COASTAL INFRASTRUCTURE
ASSET MANAGEMENT PLAN

April 2025

City of Wanneroo

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1. EXECUTIVE SUMMARY

1.1 The Purpose of the Plan

This Coastal Infrastructure Asset Management Plan (CIAMP) is specifically developed for Coastal Infrastructure Assets and forms part of a suite of Asset Management (AM) Plans namely, Transport Infrastructure, Stormwater Drainage, Buildings, Parks and Natural Areas that enables the City of Wanneroo (the City) to improve its long term strategic management of infrastructure assets and ensure current and future levels of service are sustainable.

The CIAMP investigates the current state of coastal infrastructure assets and considers current and future requirements together with associated risks to inform the optimum lifecycle costs and management into the future. The CIAMP aims 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 practices 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.

This CIAMP 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 plan covers coastal infrastructure assets that provide opportunities for residents, community and visitors to enjoy and connect to the City's diverse natural and built coastal and marine environment ensuring:

- adequate protection to coastal facilities, and
- safe access and accessibility for all users to coastal facilities.

These assets provide opportunities for community leisure and recreation, public amenity, safety and rescue, coastline and asset protection, coastal monitoring and environmental management services.

The current infrastructure assets in this CIAMP have a replacement value estimated at $55.9M and covers the following assets:

- Groynes, Breakwaters and Artificial headland
- Jetties
- Revetment Walls
- Swimming Enclosure
- Surf Life Saving Club Towers
- Beach Matting and Beach Wheelchair

- Beach Access Ways including boardwalks, platforms, stairs and lookouts/gazebos
- Major Retaining Walls along the coast
- Beaches
- Yanchep (Compass Circle) Pedestrian Bridge
- Coastal and Beach Signage.

1.3 Levels of Service

The Technical Levels of Service governs much of measures for coastal protection infrastructure and are driven mainly by legislative and industry requirements. Critical coastal infrastructure have been identified with a strong focus on Quinns Rocks Mindarie and Yanchep beaches. The following critical measures are in place:

- Coastal monitoring program (6-monthly monitoring and reporting) of the City's coastline.
- Targeted inspection and servicing of coastal structures within available operational budgets that includes reworking of existing and placement of new rock material, patching of sandbags and addressing scour issues. Where necessary larger scale maintenance activities are also listed for consideration in the City's capital works program.
- Coastal limestone hazard assessments - annual inspections (site specific) and technical assessment every 10 years (32km of City coastline).
- Beach scraping at the Quinns Rocks Dog beach and annual beach renourishment at Quinns Beach and Yanchep Lagoon.

For coastal recreational assets, the customer levels of service measures in place to ensure that, all assets to be in good visual and structural condition; fit for purpose and provides for the intended function; and operates as expected, are:

- Swimming enclosures, beach matting, surf life-saving patrol towers installed over summer periods. Reinstated in October and removed in April each year. Monthly inspection and servicing conducted on these assets.
- Fortnightly cleaning of beaches between October and April at Yanchep Lagoon Beach; Shorehaven Beach; Eden Beach; Quinns Mindarie Beach; and Alkimos Beach.
- Monthly inspection and maintenance of all coastal safety signage.
- Annual inspection and clearing of localised beach sand movement as required to maintain beach accessibility.
- Undertake limestone hazard rectification works as required.
- 6-monthly visual inspections of beach accessway structures including 5-yearly structural condition assessments and report completed to enable targeted renewals of components and maintenance of assets.
- 6-monthly visual inspections of jetty structures and condition assessment by marine structural engineers as required.

There is no functional rating system currently in place. Assessment on functionality of the assets is based on historical knowledge and professional judgement of the asset. 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, recommendations resulting from coastline studies and assessed on need in accordance with the City's AM Policy.

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 demographics, consumer preferences and expectations, technological changes, economic factors, seasonal factors, climate change and sea level rise.

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 coastal facilities and assets particularly along the northern coastal corridor have been constructed and 'gifted' to the City through the land development process.

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

Providing additional access to coastal facilities to meet demand can be challenging due to the sensitive nature of the coastal foreshore dune systems. Identifying safe and suitable access locations to coastal facilities will require careful consideration in line with the City's Coastal Hazard Risk Management and Adaptation Plan (CHRMAP).

Demand management practices may also include a combination of non-asset solutions, insuring against risks and managing failures. Environmental/Climate and Technological changes are addressed through other City management plans, policies and management processes such as,

- Coastal Hazard Risk Management and Adaptation Plan (CHRMAP).
- State Planning Policy 2.6 – Coastal Planning (SPP 2.6) and the City's Local Planning Policy - Coastal Assets (LPP 4.21).
- Coastal monitoring program to monitor seasonal and long-term coastal erosion.
- Regular monitoring and performance assessments over time of coastal assets and quality of materials used.

1.5 Lifecycle Management Plan

What does it Cost?

Coastal management works associated with groynes, breakwaters and beach renourishment have been funded adequately from a funding reserve allocated specifically to address the management of these assets along the harsh coastal environment. Grant funding has also been available to supplement the cost of rehabilitation works to coastal protection infrastructure.

Funding for recreational assets built along the coast on the other hand is not funded through this funding reserve but competes for funding as part of annual budget deliberations. At this stage the renewal demand for these assets is adequately funded in the LTFP. Although asset condition assessments are conducted on these assets, the implementation of proactive planned maintenance on these assets require further consideration.

The forecast lifecycle costs necessary to provide the services covered by this CIAMP includes:

Lifecycle Activity & Costs	Financial Year (FY)				
	2026	2027	2028	2029	2030
Maintenance	$1.530M	$1.590M	$1.653M	$1.720M	$1.788M
Planned renewals				$0.500M	
Planned upgrades & acquisitions	$1.693M	$3.457M	$0.837M	$0.807M	$0.707M
Total	**$3.223M**	**$5.047M**	**$2.490M**	**$3.027M**	**$2.495M**

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.

The planned Two Rocks Beach Accessway project (FY 2027) includes assets not covered by the CIAMP (including stormwater drainage, road, fencing and a carpark). Assets not covered by the CIAMP will be assigned to their respective AM Plans following completion of construction.

1.6 Financial Summary

What we will do

It is considered that the current maintenance budget allocation and trends are adequate to meet the required 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 additional funding will be required to better manage coastal sites north of Quinns Rocks/Mindarie, such as Jindalee, Alkimos, Eglington, Yanchep and Two Rocks.

Coastal management works associated with groynes, breakwaters and beach renourishment will continue to be funded from the Coastal Infrastructure Management Reserve fund.

At this stage, the requirements of the CIAMP is expected to be fully funded within the LTFP at least for the next 5 years. This requirement will be reviewed following further studies to be undertaken at Jindalee, Alkimos, Eglington, Yanchep and Two Rocks beaches.

What we cannot do

At this stage there are activities that have not yet been considered which will require further budgetary consideration in future such as:

- Erosion north of the Two Rocks Marina which is dependent on State Government input.

- Resourcing and capacity issues for expansion of detailed coastal monitoring to the whole of the City's foreshore.
- Erosion in recently developed areas such as Alkimos and Eglington.

Managing the Risks

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

- Structural damage to coastal protection structures and threat to further erosion and property damage due to extreme storm events.
- Structural damage to marine jetties or unexpected accelerated deterioration of non-visible column supports below the water line.
- Damage to Quinns Beach Swimming Enclosure – loss of amenity.
- Inadequate or availability of beach safety warning and emergency signage resulting in public safety risks.
- Structural damage to beach access way structures – increasing public safety risks.
- Loss of beach accessibility due to erosion or sand drift at beach accessways.

The City will endeavor to manage these risks within available resourcing and funding by:

- Implementing the City's Coastal Monitoring Program encompassing 6-monthly survey and inspection, annual condition assessments and undertaking maintenance works as required.
- Engaging marine structural engineers as required to assess marine structures.
- Implementing a contract to manage the swimming enclosure over a 5-year period including fortnightly inspections, servicing, reinstating in October and removal in April.
- Monthly signage audits and undertake maintenance as required.
- Conducting 6-monthly visual inspections and 5-yearly condition assessment by structural engineering consultant on beach access way and viewing platform/lookout structures.
- Undertaking maintenance works as required to maintain accessibility at beach access ways.

