STORMWATER DRAINAGE
ASSET MANAGEMENT PLAN

April 2025

City of
Wanneroo

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V1.75	September 2020	Stormwater Asset Management Plan created	JT	BC	Council
V2. 09	October 2021	Stormwater Asset Management Plan (AM Plan) revised, updated and reviewed	JT	BC	ELT
V3.09	December 2024	Updated document with latest legislation and City policies and strategies and surveys	RM	BC	BC
V4.02	January 2025	Updated contents of the AM Plan to latest Nams+ 2023 Template	RM	BC	ELT
V4.07	01 April 2025	2025 Review Final - Council Member Endorsed	RM	BC	Council Members

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1. EXECUTIVE SUMMARY

1.1 The Purpose of the Plan

Asset Management (AM) Plans details information about infrastructure assets with actions required to provide an agreed level of service and tactical requirements for the management of assets to deliver services to the community. They highlight the processes and systems used to manage the associated assets that services rely on and consider how current and future services to the community will be sustainably provided in the most cost-effective manner.

AM Plans developed in alignment with the City of Wanneroo's (the City's) AM Policy, AM Strategy and Strategic Community Plan (SCP) enables the City to improve its long term strategic management of infrastructure assets. They look into the current state of infrastructure assets and considers current and future requirements together with associated risks to inform the optimum lifecycle costs and management into the future. They aim to:

- determine an agreed level of service at a cost that is affordable to the community,
- determine the short, medium and long-term financial requirements for assets and to inform the City's Long Term Financial Plan (LTFP),
- document AM practises that ensure sustainable management of community assets and identify opportunities for improvement,
- ensure legislative and reporting requirements are met,
- support business cases and funding applications, and
- support community and organisational needs.

The AM Plans defines the services to be provided, how the services are provided and what funds are required over the 20 year planning period.

1.2 Asset Description

This Stormwater Drainage AM Plan (SDAMP) focuses on the City's approach to the management of its stormwater drainage assets and forms part of a suite of AM Plans for other asset categories namely, Transport Infrastructure, Buildings, Parks, Natural Areas and Coastal Infrastructure.

Stormwater Drainage assets contribute to the community through:
- collecting and conveying stormwater runoff from roads safely to receiving outlet locations ensuring safe road conditions during wet weather.

The stormwater drainage asset portfolio covered under this SDAMP has an estimated replacement cost of **$462.8 million** and includes:

- Drainage Pipes
- Drainage Pits
- Underground Infiltration Cells
- Gross Pollutant Traps
- Sumps and Retention Basins

The details of the stormwater drainage asset portfolio are summarised in the table below.

Stormwater Drainage asset portfolio (as at 30/06/2024)		
Asset Category	Quantity	Replacement Cost ($)
Pipes (length in km)	1,109	321,719,000
Pits (no.)	46,364	112,717,000
Underground Cells (square metres.)	9,040	5,052,000
Gross Pollutant Traps (no.)	243	17,161,000
Sump Fencing (length in metres)	45,500	6,137,000
Total Stormwater Drainage Assets		462,786,000

1.3   Levels of Service

Similar to the transport infrastructure, Technical Levels of Service governs much of the measures for stormwater drainage assets as well and are driven mainly by legislative and industry requirements. At this stage, intervention points and chosen treatment methods, are based upon:

- Available budget and resource allocations.
- Criticality of the asset and the level of risk exposure.
- Historical data on customer request and complaints.
- Frequency of maintenance requirements.
- General performance of the asset portfolio based on asset condition assessments.

The drainage associated with critical transport routes with a high traffic volumes and important connectors are identified and are treated with a higher level of service. Other critical areas are stormwater outlets at low lying areas with limited capacity and has the potential to flood adjacent land and property.

This plan, and future revisions, will inform the long-term financial planning to fund the future maintenance, renewal and upgrades necessary to meet the demand and levels of service.

1.4   Future Demand

The factors influencing future demand and the impacts they have on this category of assets include things such as population growth, regulations, changes in the design of transport systems, transportation preferences and expectations, technological changes and climate change.

These demands will be approached using a combination of managing existing assets, upgrading existing assets and providing new assets balancing priorities and funding to meet demand. Many of the new stormwater drainage assets have been constructed and 'gifted' to

the City through the land development process. This puts added pressures on the budget and resourcing requirements for the ongoing maintenance of these assets.

Ensuring these assets are constructed to a standard and quality that will last will be key to ensuring that the City is not unnecessary burdened with high maintenance and renewal costs associated with premature failure.

Other demand management practises include:

- Optimising assets - Efficiently using and maintaining existing assets to extend their lifespan and performance.
- Capacity Upgrades - Enhancing the capacity of current assets to meet increased demand.
- Non-Asset Solutions: Implementing policies or programs that reduce demand, such as promoting at source drainage solutions.

1.5   Lifecycle Management Plan

What does it Cost?

The forecast lifecycle costs necessary to provide the services covered by this AM Plan includes operation, maintenance, renewal and acquisition of assets. Although the AM Plan and LTFP may be prepared for a 20-years planning period, the accuracy of the predictions outside of the first 5 year would be less accurate.

Based on the City's current AM practise, the forecast lifecycle costs necessary to provide the services covered by this SDAMP are:

Lifecycle Activity & Costs	Financial Year (FY)				
	2026	**2027**	**2028**	**2029**	**2030**
Maintenance	$ 2.090M	$ 2.300M	$ 2.530M	$ 2.780M	$3.060M
Planned renewals	$ 0	$ 0	$ 0	$ 0	$ 0
Planned upgrades & acquisitions	$ 1.500M	$ 0.775M	$ 0.930M	$ 0.500M	$ 0.350M
Total	**$ 3.590M**	**$ 3.080M**	**$ 3.460M**	**$ 3.280M**	**$ 3.410M**

1.6   Financial Summary

What we will do

It is considered that, based on the current maintenance practises, the budget allocation and trends are adequate to meet the minimum service levels, which may be less than or equal to current service levels. Detailed maintenance budgeting will be evaluated in future revisions of this plan to determine more accurate operating and maintenance costs. This will be critical when more and more areas within the City develops.

Current Services and Costs

As at 30/06/2024, the City's stormwater drainage assets with a current replacement value of $462.8M, has a written down value of $362.8M and an expected annual depreciation rate of $4.48M.

Based on renewal model forecast, the renewal demand for stormwater drainage assets over the next ten (10) years is $ 902K. The majority of stormwater drainage assets have long useful lives and will little to no significant impact on the City in the short to medium term. The renewal demand forecast of $902K is attributed to the fencing and gates around stormwater drainage sumps. Any issue with these assets tend to be addressed through routine maintenance activities. Inspections on this predicted renewals will be validated on site and budgets allocated if deemed required.

The main upgrade requirement for the SDAMP is the need to rationalise stormwater drainage sumps in the older areas of the City. Investigation and assessment of the number of sumps required and potentially converting these sumps into useable spaces.

The City will continue to:

- inspect and maintain the stormwater drainage assets to ensure they are functional to service the requirements of the transport system.
- prioritise renewals, upgrades and expansions, and
- undertake regular asset condition assessments and review the useful lives and replacement costs of assets to validate the renewal modelling outputs that inform the LTFP.

What we cannot do

The funding allocation in the planned budget is considered sufficient to continue providing existing services at current levels for the planning period. There are currently no major issues identified with the SDAMP apart from:

- Investigation and feasibility assessment into rationalising the number of sumps required and potentially converting these sumps into useable spaces,
- Investigation and feasibility assessment into removing direct discharges into Lake Yellagonga, and
- Investigation and feasibility assessment into removing direct stormwater drainage ocean outfalls.

Managing the Risks

Our present budget levels are sufficient to continue to manage risks in the medium term. The main service consequences are:

- Response timeframes for undertaking maintenance activities will increase impacting on the associated road traffic safety and community health.

- Reduced maintenance frequency and repairs causing premature failure resulting in increased repair costs.
- Increase pollution impact on Lake Yellagonga should there be an environmental spillage around the drainage system that discharges into it.

The City will endeavour to manage these risks within available resourcing and funding.

1.7 Asset Management Planning Practices

The systems to manage assets include:

- Financial System: Oracle, and
- Asset System: QGIS and Assetic

Assets requiring renewal/replacement are identified from the remaining useful life in the asset register and are inspected to validate and confirm their condition. The Asset Register was used to forecast the renewal life cycle costs for the SDAMP. Future renewal modelling forecasts will be undertaken using Assetic's Predictor Module.

The figures presented in this AM Plan is based on data with a confidence rating of 'C' which is a medium level of confidence.

1.8 Monitoring and Improvement Program

The City's stormwater drainage assets are currently in good condition due to their long useful lives. There are no major capital renewal requirements from this category of assets in the short to medium term. There should not be any issues with the assets as long as inspections are carry out to ensure defects are detected early and repairs completed promptly. Defects in the underground pipe network have the potential to manifest into major collapse of the pipe system.

The next key steps resulting from this AM Plan to improve AM practices are:

- audit the asset register regularly to ensure accuracy of the information.
- document the methodology to be used in determining the asset condition assessment cycle is what, when and how it is done.
- Investigation and feasibility assessment into rationalising the number of sumps required and potentially converting these sumps into useable spaces,
- Investigation and feasibility assessment into removing direct discharges into Lake Yellagonga, and
- Investigation and feasibility assessment into removing direct stormwater drainage ocean outfalls.

2. INTRODUCTION

2.1 Background

Asset Management (AM) Plans support the AM Policy in alignment with the City of Wanneroo's (the City) AM framework which is detailed in the City's AM Strategy. AM Plans detail the levels of service and tactical requirements for the management of assets to deliver services to the community. These plans define the services to be provided, how they are provided and what funds are required over the 20-year planning period and linking these to the City's Long-Term Financial Plan (LTFP).

This Stormwater Drainage AM Plan (SDAMP) focuses on the City's approach to the management of its stormwater drainage infrastructure and forms part of a suite of AM Plans for other asset categories namely, Transport Infrastructure, Buildings, Parks, Natural Areas and Coastal Infrastructure. The SDAMP provides information on the state of stormwater drainage assets, processes and systems used to manage the associated assets that services rely on and consider how current and future services to the community will be safely and sustainably provided in the most cost-effective manner. In delivering the service, risks are identified and managed so that a balance is achieved between achieving the desired performance of the asset, against the cost of providing the service.

