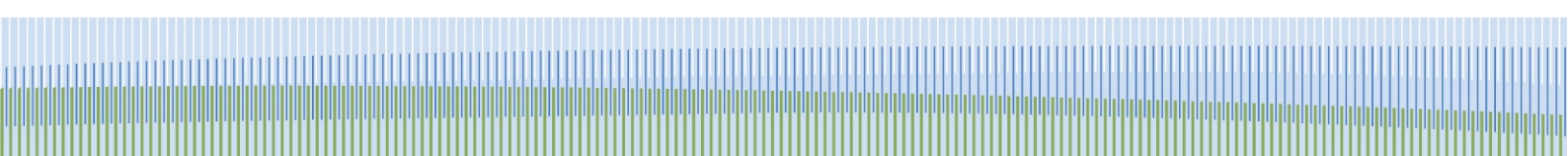
## 2. Introduction

### 2.1. Purpose and Scope of Plan

The Infrastructure Asset Management Plan is the means for outlining the key elements involved in managing the Shire of Murray's Infrastructure Assets. It combines management, financial, engineering and technical practices to ensure that the level of service required by the community is provided at the lowest term cost within the limits of any fiscal constraints that may be imposed by Council.

The Infrastructure Asset Management Plan is a key element of Council's strategic asset management planning.

The specific purpose of the plan is to:

- Demonstrate responsible stewardship by Council
  - Provide a basis for customer consultation to determine the appropriate levels of service
  - Define and articulate how the infrastructure is and will be managed to achieve the organisations objectives
  - Achieve savings by optimising whole of life costs
  - Manage risk and asset failure
  - Support long term financial planning
- 

The outcomes of the plans will identify the future funding requirements service delivery accounting for the following factors:

- Adopted Levels of Service
- Future demand for infrastructure
- Current asset performance
- Asset failure
- Risk
- Required works
- Funding constraints

Council's performance in providing the funding necessary to meet lifecycle renewal needs through asset depreciation will be measured. In addition, such funding has to meet any backlog of works. The plan will endeavor to separate the ongoing annual lifecycle renewal needs for any backlog.

The Infrastructure Asset Management Plan covers the following types of assets:

<b>Bridges:</b>	<b>Parks:</b>	<b>Parks Continued:</b>
Traffic Bridges	Bus Shelters	Signs
Pedestrian Bridges	Carparks	Lighting
<b>Buildings:</b>	Fences	Entry Statements
Building - Structure	BBQ's	Flag Poles
Building – Roof	Benches	Garden Arbours
Building – Fitout	Bike Racks	Gazebos
Building Mechanical Services	Gates	Information Bays
<b>Drainage:</b>	Park Benches	Memorials
Stormwater Pits	Picnic Table and Chairs	Rotunda
Stormwater Pipes	Rubbish Bins	Sculpture
Culverts	Water Fountains	Shelters
<b>Footpaths:</b>	Water Taps	Clock
Concrete / Concrete Pavers	BMX Facility	Communications Tower
Brick Paved	Basketball Courts	Feature Walls
Asphalt	Cricket Nets	Totem Poles
Timber	Cricket Wicket	<b>Roads and Kerbs:</b>
<b>Waterways:</b>	Football Goals	Sealed Road
Barge	Football Scoreboards	Unsealed Road
Boat Ramp	Multi Courts	Kerbs
Canal Wall	Skate Parks	
Canoe Launch Facility	Soccer Goals	
Floating Jetties	Tennis Courts	
Jetties	Play Equipment	
Pontoon	Garden Bed Kerbing	
River Walls	Retaining Walls	

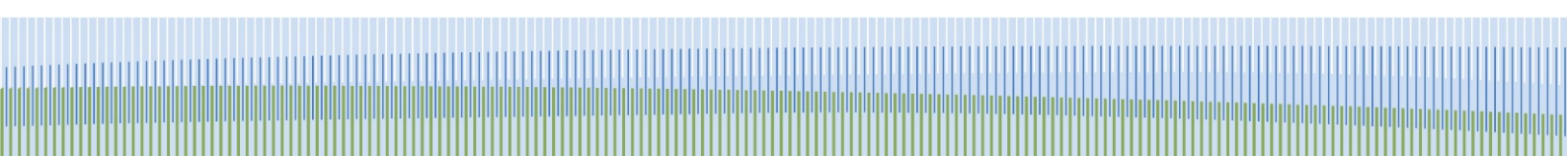
## 2.2 Plan Format

This asset management plan follows the framework set out in the Institute of Public Works Engineering Australia's (IPWEA) International Infrastructure Management Manual.

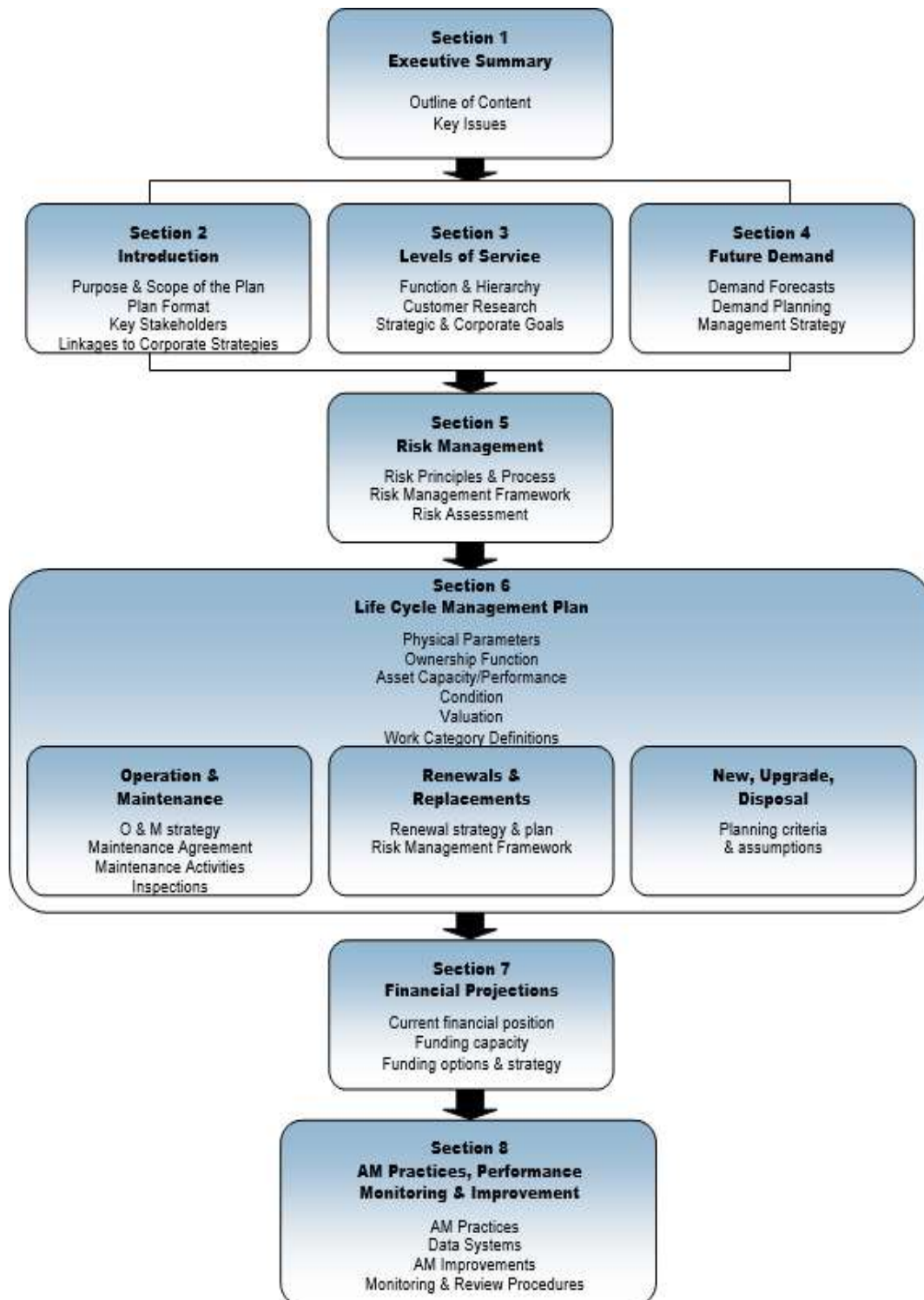
Key elements of the plan are:

- Levels of service – specifies the services and levels of service to be provided by the organisation,
- Future demand – how this will impact on future service delivery and how this is to be met,
- Life cycle management – how Council will 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,
- Monitoring – how the plan will be monitored to ensure it is meeting organisation's objectives,
- Asset management improvement plan.

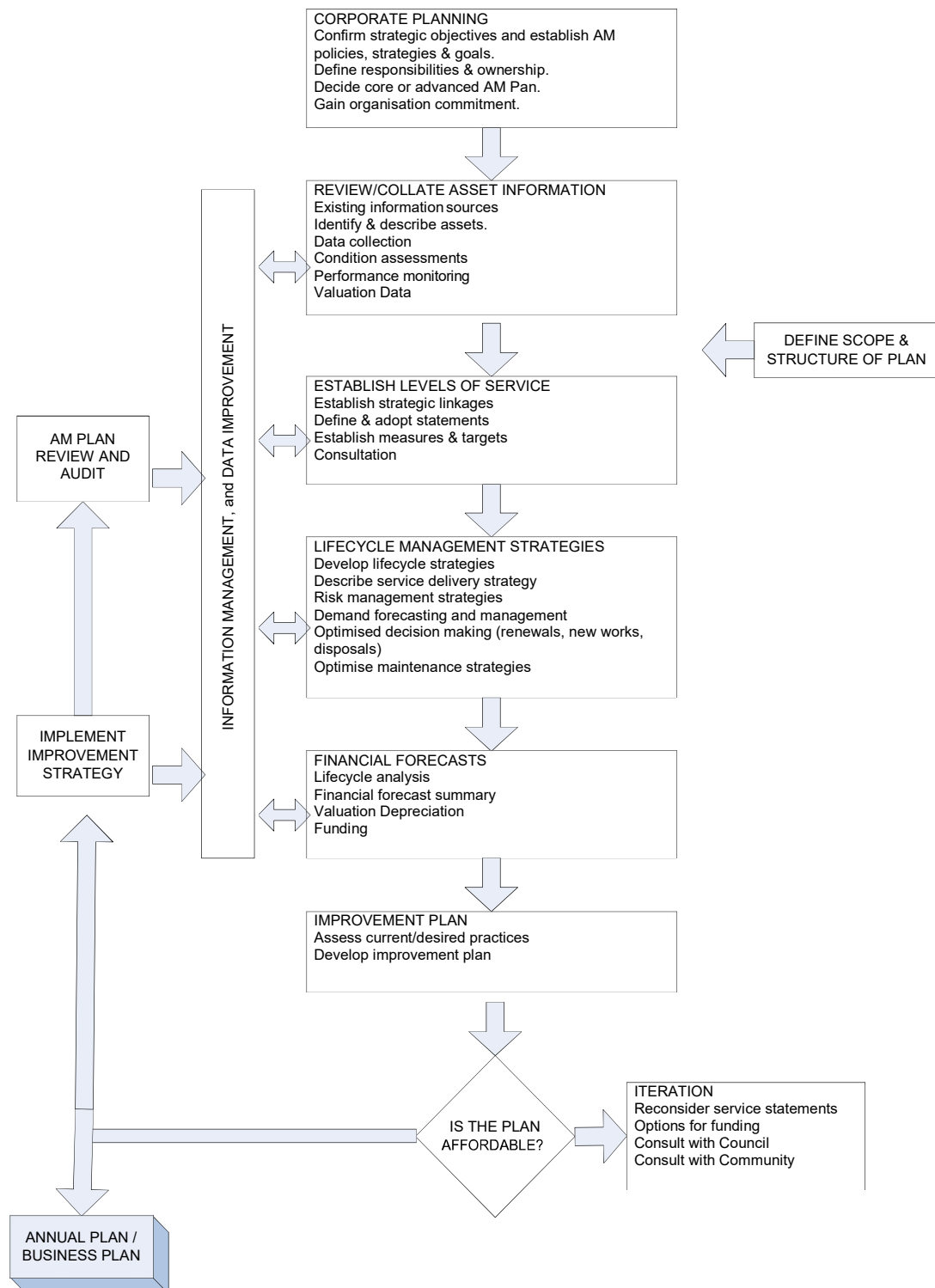
The Framework is outlined in the following diagram:







The key steps in preparing an asset management plan are shown below.