1.7 Asset Management Planning Practices

Key assumptions made in this AM Plan are:

- Future coastal operation and maintenance budgets are assumed to be consistent and increase with expansion of coastal and marine asset portfolio.
- Forecasts have been made based on current asset database and accurate rates for replacement cost.
- The timing of capital renewals is derived from an estimate of remaining useful life of assets supplemented by a combination of regular asset condition assessments, expert knowledge and information available from the asset registers.

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 next steps resulting from this AM Plan to improve asset management practices are:

- Undertake regular audits on asset data inventory and condition assess all coastal assets not currently included in the AMIS including coastal retaining walls and improve data reliability and confidence.
- Expand coastal monitoring data collection, analysis and reporting to include developer managed areas and future areas of coastal vulnerability.
- Investigation and mapping of all Developer managed Coastal and Marine Assets (e.g. Shorehaven Limestone Seawall).
- Investigate long term budget requirements for coastal management based on CHRMAP recommendations, condition assessments and coastal monitoring recommendations to inform annual funding allocation to the Coastal Infrastructure Reserve.
- Investigate opportunities to capture and track detailed operational and maintenance expenditures for coastal works against coastal assets.
- Investigate the creation of maintenance specifications for new and existing assets, including frequency of inspections.
- Expand future community satisfaction surveys (Wanneroo Liveability Survey) to include feedback on asset performance specifically for coastal and marine facilities and assets. This will enable the City to measure its performance against community expectations and how customers value these assets.

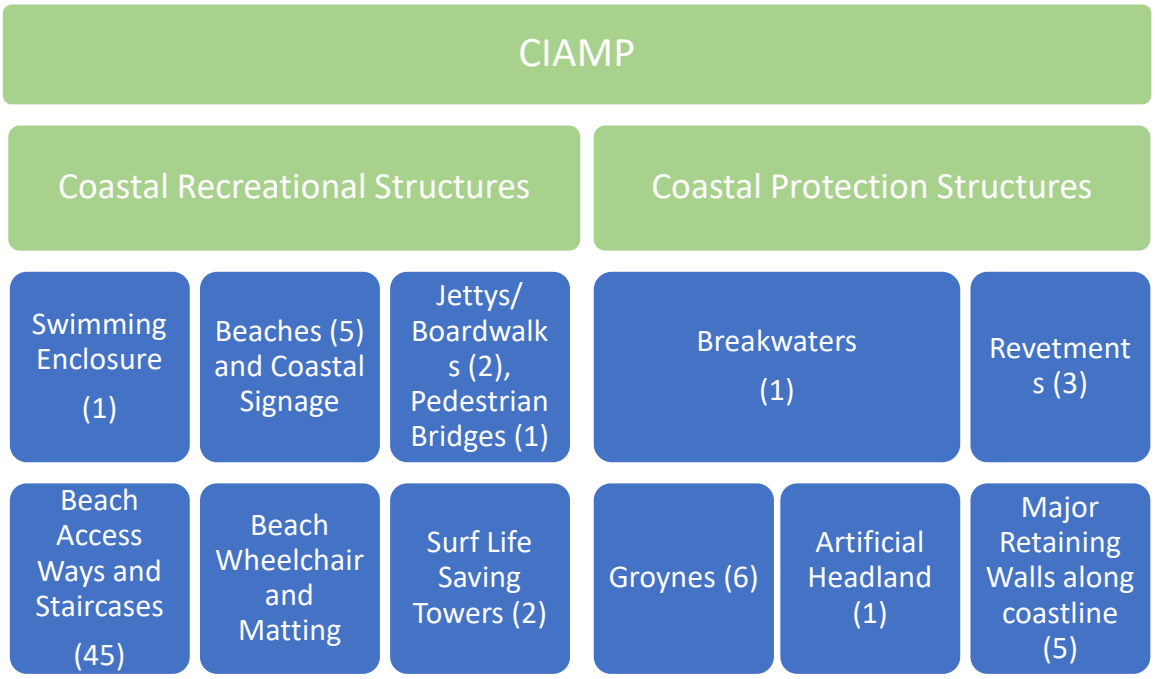
2. INTRODUCTION

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 Coastal Infrastructure AM Plan (CIAMP) focuses on the City's approach to the management of its coastal infrastructure assets and forms part of a suite of AM Plans for other asset categories namely, Transport Infrastructure, Stormwater Drainage, Buildings, Parks and Natural Areas. The CIAMP provides information on the state of coastal infrastructure 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 June 2024. The assets covered under this CIAMP are shown below. The total replacement value of these asset is $55.9M



The CIAMP 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 CIAMP is to document the measures currently taken by the City, or which need to be improved upon to ensure coastal infrastructure assets will:

- provide an appropriate level of service, safe access and accessibility for all users to coastal facilities at a cost that is affordable to the community, and
- continue to provide adequate protection to coastal facilities and that these assets are adequately maintained.

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 asset management 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 2.1 shows the key stakeholders in the preparation and implementation of this AM Plan:

Table 2.1: List of Key Stakeholders

Stakeholders	Description and Level of Involvement
Ratepayer groups and residents	Stakeholder consultation including Community Satisfaction Surveys and direct engagement with Resident's associations.
Quinns Beach Coastal Management Advisory Group	Group established in 2014 and assists with the development and implementation of coastal management options and community consultation for Quinns Beach Coastal Management.
Yanchep Coastal Management Advisory Group	Group established in December 2024 and assists with the development and implementation of coastal management options and community consultation for the Yanchep Coastal Management Study.
Coastal Hazard Risk Management and Adaptation Planning (CHRMAP) Forum (WALGA)	Forum run by WALGA including all coastal councils within WA to discuss CHRMAP development and implementation and all other coastal management and planning matters.
Northern Beaches Alliance	Knowledge sharing and collaboration of joint projects including coastal survey data capture and investigation into offshore sand sources for beach renourishment.

Stakeholders	Description and Level of Involvement
	Alliance includes City of Nedlands, Town of Cambridge, City of Stirling, City of Joondalup, City of Wanneroo and Shire of Gingin.
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.
CEO and Directors	Provide strategic direction and leadership for AM practices and associated decisions. Responsible for the development of AM Policy, AM Strategy and AM Plans.
Coastal Foreshore Working Group – Administration working group	Knowledge sharing and collaboration between internal City stakeholders involved in the planning, delivery and management of coastal areas and coastal assets. Makes recommendations to the AMSG relating to asset acquisition, operations, maintenance, rehabilitation, rationalisation and disposal.
Assets Maintenance (AMtce)	Inspect and maintain the City's coastal and marine assets to a safe standard, including the determination of technical levels of service and monitoring performance measures. Undertake survey, planning, design activities and deliver new, upgrade and renewal projects for coastal assets.
Asset Planning (APlan)	Management of infrastructure asset inventory data and asset condition assessments including coastal infrastructure. Long term planning and management of infrastructure assets, renewal demand modelling and long-term renewal budget analysis. Author and reviewer of the CIAMP.
Corporate Strategy and Performance Directorate	Long-term strategic and financial planning incorporating asset management principles.
Strategic Land Use Planning and Environment (SLUPE)	Author and reviewer of the Coastal Hazard Risk Management Adaptation Plan (CHRMAP) and Coastal Management Plan. Author and reviewer of the City's Local Planning Policy - Coastal Assets (LPP 4.21).
Community Facilities	Assist with coordination of coastal areas patrolled by Surf Life Saving WA and local surf clubs. Facilitates discussions with Surf Life Saving Clubs and provides feedback as a key internal stakeholder regarding the maintenance and installation of Patrol towers, Swimming Enclosure, Beach Cleaning activities and Beach Matting.
Land Development (LDev)	Identifies coastal asset requirements for new developments. Assesses, determines, audits and accepts the handover of new coastal assets from land developers. Manages the review, provision of City feedback and approval of foreshore management plans (FMP's) proposed by developers for coastal foreshores within new developments.