Information contained in this plan is current as of 30 June 2024. The assets covered under this SDAMP are shown below. The total replacement value of these asset is estimated at **$462.78M** and is made up of the assets listed in Table 1.

Table 1: Stormwater Drainage asset portfolio (as at 30/06/2024) used in AM Plan

Stormwater Drainage asset portfolio (as at 30/06/2024)		
Asset Category	**Quantity**	**Replacement Cost ($)**
Pipes (length in km)	1,109	321,719,000
Pits (no.)	46,364	112,717,000
Underground Cells (square metres.)	9,040	5,052,000
Gross Pollutant Traps (no.)	243	17,161,000
Sump Fencing (length in metres)	45,500	6,137,000
Total Stormwater Drainage Assets		**462,786,000**

The receiving stormwater drainage runoff infrastructure environment are not included above such as, roadside swales and table drains, detention basin, fenced sumps, and park swale areas. These are not valued as these do not depreciate and do not require major renewal considerations and requires in most instances only ongoing maintenance operational effort to maintain these structures.

The SDAMP has been developed in conjunction with other City planning documents. These include (refer to Section 9 for additional reference documents):

- AM Policy
- AM Strategy 2024-2030
- Strategic Community Plan (SCP) 2021-2031
- Corporate Business Plan (CBP) 2023/24–2026/27

2.2 Goals and Objectives of Asset Ownership

The goal of the SDAMP is to document the measures currently taken by the City, or which need to be improved upon to ensure stormwater drainage assets support the objectives of the the Transport Infrastructure AM Plan (TIAMP) by:

- collecting and conveying stormwater runoff from roads and transport systems safely to receiving outlet locations ensuring safe road conditions during wet weather.

The objectives of the AM Plan are:
- To document the defined levels of service and performance monitoring schedules,
- To manage the impact of growth and future demand through demand management and infrastructure investment,
- To take a lifecycle approach to developing cost-effective management strategies for the long-term that meet the defined levels of service,
- To determine appropriate AM practices to manage the provision of the services ensuring at a minimum legislative and reporting requirements are met,
- To identify, assess and appropriately control associated risks,
- To identify required and affordable forecast costs and link these to the City's LTFP, and
- To monitor performance and identify areas of improvements to ensure objectives are met with the aim to continually increase AM maturity.

2.3 Key Stakeholders

Table 2 shows the key stakeholders in the preparation and implementation of this AM Plan:

Table 2: Key Stakeholders in the AM Plan

Key Stakeholder	Role in AM Plan
Ratepayer Groups and residents	- Represent needs of community/shareholders - May include Stakeholder consultation - Allocate resources to meet planning objectives in providing services while managing risks, - Ensure service sustainable.
Elected Members	- Stewardship and AM leadership. Endorsement of AM Policy, AM Strategy, AM Plan. - Adoption of the key AM principles and the approval of Capital Works Budgets that support good AM principles.

Key Stakeholder	Role in AM Plan
Executive Leadership Team (ELT)	• Provide strategic direction and leadership for AM practices and decisions within the City. • Responsible for the development of AM Policy, AM Strategy and AM Plans.
Assets Maintenance	• Maintain the stormwater drainage network to a safe standard including the determination of technical levels of service, monitoring performance measures and condition assessments.
Traffic Services	• Ensure the transport network is designed with stormwater drainage runoff requirements in mind to ensure safety is maintained
Infrastructure Capital Works (ICW)	• Design and construct stormwater drainage assets to required standards. • Capital Works Program development and scheduling for Stormwater Drainage projects.
Asset Planning	• Long term planning and management of stormwater drainage assets, assets inventory, renewal demand modelling and long-term renewal budget analysis. Author and review of this AM Plan.
Corporate Strategy and Performance Directorate	• Long Term Strategic and Financial Planning incorporating AM principles. Financial reporting of asset performance.
Planning and Sustainability Directorate	• Plan for efficient transport networks and stormwater drainage systems for vehicular, bicycle and pedestrian movements. Improve transport options and connections in future land subdivision developments. • Review and approve engineering drawings and acceptance of stormwater drainage assets constructed as part of subdivisional developments
State Government Agencies (MRWA, WP and PTA)	• Main Roads Western Australia (MRWA) provides grants for the City to maintain and upgrade its road network including the supporting stormwater drainage systems
Federal Government (The Department of Infrastructure, Transport, Regional Development and Communications)	• Provides grants to support the maintenance of the nation's local road infrastructure through the Roads to Recovery Program which include any impact on stormwater drainage systems.

3. LEVELS OF SERVICE

The City has recently completed a Wanneroo Liveability Survey whereby the results of the survey have yet to be analysed to inform this AM Plan. These will be considered in future revisions of this plan. The levels of service and performance measures identified in the SDAMP have been based on past community engagement surveys, together with inputs and feedback from Resident Groups, Advisory Groups and Elected Members. Other factors that heavily influence the level of service determinations are:

- service risks, Industry best practice and consequences to meet legislative and safety requirements,
- the strategic objectives and requirements of the TIAMP,
- the availability of resources and financial constraints, and.
- customer expectations of the quality of service, balanced against the price they are willing and able to pay.

The levels of service defined in this section will be used to:

- Clarify the level of service that the community should expect.
- Identify works required to meet these levels of service.
- Enable Council and the community to discuss and assess the suitability, affordability and the quality of the existing service level and to determine the impact of increasing or decreasing this level in future.

A key objective of this AM Plan is to identify the current levels of service provided by the transport asset portfolio's AM Plan and where appropriate support the common objectives. The level of service currently in practice will be used:

- To inform customers of the level of service they can expect.
- To develop AM strategies to meet or continue to meet these levels of service.
- To measure the effectiveness of the City's AM practices and the performance of this plan.
- To identify the costs and benefits of the services offered.
- To enable the City and customers to discuss and assess the suitability, affordability and equitable of the existing service level and to determine the impact of increasing or decreasing this level in future.

3.1 Strategic and Corporate Goals

The SDAMP is aligned with the goals and priorities of the City's SCP as shown in Table 3:

Table 3: Alignment to Strategic Community Plan Goals

Goal	Priority	How Goal and Objectives are addressed in the AM Plan
5. A well-planned, safe and resilient City that is easy to travel around and provides a connection between people and places	5.1. Develop to meet current need and future growth 5.3. Manage and maintain assets	Provision of well designed stormwater drainage systems to support the TIAMP's objective of providing a safe and efficient transport network. Undertake a program for condition monitoring and inspection activities to assess asset performance. Continuously review and improvement of the quality of AM practices and updating this AM Plan. Providing a defined level of service, monitoring performance and implementing initiatives to improve efficiency and effectiveness.
	5.4 People can move around easily	Provision of effective stormwater drainage infrastructure to ensure road stormwater runoff is removed adequately to maintain a safe transport network during wet weather conditions.
6. A future focused City that advocates, engages and partners to progress the priorities of the community	6.2. Actively seek to engage 6.4. Understand our stakeholders and their needs	Internal communication across Directorates to ensure that assets, be that new or replacement are to a standard of compliance whilst also meeting the needs of the community. Conduct community and key stakeholder engagement during the planning and implementation of new, upgrade and renewal projects.
7. A well-governed and managed City that makes informed decisions, provides strong community leadership and valued customer focused services	7.1. Clear direction and decision making 7.2: Responsibly and ethically managed	Complete asset inspections and assessments to inform the development of new, upgrade and renewal coastal and marine projects within the City's LTFP. Effective management of assets through their lifecycle to ensure long-term, sustainable outcomes to provide for current and future communities. The development of AM Policy, AM Strategy and AM Plans to drive AM maturity to improve AM practises ensuring clear understanding of roles and accountabilities. Develop and apply AM principles to support the management and maintenance of infrastructure assets. Maintain an accurate asset database and the provision of asset performance data to enable informed decision making.

3.2 Legislative Requirements and Industry Standards

The City has to meet many legislative requirements, Standards, Regulations, Acts and City Local Laws that impact the way assets are managed. These include Federal and State legislation and City Policies and By-Laws. These are shown in the **Error! Reference source not found.**.

Table 4: Legislative Requirements and Industry Standards

Legislation	Requirement
Local Government Act 1995	Sets out role, purpose, responsibilities and legal powers of local governments including the requirement for the preparation of a long-term financial plan supported by AM plans for sustainable service delivery.
Road Traffic Act 1974	Maintain unhindered access to road reserves and associated transport infrastructure assets as part of stormwater drainage works..
Emergency Management Act 2005	Provide for functional response to community public emergencies.
Occupational, Safety and Health Act 1984 and Regulations	Sets out roles and responsibilities to secure health, safety and welfare of pedestrians and road users.
Environmental Protection Act 1986 and Regulations 2004 & Environmental Protection and Biodiversity Conservation Act 1999	Sets out legislative requirements associated with the clearing of native vegetation and the protection of species and habitat associated with any clearing. Minimise impact on the environment as a result of infrastructure works.
Australian Standards	Duty of care to ensure minimum established industry standards are met.
Aboriginal Heritage Act 1972 and Heritage Act of WA 1990	Minimise impact on heritage site as a result of infrastructure works.

3.3   Customer values

Service levels are defined in three (3) ways, customer values, customer levels of service and technical levels of service.

Customer Values indicate:

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

The results from the recent Wanneroo Liveability Survey which has yet to be analysed to inform this AM Plan will be used to populate Table 5.

Table 5: Customer Values and Satisfaction Survey Levels

Customer Values	Customer Satisfaction Measure	Current Feedback	Expected Trend Based on Planned Budget
Assets are fit for purpose	Not available	Performance not currently measured	Not available
Satisfaction with coastal and marine assets	Not available	Performance not currently measured	Not available

3.4 Customer Levels of Service

Customer Levels of Service are considered in terms of:

- Condition: How good is the service. What is the condition or quality of the service?
- Function: Is it suitable for its intended purpose. Is it the right service?
- Capacity/Use: Is the service over or under used. Do we need more or less?

In Table 6 under each of the service measures types (Condition, Function, Capacity/Use) there is a summary of the performance measure being used, the current performance, and the expected performance based on the current budget allocation.