## 2.3 Key Stakeholders

Stakeholders include any person, agency, body or group that have any interest or that are affected by the infrastructure and assets owned by Council.

Stakeholder	Expectations
Councillors	Meeting community needs, sound management and allocation of resources, good governance
Employees / Contractors	Safe working environment
Community Residents and Businesses	Value for money, equitable and responsible service, well maintained assets
Asset Users	Well maintained assets specific to users' needs
Insurers	Appropriate risk management policies and practices, safe working environments, well maintained assets
Tourists	Well maintained assets, accessible services, safe facilities
Government (Federal and State)	Systems in place to sustain infrastructure, accountability, transparency

## 2.4 Goals and Objectives of Asset Management

The Shire of Murray exists to provide services to its community. Some of these services are provided by infrastructure assets. The Shire has acquired infrastructure assets by purchase, contract, construction by Shire staff and by donation of assets constructed by developers and others to meet increased levels of service.

The key elements of infrastructure asset management are:

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

The Shire's goal in managing infrastructure assets is to meet the required level of service in the most cost effective manner for present and future consumers. The goal of the asset management plan is to:

- Document the services / levels of service to be provided and the costs of providing these services;
- Communicate the consequences for levels of service and risk, where desired funding is not available; and
- Provide information to assist decision makers in trading off levels of service, costs and risks to provide services in a financially sustainable manner

The benefits of improved asset management include:

Asset Management Process	Benefits
Strong Governance and Accountability	<ul style="list-style-type: none"> <li>- Demonstrating to owners, customers and stakeholders that services are being delivered effectively and efficiently</li> <li>- providing a transparent and auditable basis for making service/risk/price trade-off decisions</li> <li>- Improving accountability for use of resources through performance and financial indicators</li> <li>- Providing the opportunity to benchmark results against similar organisations</li> </ul>
More Sustainable Services	<ul style="list-style-type: none"> <li>- Considering all viable options (including demand management) and all aspects of decisions</li> <li>- Ensuring all lifecycle costs are included in decision processes, so that the emphasis is on sustainable efficiencies not unsustainable short-term gains</li> </ul>
Enhanced Customer Service	<ul style="list-style-type: none"> <li>- Improved understanding of service requirements and options</li> <li>- Improved performance and control of service delivery to the required standards</li> <li>- A more holistic approach to asset management within the organisation, through multi-disciplinary management teams</li> </ul>
Effective Risk Management	<ul style="list-style-type: none"> <li>- Understanding the risks relating to asset management and service delivery and applying a framework to prioritise mitigation</li> <li>- Applying business continuity practices</li> <li>- Addressing the inter-relationship between different networks</li> </ul>
Improved Financial Management	<ul style="list-style-type: none"> <li>- Improved decision making based on costs and benefits or alternatives</li> <li>- Prioritisation of investments, interventions and asset care activities</li> <li>- Justification of forward work programs and funding requirements</li> <li>- Recognition of all costs of owning/operating assets over the lifecycle of the assets</li> <li>- Selecting the most effective procurement method</li> <li>- Benchmarking condition and performance to promote innovation and efficiency</li> </ul>

The main goal of the asset management plan is to ensure that assets acquired support and meet the strategic and annual objectives of the organisation and that the cost of providing the service to the community does not outweigh the benefits.

## 2.5 Strategic and Corporate Goals

The Shire's Strategic Community Plan 'Murray 2030' includes recognition to "Maintain long-term financial sustainability". The Shire has acknowledged the need to take an organisation wide approach to asset management and one which involves the community on a wider basis. The corporate goal encapsulates having a whole of life cost approach to the provision and maintenance of assets, and to consider the ongoing costs of existing assets when making decisions on the renewal and acquisition of new assets.

The Shire's Asset Management Policy outlines the key principles that will be considered when making decisions in relation to infrastructure assets:

- Philosophy of renewing assets before acquiring new assets, with an emphasis on integrating services while maintaining / upgrading / replacing existing assets rather than adding new assets to Shire inventory, unless cost benefit analysis justifies otherwise.
- Prior to consideration of any acquisition or major improvement to an asset, a critical review of the following will occur as part of the evaluation process:
  - Demonstrated need and asset function
  - Level of service
  - Community benefits
  - Overall community value of asset ownership
  - Risk Implications
  - Statutory Obligations
  - Opportunities for rationalisation including multiple use
  - Whole of life cost

The Shire will utilise clear prioritisation methods for capital works expenditure. This will include the requirement to report expenditure in the following classifications to ensure that discretionary and non-discretionary expenditure is identified:

- Renewal (non-discretionary)
- Upgrade (discretionary)
- New (discretionary)
- Operational (discretionary)
- Maintenance (non-discretionary)

## 2.6 Legislative Requirements

There are many legislative requirements that impact on the management of Shire infrastructure assets. The legislation requirements that relate to assets under the care control and responsibility of Local Government include the following:

Legislation	Requirements
Local Government Act 1995	Sets out the role, purpose, responsibilities and powers of local governments.
Local Government (Miscellaneous Provisions) Act 1960	An Act to deal with certain matters concerning local government. To be read as part of Local Government Act 1995
Land Administration Act 1997	An Act to consolidate and reform the law about Crown land and the compulsory acquisition of land generally
Town Planning and Development Act 2005	Defines the land use and zoning of waterway facility infrastructure
Environment Protection and Biodiversity Act 1999	Regulations regarding noise, sustainability, landfill, stormwater and groundwater resources.
Occupational Health & Safety Act 1984	Provide a work environment that is safe and as far as practicable without risk to health.
Native Title (State Provisions) Act 1999	Recognises the traditional rights and interests to land and waters of Aboriginal and Torres Strait Islander people
Heritage of Western Australia Act 1990	Establishes the State Register of Heritage Places that are protected due to their cultural heritage significance
Conservation and Land Management Act 1984	An Act to make better provision for the use, protection and management of certain public lands and waters and the flora and fauna thereof, to establish the Conservation and Parks Commission, to confer functions relating to the conservation, protection and management of biodiversity and biodiversity components, and for incidental or connected purposes.
Aboriginal Heritage Act 1972	Provides a means to protect and preserve Aboriginal sites
Telecommunications Act 1997	Regulates the activities of a number of participants in the telecommunications industry, including 'carriers' and 'carriage service providers'
Local Government (Financial Assistance) Act 1995	An Act to provide for financial assistance for local government purposes by means of grants to the States, the Australian Capital Territory and the Northern Territory, and for related purposes



## 2.6.1 Integrated Planning and Reporting Framework

The Integrated Planning and Reporting Framework provides the basis for improving the practice of strategic planning in Local Government. Asset Management is a key component of the Integrated Planning and Reporting Framework, as it clearly links to the Strategic Community Plan, Corporate Business Plan and Annual Report, enabling these documents to be influenced by the development of integrated planning elements such as Asset Management Plans.

The Integrated Planning and Reporting Framework has been developed by the WA Department of Local Government as part of the State Government's Local Government Reform Program. The program seeks to improve the capacity in the local government sector to respond to community needs.

The Integrated Planning and Reporting Framework addresses the minimum requirements to meet the intent of the Local Government Act 1995 and outlines how local governments can produce a Strategic Community Plan and a Corporate Plan. It also reflects a nationally consistent approach to integrated planning, as expressed by the Council of Australian Governments Local Government Planning Ministers Council.

The Department released an advisory standard for the key elements of integrated planning – the Strategic Community and Corporate Plans including Asset Management, Financial Management and Workforce Planning, which outlines the compliance requirements for local governments and how these will be measured.

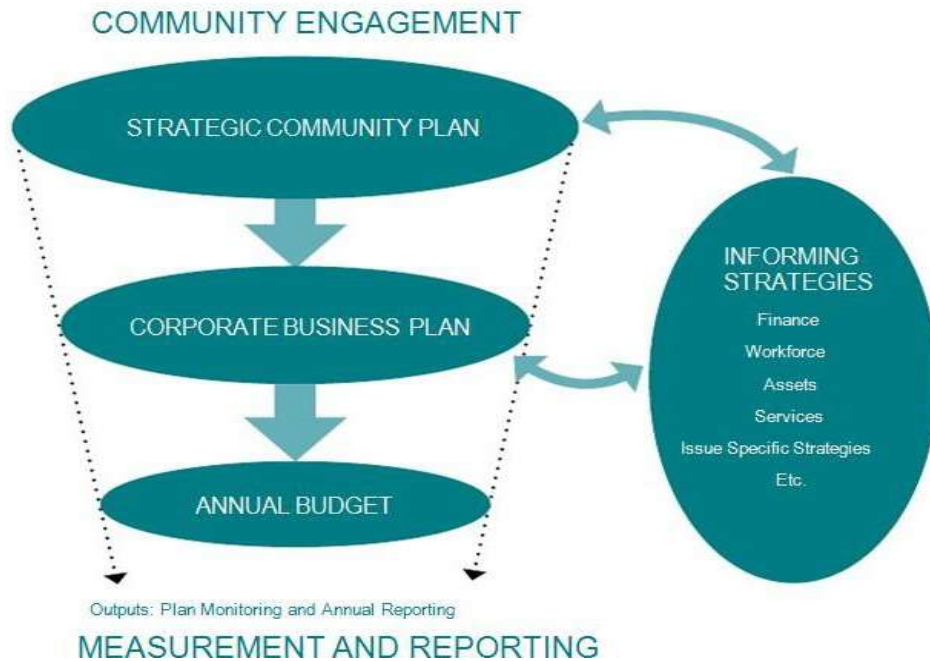
While local governments were required to meet the basic standard of planning by 30 June 2013, the underlying objective of the Department's approach to integrated planning and reporting is to create a process of continuous improvement.

The Asset Management Plan is an informing strategy to the Strategic Community Plan, the Corporate Business Plan and other informing strategies. The department has also prepared an Asset Management Framework that defines what Local Governments should strive to develop in order to have asset management policies, strategies and plans.

The advantages of the integrated planning and reporting process are as follows:

- Recognises that planning for a local government is holistic in nature and driven by the community;
- Builds organisational and resources capability to meet community need;
- Optimises success by understanding the integration and interdependencies between the components; and
- Emphasises performance monitoring so that local governments can adapt and respond to changes in community needs and the business environment.

The figure below illustrates the different elements of the Integrated Planning Framework:



## 2.7 Linkages to Corporate Strategies

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

The Shire's vision is:

"By 2030, the Shire of Murray will be a place where business thrives, we protect our environment, and all people enjoy an outstanding quality of life".

Asset Management Plans are a crucial component of the Shire's planning process linking with the following corporate documents:

- Strategic Community Plan "Murray 2030"
- Corporate Plan 2019 - 2023
- Long Term Financial Plan
- Annual Report
- Risk Management Strategy
- Risk Management Policy
- Asset Management Policy
- Asset Management Improvement Strategy
- Community Infrastructure Plan
- Workforce Plan