Stakeholders	Description and Level of Involvement
	Manages the review and provision of City feedback for land developer monitoring reports for coastal foreshore with approved management plans.
Property Services (PServ)	Manage the property management requirements of the City's Leased Areas portfolio (includes leased areas that contain coastal assets). Granting and monitoring of leases.
Local Government Authorities (LGA's) (e.g. City of Joondalup)	On-going stakeholder consultation coordinated maintenance activities and agreed management objectives of coastal and marine assets present across Local Government boundaries.
Mindarie Marina Operator	On-going consultation regarding coordinated maintenance activities and agreed management objectives of shared-responsibility assets.
State Government Agencies • Dept of Transport (DoT) • Dept of Planning, Land and Heritage (DPLH) • Dept of Biodiversity, Conservation and Attractions (DBCA) • Dept of Water and Environmental Regulation (DWER)	Funding assistance, provision of advice and the development of relevant standards and legislation for coastal and marine assets. Coordinated maintenance and management of abutting coastal and marine assets that are managed by State Agencies and the City respectively. DoT – Delivers services allowing the community the safe enjoyment of waterways and grows the State's economy with the development and management of coastal infrastructure. Provides technical and financial assistance for coastal engineering and management projects. DPLH - Planning and managing the State's land and heritage. Provides technical and financial assistance for coastal projects. DBCA – Planning for the conservation and protection of the WA's marine environments, including the expansion of Marmion Marine Park. DWER - Manages and regulates the State's environmental and water resources, including coastal and marine flora.
Federal Government – • Department of Climate Change, Energy, the Environment and Water (DCCEEW) • National Emergency Management Agency (N EMA)	DCCEEW - Development of relevant advice, standards, guidelines and legislation for coastal and marine areas containing Matters of National Environmental Significance (MNES), including threatened species and migratory species. NEMA - Provides financial assistance for coastal projects.
Contractors / Consultants / Suppliers	External providers of goods and services for the maintenance and management of coastal and marine assets.

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 revision of this plan. The levels of service and performance measures identified in the CIAMP

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,
- strategic objectives,
- 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.

The primary objective of the assets within this CIAMP is that they are suitably managed to provide valued services to the community, visitors and the environment. The following tables describes the service levels and performance measures:

3.1 Strategic and Corporate Goals

The CIAMP is aligned with the goals and priorities of the City's Strategic Community Plan (SCP) as shown in Table 3.1:

Table 3.1: Alignment to Strategic Community Plan Goals

Goal	Priority	How Goal and Objectives are addressed in the CIAMP
1. An inclusive and accessible city with places and spaces that embrace all	1.2. Value public places and spaces	Provision of new, upgraded and renewed coastal assets that provide opportunities for recreational pursuits along the City's coastlines. The design process and materials used in coastal projects will be suitable for coastal conditions, compliment the surrounding environment as best as possible and be suitably located for recreational use and coastal conditions.
	1.3. Facilities and activities for all	Undertake coastal and marine asset analysis across the City's coastline to determine future asset needs. Provision of adequate funding towards coastal and marine assets to meet the growth of the community, including seeking grants and developer contributions. Provide adequate funding and resources for maintenance, upgrade and renewal of existing coastal and marine assets.
4. A sustainable City that	4.1. Plan for climate change	Implement the City's Coastal Hazard Risk Management and Adaptation Plan (CHRMAP).

Goal	Priority	How Goal and Objectives are addressed in the CIAMP
balances the relationship between urban growth and the environment		Implement State Planning Policy 2.6 – Coastal Planning (SPP 2.6) and the City's Local Planning Policy - Coastal Assets (LPP 4.21) for new assets within the foreshore reserve and ensure Developer built assets also comply with these requirements. Implement the City's coastal monitoring programme including aerial coastal surveys to monitor long-term erosion. Undertake regular sand renourishment and beach scraping at identified locations along the City's coastline. Investigate alternative materials and investigate design and construction methodologies to incorporate resilience.
	4.2. Manage and protect local Biodiversity	New, upgrade and renewal projects for coastal and marine assets acknowledge the sensitive environments in which they are located. Construction works for coastal and marine assets adhere to conditions and requirements limiting negative impact(s) to these environments. Areas temporarily impacted by City coastal and marine asset projects and maintenance works will be revegetated with suitable coastal species.
	4.3. Manage natural assets and resources	Undertake regular sand renourishment along the City's coastlines to ensure recreational use of the City's beaches is available.
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	Monitor the usage of coastal assets providing a recreational function to ensure that the existing asset meets the changing needs of the community.
	5.3. Manage and maintain assets	Coastal and marine asset data collection and validation, including the 5- yearly coastal and marine asset assessments. Coastal monitoring to establish baseline and long-term data to inform the City's capital works, maintenance and management programs. New, upgrade and renewal projects for coastal and marine assets. Planning, scheduling and undertaking on-ground maintenance and management activities on coastal and marine assets. Undertake prompt repairs and maintenance of damaged coastal and marine assets.
6. A future focused City that advocates,	6.2. Actively seek to engage	Provide improved opportunities for community and stakeholder engagement across traditional and digital engagement options.

Goal	Priority	How Goal and Objectives are addressed in the CIAMP
engages and partners to progress the priorities of the community		Conduct community and key stakeholder engagement (including Community Advisory Groups) during the planning and implementation of new, upgrade and renewal coastal and marine projects. Maintain the Coastal Foreshore Working Group to ensure the efficient delivery of Capital Works and maintenance of the City's marine and coastal assets.
	6.3. Build local partnerships and work together with others	Compliance with, and administration of State and Federal legislation for the maintenance and management of coastal and marine assets. Advocacy and participation in stakeholder consultation regarding the development and/or review of State agency documentation affecting coastal and marine assets and the environment in which they are located. Advocacy for optimal outcomes in coastal and marine areas. Participate in the Northern Beaches Alliance to ensure optimal outcomes for coastal and marine opportunities and issues.
	6.4. Understand our stakeholders and their needs	Conduct community and key stakeholder engagement during the planning and implementation of new, upgrade and renewal coastal and marine 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	Complete asset inspections and assessments to inform the development of new, upgrade and renewal coastal and marine projects within the City's LTFP.

3.2 Legislative Requirements and Industry Standards

Legislative requirements and industry standards that impact the delivery of coastal and marine asset services are outlined in Table 3.2.

Table 3.2: Legislative Requirements and Industry Standards

Legislation / Industry Standard	Requirement
Aboriginal Heritage Act 1972	Conserves registered places and provides protection or Aboriginal Sites and objects.

Legislation / Industry Standard	Requirement
Australian Standards	Local government duty of care to ensure that the minimum established industry standards are met.
Biodiversity Conservation Act 2016	Provides for the conservation and protection of Western Australian biodiversity (inclusive of flora and fauna) and biodiversity components and the ecological sustainable use of biodiversity components.
Building Act 2011 and relevant Regulations	Legislates the building approvals process. A building approval is required for the construction of certain types of infrastructure assets within coastal areas including retaining walls, boardwalks, staircases, lookouts etc.
CHRMAP Guidelines 2014	Provides guidance to support the implementation of SPP 2.6 by assisting statutory decision-makers, landholders and those conducting investigations on their behalf in developing and implementing effective CHRMAP
Conservation and Land Management Act 1984	Provisions for the use, protection and management of certain public lands and waters and the flora and fauna therein. E.g. National Parks, Nature Reserves, Marine protected lands under the management of Conservation Commission etc.
Disability Discrimination Act 1992	Provides protection against discrimination based on disability, in this case access to facilities.
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act 1999) and relevant Regulations 2000	The EPBC Act provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places defined in the Act as matters of national environmental significance. Regulates activities that are likely to have a significant impact on nationally protected matters Establishes the National Heritage List which includes natural, indigenous and historical places on Commonwealth lands and waters or under Australian Government control that are of outstanding heritage value to the nation.
Environmental Protection Act 1986 and relevant Regulations 2004	The Act provides for the prevention, control and abatement of pollution and environmental harm, for the conservation, preservation, protection, enhancement and management of the environment and for matters incidental to or connected with the foregoing.
Fish Resources Management Act 1994	The Act is the primary State legislation regulating the management of, and utilisations and conservation of fish (which includes all aquatic organisms except reptiles, birds, mammals, and amphibians) and their habitat.
Heritage Act 2018	Recognises the importance and promotes understanding and appreciation of WA cultural heritage. Identifies and documents places of cultural heritage significance and for the conservation, use, development and adaptation of such places.
Land Administration Act 1997	Provision for dealing with the management of the State's Crown Land, including the creation, administration and management of reserves over Crown land/waters.
Liveable Neighbourhoods	State Planning guidelines for urban development requirements.
Local Government Act 1995 and relevant Regulations	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 asset management plans for sustainable service delivery
Marine and Harbours Act 1981	Provides for the advancement of efficient and safe shipping and effective boating and port administration through the provision of

Legislation / Industry Standard	Requirement
	certain facilities and services, and for incidental and connected purposes.
State Planning Policy No.2.6 - State Coastal Planning Policy (SPP 2.6) and Guidelines	Provides statutory guidance and informs matters related to sustainable coastal land use and development.
Coastal Engineering Manual (USACE 2002)	Provides coastal engineering guidelines for all coastal management activities including design and construction of coastal protective structures, beach access and beach renourishment.