Table 6: Customer Levels of Service Measures

Type of Measure	Community Level of Service	Performance Measure	Current Performance	Expected Trend Based on Planned Budget
Condition	All assets to be in good visual and structural condition.	Assets designed and constructed to a high standard. Asset are inspected regularly, maintenance requirements identified, rectified promptly and completed to a high quality and safety standard Community consulted with respect to the levels of service standards.	Stormwater drainage systems associated critical transport infrastructure are identified and inspected with set frequencies, maintenance requirements scheduled and actioned accordingly to a high quality and safety standard. Other assets are attended to on a reactive basis within agreed timeframes. Cleaning and visual condition inspection of underground pipe network is completed once annually Critical areas that experience high frequencies of flooding are inspected and the systems cleaned before winter seasons.	For asset attended to on a reactive basis, improve resourcing to target a more proactive preventative maintenance regime and cleaning frequency. Increase renewal budget allocations and resourcing to target earlier intervention condition of assets before they reach poor to very poor levels. Increase inspection frequencies for improved evidenced based renewal planning for the first 3 to 5 years of the

Type of Measure	Community Level of Service	Performance Measure	Current Performance	Expected Trend Based on Planned Budget
			Where maintenance is considered no longer viable, these assets are listed and prioritised for renewal in Capital Works Program. Consultation will be in conjunction with road work requirements.	budget planning process. Community and users engaged and consulted with respect to the levels of service standards through the AM Plans
Function	Assets are fit for purpose, provides for the intended function and operates as expected.	Assets are designed and constructed to high standards in accordance with the City's design standards or recognised industry standards Assets are planned and located in alignment with the City's policies and guidelines with consideration to the City's SCP goals. Community and users input considered in service requirements.	Design and construction of assets are in accordance with design standards and/or well-established industry standards with the use of appropriate materials in coastal environments. There is no functional rating system currently in place. Assessment on functionality of the assets is based historical knowledge and professional judgement of the asset. Community consulted in accordance with the City's Community Engagement Policy	Extend condition assessment of assets from just physical condition of the assets to include functionality and capacity criteria. Increased community and user involvement with asset renewals and determining current functionality needs of stormwater drainage assets.
Capacity	Assets can meet current and future demand	Availability of appropriate infrastructure to meet community expectations in distributed locations. Regular review of City planning documents to address the provision of asset and services to improve capacity to meet growth. Early planning to address community and users needs – timely provision of community facilities.	Renewal of assets are upgraded where deemed required with considerations to cater for increased capacity or functionality requirements such as accessibility requirements, optimum standards or meet modern equivalent standards. Planning for new and increasing the asset portfolio are based on community request and assessed on need in accordance with the City's AM Policy.	Improved planning for new asset provisions – Development of management plans, master plans based on growth trends. Inclusion of budget allocations for future assets upgrades and new provisions in the LTFP.

Type of Measure	Community Level of Service	Performance Measure	Current Performance	Expected Trend Based on Planned Budget
				Improved long term planning for new and upgrades of stormwater drainage assets with scheduled timeframes and budget planning in the LTFP with consideration to growth in East Wanneroo.

3.5 Technical Levels of Service

Technical levels of service measures are linked to annual budgets covering:

- Operations and maintenance – the activities necessary to retain an asset as near as practicable to an appropriate level of service (e.g. road patching, unsealed road grading, and structure repairs). This also includes electricity tariffs paid to Western Power for the provision of streetlights.
- 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). An asset is renewed when maintenance is no longer is able to meet the required level of service.
- Upgrade/New – the activities to provide a higher level-of-service (e.g. widening a road, sealing an unsealed road), meet a higher demand.

Table 7 describes the different types of technical levels of service used and Table 8 describes the current levels of service in practice.

Table 7: Technical Measures

Service Criteria	Technical measures
Quality/ Condition	Reliability of the road network as a consequence of a poor stormwater drainage network.
Function	Adequacy of stormwater drainage infrastructure to convey stormwater runoff from transport infrastructure systems. Frequency of flooding experiences from blockages causing disruptions and property damage.
Quantity	Adequacy of stormwater drainage systems throughout the City. How many areas flood due to insufficient drainage provisions.
Safety	Number of injury accidents associated with stormwater drainage assets

Table 8: Current Technical Service Levels

Key Performance Measure	Level of Service	Performance Measure Process	Performance Target
Quality/ Condition	Assets renewed before the end of their useful life.	No maintenance issues due to age and condition	No replaceable drainage with asset conditions greater than 8.
Function & Quantity	Provision of stormwater collection pits to adequately remove stormwater from the road surface.	Provision of adequate stormwater drainage collection pits in accordance with minimum development guidelines.	All collection pits meet development guidelines
Cost effectiveness	Undertake preventative maintenance to reduce more expensive reactive maintenance	Percentage of maintenance classed as preventative	>70% preventative against reactive as measured using the AMIS
Safety	The safe and efficient removal of stormwater insuring roads are clean and safe.	Routine safety inspection undertaken annually by maintenance staff.	90% of safety inspections are completed once per annum
	Response times to defects not exceeding thresholds defined in the Engineering Maintenance Intervention Levels[2]	Time to respond to routine safety inspection undertaken annually by maintenance staff.	Defects are investigated and responded to within allocated timeframes in 90% of cases

Note that some of the service levels in the table are not currently measured and the measuring of these has been added to the improvement plan.

4.   FUTURE DEMAND

4.1   Demand Drivers

Drivers affecting demand would be those that influence the TIAMP which include things such as population change, regulations, changes in demographics, vehicle ownership rates and EV vehicles, consumer preferences and expectations, technological changes, economic factors, climate change, etc.

Demand for new services with respect to Stormwater Drainage will be in the form of requests associated with:

- flooding issues due to inadequate or lack of the provision of effective stormwater drainage infrastructure requiring upgrades,
- conversion of the drainage network due to inappropriate drainage discharge outfall locations being into sensitive areas, lakes, wetlands, bushland or oceans,
- new road networks requiring servicing from a stormwater drainage network,
- addressing road safety issues and blackspot accident sites due to inadequate stormwater drainage infrastructure provisions, and
- conversion or rationalising of the excessive number of fenced stormwater drainage sumps – requiring investigation and feasibility assessment on the vialbity of combining sumps, redirect the runoff elsewhere or converting them to swales detention basins and useable spaces.

4.2   Demand Management Plan

The City will need to ensure that the factors associated with future demand are considered in the planning and determination of the LTFP. Demand for new services will be managed through a combination of managing existing assets, upgrading of existing assets and providing new assets to meet future demand requirements.

Demand management practices include non-asset solutions, insuring against risks and managing failures. Where there is a demand for infrastructure is known and supported, a project is listed in the 20-year Capital Works Program and LTFP for budget consideration. Pre-planning activities are undertaken to establish the feasibility and approval requirements of the project prior to consultation and budget approval for delivery.

The present position and projections for demand drivers that may impact future service delivery and utilisation of assets are documented in Table 9 and a Demand Management Summary shown in Table 10.

Table 9: Demand Drivers, Projections and Impact on Services

Demand Drivers	Present Position	Projection	Impact on Services	Demand Management Plan
Population growth	243,013 (2025)	437,016 (2046)	Population increases, will increase demand for transport assets and in turn increases demand on stormwater drainage infrastructure and/or the need for upgraded stormwater systems. Future developments will add new assets, increasing drainage maintenance demands, while the demand for better pedestrian infrastructure and parking will further pressure the existing stormwater network.	Continue to source non-Council funding to reduce the impact of associated infrastructure costs on local rate payers.
Public demand for aesthetically pleasing infrastructure.	Many sumps and swales in the City.	To be Investigated.	Re-design of existing sumps and swales to accommodate public demand.	Continue to source non-Council funding.
Public demand for water sensitive urban design.	Small numbers of Bio-filters within the City.	To be Investigated.	Re-design of existing sumps and swales to accommodate public demand.	Continue to source non-Council funding.
Demand for free of pollutant stormwater discharge points to water bodies	Not all outfalls in the City have GPT's installed.	To be Investigated.	Installation of GPT's immediately before all outfalls in the City.	Continue to source non-Council funding.

Table 10: Demand Management Plan Summary

Service Impact	Demand Management Plan
Reduce reliance on piped network to convey stormwater away from the location	• Promote investigations into feasibility of options to dispose runoff at source.
Increased traffic volumes on road network due to population growth Expansion of Industrial and commercial areas of Neerabup Industrial Estate, Yanchep Industrial Estate, Wangara/Landsdale Industrial Area Increased traffic volumes on road network due to population growth as part of the East Wanneroo Structure Plan Impact of increased traffic volumes on major intersections and potential speeding on local roads in residential areas. Impact of urban growth on existing rural roads. Increase in asset stock as a result of growth and expansion.	Tactically undertake upgrades to existing major routes to cope with anticipated increase in traffic loading. Ensure allocation of funding in the 20 year LTFP for the creation of new assets and upgrade of existing assets ensuring stormwater drainage requirements are considered at the same time.

Stormwater drainage assets associated with new roads and pathways required to meet growth in new residential developments will be acquired from land developers through the land subdivision and development process. All plans submitted by developers in new subdivisions vetted by the City to ensure they meet the City's standard and specifications.

Acquiring new assets from land developers will commit Council to fund ongoing operations, maintenance costs and eventual replacement. It is critical that the City captures the data associated with these assets in asset registers to enable future financial planning for their eventual renewal.

5. LIFECYCLE MANAGEMENT PLAN

The lifecycle management plan details how the City plans to manage and operate the assets at the levels of service detailed in Section 3 while managing life cycle costs.

5.1 Background Data

The dimension and replacement value of Stormwater Drainage (as at 30 June 2024) considered in this AM Plan is as summarised in Table 1 back in the Introduction section. The total replacement cost of the stormwater drainage asset portfolio is estimated at $**462.78M.**

5.1 Age Profile

The age profile (represented by the total value of assets at the year of construction) of the stormwater drainage asset portfolio is shown in Figure 1.