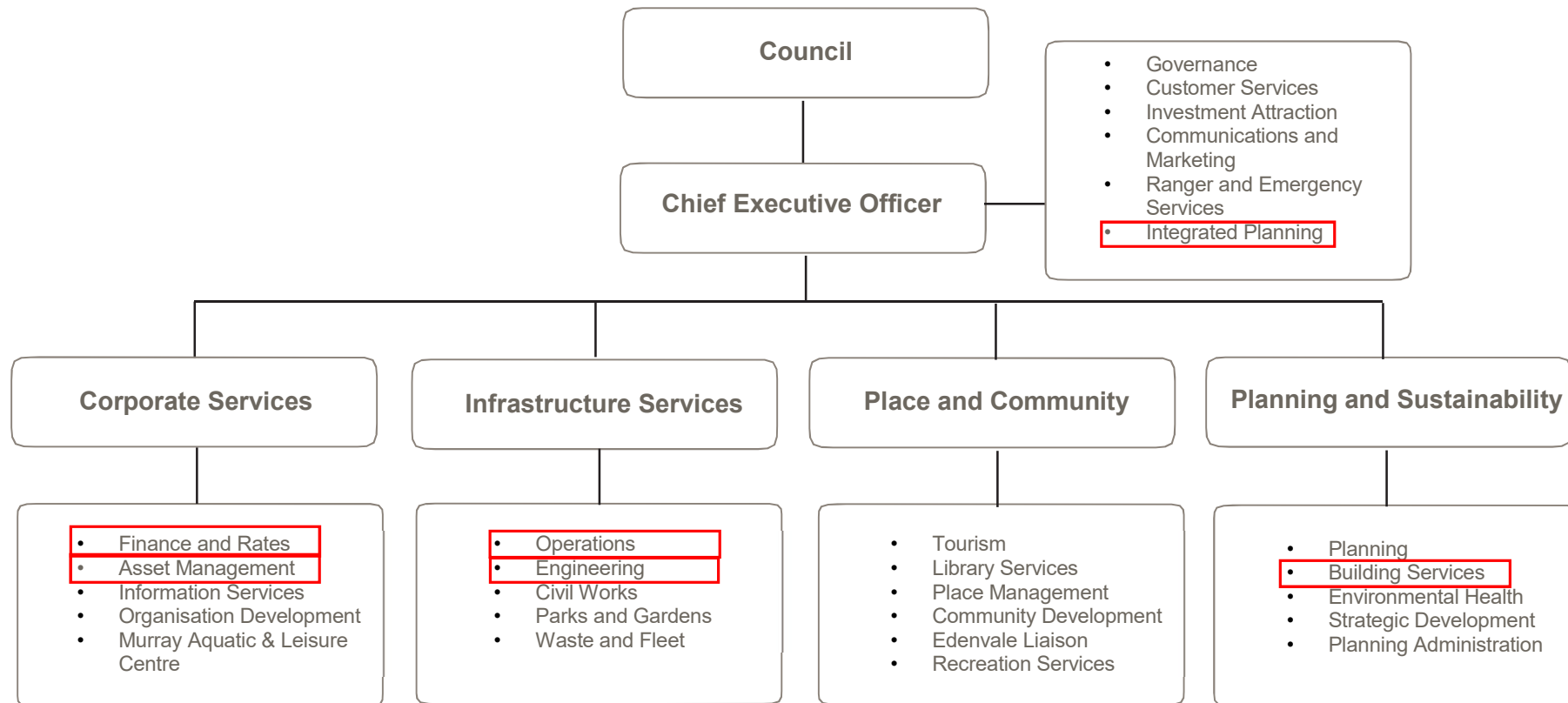
The purpose of this plan is to assist the Shire and Executive to make informed decisions on the allocation of resources to manage facilities, and to communicate this information to the public. The plan takes into account three main drivers in managing infrastructure assets, which when combined determine the level of service of the asset. They are:



1. **Function** – The plan considers the function of each component of each asset class based on its intended purpose;
2. **Risk** – The various consequences resulting from a range of scenarios that flow from implementing different management practices; and
3. **Lifecycle cost** – The cost to the community, in consideration of the likely consequences, of implementing various management practices.

## 2.8 Organisational Structure

The Asset Management Plan recognises that Asset Management as a multidisciplinary approach. The following diagram below provides overall detail of where assessment management and maintenance staff sit in relation to the Shire's overall functional structure.



## 2.9 Core and Advanced Asset Management

### 2.9.1 Core Approach

This Asset Management Plan has been prepared as a core asset management plan in accordance with the International Infrastructure Management Manual. The plan has also been developed in accordance with the Department of Local Governments Integrated Planning and Reporting Framework to assist the Shire in driving future budgeting requirements whilst providing sustainable service delivery and long term financial planning and reporting. At the 'Core' level it is important to begin with an understanding of what level of service is currently provided. It is typically a case of selecting assets that are deemed to be most critical to the safety and wellbeing of the community and focusing on these to carry out the initial condition assessment inspection. Hence these might be located in older business precincts or on major transport corridors where the consequence or impact of failure coupled with a potentially higher probability of failure, make these a priority of investigation.

This will typically identify any hazards (and associated risks) requiring immediate mitigation. It will also provide some basis data on the condition that will enable analysis of renewal or replacement works required now and in the longer term. This then provides the necessary financial data to inform the Long Term Financial Plan. Works identified, immediate and future, can then be allocated to projects, both maintenance and capital in nature, to be carried out and the timeframe for such. Regularly repeating these basic steps with appropriate refinement of the process and as resources permit is part of the continuous improvement journey, leading to a more advanced asset management program.

### 2.9.2 Advanced Approach

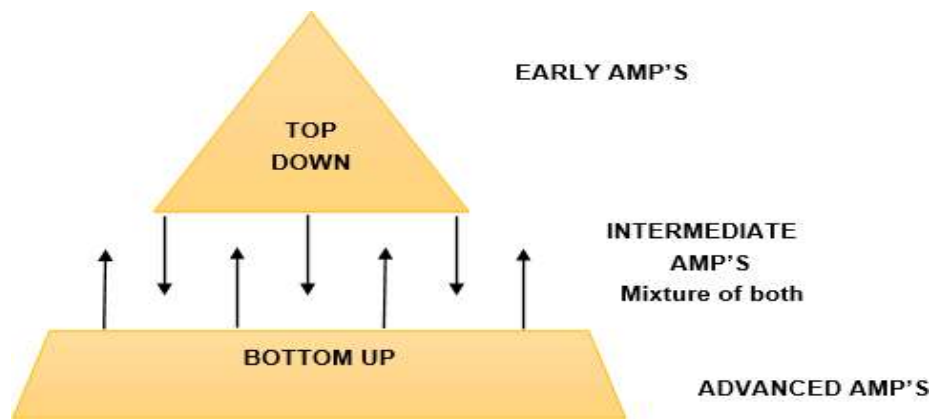
The Asset Management Plan contains elements of advanced asset management practices to establish a 'bottom up' approach for gathering asset information for individual assets. With future revisions of these plans the Shire will continue to move forward towards "Advanced" asset management to support the optimisation of activities and programs to meet agreed service levels.

Advanced asset management will show features such as:

- Long term optimised lifecycle,
- Corporate objectives and asset performance are aligned and complimentary,
- Information systems integrated and used effectively,
- Competencies are aligned to roles and responsibilities, and
- Strategies are risk based, with appropriate use of predictive models, problem solving and iterative continuous improvement

As the Shire is moving into a more 'advanced' phase it will address the whole portfolio of its assets and more formally apply criticality and risk management principles to better determine the frequency and scope of condition assessment inspections. The Shire will collect more detailed data, with greater breakdown into various components and will apply quality standards to test the level of service being provided and use this to assist the condition assessment process in deciding on future needs.

The resultant data will be more rigorously analysed and optimised decision making typically employed to determine priorities for works. The analysis will give a more accurate picture on the remaining life of the assets down to their various components, their current replacement cost and their depreciated replacement cost.



### 3. Levels of Service

Levels of service are key business drivers and influence all asset management decisions. Levels of service typically relate to service attributes such as quality, reliability, responsiveness, sustainability, timeliness, accessibility and cost. Understanding the level of service required of an asset is essential for its lifecycle management, as this largely determines an asset's development, operation, maintenance, replacement and disposal. Levels of service are pivotal in asset management as they have a direct financial impact due to their importance in both operational and risk-based prioritisation.

Service levels are defined service levels in two terms, community levels of service and technical levels of service.

#### 3.1 Community Levels of Service

Community Levels of Service relates to the function of the service provided and how the customer receives the service in terms of appearance, availability, comfort and safety.

Community levels of service measures used in the asset management plan are:

Quality	How good is the service?
Function	Does it meet users' needs?
Capacity/Utilisation	Is the service over or under used?

A key objective of this asset management plan is to match the level of service provided by an asset category with expectations of stakeholders. This requires a clear understanding of needs, expectations, preferences and willingness to pay for any increase in the levels of service.

Function decides strategic importance and takes into account the key principles which impact in determining the functional level of service as part of providing a sustainable range of facilities to the community.

The levels of service for asset users are a combination of the Shire's current service levels and service levels based on community input and feedback from the Community Infrastructure Surveys. Consistency is needed between the levels of service provided by the Shire and the expectation of the community. The communities' willingness to pay determines the level of service. High community expectations need to be matched to both a willingness and ability to pay. These will be looked at in further detail in future revisions of the asset management plan.

## 3.2 Technical Levels of Service

Technical levels of service relates to the technical measures and the outputs the customer receives in terms of quality, quantity, maintainability reliability and performance, responsiveness, capacity, environmental impacts and affordability.

These technical measures relate to the allocation of resources to service activities that the organisation undertakes to best achieve the desired community outcomes and demonstrate effective organisational performance.

Technical service measures are linked to annual budgets covering:

- Operations – the regular activities to provide services such as opening hours, cleaning, mowing grass, energy, inspections, etc.
- Maintenance – the activities necessary to retain an asset as near as practicable to an appropriate service condition (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 (e.g. frequency and cost of road resurfacing and pavement reconstruction, pipeline replacement and building component replacement)
- Upgrade – 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).

Service and asset managers plan, implement and control technical levels of service to influence the customer service levels.

In developing the service levels, the Shire has generally applied the framework as set out in the International Infrastructure Management Manual - 2015.

The process broadly applies 5 steps, being:

- Identify service attributes important to customers;
- Define the customer service levels the Shire delivers;
- Develop performance measures;
- Consult with customers; and
- Make service level based decisions.

### 3.3 Customer Research and Expectations

Research and information pertaining to community expectations and perceptions for infrastructure is gained from Community Surveys. The Shire is committed to updating the levels of service according to the results of community feedback. As targets for levels of service provide the basis for lifecycle management strategies and capital programs, the previously stated levels of service have been reviewed to incorporate the identified requirements of the community. As continued work is undertaken to resolve disparities between renewal funding requirements and available funds, the link between service level and cost is an important area for investigation. Consultation with the community may show that, on identifying that significant rate rises are required to fund infrastructure, the community would prefer to consider a reduction in service level. The issue of community consultation is important for further development in all updates of this asset management plan.

### 3.4 Function and 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.

## 4. Future Demand

### 4.1 Demand Forecasts and Drivers

The Shire of Murray is currently experiencing pressure for new urban growth areas. By 2031 the population of Perth and Peel is expected to grow by between 35 and 40 percent. This growth will place significant demand on existing community infrastructure available within the Shire and will require the provision of additional infrastructure to meet the needs of a growing community.

In 2011, a demographic study was commissioned by the Shire of Murray undertaking an analysis of possible demand, which has allowed anticipated impacts to be quantifiable and this data will be used extensively in predicting future demand levels for infrastructure assets.

This asset management plan considers a 10 year planning horizon and therefore the factors that may influence the potential demand of infrastructure must be recognised over this time. The following section provides commentary on the varying factors that may be subject to change and that in turn, may affect the demand for services that rely on this network.

Drivers affecting demand include population change, changes in demographics, seasonal factors, vehicle ownership rates, consumer preferences and expectations, technological changes, economic factors, agricultural practices and environmental awareness.

#### 4.1.1 New Subdivision Activity

The growth in assets has mainly occurred through vested assets from subdivision developments. Over the next 20 years this development is expected to increase considerably as significant residential development is expected. The forecast development and total dwelling gain in the Shire of Murray is shown below. The principal forecast land assumptions 2016-2041 are:

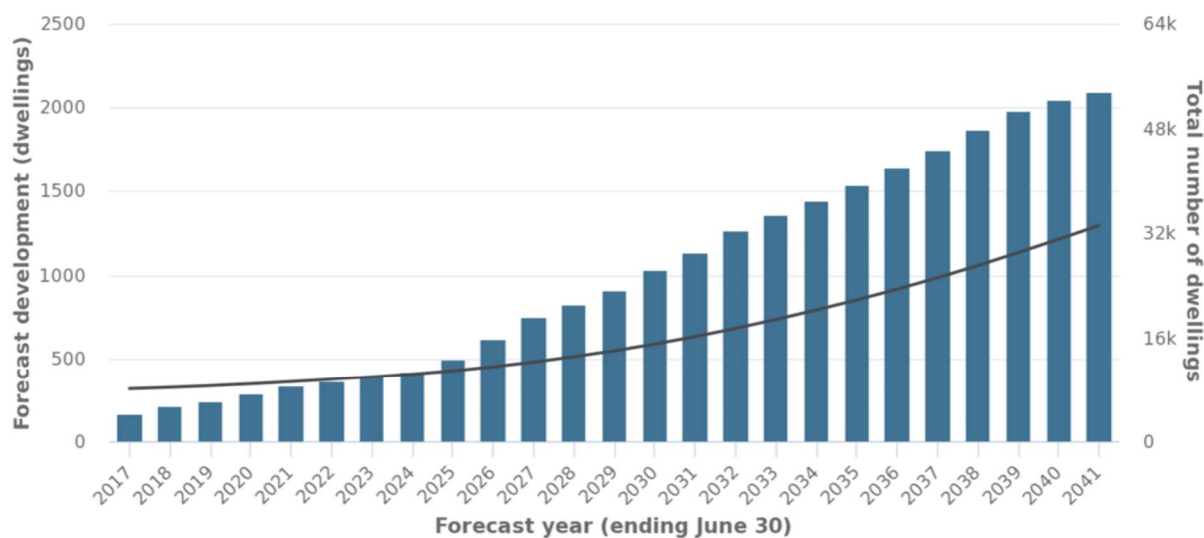
## Forecast residential development, 2016 to 2041

Murray Shire Council		Change in dwellings between 2016 and 2041	
Area	Number	%	
Shire of Murray	+25,232	+318.0	
Furnissdale	+982	+162.3	
North Dandalup - Rural North	+714	+219.3	
North Yunderup	+545	+112.4	
Pinjarra	+3,099	+143.9	
Point Grey	+1,295	+65075.0	
Ravenswood	+3,577	+361.5	
Ravenswood North	+6,415	+31065.4	
Rural South	+299	+35.8	
South Yunderup	+2,470	+138.7	
Stake Hill - Barragup - Nambeelup	+1,064	+171.3	
West Pinjarra Strategic Growth Area	+4,772	+4149.2	

## Forecast residential development

Murray Shire Council

■ Forecast development — Total dwellings



Population and household forecasts, 2016 to 2041, prepared by .id the population experts, November 2017.