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 3.3.

Table 3.3: 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 3.4 under each of the service measure 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 3.4: 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 last a long time with selection of material used that are not susceptible to corrosion within the coastal environment. Asset are inspected regularly, maintenance requirements identified, rectified promptly and completed to a high quality and safety standard	Critical coastal infrastructure are identified and inspected annually, 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. Structural condition assessments of critical assets are conducted every 5 years and components renewed as required within current resourcing limitations. Where maintenance is considered no longer viable, these assets are listed and prioritised for renewal in Capital Work Program.	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 budget planning process.
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 Coastal Management Plan with consideration to the City's SCP goals.	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.	Extend condition assessment of assets from just physical condition of the assets to include functionality and capacity criteria.

Type of Measure	Community Level of Service	Performance Measure	Current Performance	Expected Trend Based on Planned Budget
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 such as the Coastal Management Plan and the CHRMAP.	Renewal of assets are upgraded where deemed required with considerations to cater for increase 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.

3.5 Technical Levels of Service

Technical Levels of Service detail what the City does to deliver its services in accordance with set levels of service. Assets are managed with consideration to whole-of-life costs to ensure the best value for resources used. Current performance is based on existing resource provision and work efficiencies. It is acknowledged circumstances such as technology and customer priorities will change over time. Technical service measures are linked to the asset lifecycle activities and annual budgets and the details of each are shown below.

Table 1: Technical Levels of Service

Lifecycle Activity	Purpose of Activity	Activity Measure	Current Performance	Recommended Performance
Acquisition	Acquire coastal assets from Developers.	Adherence to Foreshore Management Plan (FMP) guidelines.	Assessment of proposals against FMP	Review FMP regularly taking into consideration issues experienced.
		Adherence to Development Application (DA) conditions of approval.	Assessment of proposals against DA conditions.	Ensure review of DA documentation.
		Compliance to approvals and undertake Practical Completion (PC) and collection of as-constructed asset data.	PC's completed with asset data not being provided on occasions	Review PC inspection process and consider inclusion of detailed review of construction documentation such as structural certification and material specifications.

Lifecycle Activity	Purpose of Activity	Activity Measure	Current Performance	Recommended Performance
Acquisition (cont'd)	Acquire coastal assets from Developers (cont'd)	Negotiate developer maintenance period prior to handover to the City (currently 5-year maintenance period). Undertake handover inspections.	Handovers are completed with asset data not being provided on occasions.	Review handover process and consider structural engineering assessment of high-risk structures prior to acceptance.
	Provision of new or upgrade of assets	Undertake needs assessment in accordance with AM Policy. Undertake planning and community consultation in accordance with Community Engagement Policy. Prepare project mandates and seek approval for budget allocations.	Projects are listed and prioritised in the draft 20-year Long-term Capital Works Program to inform the LTFP. Prioritisation currently made at officer and executive level.	Establish assessment criteria to objectively prioritise projects against corporate objectives and alignment to AM Policy. Review and update Coastal Management Plan to address the provision of a greater variety of coastal facilities and asset needs.
Operations and Maintenance	Monitor coast and beach conditions and the effects of coastal actions.	Undertake coastal monitoring program and reporting Undertake regular asset condition assessments.	Coastal monitoring program (6-monthly monitoring and reporting). Coastal Protective Structure condition assessments completed on an annual basis. Coastal limestone hazard assessments of entire 32kms of City coastline (technical assessment every 10 years and annual inspections).	Increase and formalise monitoring for post storm impacts. Inclusion of additional sites within the monitoring program including developer managed areas.
		Maintain coastal protective infrastructure	Maintenance of coastal structures within available operational budgets based on condition assessments and inspections	No improvements identified at this stage
		Maintenance of beach assets to improve accessibility and minimise erosion impacts.	Beach scraping undertaken two (2) times per year at the Quinns Rocks Dog beach based on coastal monitoring recommendations.	Investigate other sites for beach maintenance works based on long term and seasonal changes.

Lifecycle Activity	Purpose of Activity	Activity Measure	Current Performance	Recommended Performance
			Annual beach renourishment (up to 10,000m^3) undertaken at Quinns Beach and Yanchep Lagoon based on coastal monitoring recommendations.	
Operations and Maintenance (cont'd)	Maintain safe beach swimming conditions at selected beaches	Servicing of the Quinns Beach swimming enclosure.	Fortnightly inspection and servicing. Enclosure installed over summer periods. Reinstated in October and removed in April.	No improvements identified at this stage.
		Inspections and servicing of surf lifesaving patrol towers at Quinns/Mindarie Beach and Yanchep Beach.	Monthly inspection, and servicing. Towers reinstated in October and removed in April.	Investigate the need for additional patrol towers in other locations such as Alkimos and modifications at Quinns Beach and Yanchep to avoid the need for removal over winter.
	Beach Wheelchair access to beach	Installation of beach matting for beach wheelchair at Quinns/Mindarie Beach.	Beach matting installation in October and removal in April.	No improvements identified at this stage
	Clean Beaches	Undertake beach cleaning and sweeping during summer seasons.	Fortnightly cleaning of beaches between October and April at Yanchep Lagoon Beach; Shorehaven Beach; Eden Beach; Quinns/Mindarie Beach; and Alkimos Beach.	Review and expand beach cleaning to new locations as required.
	Maintain beach safety signage	Undertake regular inspections and repairs.	Monthly inspection and maintenance of all coastal safety signage.	No improvements identified at this stage
	Maintain safe and functional access to the City's beaches	Undertake regular condition assessments and maintenance of beach access ways and structures.	6-monthly inspections. Clearing of localised beach sand movement as required to maintain beach accessibility. Undertake limestone hazard rectification works as required.	Increase frequency of inspections over summer months.

Lifecycle Activity	Purpose of Activity	Activity Measure	Current Performance	Recommended Performance
			Undertake beach access maintenance works as required.	
		Structural condition assessment and asset inspection of beach access structures	5-yearly beach access asset structural condition assessments and condition report completed to enable targeted renewals of components and maintenance of assets.	No improvements identified at this stage.
Operations and Maintenance (cont'd)	Maintain marina jetty assets.	Structural condition assessment and asset inspection of jetty structures	6-monthly internal inspections and condition assessment as required by marine structural engineers.	Investigate renewal options/requirements for aging marina jetty infrastructure.
Renewal	Beach Access Way Renewal and Upgrade Program	5-yearly beach access asset condition assessments.	Beach access renewal projects are undertaken annually part of the City's capital works program. Priority for renewal works are based on recommendations from a 5-yearly beach access condition assessment undertaken by structural engineering consultants.	No improvements identified at this stage.
	Larger scale maintenance / upgrade activities and works on coastal protective structures.	As part of the annual condition assessments and the City's coastal monitoring program, critical maintenance works outside of the capacity of regular maintenance are identified and scheduled.	Annual condition assessments undertaken by the City's coastal engineers or site-specific coastal management studies undertaken by coastal engineering consultants. Larger scale maintenance and upgrade of coastal protective structures are planned and listed in the City's capital works program.	No improvements identified at this stage.
	Renewal of Surf Lifesaving Towers and Swimming Enclosure	Condition and performance of these assets undertake regularly to ensure continued service.	Assets inspection and requirement for renewal monitored annually. Schedule renewal budget allocation on the Capital Works Program based on predicted end of life.	No improvements identified at this stage.