Figure 1: Age profile of stormwater drainage assets
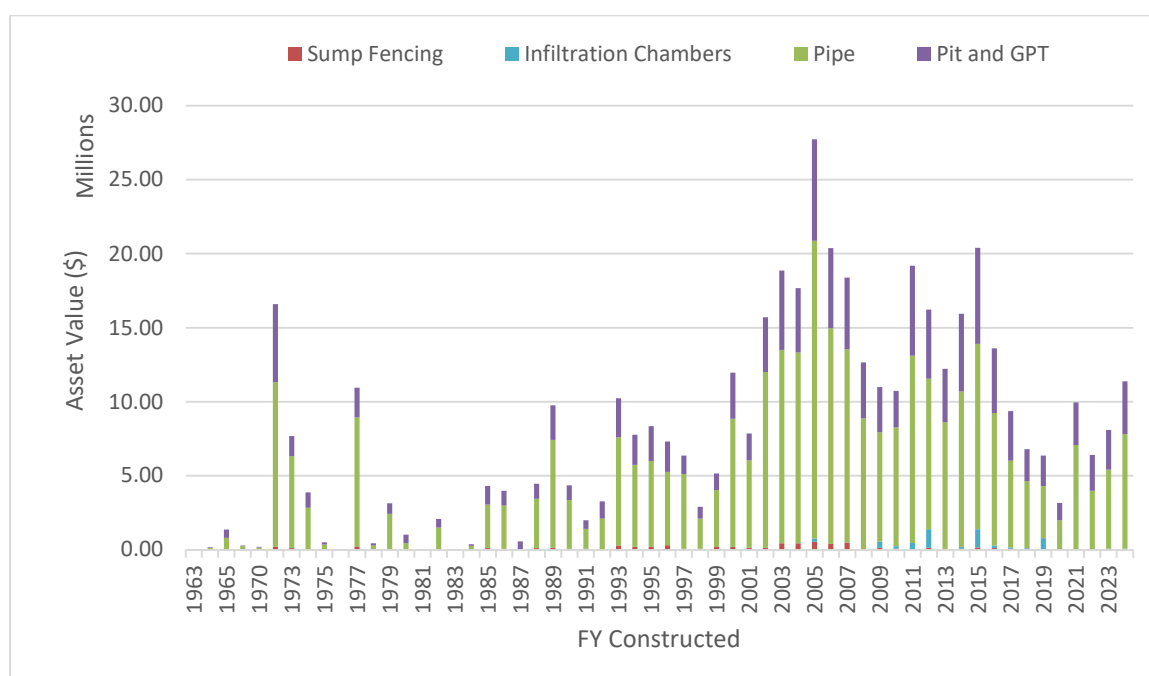
The asset age profiles depicted above provide an indication of the growth experienced within the City with relatively high rates of stormwater drainage assets being constructed since the 1990s and continues to today. The majority of stormwater drainage infrastructure assets have very long lives and their renewal demand will not impact on the City for another 50 years. It is unlikely that a total replacement of this form of infrastructure will be the renewal treatment but rather alternative measure to revive the aging pipes such as relining of the pipes in situ. These will be considered closer to the time these require intervention.

5.3 Condition Profile

There is not a specific asset condition assessment program set for stormwater drainage assets. The assets are considered in excellent condition due the nature of their long useful lifespans. The City however does have some preventative maintenance programs involving

the inspection and capture of CCTV footage of underground pipes and jet cleaning where the need arises. Cleaning of the stormwater system is generally done as part of reactive maintenance call outs. Other preventative measures include street sweeping of roads, GPT cleaning and vegetation clearing at drainage sumps. The details of the periodic maintenance asset practices are shown in the Table 11.

Table 11: Assets inspection cycles

Asset type	Inspection or maintenance cycle	Comments
Pipes, Pits and GPTs	Once in 5 to 10 years.	CCTV camera inspections for the City network. Actions undertaken as required.
GPTs and street sweeping	Target at least 2 times a years	Inspected at the same time as roads
Drainage sumps	2 times a year	Slashing of berms and cleaning as required.

Figure 2 shows the condition profile of stormwater drainage asset portfolio.

Figure 2: Condition profile of stormwater drainage assets
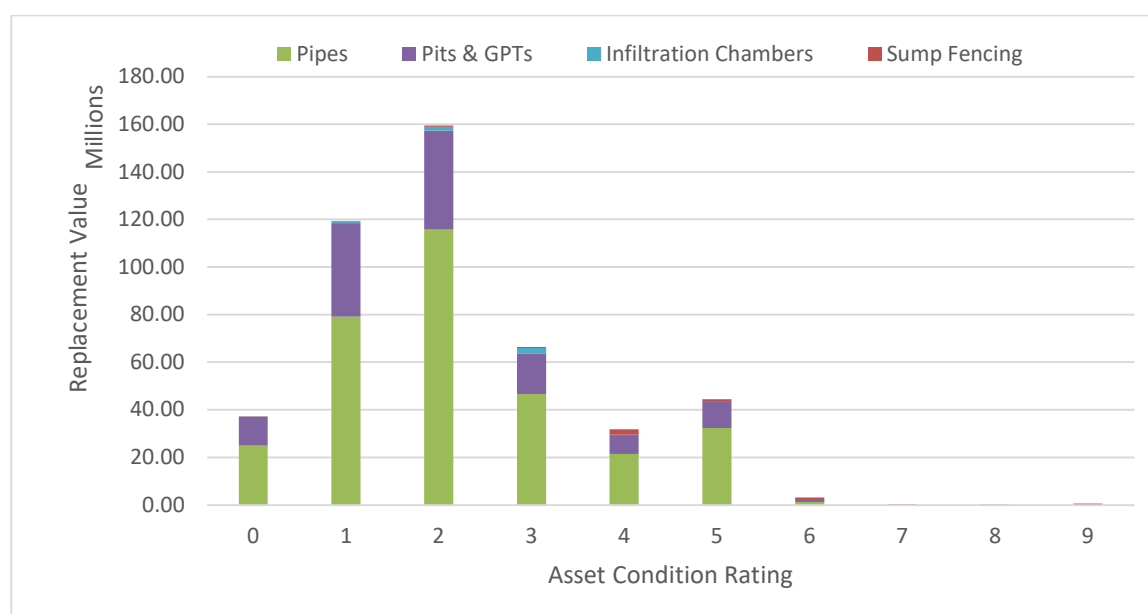
Note: Condition rating of stormwater drainage assets are based on the age calculated from the year of construction.

The assets that are in need for renewal are Sump Fencing asset type. The value of these assets as very small compared to the rest of the portfolio and is not visible in the chart above. Having much shorter lifespans there is a small amount totalling $1M within the condition rating of 7, 8 and 9. Noting that the fencing assets have been based on age, these will need to verified before planning for their renewal.

Conclusions and Recommendations

The City's ongoing inspection and conditioning of its stormwater drainage assets is key to informing future renewals and predicting the age and condition profiles of the different

components in the transport asset portfolio.

1. The bulk of asphalt seals are in Condition 1 (excellent condition). The City expects to address roads seals with condition 7 and worse in the next 10 years.

2. Conditioning of stormwater drainage assets using age at this stage may be sufficient based on the low risk of these failing in the short term due to their long useful life.

3. Concrete pipes, pits and GPT's are expected to last over 100 years and are not expected that there will be any significant impact on demand for upgrades due to condition in the short to medium term.

4. The inspection of sump fencing that is predicted as needing intervention will be scheduled for inspection to validate their condition and update the register with more accurate visual ratings.

5.4   Operations and Maintenance Plan

Maintenance for stormwater drainage tend to be about ensuring the system is able to perform effectively by ensuring the system is cleared of debris that can block the network causing flooding. Based on current budget availability, maintenance practises have been limited to reactive measures and targeting areas that have been previously reported as problematic areas and high trafficked roads.

Maintenance operations include regular cleaning activities such as cleaning of the underground stormwater drainage pipe network, GPTs, pits and gullies, street sweeping, asset inspection, and maintenance of the berms around stormwater drainage sump sites.

Due to budget and resource limitations, there are limited preventative and cyclical maintenance programs in place. These are:
- a CCTV inspection program for underground pipe and pits, aiming to complete the whole City network over a period of 8 to 10 years.
- street sweeping aiming to complete sweeping of set road network area 2 times a year.
- Cleaning of GPTs on a frequency of twice a year.

Assessment and prioritisation of reactive maintenance is undertaken by the City's Assets Maintenance team using experience and judgement. The City has many maintenance tasks and activities that are associated with the maintenance of stormwater drainage assets. A large proportion of these procedures are well documented. Integration of these activities with a the City's AM Information System (AMIS) is currently in progress.

In order to meet the requirements of ISO 9000 and ISO 55000 standards, these processes and procedures will need to be clearly documented and integrated with an AMIS. The City has commenced the identification and mapping of maintenance activities and their relationship to the other AM activities.

In support of this AM Plan, a Transport Asset Maintenance Management Plan had been

developed for transport and stormwater drainage assets detailing the maintenance activities that are required to meet the agreed levels of service.

The trend in maintenance budgets and projected requirements is shown in Figure 3.

Figure 3: Twenty Year Planned Park Maintenance Expenditure

(based on the 2024/2025 Twenty Year LTFP growth projections – does not include inflation)
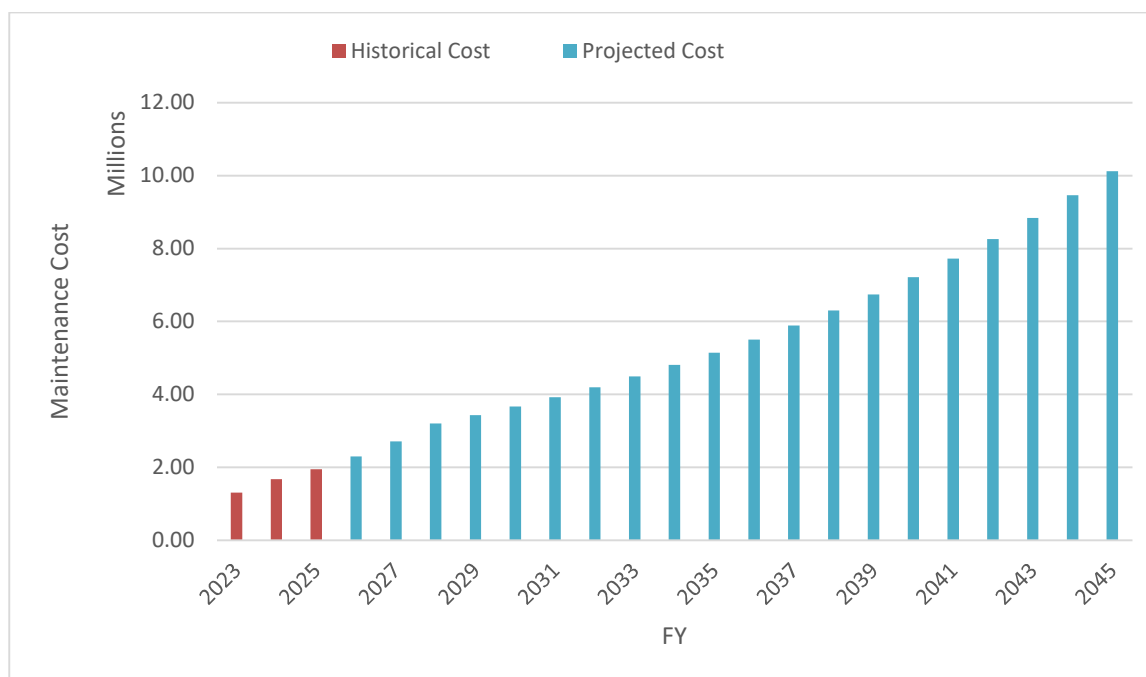
The current maintenance expenditure level is considered inadequate to meet some of the required service levels such as response times.and introducing more preventative maintenance program. Shortage in maintenance funding continues to be investigated and is to be evaluated in conjunction with the further development of the Maintenance Management Plan. The results of this work will inform future revisions of this AM Plan.