**.id** the population experts



#### 4.1.2 Political

Local government policy change, as well as state government service reallocation, can often affect the demand for community services. These services then often require infrastructure to support them. Whilst a number of policies could potentially affect demand, it is thought that those concerning infrastructure funding would potentially have the greatest impact on the Shire. For example, a cut in funding would place more pressure on municipal revenue to fund infrastructure projects. This could result in lower levels of service being delivered to the community. Conversely, increases in funding can also have a distinct effect. For example, many grants are often tied into the creation of new assets, or upgrading of existing ones. Where this situation occurs, the Shire will need to fully understand the whole of life cost implications of grant funding.

#### 4.1.3 Economic

The Shire currently features a relatively small residential population, with the majority of residents located at the western end of the Murray River at South Yunderup, North Yunderup, Furnissdale and Ravenswood, as well as in Pinjarra. Other settlements of note include North Dandalup, Dwellingup and Coolup. The economic base of the Shire is strongly influenced by alumina refining at Pinjarra, with more than a third of all jobs carried out in the Shire of Murray associated with this industry. Other important industries include construction (driven by housing growth in the region) and other services, such as retail trade, education and health. Agriculture and forestry are the dominant land uses, but employ less than ten per cent of the population.

Predicted growth in the region will see increased demand for new infrastructure and greater wear on existing infrastructure as the population expands. This will likely lead to higher costs to the Shire as asset lives will be reduced.

#### 4.1.4 Social

Total population figures were sourced from Forecast ID and are summarised in the table below for the Shire of Murray. The graph contains estimated resident populations from between 2016 and 2041.

The statistical data suggests that over the life of this asset management plan that significant population change will occur within the Shire of Murray. Therefore, it is expected that due to an increase in population there will be an effect on existing infrastructure demand due to population change. This may result in infrastructure not providing an appropriate level of service to the community if it is not managed appropriately.



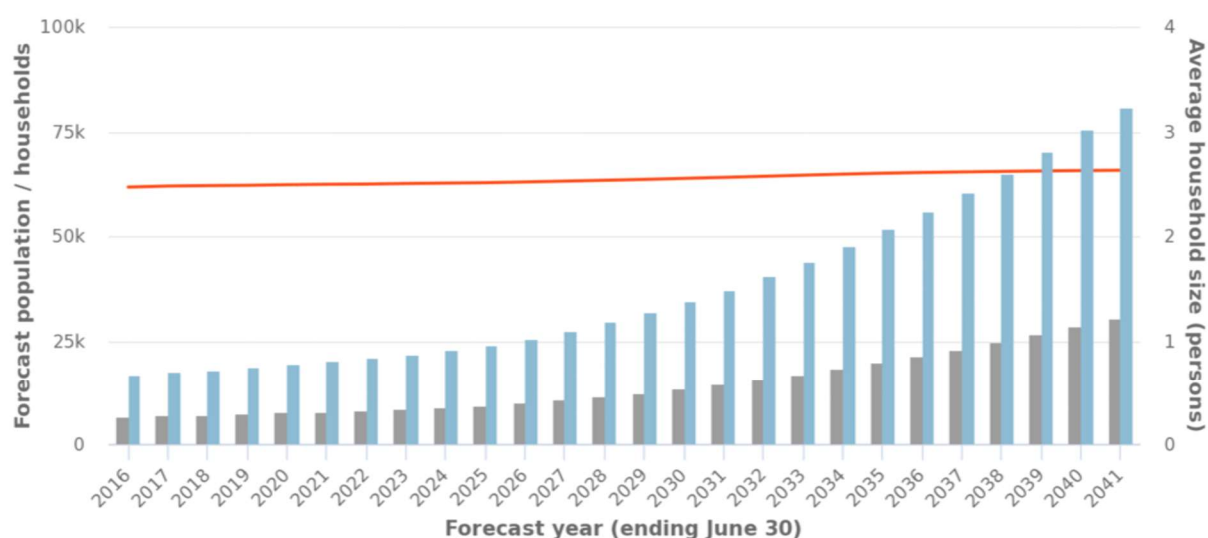
## Population summary – 2016-2041

Murray Shire Council	Forecast year						Change between 2016 and 2041	
Area	2016	2021	2026	2031	2036	2041	Total change	Avg. annual % change
Shire of Murray	17,085	20,150	25,676	37,356	55,980	80,781	+63,696	+6.41
Furnissdale	1,056	1,369	1,737	2,103	2,614	3,217	+2,161	+4.56
North Dandalup - Rural North	813	1,132	1,514	1,949	2,380	2,789	+1,976	+5.05
North Yunderup	872	903	1,181	1,505	1,801	2,084	+1,212	+3.55
Pinjarra	5,025	5,836	7,268	9,055	10,845	12,614	+7,589	+3.75
Point Grey	5	5	95	1,019	2,138	3,211	+3,206	+29.51
Ravenswood	2,189	2,669	3,668	5,320	7,217	10,507	+8,318	+6.48
Ravenswood North	54	46	381	2,840	8,189	16,602	+16,548	+25.75
Rural South	1,772	1,853	1,940	2,051	2,174	2,292	+520	+1.03
South Yunderup	3,182	4,085	5,317	6,571	7,851	8,843	+5,661	+4.17
Stake Hill - Barragup - Nambeelup	1,807	1,880	1,988	3,050	4,370	4,661	+2,854	+3.86
West Pinjarra Strategic Growth Area	310	370	587	1,894	6,400	13,961	+13,651	+16.45

## Forecast population, households and average household size

Murray Shire Council

— Average household size ■ Occupied private dwellings ■ Total population



Population and household forecasts, 2016 to 2041, prepared by .id the population experts, November 2017.

**.id** the population experts

#### 4.1.5 Demographic Change

The primary housing market role that the Shire has played over the last two decades has been to provide relatively affordable housing for young and established families, as well as retirees and older adults. The age profile of the Shire's population over the next 20 years is shown in the figure below. This role is expected to continue and expand as the stocks of residential land in Mandurah are depleted.

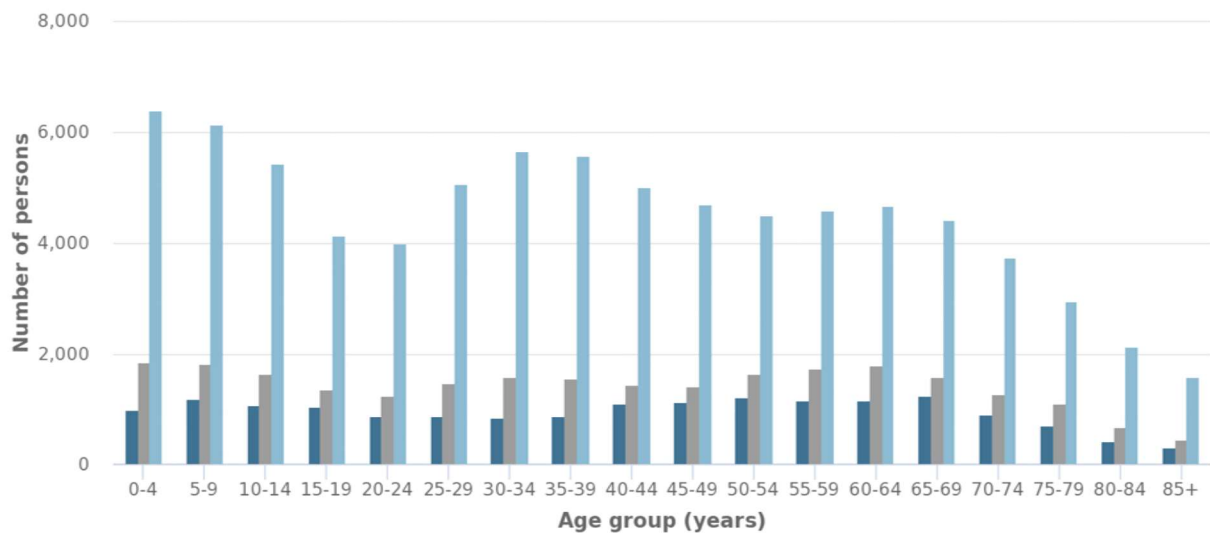
The below table details the Shire's predicted population age distribution.

Forecast age structure - 5 year age groups							
Murray Shire Council - Total persons	2016		2026		2041		Change between 2016 and 2041
Age group (years)	Number	%	Number	%	Number	%	Number
0 to 4	990	5.8	1,860	7.2	6,405	7.9	+5,414
5 to 9	1,181	6.9	1,845	7.2	6,142	7.6	+4,960
10 to 14	1,075	6.3	1,638	6.4	5,433	6.7	+4,358
15 to 19	1,043	6.1	1,364	5.3	4,147	5.1	+3,103
20 to 24	886	5.2	1,248	4.9	4,003	5.0	+3,117
25 to 29	883	5.2	1,474	5.7	5,080	6.3	+4,196
30 to 34	835	4.9	1,567	6.1	5,674	7.0	+4,839
35 to 39	873	5.1	1,550	6.0	5,567	6.9	+4,694
40 to 44	1,091	6.4	1,423	5.5	5,012	6.2	+3,921
45 to 49	1,140	6.7	1,403	5.5	4,691	5.8	+3,551
50 to 54	1,203	7.0	1,639	6.4	4,495	5.6	+3,291
55 to 59	1,157	6.8	1,759	6.9	4,605	5.7	+3,448
60 to 64	1,142	6.7	1,801	7.0	4,677	5.8	+3,534
65 to 69	1,247	7.3	1,587	6.2	4,434	5.5	+3,188
70 to 74	912	5.3	1,272	5.0	3,740	4.6	+2,829
75 to 79	703	4.1	1,101	4.3	2,960	3.7	+2,257
80 to 84	416	2.4	688	2.7	2,141	2.7	+1,725
85 and over	307	1.8	458	1.8	1,576	2.0	+1,269
Total persons	17,085	100.0	25,676	100.0	80,781	100.0	+63,696

## Forecast age structure - 5 year age groups

Murray Shire Council - Total persons

2016 2026 2041



Population and household forecasts, 2016 to 2041, prepared by .id the population experts, November 2017.

.id the population experts

Factors affecting demand for infrastructure include population growth, changes in demographics, seasonal factors, vehicle ownership, customer preferences and expectations. If the Shire does not plan for population growth and manage the future urban form of the Shire, growth pressures and unfavourable patterns of development can have serious impacts on the community. These include a lack of access to essential infrastructure and services and increased response times for emergency services.

With an increase in the number of retirees moving to the area and the increase in life expectancy the ageing population is expected to increase the Shire's need for appropriate facilities and infrastructure to cater for this age demographic. This may necessitate significant upgrade or development of infrastructure, as well as possible greater maintenance requirements.

An ageing population will mean a greater need for aged care facilities and disability access. Increase in age of population will also require improvements to public transport infrastructure and services.

The Shire of Murray is predominantly rural, with rural-residential areas in the main township of Pinjarra, the small townships of Dwellingup and North Dandalup, and numerous smaller settlements. Land is used predominantly for agriculture (mainly cattle, with some pigs and horses and orcharding), mining, forestry and conservation. Major features of the Shire include Peel Inlet, Harvey Estuary, the Murray River, the Serpentine River, Lake Banksiadale, Peel Zoo, Hotham Valley Tourist Railway, Forest Discovery Centre, Alcoa Alumina Refinery, Huntly Bauxite Mine, WA Skydiving Academy (Pinjarra Dropzone), Fairbridge Village, Edenvale Heritage Precinct, Forest Heritage Centre, Murray Aquatic and Leisure Centre, Dwellingup Trails and Visitor Centre, Pinjarra Golf Club, Pinjarra Park Racecourse, Pinjarra PACEWAY, Murray District Hospital, Pinjarra Junction Shopping Centre, Austin Bay Nature Reserve, North Dandalup Dam, South Dandalup Dam, the Bibbulmun Track, the Munda Biddi Trail and several wineries.