Lifecycle Activity	Purpose of Activity	Activity Measure	Current Performance	Recommended Performance
	Beach Chair and Beach Matting renewals	Condition and performance of these assets undertake regularly to ensure continued service.	Operational assets repaired as necessary and replaced through operational budgets as required.	No improvements identified at this stage.
	Management of coastal effects at other coastal areas	Coastal Engineering investigations and/or coastal management studies.	Consultancies procured to undertake studies and make recommendations.	No improvements identified at this stage.

4. FUTURE DEMAND

4.1 Demand Drivers

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

4.2 Demand 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 future demand requirements. Demand management practices include non-asset solutions, insuring against risks and managing failures. Where there 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.

Acquiring new assets will commit the City to ongoing operations, maintenance and renewal costs for the period that the service provided from the assets is required. These future costs are identified and considered in developing forecasts of future operations, maintenance and renewal costs for inclusion in the LTFP.

The impacts of demand drivers that may impact future service delivery and utilisation of assets are documented in Table 4.1.

Table 4.1: Demand Management Plan

Demand driver group	Driver and projection	Impact on services	Demand management plan
Political	State and Federal funded initiatives for infrastructure projects in-line with the associated political election cycles.	Changed priorities and reallocation of resources and rescheduling of capital works to accommodate additional funding. There will be impacts staff workloads and increases to ongoing operating and maintenance expenses.	Review Capital Works Program annually to enable adjustments and changes to priorities. Early identification of major infrastructure projects that would attract politically driven funding and advocate for these.

Demand driver group	Driver and projection	Impact on services	Demand management plan
			Undertake pre-planning activities in preparation of potential grants.
Social	Population growth from 243,013 in 2025 to a projected figure of 437,016 in 2046. Also combined with above average percentages of children 0-18 years and elderly residents (over 65-year-olds) will increase demand for improved access to coastal facilities.	Increased demand for additional coastal facilities and improved access to existing coastal facilities. Increased demand on accessible infrastructure to coastal facilities	Review of the Coastal Management Plan to cater for growth. Undertake coastal studies to determine suitability of the additional coastal facilities along the coastline. Develop coastal facilities that are accessible friendly and upgrade existing access to coastal facilities to accommodate accessibility requirements where practical.
Social	Additional coastal facilities and infrastructure built by developers along the northern coastal corridor traditionally at a much higher level of service requirement.	Increased operational and maintenance cost associated with gifted coastal facilities and infrastructure. Increased inspections and monitoring of asset condition and performance. Increased funding required to renew assets in the future.	Ensure high standards of assets provision to ensure asset longevity and performance. Negotiate for an increased period of maintenance prior to hand over to the City. Recognise the value of the asset. Ensure adequate funding and resourcing allocation for the ongoing maintenance and asset performance monitoring. Monitor asset degradation and financially plan for the asset's eventual replacement.
Social	Opportunity for coastal facilities to accommodate a variety of recreational activities such as fishing platforms and jetties, boat launching ramps, dog beaches, beach wheelchair access, etc.	Increased infrastructure funding investment. Increased in operating costs. Increased risk exposures.	Review of Coastal Management Plan and Policies associated with locating coastal activities at suitable locations. Undertake studies as required to facilitate the suitability to accommodate the activity and the provision of associated assets.

Demand driver group	Driver and projection	Impact on services	Demand management plan
Environmental/ Climate Change	Mediterranean climate 13-25℃ with hot, dry summers and mild, wet winters. More frequent and stronger storm/weather events, increasing temperatures, rising sea levels and storm surges.	Increasing temperatures will increase demand and visitation to coastal locations, beaches and associated assets and services. Existing services may require amendment to cater for changes in impact of sea level rise and storm impact. Increased wind speeds, increased erosion, damage to structures, wave action/overtopping flooding to coastal areas and loss of beach or reduced beach or foreshore reserve width due to coastal erosion. Potentially more localised flooding in coastal areas, traffic hinderance and safety.	Implement the City's Coastal Hazard Risk Management and Adaptation Plan (CHRMAP). Implement State Planning Policy 2.6 – Coastal Planning (SPP 2.6) and the City's Local Planning Policy - Coastal Assets (LPP 4.21) for new assets within the foreshore reserve. Continue implementing and improving on the City's long term coastal erosion monitoring programme. Continue beach renourishment along the City's priority coastal areas. Investigate the use of offshore sand for beach renourishment over the long term. Review City insurance policies to ensure they adequately address climate change risks. Continue to undertake asset condition assessments of coastal infrastructure. Incorporate sea level rise projections into the design of all coastal assets including coastal protective structures and beach accessways.
Environmental/ Climate Change	Increased temperature. Hotter temperature during the day and consecutive hot days, increased potential for bushfires.	Damage to structures, inability to utilise asset due to material surface temperature, concerns regarding pavement integrity and increased demand to provide cooling and respite during heat waves.	Investigate alternative materials and investigate design and construction methodologies to incorporate and increase resilience.
Technological	Investigating, and shifting from	Use of alternative materials/techniques	Monitor and assess proposed changes for impacts on

Demand driver group	Driver and projection	Impact on services	Demand management plan
	traditional materials to materials with long asset life cycles.	Improved effectiveness and reduced lifecycle costs.	construction and maintenance costs. Monitor and assess proposed changes for increased asset lifecycle and improved resilience.

5. LIFECYCLE MANAGEMENT PLAN

5.1 Background Data

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.

Coastal assets present along the City's 32km's of coastline include:

- Coastal Protection Structures – asset that provide protection to the coastline from the impacts of coastal processes, and
- Coastal Recreational Structures – assets that provide the community opportunities to access beaches and marine waters to undertake recreational pursuits.

Due to the nature of the coastal environment in which they are located, these assets are regularly inspected and assessed to determine short and long-term maintenance and renewal requirements.

The core asset data shown in this CIAMP provides the baseline for growth and asset renewal demand predictions to be generated and is used to inform the City's annual budget and LTFP development. This data used to compile this AM Plan is stored separately in the City's document management system. Until such time a major review of this plan is undertaken, the data and asset performance predictions are updated annually outside of this AM Plan to inform and update subsequent capital budgets and the LTFP.

The assets covered by the CIAMP are shown in Table 5.1.

Table 5.1: Details of assets covered by this Plan

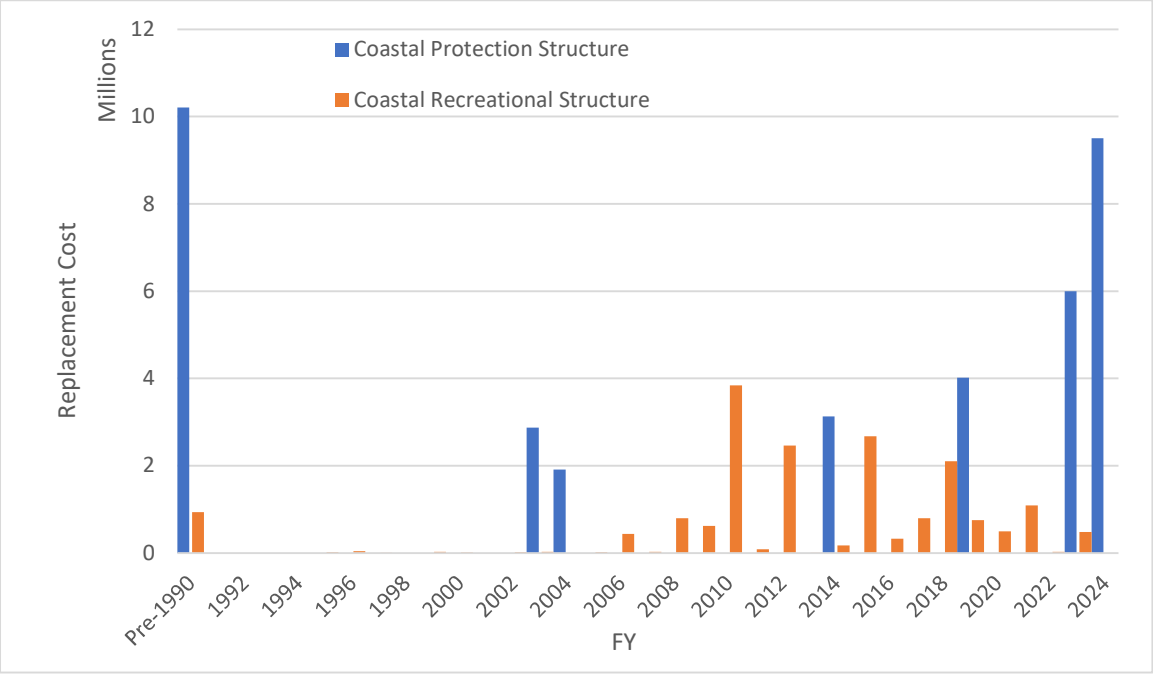
Asset Category	Asset Type	Quantity	Dimensions	Replacement Value
Coastal Protection Structures	Groynes / Artificial Headland (7 sites)	7	Item	$ 17M
	Breakwaters (1 site)	1	Item	$ 19M
	Revetment (3 sites)	3	item	$ 1.6M
Coastal Recreational Structures	Swimming Enclosure (1 site)	1	Item	$ 500,000
	Jetty/Boardwalks/Pedestrian Bridge/Lookout Structures	9	Item	$ 2.5M
	Surf Life Saving Observation Towers (2 sites)	2	Item	$ 100,000
	Beach Access Way (includes built staircase structures)	4,900	Metres	$ 14.5M
	Beach Matting (1 site)	120	Square metres	Operational Maintenance cost only
	Beach Wheelchair (1 site)	1	Each	Operational Maintenance cost only