The current LTFP makes an allowance of a percentage increase in the annual operations and maintenance budget to trend in line with the increased value of the asset stock resulting from growth.

5.5   Renewal Plan

At this stage apart from sump fencing, there is little to no renewal demand associated stormwater drainage assets in the short to medium term.

The responsibility for the programming of renewals for stormwater drainage assets lie with Asset Planning. The long term renewal demand requirement is derived from predictions made using available data on the age of the assets and their expected useful life, and putting this data through a City self-developed renewal spreadsheets. The City will move to utilise the Assetic Predictor module in future years for modelling renewals once the use of the software is fully understood.

The useful lives of each of the asset component and the corresponding intervention condition level (which is an agreed trigger point at which a renewal of the asset component will be required) used in the renewal prediction model and evaluations for all asset types are to be reviewed regularly. These processes should also incorporate updated parameters for better predictions to be made.

Figure 4 shows the comparison between the predicted renewal demand and the renewal budget allocation for stormwater drainage assets in the LTFP. Note that there is no budget allocation at this stage to meet this demand. The demand has yet to be validated and because of the insignificant value and low risk of the works, these could be addressed on an as-need-basis.

The total requirement over the 20 year period is estimated at $900K and the corresponding renewal budget total over the same period totals $0. It is considered that the resultant Asset Renewal Funding Ratio in this instance would not be meaningful for low figures that is being considered.

Figure 4: Stormwater drainage assets - Renewal Forecast v Budget
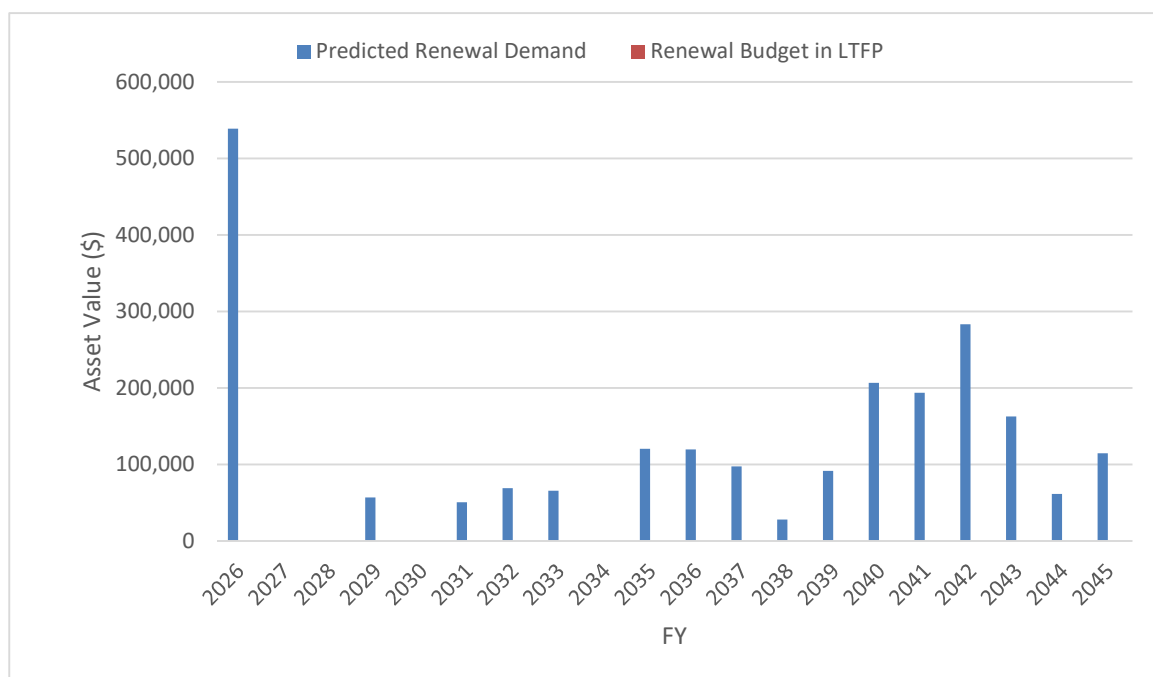
5.6 Acquisition and Upgrade Plan

As a growth council, a significant amount of new stormwater drainage assets would be constructed and gifted annually in conjunction with roads and pathways, through subdivision developments. An allowance is made to account for this growth as part of the development of the LTFP and the long term asset renewal demand modelling predictions.

The City's construction program also contributes to the increase in stormwater drainage assets

along with new and upgrades of transport assets which is driven by plans such as:

- 'Perth to Peel@3.5million: The Transport network'
- Perth Transport Plan for 3.5 Million
- City's Place Framework
- City's Transport Strategy
- City of Wanneroo Cycle Plan
- Local and District Structure Plans

The City has a program of works for stormwater drainage upgrades to address areas where there are flooding issues with the current system in some areas. Figure 5 shows the anticipated growth and planned expenditure on the upgrade of assets over the next 20 years for all stormwater drainage assets.

Figure 5: Developer contributed, Planned Capital Expenditure on Upgrades
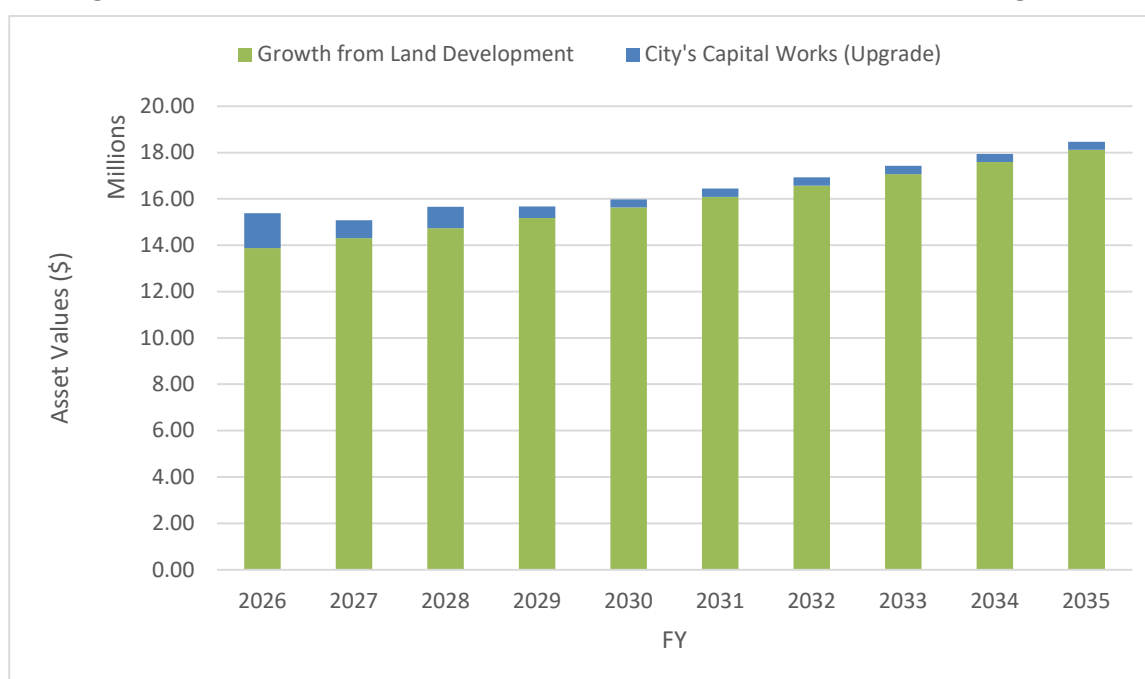
A significant value of stormwater drainage assets are constructed and 'gifted' to the City through the land development process. The magnitude of new additions to the asset portfolio annually will put added pressures on the budget and resourcing requirements for the ongoing maintenance of these assets. Accurate long term financial planning is critical for the maintenance budget in the long term to ensure the City keeps up the maintenance of these assets.

Ensuring these assets are constructed to a standard and quality that will last will be key to ensuring that the City is not unnecessary burdened with high maintenance and renewal costs associated with premature failure.

5.6   Disposal

Disposal requirements are assessed on an individual case-by-case basis. At this stage, there are and will not be any disposals anticipated for this category of asset.
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5.7   Standards and Specification

The standards and guidelines used in building, maintaining and renewing stormwater drainage assets are listed below:
- Local Government Guidelines for Subdivisional Development.
- Austroads guides
- The City's Guidelines and Standard Drawings.
- MRWA Traffic Management for Works on Roads – Code of Practice
- Occupational Safety and Health Act 1984 (the OSH Act) and the Occupational Safety and Health Regulations 1996 (the OSH regulations)
- Australian Standards

6. RISK MANAGEMENT

An assessment of risks associated with service delivery from Stormwater Drainage assets has identified critical risks to the City in accordance with the City's Risk Assessment Criteria Matrix.

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

Critical risks identified in this plan, being those assessed as 'High' - items prioritised corrective action. Other risks identified in this plan include those assessed as 'Moderate' - items requiring moderate corrective action and 'Low' – items requiring performance monitoring or corrective actions with a low priority rating subject to available resources.

6.1 Asset Criticality

Critical assets are those assets which have a high consequence of failure but not necessarily a high likelihood of failure. By identifying critical assets and critical failure modes, organisations can target inspection activities, maintenance plans and capital expenditure plans at the appropriate time and level of importance. A list of critical sites based on the critical assets listed in the TIAMP are included in Appendix D.

Operations and maintenances activities target critical assets to prevent failure and maintain service levels. Critical assets failure modes and required operations and maintenance activities are detailed in Table 12.