It is reasonable to expect tourism demand to grow at a rate above that forecasted for the State. With sensible strategic investment into key tourist assets, as well as in assets that contribute to overall town site aesthetics (e.g. well maintained roads), the Shire could see tourism growth figures higher than the expected state average of 3.9% by 2025. However, any future tourism growth will be strongly linked to both governmental and private industry investment within the Shire.

#### 4.1.6 Changes in Technology

Changes in material and construction techniques could lead to improved service levels and infrastructure standards, and ultimately reduced maintenance requirements. However, it is difficult to predict whether newer materials, construction and maintenance techniques will affect demand. Therefore, none are currently predicted.

#### 4.1.7 New Assets from Growth

The new assets required to meet growth will be acquired from land developments and constructed by the Shire. Acquiring these new assets will commit the Shire to fund ongoing operations and maintenance costs for the period that the service provided from the asset is required.

#### 4.1.8 Legislation

The Shire is bound to meet a range of legislative obligations which if altered, could affect the Shire's management obligations.

Another current legislative driver of change is the amendment of the Local Government Act 1995. The Act promotes integrated planning and ensures that long term financial planning, asset management planning and workforce planning become standard business practices for all local governments. This means that the majority of WA local government organisations will have to notably improve their current practices and processes, which the Shire is currently working towards.

#### 4.1.9 Tourism Growth

Tourism can have a major effect on infrastructure. An increase in tourism will result in higher utilisation of infrastructure, and this in turn would mean that the Shire will incur higher costs for asset replacement.

Whilst the impact of the COVID-19 pandemic on tourism numbers in the Shire of Murray is still unknown, it is anticipated that the majority of visitors over the next 18 months will be from the domestic market.

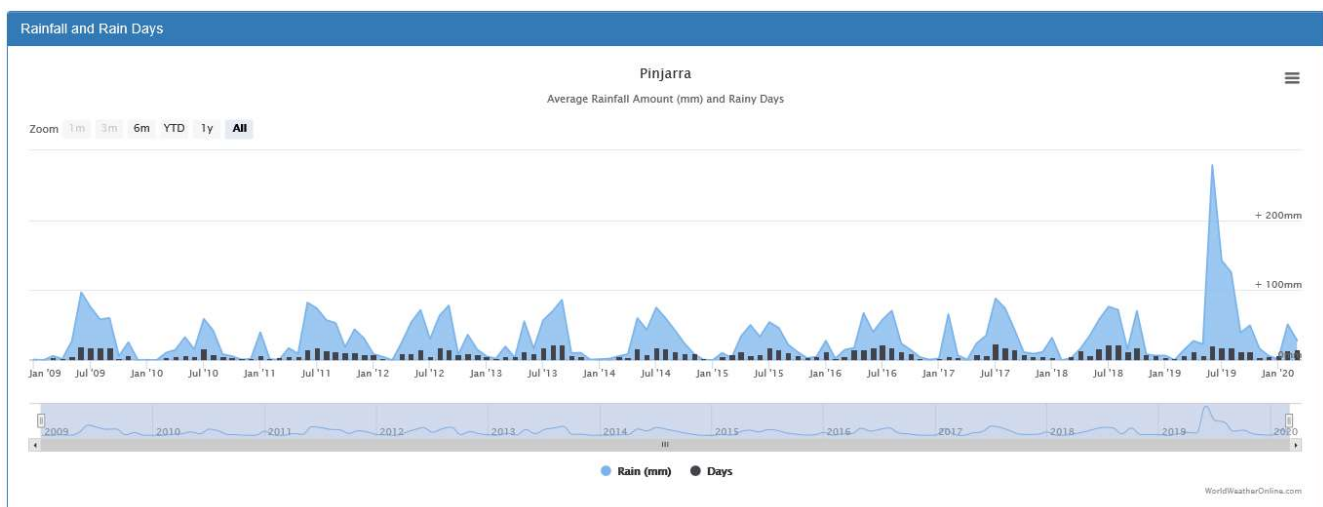
Currently, the market within the Peel Development Commission Region consists of 89% domestic travel, 7% Interstate (a 2% fall from 2017) and 5% International. The majority of the intrastate market is from Perth and a large proportion of these visitors will be day trip, weekend and school holiday visitors.

#### 4.1.10 Climate Change

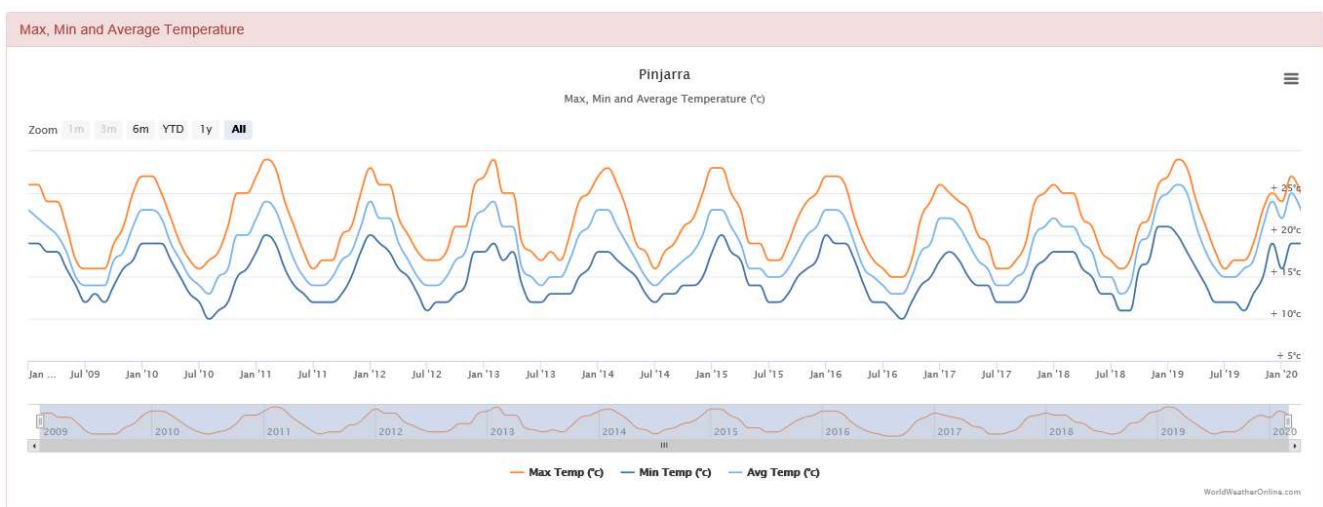
There is an increasing body of evidence that the earth's climate is changing. Climate change can have direct and indirect impacts on assets. The direct impacts are due to the effects of the environment. The indirect impacts of climate change on assets are due to the effects on the location of population and human activity altering the demand for assets.

There is continuing discussion about changing climatic conditions, increased rainfall, rising sea levels, fluctuations in wet/dry season and periods. Continued variation in weather patterns and extremes is forecast to occur. This is likely to impact on condition of assets, place pressure on asset lifecycle costs and potentially reduce asset life e.g. increased moisture in ground and road pavements. This could also potentially lead to more frequent asset failures. An understanding of the expected impacts of future climate change by the Shire could enable considerable cost savings in the long term.

The figure below summarises the annual rainfall change (mm) in Pinjarra from 2009-2020.



The figure below summarises the annual mean maximum and minimum temperatures from 2009-2020.



The Shire currently has the following processes in place to monitor the effects of climate change:

- Regular condition inspections of infrastructure
- Programmed maintenance activities
- Business Continuity Plan in place if natural disaster was to occur eg flood

## 4.2 Demand Impacts and Management Plan

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 include non-asset solutions, insuring against risks and managing failures.

Non-asset solutions focus on providing the required service without the need for the organisation to own the assets and management actions including reducing demand for the service, reducing the level of service (allowing some assets to deteriorate beyond current service levels) or educating customers to accept appropriate asset failures. Examples of non-asset solutions include providing services from existing infrastructure such as aquatic centres and libraries that may be in another community area or public toilets provided in commercial premises.

The objective of demand management is to actively seek to modify customer demands for services in order to:

- Optimise the utilisation / performance of existing assets
- Reduce or defer the need for new assets
- Meet the organisations strategic objectives
- Deliver a more sustainable service
- Respond to customer needs

It is vital to the success of the Infrastructure Asset Management Plan that demand factors be analysed comprehensively, and their impact quantified in terms of the following:

- The effect of the growth of the asset network;
- Any possible future need to increase or decrease infrastructure; and
- The implementation of non-asset solutions, such as managing demand.



In addition to the factors mentioned above, risk affects demand for services and consequently the following must be taken into account.

- The methodology and accuracy of forecasts;
- The currency of forecasts;
- The uncertainty of forecasts; and
- Any unforeseen natural factors

The forecasts for the Shire of Murray indicate significant population growth in the area. This growth trend is expected to cause an increase in the asset base due to the creation of new assets, as a result of increased demand.

Opportunities identified to date for demand management are shown in the table below. Further opportunities will be developed in future revisions of this asset management plan.

## 4.3 Demand Management Strategy

Demand management strategies provide alternatives to the creation of new assets through modifying customer demands. A key long term strategy is to manage demand so that there are funds in place for the renewal, operation and maintenance of future services. Demand management practices include non-asset solutions, insuring against risks and managing failures. The key long term strategy is to manage the demand so that services can still be provided into the future at a reasonable cost to the community. These strategies include:

Demand Driver	Impact on Services	Demand Management Plan
New Subdivision Activity	Increase in vested assets from subdivision developments	Maintain detailed records and undertake an inspection of assets prior to hand over.
Political	Changes in government policy or service allocation could result in more pressure on municipal revenue	Continue to fund high priority projects. Investigate new & cost-efficiency technologies and seek external funding.
Economic	Increased demand for new infrastructure and greater wear on existing infrastructure as the population expands. This will likely lead to higher costs to the Shire as asset lives will be reduced.	Monitor through regular condition assessments, customer works requests analysis and community consultation
Social	Demand for more walkway, park and recreation facilities	Identify needs and incorporate in an Open Space Strategy
Demographic Change	Appropriate facilities and infrastructure will need to be constructed (or upgraded) to cater for the age demographic. An ageing population will mean a greater need for aged care facilities and disability access. Increase in age of population will also require improvements to public transport infrastructure and	Monitor through Forecast ID statistics and other sources that are available

	services.	
Changes in Technology	New technology may allow for cost savings and protect the environment	These technical factors need to be assessed in determining the scoping requirements for capital and maintenance works
Legislation	Improvement required to current process and practices	Regularly update process and practices to ensure they are aligned with current legislation
Tourism Growth	Increased need for the construction of public car parks, traffic calming devices / signage, public amenities such as toilets etc.	Monitor through Forecast ID statistics and other sources that are available
Climate Change	Likely to result in more maintenance works being required to maintain standard of assets requiring level of service review.	Monitor through regular condition assessments, customer works requests analysis
Increased construction costs	Cost increases are anticipated to continue, and will likely be at a higher rate than CPI. Cost of renewing infrastructure assets is increasing	Continue to fund high priority projects. Investigate new & cost-effective technologies, seek external funding and investigate alternative ways that the construction can be delivered within the funding limitations.

Demand drivers that will have an impact on each asset class are summarised in each of the Appendices, with management strategies in place to manage these drivers/impacts

The Shire of Murray will need to carefully analyse and establish alternatives to the use of assets in some circumstances where the relative demand cannot justify the replacement of some infrastructure for what they were originally intended. In addition, removal of some infrastructure from the Shire's asset register may need to be undertaken where it can be demonstrated that assets would be better managed and controlled by others, or the demand level is so low that allocation of funds toward infrastructure cannot be justified.

## 5. Risk Management

The Shire of Murray has acknowledged that Risk Management is an integral part of its organisation. The Risk Management Policy is a statement of commitment to ensure that the interests of the community, its employees and contractors are protected by minimising loss arising from Shire activities and services.