Asset Category	Asset Type	Quantity	Dimensions	Replacement Value
	Coastal Beach Signage	152	Each	Operational Maintenance cost only
	BEN Signs	64	Each	Operational Maintenance cost only
	Beaches subject to mechanical cleaning* (5 sites)	29,000	Sqm	Operational Maintenance cost only
	Coastline / Beaches	32	Kms	Operational Maintenance cost only
	Major Coastal Retaining Walls	Data not currently available	Metres	Operational Maintenance cost only

5.2 Age Profile

The age profile of coastal assets is shown in Figure 1.

Figure 1: Asset Age Profile – Coastal Assets



The age profiles chart above provides an indication of the growth periods experienced with coastal recreational structures becoming more prominent over the last 10 to 20 years with the development of the Northern Coastal Corridor. Increased community demand for improved coastal facilities and access to beaches has resulted in the upgrading of sand tracks to more formal beach access ways with staircases and viewing platforms/lookouts. Additional coastal facilities have also been constructed by developers as part of subdivisional developments along the coast.

The City's capital injection has mainly been expended on the rehabilitation of the coastal protection structures such as Mindarie Breakwater (in 2024) and four (4) Quinns Beach groynes (in 2018-2021) and the upgrading of old beach access ways and staircases. With respect to coastal protection structures, it is unlikely that these structures will be left to deteriorate to a point where a total reconstruction be undertaken. Due to the nature of these assets, their condition and performance are closely monitored regularly and are rehabilitated on an ongoing basis as the need arise.

5.3 Condition Profile

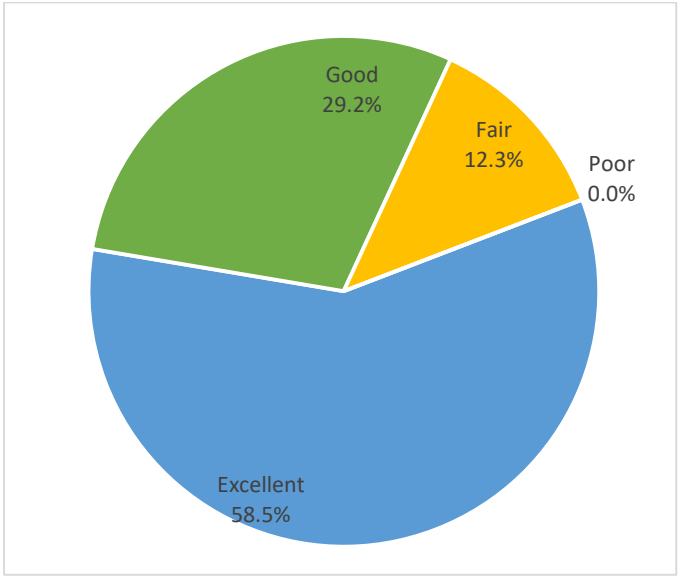
Condition of assets is measured using a 1 – 5 grading system as detailed in Table 5.2. It is important that a consistent approach is used in reporting asset performance enabling effective decision support. A finer grading system of 1 - 10 for structural assets and 0-6 for coastal protective structures is used operationally, however, for reporting in the AM Plan results are translated to a 1 – 5 grading scale for ease of communication.

Table 5.2: Asset Condition Grading System

Condition Grading	Description of Condition	Equivalent Grading at 1 -10
1	**Very Good**: free of defects, only planned and/or routine maintenance required	0 - 2
2	**Good**: minor defects, increasing maintenance required plus planned maintenance	2 - 5
3	**Fair**: defects requiring regular and/or significant maintenance to reinstate service	5 - 7
4	**Poor**: significant defects, higher order cost intervention likely	7 - 8
5	**Very Poor**: physically unsound and/or beyond rehabilitation, immediate action required	8 - 9

The condition profile of coastal assets is shown in Figure 2.

Figure 1: Asset Condition Profile – Coastal Assets



Condition	Replacement Cost ($)
Excellent	32,685,958
Good	16,330,187
Fair	6,880,000
Poor	0
Grand Total	**55,896,145**

The City currently undertakes condition assessments on its assets on a periodic basis. These are undertaken to enable predictions to be made on their expected renewal timeframe and their long-term financial requirements. Condition assessments are also used to verify and/or determine the actual condition of the assets to ensure that renewals are only considered if they are deemed necessary. This data is also used to validate the asset useful life predicted for the various asset types.

The City currently has two (2) formal scheduled condition assessment audits undertaken by consultants as part of the operating budget:

- Data validation and structural condition assessment of coastal recreational structures, and
- Coastal monitoring and condition assessment of coastal protection structures.

The details and frequency of condition assessments are as described in Table 5.3.

Table 5.3: Assets Condition Assessment Cycles

Asset type	Condition Assessment cycle (years)	Comments
Coastal Protection Structures – Breakwater, Groynes and Revetment Walls.	6-monthly inspection and annual condition assessment.	Assessments conducted in accordance with the City's Coastal Monitoring Program. Coastal limestone hazard assessments of the City's entire 32km of coastline (technical assessment every 10 years and annual inspections).
Beaches	6-monthly assessment.	Assessments conducted in accordance with the City's Coastal Monitoring Program, including coastal surveys and aerial imagery of 32kms of City managed coastline and photographic monitoring of selected sites.
Beach Access Structures – Viewing Platform/Lookout, Staircase, Pedestrian Bridge	Visual Assessment – 6-monthly cycle Structural Assessment – 5-year cycle	Visual inspection conducted by internal officers while Structural Assessment are conducted by structural engineers.
Jetty (marina environment)	Visual Assessment – 6-monthly cycle	Visual inspection conducted by internal officers and structural assessments conducted by marine structural engineers as required.
Beach Access Ways	6-monthly cycle	Sand clearing conducted as required as part of 6-monthly inspection program.

Swimming Enclosure	1-year cycle as part of seasonal use.	Fortnightly servicing inspection completed by contractor as part of seasonal installation and removal contract.
Surf Life Saving Patrol Towers	1-year cycle as part of seasonal use.	Monthly servicing inspection completed by contractor as part of seasonal installation and removal contract.
Operational assets – Beach Wheelchair, Beach matting	1-year cycle as part of seasonal use.	Inspection and performance of assets assessed as part of operating the asset.

5.4 Operations and Maintenance Plan

Operations include regular activities to provide services. These include cleaning assets, beach renourishment and scraping, beach access way sweeping, asset inspections and monitoring asset performance.

Maintenance includes all actions necessary for retaining an asset as near as practicable to an appropriate service condition including regular ongoing day-to-day work necessary to keep assets operating. Maintenance activities for coastal assets include the following:

- Coastal protective structures (rock): monitoring and condition assessments, reworking existing displaced rock armour, import and placement of new rock armour and repairs to trafficable surface (e.g. crushed limestone).
- Coastal protective structures, Geosynthetic Sand Container (GSC): monitoring and condition assessments, patching of vandalized or damaged GSCs and graffiti cleaning.
- Beach Accessways: monitoring and condition assessments, tightening fixings, sanding and recoating timber or corroded materials, repairs to concrete, asphalt, crushed limestone or Emulsion Stabilised Limestone (ESL).
- Jetty Structures: monitoring and condition assessments, tightening fixings, sanding and recoating timber or corroded materials, replacement of decking boards.