Table 12: Critical Assets and Service Level Objectives

Critical Assets	Critical Failure Mode	Operations & Maintenance Activities
Flooding at Arterial Roads and other major roads	Inadequate drainage systems to convey stormwater runoff to safe location	Regular inspections to identify potential issues, maintenance or renewal work if required. Street sweeping.
	Underground Pipe blockages or collapse	
	Inadequate stormwater runoff escape route or blocked passages.	
	Gross Pollutant Traps uncleaned and choked	

7. FINANCIAL SUMMARY

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

7.1 Financial Sustainability and Projections

There are two key indicators of sustainable service delivery that are considered in AM. The two indicators are the:

$$\text{Asset Renewal Funding Ratio (ARFR)} = \frac{\textit{proposed \textbf{renewal budget} for the next 10 years}}{\textit{proposed \textbf{renewal demand} for the next 10 years}}$$

$$\text{Lifecycle Funding Ratio (LFR)} = \frac{\textit{proposed \textbf{lifecycle budget} for the next 10 years}}{\textit{proposed \textbf{lifecycle demand} for the next 10 years}}$$

The ARFR is an important indicator and illustrates how the City will be performing over the next 10 years in terms of funding its renewals demand. An ARFR of 100% would mean that the City intends to fully fund its asset renewal demand over the next 10 years.

As discussed in Section 5.5 and Figure 4, there is no budget allocation at this stage to meet the total predicted renewal requirement over the 20 year period of $900K. This demand requirement has yet to be validated and because of the insignificant value and low risk of the works, these could be addressed on an as-need-basis.

It is therefore considered that the resultant Asset Renewal Funding Ratio in this instance would not currently be meaningful for low figures that is being considered.

The LFR measure is a similar measure to the ARFR except that the LFR includes all lifecycle costs, inclusive of asset renewal requirement, operations and maintenance costs over a 10-year period. This provides input into 10 year financial and funding plans aimed at providing the required services in a sustainable manner.

The City currently does not have an accurate way of forecasting it's long-term operating and maintenance budgeting requirement. As part of the LTFP process a percentage allowance for inflation and growth is added to the current financial year operating and maintenance budget. At financial year end, the total actual expenditure is measured against budget to determine the adequacy of budget allowances. Therefore, at this stage the LFR is not able to be calculated.

The financial projections will be improved as further information becomes available. A recent audit report identified improvements required in the City's calculations of the performance ratios. A joint Finance and Asset Management review is to be carried out to improve the processes associated with calculating the ratios.

7.2   Funding Strategy

Based on current reactive maintenance practice, the forecast renewal demand and maintenance requirements for this AM Plan is expected to be fully accommodated within the City's operational budgets.

The financial expenditure projections for stormwater drainage assets over the coming 10 years are shown in Figure 6 noting that there is no budget planned for renewals at this stage.

Figure 6: 20 Year Planned Expenditure for Stormwater drainage assets
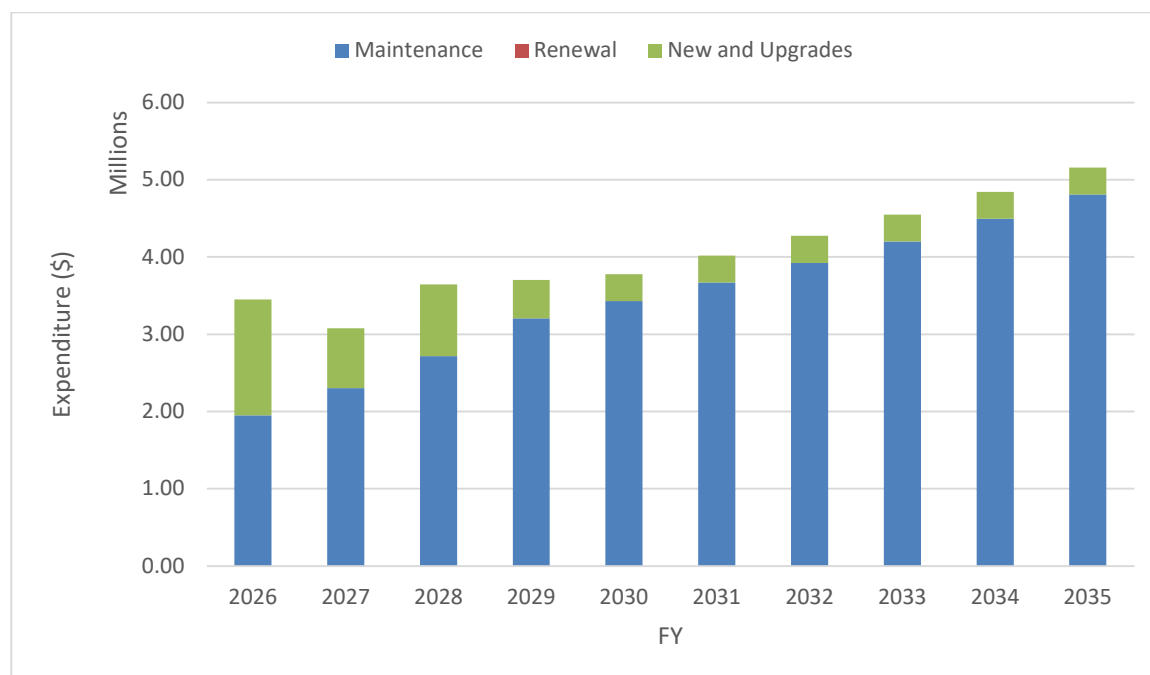
The predicted 10 year maintenance and operations cost figures are expected to increase as the cost to maintain existing assets increases. These costs are inclusive of an assumed annual allowance increase to allow for growth and material costs. The current annual estimated percentage increases need to be validated with projections based on more accurate data.

7.3   Asset Valuation Forecasts

The value of stormwater drainage assets covered by this AM Plan as at 30 June 2024 is summarised in Table 13.

Table 13: Replacement Value of Assets as at 30 June 2024

Asset Category	Replacement Cost ($)	Depreciated Replacement Cost (Fair Value) ($)	Annual Depreciation ($)
Stormwater drainage assets	462.8M	345.9M	4.47M

7.4 Key Assumptions Made in Financial Forecasts

Key assumptions made in this AM Plan are:

- Future operations and maintenance budgets are assumed to be consistent and increase with expansion of the stormwater drainage asset portfolio.
- Forecasts have been made based on current asset databases and accurate rates for replacement cost.

7.5 Forecast Reliability and Confidence

The forecast costs, proposed budgets, and valuation projections in this AM Plan are based on the best available data. The data confidence used is classified on a 'A'–'E' level scale in accordance with Table 14.

Table 14: Data Confidence Grading System

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

The estimated confidence level for and reliability of data used in this AM Plan is shown in Table 15.

Table 15: Data Confidence Assessment for Data used in AM Plan

Data		Confidence Assessment	Comment
Demand drivers		C	Demand and growth projections is subject to rate of development experienced
Growth projections		C	
Acquisition forecast		C	
Operations & Maintenance forecast		C	More accurate budget planning needs improvement.
Renewal forecast	Asset values	B	Renewals have been based on condition assessment where available.
	Asset useful lives	C	Useful lives are based on professional judgement, experience and available industry data.
	Condition modelling	B	Modelling based on asset data
Disposal forecast		C	Based on known planned disposals

8.   PLAN IMPROVEMENT AND MONITORING

8.1   Improvement Plan

The improvement plan generated from this AM Plan targets the City's asset management of park assets and is detailed in Table 16. All tasks aim at improving AM practices in the short and longer term. The task outcomes will be measured and monitored over the next four years and progress reported on in the next SDAMP iteration.

8.2   Performance Monitoring

It is intended that this AM Plan is a live document that is relevant and integral to the daily AM activities at the City. The AM Plan has a life of 4 years whereby a review will be undertaken following this period.

The annual and LTFP projections detailed in the AM Plan represents the state of assets at the time of AM Plan development. The asset data and lifecycle cost projections are stored separately in the City's Content Manager record system.

Until such time a full review of this AM Plan is undertaken, the core data included in this plan and the associated projections is located in CM ##/#### and will be updated annually as new versions to inform subsequent LTFPs and annual budget developments.

8.3   Performance Measures

The effectiveness of the AM Plan can be measured in the following ways:

- The degree to which the required forecast costs identified in the SDAMP are incorporated into the LTFP,
- The degree to which the 1–5-year detailed works programs, budgets, business plans and corporate structures consider the works program trends provided by the SDAMP,
- The ARFR achieving the organisational target of 90 – 100%.
- Achieving the intended outcomes of the improvement plan.

Table 16: Improvement Plan

EM – Engineering Maintenance, LD – Land Development, AP – Asset Planning, ICW – Infrastructure Capital Works, CIS - Customer & Information Services, TS – Traffic Services, AMIS – Asset Management Information System, SLUPE – Strategic Land Use Planning and Environment

Task No	Task	Responsibility	Resources Required	Proposed Completion date	Progress Comment
1.	Implementation of Assetic (AMIS) to enable asset data to be stored in a corporate system.	CIS & Assets including AP	June 2025	Elaine Coetzee Project Manager Enterprise Software Renewal Program	January 2025 update: AMIS schedule has been extended to June 2025, ensuring full delivery with additional services and expanded scope. This includes the integration of new Business Units, enhancing the project's overall value and coverage.
3.	Introduce asset collection utilising the D-Spec format for capital works projects	ICW, AP	2024	Phil Calley Project Manager Infrastructure Capital Works	January 2025: Phil's comment: There is currently a A-SPEC contract in place. The final 12-month contract extension has been recommended with effect from mid-March 2025 so a new contract will be sought next year and established in March 2026. 8 projects per month are being traced in terms of usage rate of the current contract. As-cons for projects are handed across to Jhosie to monitor this.
5.	Integrate Stormwater Drainage Asset Management (SDAMP) and Transport Asset Management (TIAMP) Plans	AP	January 2028	Mahbuba Rakhi	Measure of Success: • Formal proposal developed by mid-2027 for integration feasibility. • Pilot sections of both plans integrated into a single AMP document by end of 2027.
6.	Investigation and assess feasibility of replacing existing sumps with Water-Sensitive Urban Design (WSUD)	AP, EM	June 2026	Mahbuba Rakhi Cameron Healy	Measure of Success: • Formal proposal developed by mid-2027 for integration feasibility. • Pilot sections of both plans integrated into a single AMP document by end of 2027.