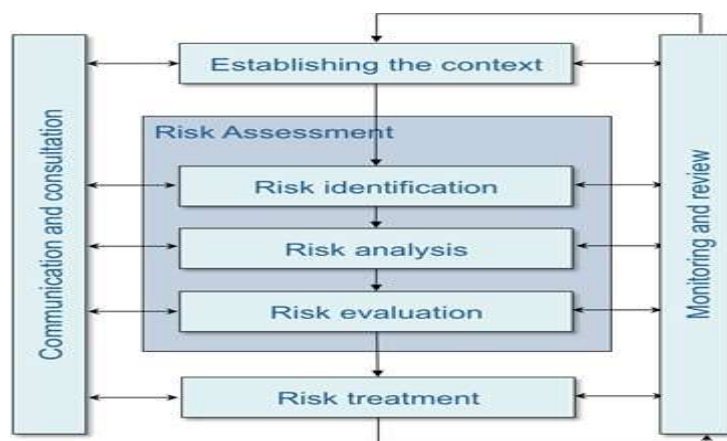
The Risk Management Policy is supported by a Risk Management Strategy, which sets the risk management direction for all projects, strategic and operational areas within the Shire. The management of risk is crucial to achieving the objectives in the Shire's Strategic Community Plan and an integral part of good management practice.

The primary objectives of risk management in Local Government are to:

- Ensure that environmental, social and financial costs are considered as part of decision making processes. As a result, the Shire's assets - people, financial, property and reputation are safeguarded.
- Create an environment that enables the Shire to deliver services and meet performance objectives in a timely, efficient, cost effective manner.
- Formally assign ownership of risks and controls within each area of the Shire of Murray, ensuring management and staff take ownership of, and manage risks within their respective areas.
- Demonstrate transparent and responsible risk management processes, which align with best practice.

## 5.1 Risk Management Process

The process outlined in the International Standard ISO 31000:2018 as illustrated in the below, is utilised in order for the Shire to achieve the objectives of risk management.



## 5.2 Risk Management Framework

The Shire of Murray has developed an organisational wide approach to risk management. This risk management framework consists of a risk management policy, a risk management strategy supported by a corporate risk register. The framework is designed to ensure that:

- All significant operational and organisational risks are understood and identified.
- The highest risks are identified and addressed.
- Risk reduction treatments are implemented which best meet business needs.
- Responsibilities for implementing, evaluating and managing risks are allocated to specific staff and reporting regimes adopted.

## 5.3 Risk Assessment

The key risk management criteria relating to Shire assets include:

- Public health and safety
- Environmental and legal compliance
- Image reputation, political and public relations
- Financial risk – escalating costs in deterioration
- Damage through flooding or fire
- Natural hazard

### Step 1: Risk Identification

As part of its operational procedures, the Shire undertakes a review of potential risks. Any risks identified are assessed to determine their potential impacts. The current and required controls are documented in the Corporate Risk Register.

The Shire of Murray Risk Categories are outlined in the table below:

Category	Possible Risk Areas
Financial	<ul style="list-style-type: none"><li>• Tasks going over budget</li><li>• Legal costs/fines</li><li>• Insurance claims</li><li>• Overpayments</li><li>• Inappropriate use of resources</li></ul>
Environmental	<ul style="list-style-type: none"><li>• Regulatory compliance</li><li>• Contamination</li><li>• Inadequate environmental practices in processes and procedures</li></ul>
Operational	<ul style="list-style-type: none"><li>• Adverse effects on core business</li><li>• Business continuity</li><li>• Human resources risks</li><li>• Loss of knowledge</li></ul>
Reputational	<ul style="list-style-type: none"><li>• Public and internal staff perception</li><li>• Poor customer service</li><li>• Substandard works</li><li>• Corruption</li><li>• Misuse of confidential information</li></ul>
Health	<ul style="list-style-type: none"><li>• Exposure to health risks</li><li>• Injuries (both physical or mental) or adverse health effects to the public or staff within Council buildings or on Council property</li><li>• Injuries or adverse health effects to staff</li></ul>
Project	<ul style="list-style-type: none"><li>• Delays to the start or completion</li><li>• Variations to scope</li><li>• Variations to budget</li><li>• Insufficient resources</li></ul>

## Step 2: Risk Analysis and Evaluation

Risk analysis and evaluation follows the principles as set out by the international standards on risk management. The analysis considers both the likelihood and consequence of events and other risks. The below table shows the Shire's adopted consequence table with descriptions of the different level of impact that could result. The officer undertaking a risk assessment would select the most relevant consequence level.

## Consequence Rating Scale

Level	Description	Financial Impact	Health (physical and psychological)	Reputation	Operation	Environment	Project
1	Insignificant	Less than \$10 000	Near miss / negligible injuries or health effect	Low impact, low profile, minor complaint.	Little impact – objectives still achieved with minimum extra cost or inconvenience	Contained, little and reversible impact managed by on site personnel	Insignificant impact on the project. It is not possible to measure the impact on the project as it is minimal
2	Minor	\$10 000 to \$50 000	Minor injury or health effect / First aid treatment	Heightened concern by community, several complaints.	Inconvenient delays – partial achievement of objectives with some compensating action taken	Contained, minor damage or contamination that is reversible and managed by on site personnel	<5% deviation in scope, scheduled end-date or project budget requiring Managers approval
3	Moderate	\$50 000 to \$250 000	Moderate injury or health effect / Medical treatment	Low level local news profile.	Significant delays to major deliverables – additional costs required and or time delays to achieve objectives. Adverse impacts on KPI's and targets.	Contained, significant contamination and damage that is reversible, managed by on site personnel	5-10% deviation in scope, scheduled end-date or project budget requiring Senior Management approval
4	Major	\$250 000 to 1 million	Serious health effect, death or extensive injuries	Major coverage in local media, low profile in state media.	Unable to achieve corporate objectives or statutory obligations resulting in significant visible impact on service provision such as closure of facilities	Uncontained, significant contamination and damage that is reversible but requires third party assistance, minor breach of legislation	10-25% deviation in scope, scheduled end-date or project budget requiring restructure of project and Senior Management or Council approval
5	Catastrophic	More than 1 million	Multiple deaths or severe permanent disablements	High state or national news profile.	Organisation unable to function.	Extensive contamination and damage that is irreversible, major breach of legislation	>25% deviation in scope, scheduled end-date or project budget requiring the project to be deferred or redeveloped.

The next process is to estimate the likelihood of a risk actually occurring. The table below shows the Shire of Murray's adopted level of likelihood.

### Likelihood Rating Scale

Level	Description	Probability
5	Almost Certain	Expected to occur in most circumstances Eg More than once per year or greater than 90% chance
4	Likely	Will probably occur in most circumstances Eg At least once per year or between 60% and 90%
3	Possible	Should occur at some time Eg At least once in three years or between 30% and 60%
2	Unlikely	Could occur at some time Eg At least once in ten years or between 5 and 30%
1	Rare	May occur, only in exceptional circumstances Eg Less than once in fifteen years or less and 5%.

With the consequence and likelihood levels chosen, the risk is then assigned a risk rating and actions taken as required.

### Risk Level

			Consequence				
			Insignificant	Minor	Moderate	Major	Catastrophic
			1	2	3	4	5
Likelihood	Almost Certain	5	M(5)	H(10)	H(15)	E(20)	E(25)
	Likely	4	M(4)	M(8)	H(12)	H(16)	E(20)
	Possible	3	L(3)	M(6)	M(9)	H(12)	H(15)
	Unlikely	2	L(2)	M(4)	M(6)	M(8)	H(10)
	Rare	1	L(1)	L(2)	L(3)	M(4)	M(5)

<b>L</b> Low	<b>M</b> Moderate	<b>H</b> High	<b>E</b> Extreme
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## Risk Evaluation

Once the level of risk has been determined, the risk is evaluated and a decision made as to where the risk fits against the organisation's overall risk criteria. The Shire's Risk Acceptance Criteria table is shown below. This gives guidance as to the action to be taken, acceptability of the risk, the review frequency, and who the Risk Owner needs to be.

Risk Rating	Descriptor	Action Required	Criteria for Risk Acceptance	Review Frequency		Risk Owner	
				Strategic/ Operational	Project Risks	Strategic/ Operational	Project Risks
<b>Low</b>	Acceptable	Accept the risk	Risk acceptable with adequate controls	Annual	If the scope / context changes	Operational Manager	Project Manager
<b>Moderate</b>	Monitor	Monitor the risk but consider Risk Treatments	Risk acceptable with adequate controls	Semi-annual	If the scope / context changes	Operational Manager	Project Manager
<b>High</b>	Treat	Treat the risk. Reduce either the likelihood, consequence or both by improving existing controls or adding new controls	Risk acceptable with excellent controls	Quarterly	Monthly	Executive Management	Steering Committee where relevant or Project Director
<b>Extreme</b>	Treat	Treat the risk. Reduce either the likelihood, consequence or both by improving existing controls or adding new controls	Risk only acceptable with excellent controls and all treatment plans to be explored and implemented where possible	Monthly	Monthly	CEO	Steering Committee where relevant or Project Director

### 5.3.1 Critical Assets

Critical assets are those assets which have a high consequence of failure but are not necessarily a high likelihood of failure. By identifying critical assets and critical failure modes, the Shire can target and investigative activities, maintenance plans and capital expenditure plans at the appropriate time.

The definition of a critical asset is “an asset having potential to impact on the achievement of an organisation’s objectives”. Critical Assets are also essential for supporting the business and social needs of both the local and national economy, and have a high consequence in the event they fail. Assets can be safety-critical, environment-critical or performance-critical, and can relate to legal, regulatory or statutory requirements. Critical assets can refer to those assets necessary to provide services to the community. Asset systems can be distinguished as being ‘critical’ in a similar manner to individual assets. The critical assets for each asset class are identified in each of the Appendices.

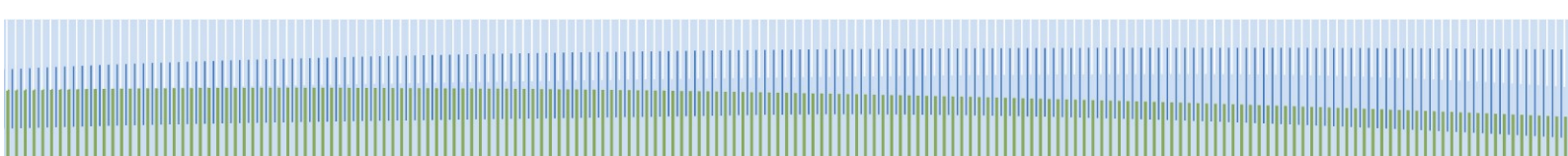
## 6. Lifecycle Management Plan

The lifecycle management plan details how the organisation plans to manage and operate its infrastructure assets at the agreed levels of service (defined in Section 3) while optimising life cycle costs.

The Life Cycle Management Plan details how Council plans to manage and operate assets at an agreed level of service whilst minimising lifecycle costs and exposure to risk and loss. These assets are operated and maintained throughout their useful life, and their performance and condition are monitored to ensure they deliver the necessary service. Over the life of the asset, there will come a point where the asset is no longer performing at a satisfactory level and may be rehabilitated or improved. This can be repeated several times, however, eventually the asset will be disposed of and potentially replaced.

Life Cycle Analysis is to ensure sustainability of assets. Sustainability can be achieved by ensuring adequate investment in both short term maintenance needs and long term replacements, renewals, upgrades and new works to continuously meet the needs of asset users in terms of the level of service they expect from these assets.

The recurrent costs of operations and maintenance, the capital expenditure for rehabilitation, and the one-off cost of replacement all form part of the asset’s lifecycle costs. This section identifies and describes the four key phases of the asset management life cycle of local government assets, namely: acquisition, operation and maintenance, renewal and disposal.







The Shire of Murray has implemented a Corporate Asset Management System (AssetMaster) to record and manage its network. The software was developed by Open Office and is a Corporate Asset Repository and Asset Management System for all local government asset classes, including condition management based on the National Framework, long term planning based on International Infrastructure Management Manual (IIMM), asset accounting based in AAS116, in-built reporting for government reporting, strategic maintenance planning and lifecycle costing.

## 6.1 Asset Condition

Infrastructure assets have a vast range of factors that influence their usability. From an asset management perspective, the various factors fall into one of the following groups:

- Fitness for Use
- Fitness for Purpose

Fitness for Use is a measure of an assets physical condition relative to its condition when first constructed or refurbished. This measurement takes account of the current condition of the structure, finishes and services supporting the assets use by the occupants. Fitness for Use has been the basis of the assets condition audit undertaken.

Condition is measured using a 1 – 10 grading system as detailed in the below table.