  Jetty maintenance works within the Mindarie Marina is a joint management responsibility between the City and Mindarie Marina. There is a cost sharing agreement in place where approval is required prior to procurement and maintenance works.
- Beaches: beach scraping, beach cleaning and beach renourishment.

  Beach scraping (500 to 1,000m^3) is undertaken two times per year at the Quinns Dog Beach based on coastal monitoring recommendations. Annual beach renourishment (up to 10,000m3) is undertaken at Quinns Beach and Yanchep Lagoon based on coastal monitoring recommendations.
- Limestone retaining walls: Visual Inspections on integrity of wall with assistance from structural engineers as required.
- Other Beach Structures: monitoring and monthly servicing, replacement of damaged components, scheduled removal in April and installation in October to avoid winter conditions.

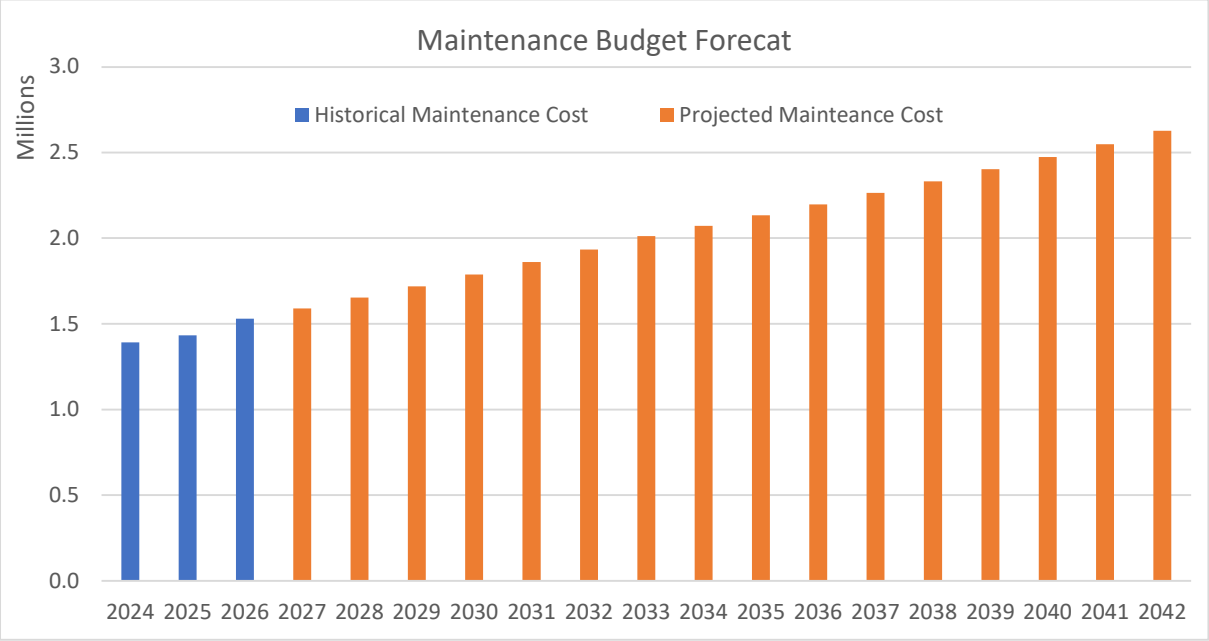
The trend in maintenance budgets is shown in Table 5.4.

Table 5.4: Maintenance Budget Trends

Year	Maintenance Budget $
2023-2024	$1,392,000
2024-2025	$1,432.000
2025-2026	$1,529,000

It is considered that the current maintenance budget allocation and trends are adequate to meet the required service levels, which may be less than or equal to current service levels. Forecast operations and maintenance costs are expected to vary in relation to the total value of the asset stock. Figure 3 shows the predicted forecast operations and maintenance costs with increases based on historical trends.

Figure 3: Forecast of operations and maintenance costs



All figure values are shown in current day dollars and do not account for an increase in assets from Developers (gifted assets) and future impacts related to climate change.

5.5 Renewal Plan

Renewal is major capital work which does not significantly alter the original service provided by the asset, but restores, rehabilitates, replaces or renews an existing asset to its original service potential. Work over and above restoring an asset to original service potential is considered to be a new acquisition or upgrade resulting in additional future operations and maintenance costs.

Asset condition assessment ratings are used to determine the asset's remaining useful life and to enable predictions to be made as to when renewal budgets are required for their eventual replacement. Current renewal performance levels, based on past budget limitations, have been limited to renewing assets at a poor to very poor condition on a priority basis and

sometimes at failure. Extending and prolonging the life of assets wherever possible through increased maintenance to keep the asset safe.

The estimates for useful life and renewal timeframes have been derived from a combination of information gathered from industry recommendations, asset valuations, experience and professional judgement with consideration to local conditions. The useful lives of assets are used to develop projected long-term renewal demand predictions. The useful lives for this CIAMP are shown in Table 5.5. These useful life figures are reviewed from time to time as more reliable information on their expected lifespan become available.

Table 5.5: Useful Lives of Assets

Asset (Sub)Category	Useful life
Groynes	50 years
Breakwaters	50 years
Jetties	25 years
Revetment Wall	The Geosynthetic Sand Container (GSC) sandbag layer has a lesser life expectancy of 10-15 years. However, with a monitoring and inspection programme, regular maintenance repairs and replacement of damaged sandbags, the sandbag layer could continue to function effectively for a long time potentially extending the useful life to 20 years.
Swimming Enclosure	The netting component of the enclosure – 5 years The anchor points along the ocean bed are expected to last 25 years
Pedestrian Bridge (Compass Circle, Yanchep)	25 years
Limestone Block retaining Walls (major)	50 years
Note: Design lives of coastal structures are generally set at is 40 to 50 years. However, in practice with an ongoing inspection and maintenance program, their useful live will likely extend beyond this timeframe. Useful lives are reviewed when more accurate life expectancies are experienced.	
Surf Life Saving Club Towers	10 years – subject to usage and maintenance regime
Beach Matting	5 years – subject to usage and maintenance regime
Beach Wheelchair	5 years – subject to usage and maintenance regime
Beach Access Structures (various material types including Fibre Reinforced Plastics (FRP))	25 years (beach access elevated structures only – such as staircases, viewing platforms/lookouts and boardwalks)
Beach Access Way – concrete surfaces	50 years
Beaches	Not applicable

Asset renewal is typically undertaken to either:

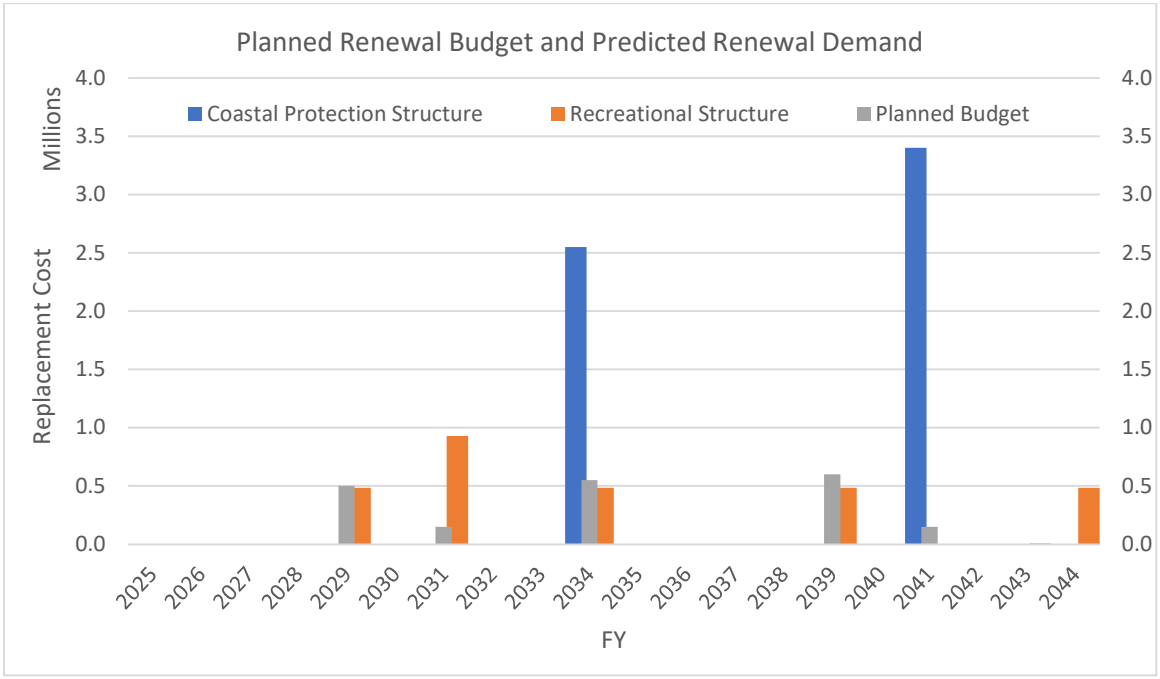
- ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate, or
- to ensure the infrastructure is of sufficient quality to meet the service requirements.