Task No	Task	Responsibility	Resources Required	Proposed Completion date	Progress Comment
10.	Establish a Dedicated Stormwater Asset Renewal Program	AP	December 2025	Mahbuba Rakhi Liam Noonan	Measure of Success: • Standalone renewal budget proposal prepared by mid-2025. • Annual stormwater renewal projects identified separately from transport renewals. • At least 30% of aging drainage assets included in a formal renewal cycle by 2026.
11	Develop a Register of High-Risk Stormwater Assets & Implement an Inspection Program	EM	June 2026	Cameron Healy	Measure of Success: • Database with at least 80% of high-risk assets mapped and classified by Q4 2025. • Inspection cycle established and at least 50% of high-risk assets inspected annually. • Prioritised maintenance plan developed based on risk assessment results.
12.	Install Pre-Filtration Systems for Underground Stormwater Cells	AP, EM, ICW	June 2027	Mahbuba Rakhi Cameron Healy Zain Hassen	Measure of Success: • At least two pilot locations installed with filtration systems by early 2026. • Evaluation report showing reduction in sediment buildup and contamination. • Recommendations for citywide implementation based on pilot results.
13.	Investigate Tree Planting in Sumps and Swales for Improved Drainage & Vegetation Control	AP, EM, ICW	June 2027	Mahbuba Rakhi Cameron Healy Zain Hassen	Measure of Success: • Pilot study on at least three sump/swale locations completed by mid-2026. • Cost-benefit analysis showing tree planting impact on drainage efficiency. • Policy developed for integrating vegetation management in drainage design.

Task No	Task	Responsibility	Resources Required	Proposed Completion date	Progress Comment
14	Introduce Smart Technology for Real-Time Monitoring of Stormwater Infrastructure	EM	TBA	Cameron Healy	Measure of Success: • Minimum of five high-risk locations equipped with smart sensors by Q2 2026. • Data integration with asset management system for predictive maintenance. • Reduction in emergency stormwater interventions by at least 25% over three years.

9. REFERENCES

Council Asset Management Related Documents

- Asset Management Policy (HPE #16/106984)
  https://www.wanneroo.wa.gov.au/downloads/file/80/asset_management_policy
- Asset Management Strategy (HPE #16/279441)
  https://www.wanneroo.wa.gov.au/downloads/file/3254/asset_management_strategy_-_2018
- Corporate Business Plan (CBP) (HPE #19/377777)
  https://www.wanneroo.wa.gov.au/downloads/file/2643/corporate_business_plan_201718_-_202021
- Long Term Financial Plan (LTFP) (HPE#18/512338)
  https://www.wanneroo.wa.gov.au/downloads/file/3265/long_term_financial_plan_201920%E2%80%93203839
- Strategic Community Plan (SCP) (HPE #17/361793)
  https://www.wanneroo.wa.gov.au/strategiccommunityplan
- Local Area Traffic Management Policy (06/01/2020) (HPE #16/83026(v2)
  https://intranet.wanneroo.wa.gov.au/documents/82/local-area-traffic-management-policy
- Public Guidance Signage In Road Reserves Policy (HPE #19/97166)
  https://intranet.wanneroo.wa.gov.au/documents/85/public-guidance-signage-in-road-reserves-policy
- Roadside Memorials Policy (HPE #13/22783v3)
  https://intranet.wanneroo.wa.gov.au/documents/87/roadside-memorials-policy
- Roadworks Excavation within Road Reserves Policy (HPE #18/488322)
  https://intranet.wanneroo.wa.gov.au/documents/88/roadworks-excavation-within-road-reserves-policy
- Bus Stop Infrastructure Policy (HPE #16/191696)
  https://intranet.wanneroo.wa.gov.au/documents/1444/bus-stop-infrastructure-policy
- Verge Treatments - Protective Devices Policy (HPE #12/68459[v3])
  https://intranet.wanneroo.wa.gov.au/documents/90/verge-treatments-protective-devices-policy
- Street Tree Policy (HPE #18/550071)
  https://intranet.wanneroo.wa.gov.au/documents/89/street-tree-policy

Council Planning Documents

- City of Wanneroo Transport Strategy 2019/20 (HPE #19/365476)
  http://www.wanneroo.wa.gov.au/downloads/file/3447/transport_strategy
- City of Wanneroo Cycle Plan (2018/19 - 2021/22) Dec 2018 (HPE #18/511133)
- City of Wanneroo, Disability Access and Inclusion Plan 2016-2019 (DAIP) (HPE #15/555335)
- Community Satisfaction Survey 2017 - City of Wanneroo
- Population Forecast - City of Wanneroo Community Profile (.id population experts website - *http://profile.id.com.au/wanneroo/population*)

Asset Management Guidance

- 'Practice Note 1: Footpaths & Cycleways', IPWEA – v2 2014.
- 'Practice Note 11: Street Lighting', IPWEA – 2014.
- 'Practice Note 2: Kerb & Channel (Gutter)', IPWEA – v2 2014.
- 'Practice Note 6: Long Term Financial Planning', IPWEA – 2012.
- IPWEA, 2015, 'Australian Infrastructure Financial Management Manual', Institute of Public Works Engineering Australia – 2nd Edition, 2015.
- IPWEA, 2015, 'International Infrastructure Management Manual', Institute of Public Works Engineering Australia - 5th Edition 2015.

Others

- City of Wanneroo Risk Assessment Criteria Matrix (HPE #19/216037).
- Australian Accounting Standards Board – publications and standards.
- Australian Standards AS ISO 55001 Asset Management System Guidelines 2014.
- Catalyse Pty Ltd, July 2017. 2017 Community Scorecard: City of Wanneroo. **http://www.wanneroo.wa.gov.au/downloads/file/2607/community_satisfaction_survey_2017**
- Government of Western Australia, Towards Zero Road Safety Strategy 2008 – 2020, **_http://www.ors.wa.gov.au/Towards-Zero.aspx_**
- Guidelines for Determining and Assigning Responsibility for Roads in Western Australia – MRWA (Updated August 2011). _http://www.mainroads.wa.gov.au/UnderstandingRoads/Facts/Pages/Facts.aspx#classification_
- Integrated Planning and Reporting Framework and Guidelines – Government of Western Australia, Department of Local Government September 2016.
- Liveable Neighbourhoods Planning Document – WA Planning Commission (WAPC).
- Part 1 Policy For Classification, Proclamation And Transfer of Western Australian Roads
- Part 2 Administrative Classification Assessment Criteria
- Western Australian Planning Commission, Perth to Peel@3.5million: The Transport Network, March 2018.

From Nams+ template – IPWEA References

- _IPWEA, 2015, 3rd edn., 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/IIMM_
- _IPWEA, 2008, 'NAMS.PLUS Asset Management', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/namsplus._
- _IPWEA, 2015, 2nd edn., 'Australian Infrastructure Financial Management Manual', Institute of Public Works Engineering Australasia, Sydney, **www.ipwea.org/AIFMM**._
- _IPWEA, 2020 'International Infrastructure Financial Management Manual', Institute of Public Works Engineering Australasia, Sydney_
- _IPWEA, 2018, Practice Note 12.1, 'Climate Change Impacts on the Useful Life of Assets', Institute of Public Works Engineering Australasia, Sydney_
- _IPWEA, 2012, Practice Note 6 Long-Term Financial Planning, Institute of Public Works Engineering Australasia, Sydney, https://www.ipwea.org/publications/ipweabookshop/practicenotes/pn6_
- _IPWEA, 2014, Practice Note 8 – Levels of Service & Community Engagement, Institute of Public Works Engineering Australasia, Sydney, **https://www.ipwea.org/publications/ipweabookshop/practicenotes/pn8**_
- _ISO, 2014, ISO 55000:2014, Overview, principles and terminology_
- _ISO, 2018, ISO 31000:2018, Risk management – Guideline_

10. GLOSSARY OF TERMS AND ABBREVIATIONS

For a of other Key Definitions Refer to Section 3 in AM Policy 2023. The following terms are used in this AM Plan:

Term	Definition
Assets	Assets are future economic benefits controlled by the City as a result of a past transaction or event whereby: • Its value can be measured reliably, and. • Its value must exceed a stated materiality threshold being $5,000 or form part of a network asset group, and. • It must be probable that future economic benefits of the asset will eventuate (i.e. the asset acquired supports the delivery of Council services to the community in line with its objectives). *ISO 55000*:2014 Asset Management – Overview and Pinciples defines an '***Asset***' as an item, thing or entity that has potential or actual value to the organisation.
Asset Class	Groupings of assets of similar nature and use in local government's operations.
Asset Management	The combination of management, financial, economic, engineering and other practices applied to assets from their planning, acquisition, operation, maintenance, replacement and disposal, to ensure that the assets meet the priorities of the Strategic Community Plan with the objective of providing the required level of service in the most cost-effective manner. *ISO 55000* defines an '***Asset Management***' as the coordinated activity of an organisation to realise value from assets.
Asset Management Plan	Asset Management Plan or AM Plan refers to documented information that specifies the long-term plan, activities, program, time scales and resources applied to specific individual major, critical assets or a grouping of assets to provide a defined level of service over the lifecycle of the asset. An AM Plan covering a grouping of assets (or asset classes) is referred also as an ***Asset Class Plan***. "**Asset Class Plan**" or '**ACP**' refers to an AM Plan that covers a class of assets, grouping of assets or a network of assets as opposed to a specific individual major or critical asset.
Asset Management Improvement Plan	The Asset Management Improvement Plan is a high-level plan that sets out how the asset management intent will be achieved and how objectives will be delivered on. It sets out the key focus areas and within these, the priority areas of work.