## Condition Grading Model:

Condition Rating	Condition Description
1	A new asset or an asset rehabilitated to new condition.
2	An asset in excellent overall condition. There would be only very slight decline but it would be obvious that the asset was no longer in new condition.
3	An asset in very good overall condition but with some early stages of deterioration evident. The deterioration is minor in nature and causing no serviceability problems.
4	An asset in good overall condition but with some obvious deterioration evident. Serviceability would be impaired very slightly.
5	An asset in fair overall condition. Deterioration in condition would be obvious and there would be some serviceability loss.
6	An asset in fair to poor overall condition. The condition deterioration would be quite obvious. Asset serviceability would now be affected and maintenance cost would be rising.
7	An asset in poor overall condition. Deterioration would be quite severe and would be starting to limit the serviceability of the asset. Maintenance cost would be high.
8	An asset in very poor overall condition with serviceability now heavily impacted by the poor condition. Maintenance cost would be very high and the asset would need to be rehabilitated.
9	An asset in extremely poor condition with severe serviceability problems and needing rehabilitation immediately. Could also be a risk to remain in service.
10	An asset that has failed, is no longer serviceable, and should not remain in service. There would be an extreme risk in leaving the asset in service.

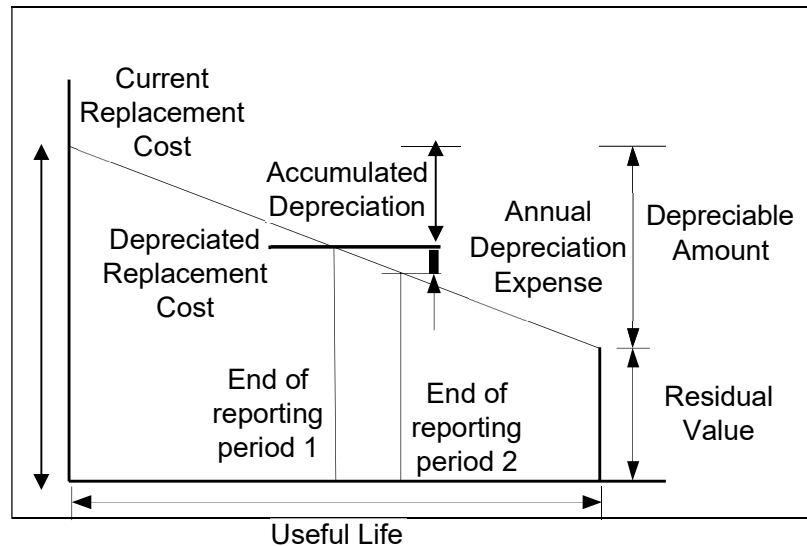
A Condition Assessment Manual has been developed for each asset class to ensure that there is consistency in the gradings.

## 6.2 Intervention Levels

Intervention levels support the service levels provided to the community as they define the trigger points for certain works to be carried out. They are also very useful in the development of ongoing maintenance programs. Having defined intervention levels also assists the Shire in being able to organise maintenance works on a risk priority basis, rather than be susceptible to carrying out works on a chronological basis, or as a result of pressure from individuals within the community. Intervention levels assist in providing a sound legal argument as to why certain works were, or were not carried out.

## 6.3 Asset Valuations

The Shire's Corporate Asset Management System values its infrastructure assets based on the current condition of each asset/component and in reference to a standard set of uniform unit rates of construction in respect of the work required to return the asset to new condition.



## 6.4 Useful Life

Useful life is used to determine the current value of the asset. Lifecycles have previously been based on the IPWEA's "International Infrastructure Management Manual" (2015) and the Moloney Asset Management Systems Renewal Gap Model. Useful lives are now verified through the collecting of evidence based useful data with an analysis undertaken based on age and condition and local environmental factors. This data is collated and enhanced each year to gain a better understanding on how assets are performing.

To validate the estimated useful life of assets, a sample of assets are selected to represent the asset portfolio. The age of each component is used to determine what length of time the component takes to move from condition 1 to condition 10. This assessment is based on the assumption that deterioration rates remain approximately equal throughout the life of the asset. The assessment sample will be extended and deterioration rates analysed further in future revisions of this plan. The results of the initial assessment are summarised in each of the Appendices.

## 6.5 Operations and Maintenance

### 6.5.1 Operations Activities

Operations activities affect service levels including quality and function through activities such as street sweeping and grass mowing frequency, intensity and spacing of street lights and cleaning frequency and opening hours of buildings and other facilities. Operations activities keep the asset utilised but have no effect on condition.

### 6.5.2 Maintenance Activities

Maintenance includes all actions necessary for retaining an asset as near as practicable to an appropriate service level including regular ongoing day-to-day work necessary to keep assets operating, e.g. road patching but excluding rehabilitation or renewal. Maintenance may be classified into reactive, planned and specific maintenance work activities.

Reactive maintenance is unplanned repair work carried out in response to service requests and management/supervisory directions. This is governed by the urgency of what is required.

Proactive (planned) maintenance is repair work that is identified and managed through a maintenance management system (MMS). MMS activities include inspection, assessing the condition against failure/breakdown experience, prioritising, scheduling, actioning the work and reporting what was done to develop a maintenance history and improve maintenance and service delivery performance. These are generally more extensive repairs that are undertaken as part of a program of works to either prevent the breakdown of elements or components of a property or to bring those elements up to an acceptable condition. The extent of this program largely depends on funding allocations.

Specific maintenance is replacement of higher value components/sub-components of assets that is undertaken on a regular cycle including repainting, replacing air conditioning units, etc. This work falls below the capital/maintenance threshold but may require a specific budget allocation.

Backlog maintenance activities refers to an accumulation of uncorrected or deferred deficiencies in an asset. This is governed by available funding and any future plans for a particular asset.

Maintenance expenditure levels are considered to be adequate to meet projected service levels, which may be less than or equal to current service levels. Where maintenance expenditure levels are such that will result in a lesser level of service, the service consequences and service risks have been identified and service consequences highlighted in this AM Plan and service risks considered in the Infrastructure Risk Management Plan.

### 6.5.3 Temporary Measures / Emergency Works

Where a potential risk is identified as a result of a customer request, officer report or maintenance report, an inspection will be carried out and temporary works effected or erection of appropriate barriers will be undertaken until such time as maintenance works can be completed.

Emergency works are works required to be undertaken immediately, outside routine maintenance and works programs, to ensure the safety of asset users and the public as a result of emergency incidents. Emergency works may include response to fires, flooding, storms and spillages. In the event of emergency works, these works shall take precedence over other maintenance and inspection regimes

### 6.5.4 Inspections

Inspections are a critical component of the asset management process and are undertaken to assess the overall condition of each individual asset and identify any defects that have the potential to create a risk or inconvenience to the public. The target inspection regimes for each asset class is outlined in each of the Appendices and the frequency and nature of the inspections are based on the hierarchy. In determining the frequency of programmed inspections, the Shire has taken into account the functional hierarchy classification of the asset and its construction type.

Personnel undertaking the inspections have been trained in house to undertake the activity and are conversant with the organisations inspection procedures and safety requirements. A three-tier inspection regime has been implemented covering safety, incidents, defects and condition.

**Responsive Inspections** – identify defects outside the tolerable level and likely to create danger or serious inconvenience to users of the asset or the wider community. They are ad hoc by nature and are undertaken following notification to the Shire by members of the community through Works Requests or by Shire employees while undertaking their normal work duties. These notifications are of defects and safety deficiencies. The inspection is conducted by an appropriate Shire officer.

**Programmed Inspections** – determine if the asset complies with the levels of service in terms of being within tolerable level of defects as specified in the Asset Management Plan. These inspections are carried out on a regular basis by a shire officer with the necessary skills to assess defects.

**Condition Inspections** - identify deficiencies in the structural integrity of the assets which if untreated, are likely to adversely affect asset values. The deficiencies may impact short-term serviceability as well as the ability of the component to continue to perform for the duration of its intended life span. The condition inspections are undertaken in accordance with a Condition Assessment Manual for each asset class.

Council has developed a systematic inspection process, including unscheduled inspections in response to community advice. The inspections will identify defects and key maintenance items. The maintenance items identified will be assessed, prioritised and added to maintenance works programs, to ensure that the highest risk maintenance items are attended to in order of priority.

In addition to the formal inspection regime listed, Council's field staff and the community report any risk or maintenance issues observed as they move around the municipality, using works requests.

#### 6.5.5 Operations and Maintenance Strategies

The organisation will operate and maintain assets to provide the defined level of service to approved budgets in the most cost-efficient manner. The operation and maintenance activities include:

- Scheduling operations activities to deliver the defined level of service in the most efficient manner,
- Undertaking maintenance activities through a planned maintenance system to reduce maintenance costs and improve maintenance outcomes. Undertake cost-benefit analysis to determine the most cost-effective split between planned and unplanned maintenance activities (50 – 70% planned desirable as measured by cost),
- Maintain a current infrastructure risk register for assets and present service risks associated with providing services from infrastructure assets and reporting high and extreme and residual risks after treatment to management and Council,
- Review current and required skills base and implement workforce training and development to meet required operations and maintenance needs,
- Review asset utilisation to identify underutilised assets and appropriate remedies, and over utilised assets and customer demand management options,
- Maintain a current hierarchy of critical assets and required operations and maintenance activities,
- Develop and regularly review appropriate emergency response capability,
- Review management of operations and maintenance activities to ensure Council is obtaining best value for resources used.

## 6.6 Renewals and Replacements

Renewal and replacement expenditure is work which does not increase the asset's design capacity but restores, rehabilitates, replaces or renews an existing asset to its original or lesser required service potential. Work over and above restoring an asset to original service potential is upgrade/expansion or new works expenditure.

Assets requiring renewal are identified from estimates of remaining life and condition data obtained from the Corporate Asset Management System. The assets are then inspected to verify accuracy of the remaining life estimate and to develop a preliminary renewal estimate. Verified proposals are ranked by priority and are scheduled in future works programs.

### 6.6.1 Renewal Strategy and Plan

Assets requiring renewal are identified from analysis of the asset condition and estimates of remaining life. Renewal will be undertaken using low cost renewal methods where practical. The aim of low cost renewals is to restore the service potential or future economic benefits of the asset by renewing the assets at a cost less than replacement cost.

A financial modelling analysis has been undertaken based on condition assessments of assets. The ranking criteria used to determine priority of identified renewal proposals is based on hierarchy and condition data.

Actual past renewal expenditure for each class of infrastructure is summarised in each of the Appendices.

### 6.6.2 Renewal and Replacement Strategies

The organisation will plan capital renewal and replacement projects to meet level of service objectives and minimise infrastructure service risks by:

- Planning and scheduling renewal projects to deliver the defined level of service in the most efficient manner,
- Undertaking project scoping for all capital renewal and replacement projects to identify:
  - the service delivery 'deficiency', present risk and optimum time for renewal/ replacement,
  - the project objectives to rectify the deficiency,
  - the range of options, estimated capital and life cycle costs for each option that could address the service deficiency,
  - and evaluate the options against evaluation criteria adopted by the organisation, and
  - select the best option to be included in capital renewal programs,
- Using 'low cost' renewal methods (cost of renewal is less than replacement) wherever possible,
- Maintain a current infrastructure risk register for assets and service risks associated with providing services from infrastructure assets and reporting high and extreme risks and residual risks after treatment to management and Council,
- Review current and required skills base and implement workforce training and development to meet required construction and renewal needs,
- Maintain a current hierarchy of critical assets and capital renewal treatments and timings required,
- Review management of capital renewal and replacement activities to ensure Council is obtaining best value for resources used.

### 6.6.3 Predicted 10 Year Renewal Funding Requirements

Projected future renewal and replacement expenditures are forecast to increase over time as the asset stock increases from growth. This is detailed in the respective asset class appendix for LTFP funding requirements.

### 6.6.4 10 Year Long Term Financial Plan Budget Allocation

The LTFP funding allocation for each asset class is detailed in each of the respective Appendices.



## 6.7 New/Upgrade/Disposal

### 6.7.1 New

New works are those that create, expand or upgrade assets to cater for growth or additional levels of service. New works create an asset that did not exist or extend an asset beyond its original size or capacity. Typical new works activities include:

- Works which create an asset that did not exist such as in a new land development
- Works which improves an asset beyond its original size or capacity
- Works which increase the service of an asset such as the sealing of an unsealed road

The strategy for the Shire acquiring new assets or undertaking significant refurbishment is to firstly complete a project submission which will address issues such as:

- relevance to corporate goals
- alignment to core business
- community need
- anticipated benefits
- environmental impacts
- risk identification and treatment
- total life cycle costs
- impact on existing services / infrastructure
- analysis as to whether service can be delivered without asset acquisition
- forecasted usage rates
- value for money

### 6.7.2 Upgrade

Upgrade refers to works which improve an existing asset beyond its current capacity. This may result from growth, social or environmental needs. Upgrade/expansion of infrastructure will contribute to the overall infrastructure inventory and will require ongoing maintenance and renewal. Recognition of the impact that this activity has on the future sustainability of infrastructure should be considered for all projects. As such, any potential upgrades should undergo a whole of life analysis to ensure the overall viability of the project.

### 6.7.3 Disposal

Disposal of an asset refers to its decommissioning, whether by sale, demolition, decommission or relocation. A key component of an asset management plan is the identification and disposal of surplus assets. This involves assessment of strategic goals and the recognition that some assets may be under-performing or surplus to operating requirements. Some disposals will attract no costs as they will either be transferred to a user group or the costs of demolition will be covered by the value of the materials.

A disposal strategy for the Shire of Murray's assets has been developed and is based around the following principles:

1. If the Shire has a particular asset that is not aligned to its core services then that asset should be considered for disposal or opportunities to transfer the responsibility to a relevant entity should be investigated.
2. The Shire will look for opportunities to appropriately dispose of assets that are surplus to current and anticipated future requirements. The use of facilities in each township should be optimised to provide ratepayers with a value for money service. Any underutilised asset identified as being surplus will be disposed of by consulting the relevant parties and investigating options to consolidate and co-locate services and/or user groups.
3. Assets that are underperforming or are unsafe will be demolished and not replaced if there is no demonstrated ongoing need.

The Assets identified for disposal are covered in each of the Appendices.

### **Asset Disposal Process**

Surplus asset disposal is a three step process whereby the asset is evaluated from a strategic perspective, the disposal process is implemented where required, and the disposal process is reviewed. The emphasis is on ensuring that under-performing and non-essential assets are identified and disposed.

### **Asset Evaluation**

The disposal process begins with identifying surplus assets. The Shire should conduct regular strategic evaluations of its asset needs. During this process, assets are evaluated against the asset disposal principles outlined above. Where it is identified that an asset does not meet these criteria, it is to be identified as surplus and disposed. The evaluation process will also take into account public interest considerations. Examples of public interest considerations would be:

- where an asset has some form of significance to the community and there could be expected to be significant public resistance to disposal or transfer of ownership of the asset;
- where an asset has strategic significance for future infrastructure development. In such instances, a clear and demonstrated future planning requirement is needed to support continued ownership. Speculation on future usage does not constitute a clear and demonstrated future requirement;
- where there are significant heritage, environmental or public usage requirements that require ongoing local government ownership and management.

The overall financial performance of the asset should also be evaluated. Where it is identified that the financial performance of an asset does not meet targets established, it should be identified as under-performing and considered for disposal.

### **Implementation of Disposal**

The method of disposal will be assessed against the principle of achieving the maximum benefit to the community through the disposal, including social, financial, economic and strategic factors.

In circumstances where a transfer to a user group is proposed, consideration will be given to the group's requirement for the property, linkages to strategic objectives and core business.

### **Review of Disposal Process**

Following the disposal process, the Shire should review outcomes and identify ways to improve performance for future processes. This would include, at appropriate times, a review of internal processes and structures that deal with asset disposal.

Asset disposal performance can be monitored through the development of appropriate measures, such as:

- average time for disposal process; and / or
- impact of disposal on organisation's finances.



## 7. Financial Projections

Financial forecast models assist in predicting the future financial requirements based upon the presumption that infrastructure assets will be replaced when the condition ratings reach a predetermined intervention level. Each Appendix contains the financial requirements for the asset class.

The financial summary will be reviewed annually and continue to be refined as planning studies, strategies and increased financial analysis are completed.

The financial modelling carried out is based on the life of the asset and the current annual expenditure for asset renewal. The forecast makes no allowance for renewal expenditure required in the future on any new assets that are added to the network. Forecasts are based on current construction cost and will be influenced by cost increases in materials and labour.

### 7.1. Asset Ratios

Various ratios of asset consumption and expenditure have been prepared to help guide and gauge asset management performance and trends over time.

The Shire is committed to monitoring progress towards achievement of the Strategic Community Plan “Murray 2030”. Ratios of asset consumption, renewal and sustainability have been prepared to help guide and gauge asset management performance and trends over time and are based on Roads, Buildings, Footpaths, Drainage and Parks and Other Infrastructure.

Indicator	2019	2018	2017	2016	2015	DLG Standard
<b>Asset Consumption Ratio –</b>  The ratio highlights the aged condition of the Shire's stock of physical assets.	73%	78%	77%	76%	74%	50% or >
<b>Asset Renewal Funding Ratio –</b>  This indicates whether the Shire has the financial capacity to fund asset renewal as required and can continue to provide existing levels of services in future, without additional operating income, reductions in operating expenses; or an increase in net financial liabilities above that currently projected.	67%	82%	82%	101%	24%	75% to 95%
<b>Asset Sustainability Ratio –</b>  This measures the extent to which assets managed by the Shire are being replaced as they reach the end of their useful lives.	72%	75%	112%	100%	18%	90%

To provide services in a financially sustainable manner, as a minimum, the Shire will need to ensure that it is renewing assets at the rate they are being consumed over the medium-long term, and funding the life cycle costs for all new assets and services within its long term financial plan.

## 7.2. 10 Year Forecasts

A 10 year financial forecast has been developed for all asset classes to predict performance of the Shire's infrastructure. The model is based on the asset condition data and shows the funding required to achieve the desired level of service. Renewal projections are based on the default assumptions that all existing infrastructure is to be renewed when a particular condition intervention is reached, and that they will be renewed using components that are substantially the same as those existing.

### 7.2.1. Key Assumptions made in Financial Forecasts

Key assumptions are made in presenting the information contained in this Asset Management Plan and in preparing forecasts of projected operating and capital expenditure and asset values and depreciation expense estimates. It is presented to gain an understanding of the levels of confidence in the data behind the financial forecasts. The most significant potential changes to the financial projections shown will result from the factors below:

- Assumptions have been made as to the average useful lives of assets based on current local knowledge, evidence based useful life analysis, experience and historical trends. These will be continuously reviewed and the accuracy improved based on real time assessments of asset deterioration.
- Changes in levels of service from those identified in this asset management plan.
- Significant fluctuation in the cost of construction / maintenance of assets
- Changes in level of asset deterioration due to natural factors such as storms as well as increases in use

## 7.3. Funding Options & Strategy

The Long Term Financial Plan (LTFP) is the 10 year financial planning document of the Shire that is governed by a series of financial strategies and accompanying performance indicators that the Council considers and adopts. The plan establishes the strategic financial direction for the Shire to meet the funding and investment challenges that are forecast for the next 10 years.

Each year the Shire will develop a Capital Works Budget for asset renewals, upgrades and new works and a recurrent budget allocation for maintenance & operations expenditure for its infrastructure.

It is intended that the expenditure will be in accordance with this Asset Management Plan, policies named within in, corporate goals, Shire Asset Management System, government legislation and regulations and the needs of the community within financial constraints.

Two modelling scenarios are run in relation to the relevant asset class based on an unlimited budget (like for like) and also using a proposed budget allocation within the Long Term Financial Plan over a 10 year planning period. Modelling scenario results are summarised in each of the Appendices.

## 7.4. Confidence Level

The confidence in the data used as a basis for the financial forecasts has been assessed using the following grading system:

### Confidence Level

Confidence Grade	General Meaning
<b>A</b>	<b>Highly Reliable:</b> Data based on sound records, procedure, investigations and analysis that is properly documented and recognised as the best method of assessment.
<b>B</b>	<b>Reliable:</b> Data based on sound records, procedures, investigations, and analysis which is properly documented but has minor shortcomings for example the data is old, some documentation is missing and reliance is placed on unconfirmed reports or some extrapolation.
<b>C</b>	<b>Uncertain:</b> Data based on records, procedures, investigations and analysis which is incomplete or unsupported, or extrapolation from a limited sample for which grade A or B data is available
<b>D</b>	<b>Very Uncertain:</b> Data based on unconfirmed verbal reports and/or cursory inspection and analysis

### Confidence Grade

The confidence level for this report is “B” overall

# 8. Practices, Performances, Monitoring and Improvement

## 8.1. Asset Management Practices

Asset management practices are the processes, analysis and evaluation techniques needed to support lifecycle asset management. This includes the following asset management functions.

- Knowledge of assets
- Levels of service
- Condition assessments
- Asset accounting - valuation, revaluation, depreciation
- Lifecycle planning
- Asset operations and maintenance
- Asset creation and disposal
- Performance monitoring
- Quality assurance and continuous improvement
- Risk management
- Design and project management
- Reviews and audit processes

Weaknesses in the current asset management processes have been identified by this document. The improvements identified and prioritised in each of the Appendices and the Asset Management Improvement Strategy, will improve the processes the Shire utilises to manage its assets, enabling greater accuracy in demand and financial forecasting.

### 8.1.1. Data Systems

The Shire of Murray's inventory data is primarily held in two different areas, the first being within the Corporate Asset Management System (AssetMaster) and the second within the Shire's Geographical Information System (GIS).

The Shire's financial system for Infrastructure is Dynamics NAV. The financial system is managed by the Shire's Finance Department within the Corporate Services Directorate. Financial reporting is prepared in accordance with the requirements of the Local Government Act 1995 and relevant Australian Accounting Standards.

The Shires asset financial prediction data is produced by software called myPredictor, which enables the Shire to optimise capital works programming.

Shire of Murray Data Systems:

Data	Current Practice	Desired Practice	Responsibility
Financial	Data stored in Dynamics NAV and AssetMaster	Desired practice now aligned with current practice. No improvement required.	Finance
Asset Hierarchy	Captured in Management Plan and Corporate Asset Management System	Desired practice now aligned with current practice. No improvement required.	Asset Management

Attribute Data	Captured in Corporate Asset management System and MapInfo Database	Desired practice now aligned with current practice. No improvement required.	Asset Management
Condition History	Captured in Corporate Asset Management System	Desired practice now aligned with current practice. No improvement required.	Asset Management
Financial modelling	Produced by myPredictor	Desired practice now aligned with current practice. No improvement required.	Asset Management

## 8.2. AM Improvement Program

This document has been based on the International Infrastructure Model with the objective of identifying and documenting the Shire's existing asset management processes, information systems, data and knowledge, and then determining any weaknesses in these. To improve Shire asset management practices, solutions to reduce the impact of these weaknesses have been developed. The improvement projects have been prioritised according to their urgency and importance, and their implementation will depend on resources allocated. Projects that have been identified as the most urgent and important for improving the management of Shire assets are summarised in each of the Appendices.

Asset management is a journey involving continuous monitoring and improvement. There are significant benefits including informed decision making, improved focus on core business, better financial planning, enhanced risk management and process improvements. The Shire of Murray has recognised the importance of asset management in improving organisational performance. Areas for improvement have been identified and documented in each of the Appendices.

## 8.3. Monitoring & Review Procedures

This Asset Management Plan has a life of twenty years but will be reviewed and updated by the Asset Management Working Group in line with the asset revaluation cycle (every 4 or 5 years depending on the asset type). This review will allow short and long term financial requirements to be updated to recognise any changes in service levels and/or the addition of new infrastructure to the Shire's portfolio.

### 8.3.1. Asset Management Working Group

The AMWG will drive the implementation of asset management across the entire organisation and ensure a team approach. Members will include representatives of all sections of the organisation that have a direct interest in asset management whether it is as an asset owner, maintainer or user. This will ensure each representative will have ownership of the outcomes of the working group.

This cross-functional multi discipline group provides a corporate and integrated approach to asset management problem solving, resource sharing, understanding of financial asset management philosophies and overall ownership of asset management plan outputs.

## 8.4. Performance Measures

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

- The degree to which the required cash flows identified in this asset management plan are incorporated into the Shire's Long Term Financial Plan and Strategic Community Plan;
- The degree to which 1-5 year detailed maintenance and capital programs, budgets, business plans and organisational structures take into account processes and principles outlined in the asset management plan;
- The performance of Council against the Levels of Service documented in each of the Appendices;
- Financial ratios documented within the Asset Management Plan / Long Term Financial Plan; and
- The Annual Report which is the prescribed reporting requirement that ensures that the short and long term service delivery levels being provided by a local government's asset portfolio are adequately reported back to the community.