Term	Definition
AM Information System" or **'AMIS'**	Refers to a dedicated AM Computer Software program and associated systems to support effective and efficient data management that is integrated with other key property and finance management software systems of the organisation.
Asset Management Strategy	A document that outlines how the City asset portfolio will meet the service delivery needs of its communities into the future, enabling the local government's asset management policies to be achieved and ensuring that asset management is established as part of the Integrated Planning Framework
Council	The elected council (comprising Councillors) of the City.
Depreciation	A systematic charge that recognises the wearing out or consumption of the non- current asset over its useful life
Infrastructure	Comprises the asset sub-classes defined in section 5 of the AMS and Guidelines issued by the Department of Local Government.
Level of Service	The defined service quality for a particular activity (i.e. road maintenance) or service area (i.e. street lighting) against which service performance ca be measured. Service levels usually relate to quality, quantity, reliability, responsiveness, environmental considerations, acceptability and cost
Life Cycle	The phases of activities that an asset (or facility) goes through, including planning, design, construction, acquisition, operation, maintenance, rehabilitation and disposal.
Maintenance	The regular ongoing day-to-day work necessary to keep an asset operating to achieve its optimum life expectancy.
Maintenance Management Plan	A documented information that specifies the lifecycle activities and processes required on a day to day, periodical or annual basis to ensure the safe and intended function of the assets is maintained.
Operations	Regular activities to provide public health, safety and amenity and to enable the assets to function e.g. road sweeping, grass mowing, and cleaning, street lighting and graffiti removal.
Renewal	Works to upgrade an asset, refurbish an asset or the replacement of part(s) of an asset to ensure continuing equivalent capacity or performance capability.
Replacement	The complete replacement of an asset that has reached the end of its life, to provide a similar or agreed alternative, level of service.
Replacement Cost	the cost of replacing an existing asset with an identical new asset.
Risk	probability and consequence of an event that could impact on the Council's ability to meet its corporate objectives.

Term	Definition
Strategic Community Plan	A documented that specifies how organisational objectives in the SCP are to be converted into AM objectives, the approach for developing AM Plans, and the role of the AMS in supporting the achievement of the AM objectives.
Stakeholders	Are those people/sectors of the community that have an interest or reliance upon an asset and who may be affected by changes in the level of service of an asset.
Upgrade	Enhancing an existing asset to provide higher level of service.
Whole of Life Cost	The total cost of an asset throughout its life cycle inclusive of costs associated with planning, design, construction, acquisition, operation, maintenance, rehabilitation and disposal.

The following abbreviations are used in this AM Plan:

Abbreviation	Full Form
ACP	Asset Class Plan
AM	Asset Management
AM Plan	Asset Management Plan
AM Policy	Asset Management Policy
AM Strategy	Asset Management Strategy
AM Framework	Asset Management Framework
AMS	Asset Management System
AMIS	Asset Management Information System
AMSG	Asset Management Steering Group
DLGSCI	Department of Local Government, Sport and Cultural Industries
GIS	Geographical Information System
IIMM	International Infrastructure Management Manual
IPR	Integrated Planning Framework
IPWEA	Institute of Public Works Engineering Australia
LTFP	Long Term Financial Plan
MMS	Maintenance Management Plan
WALGA	West Australian Local Government Association

APPENDIX A: GENERIC DESCRIPTION OF ASSET CONDITION RATINGS

Condition Rating	Generic Description of asset condition
0	A new asset or an asset recently rehabilitated back to new condition.
1	A near new asset with no visible signs of deterioration often moved to condition 1 based upon the time since construction rather than observed condition decline.
2	An asset in excellent overall condition. There would be only very slight condition 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, but the deterioration still 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 being heavily impacted upon by the poor condition. Maintenance cost would be very high and the asset would at a point where it needed 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 which is no longer serviceable and should not remain in service. There would be an extreme risk in leaving the asset in service.

APPENDIX B: STORMWATER DRAINAGE ASSETS – CAPITAL SUBPROGRAMS

(Figures reported in '000)

Sub Program	Asset Location	Work Description	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Capital Works Upgrades																						
Stormwater Drainage	276 Shiraz Blvd - Wanneroo BMX Club	Investigate options to install kerbing and drainage to cut off stormwater discharging directly onto property property from council road reserve.	145	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	145	-
Stormwater Drainage	3 Finlay Place	Investigate options to stop ponding at low point adjacent to cross over in road reserve.	15	85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	85
Stormwater Drainage	63 Girrawheen Avenue	Upgrade drainage	236	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	236	-
Stormwater Drainage	Citywide Sumps	Revitalisation Program of City's drainage sumps	-	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25
Stormwater Drainage	North Mindarie Foreshore	Investigate options to cut off stormwater discharging directly onto the sand dunes	25	25	20	150	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	25
Stormwater Drainage	Quinns Rocks Drainage Sump	Upgrade of drainage sump and construction of carpark	1,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,000	-
Stormwater Drainage	Riverlinks Park	Upgrade Riverlink Drainage Basin	50	40	400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	40
Stormwater Drainage	South Yanchep Foreshore	Investigate options to cut off stormwater discharging directly onto the sand dunes	25	-	160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	-
Stormwater Drainage	Urban Catchments (to be determined)	Upgrade Stormwater Drainage systems at various locations	-	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	350	-	350
Stormwater Drainage	Warradale Park	Consideration of reducing swale depth by introducing a depth controlled link to the lake north of the Footy Oval	5	250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	250
Upgrades Total			1,501	775	930	500	350	350	350	350	350	350	350	350	350	350	350	350	350	350	1,501	775

APPENDIX C: LEVEL OF SERVICE PERFORMANCE
Community Levels of Service

Key Performance Measure	Level of Service	Performance Measure Process	Performance Target	Current Performance
COMMUNITY LEVELS OF SERVICE				
Quality/ Condition	Roads are well maintained. Roads are in a safe condition.	Customer complaints about roads.	< 120 pa	#156[1]
	Uniformity, walkability and rideability (for cyclists).	Community perception survey	> 70% satisfaction	75%[2]
	Surface uniformity and accessibility within car parks.	Customer complaints	< 20 a pa	#
Function	Meets user requirements for:			
	- Traffic management	Community perception survey	>60% satisfaction	68%[2]
		Customer complaints	<300 pa	#344[3]
	- Pathway accessibility	Community perception survey	> 70% satisfaction	79%[2]
		Customer complaints	<75 pa	#94[3]
	- Accessibility within car parking areas - Availability of car parking facilities	Customer complaints	< 20 a pa	#
Quantity	Sufficient pathways to points of interests and recreational use	Community perception survey	> 70% satisfaction	79%[2]
	Adequacy of car parking at City facilities	Customer complaints	< 20 a pa	#

Note:

 # The data required to monitor and report on the City's specific performance in some areas is not currently available. Improved collection of this data has been listed as a required improvement outcome for this plan. (Improvement ref 2)

1. *Based on CRM Statistics from Traffic Services for the 2019 calendar year, (HPE 20/235424).This includes all CRMs under the category of 'Roads', as safety is not separated out.*

2. *This score is the sum of (Excellent + Good + okay) from the 2020 Community Scorecard results.*

3. *Based on CRM Statistics from Traffic Services for the 2019 calendar year (HPE 20/235424).*

Technical Levels of Service

Key Performance Measure	Level of Service	Performance Measure Process	Performance Target	Current Performance
TECHNICAL LEVELS OF SERVICE				
Quality/ Condition	Assets renewed at the end of their useful life.	Road Condition survey.	Whole of network survey completed once in every 3 years and prioritise for renewal. (note there is an improvement action to increase this to 5 yearly.)	Meeting target.
		Pathway Condition survey	Whole of network survey completed once in every 3 years and prioritised for renewal.	Meeting target.
		Car park Condition survey.	Whole of network survey completed once in every 3 years and prioritised for renewal.	Meeting target.
Function & Quantity	Provision of cyclist route networks throughout the City in accordance with the Wanneroo Cycle Plan	Implement actions as per recommendations of the Wanneroo Cycle Plan.	Listing and completion of projects in accordance with the Wanneroo Cycle Plan in the CWP.	In progress, ongoing
	Provision of car parking areas to support the City's facilities.	Provision of adequate car parking bays in accordance with minimum development guidelines.	90% of the City's facilities are provided with car parking facilities to the required provision.	#
Safety	Safe accessible transport network	Reported Fatal, Hospital and Medical (Casualty) crashes	Annual reduction in Fatal, Hospital and Medical (Casualty) crash numbers	5,690 (2015 – 2019)
	Defects not exceeding thresholds defined in the Engineering Maintenance Intervention Levels[2]	Routine safety inspection undertaken annually by maintenance staff.	90% of safety inspections are completed once per annum	In progress, ongoing

Key Performance Measure	Level of Service	Performance Measure Process	Performance Target	Current Performance
	Response times to defects not exceeding thresholds defined in the Engineering Maintenance Intervention Levels[2]	Time to respond to routine safety inspection undertaken annually by maintenance staff.	Defects are investigated and responded to within allocated timeframes in 90% of cases	In progress, ongoing
	Safety inspections are carried out at least once a year	Record of inspections	Annual inspections	Meeting target

Note:
The data required to monitor and report on the City's specific performance in some areas is not currently available. Improved collection of this data has been listed as a required improvement outcome for this plan.

APPENDIX D: LIST OF HIGH RISK ASSETS

ASSET NAME	HIERARCHY/TYPE
Alexander Drive – north bound (Beach Road to Gnangara Road)	Distributor A
Beach Road – eastbound (Wanneroo Rd to Alexander Drive)	Distributor A
Breakwater Drive	Distributor B
Connolly Drive (City of Joondalup boundary to Lukin Drive)	Distributor A
Flynn Drive	Distributor B
Girrawheen Avenue	Distributor B
Gnangara Road (Wanneroo Road to Ocean Reef/Sydney Road)	Distributor A
Hartman Drive	Distributor A
Hepburn Avenue	Distributor A
Hester Avenue	Distributor A
Joondalup Drive	Distributor A
Lenore Road	Distributor B
Lisford Avenue	Distributor B
Lukin Drive	Distributor A
Marangaroo Drive	Distributor A
~~Marmion Avenue (City of Joondalup boundary to Yanchep Beach Road)~~	Distributor A
Mirrabooka Avenue (Beach Road to Gnangara Road)	Distributor A
Neaves Road (Pinjar Road to City of Swan boundary)	Distributor A
Neerabup Road	Distributor A
Old Yanchep Road (Joondalup Drive to Yanchep National Park)	Distributor B
Pinjar Road	Distributor A
Two Rocks Road	Distributor B
Yanchep Beach Road	Distributor B
Marmion Avenue Pedestrian Underpass SLK 2.35 (Mindarie)	Underpass
Marmion Avenue Pedestrian Underpass SLK 3.94 (Mindarie)	Underpass
Hester Avenue Pedestrian Underpass (Clarkson)	Underpass
Joondalup Drive Pedestrian Underpass (Carramar)	Underpass
Marmion Avenue Pedestrian Underpass SLK 20.00 (Yanchep)	Underpass