Renewal of assets are prioritised by identifying assets that:

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

The planned renewal budget and predicted long-term renewal requirement for coastal infrastructure assets is shown in Figure 4.

Figure 4: Planned and forecast of future renewal costs



The renewal predictions shown for recreational structures are mainly associated with the swimming enclosure which is scheduled to be replaced once every 5 to 6 years. The predicted renewal in 2031 is associated with the renewal of a beach access way and staircase. The existing beach access way is scheduled to be upgraded.

The two (2) significant spikes in renewals predicted in 2034 and 2041 are associated with the coastal protection structures in Yanchep Beach and Quinns Beach respectively. These renewals are subject to the outcomes of the Yanchep Coastal Management Study (2025/2026) and review of Quinns Beach Coastal Management measures (proposed for 2030/31). For coastal protection structures such as breakwaters, groynes and GSC revetment sandbags, it is unlikely that these assets will be left to deteriorate to a point of total replacement. These critical assets tend to require regular inspections and maintenance to ensure they continue to function as intended. Large scale maintenance of a capital nature is often required and, in

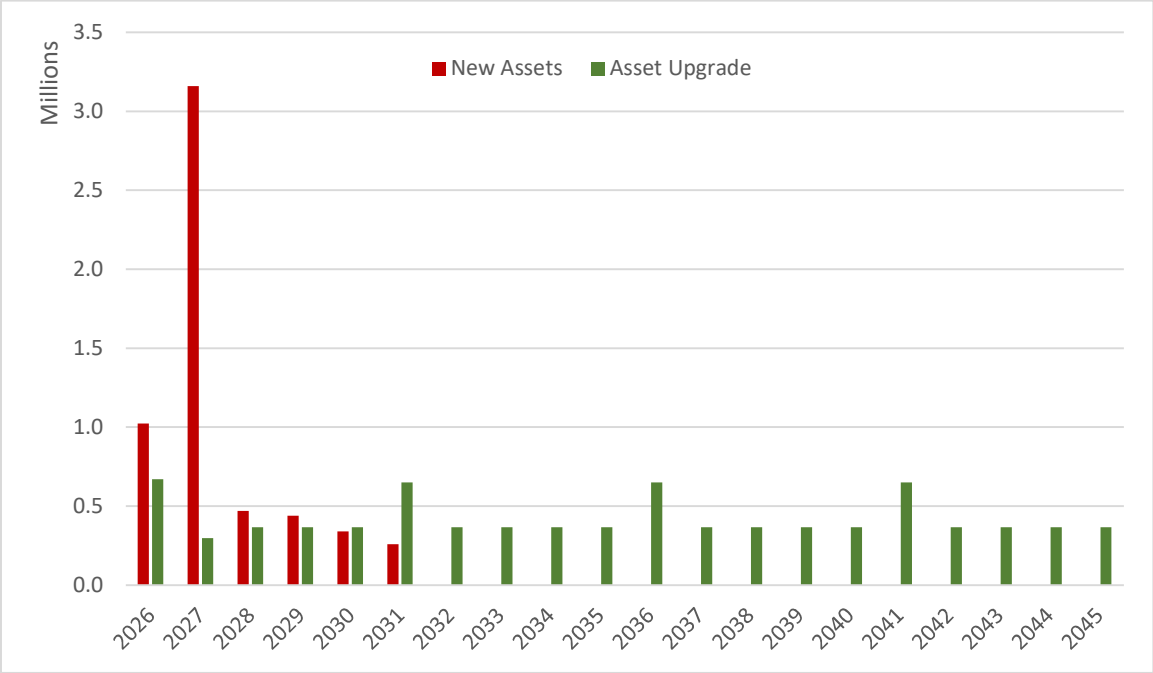
most instances, restoring the condition of the assets extending their useful life. Allowance is made in the budget to cater for these works. Should regular maintenance be successful, it is likely that the high cost of renewals predicted in those years may not eventuate or be at a lesser cost.

The planned renewal budget allocated in the long-term Capital Works Program shown in Figure 4 takes into consideration the above predicted renewal requirements.

5.4 Acquisition Plan

The planned new and upgrade projects for coastal infrastructure is shown in Figure 5.

Figure 5: Planned New Assets and Asset Upgrades



Proposed acquisition of new assets, and upgrade of existing assets, are identified from various sources such as community requests, coastal management study recommendations proposals identified by strategic plans or partnerships with others. The need and justification for new assets and upgrading of assets is assessed against the objective of the City's AM Policy and Review, alignment with the Coastal Management Plan (CMP), Coastal Hazard Risk Management and Adaptation Plan (CHRMAP), site specific coastal management studies and relevant planning policies.

Project planning and execution is completed in accordance with the City's Project Management Framework. This includes community consultation where required in accordance with the City's Community Engagement Policy.

Prioritisation of projects in the budget are currently made at officer and executive level and listed for consideration in the long-term Capital Works Program.

At this stage new projects listed for consideration are:

- Construction of a universal access fishing platform in 2025/26. Detailed design for this project will be completed in 2024/25.
- Design and Construction of South Two Rocks Beach Access Way.*
- Yanchep Coastline long term Coastal Management Study to inform future asset provisions
- Two Rocks Coastline long term Coastal Management Study to inform future asset provisions

* *The planned Two Rocks Beach Accessway project (FY 2027) includes assets not covered by the CIAMP (including stormwater drainage, road, fencing and a carpark). Assets not covered by the CIAMP will be assigned to their respective AM Plans following completion of construction.*

The asset upgrade project considered at this stage is:

- The Beach Access Way Upgrade Program – This is a recurring program that aims to upgrade one (1) beach access way each financial year with the design for the project being completed the previous year, i.e. two (2) projects will progress each financial year - one (1) will be at the design stage in preparation for construction the following year; while the second will be constructed based on the design completed in the previous financial year. This program would also incorporate assets that have been earmarked for renewal.

When the City commits to new assets, funding for future operations, maintenance and renewal costs must also be considered. At this stage the long-term impacts of asset acquisitions are not specifically considered but a percentage increase in operational costs is allowed for in the long-term planning for maintenance budgets. The figures will be based on historical trends, the cumulative value of the assets and growth impacts.

5.5 Disposal Plan

Disposal includes any activity associated with the disposal of a decommissioned asset including sale, demolition or relocation. Assets identified for possible decommissioning and disposal are shown in Table 5.6.

Table 5.6: Assets Identified for Disposal

Asset	Reason for Disposal	Timing
Swimming Enclosure	End of useful life	2029

All coastal assets covered by this plan (excluding Coastal Protective Structures and Beaches) will require disposal in the future and the useful life for these assets will need to be determined.

Coastal Protective Structures provide key functions to the City's coastlines and are therefore not likely to be disposed of, instead these will be renewed through ongoing maintenance works, or upgraded, via larger scale structural renewal works.

6. RISK MANAGEMENT

Coastal protection structures are considered critical assets and requires a higher level of management with risks that could result in loss or reduction in service, personal injury, environmental impacts, a 'financial shock' and reputational impacts.

The identification of critical assets and failure mode has enabled more targeted investigative activities, condition inspection programs, maintenance and capital expenditure plans to be developed to target these critical areas.

6.1 Critical Assets

Critical assets have been identified and along with their typical failure mode, and the impact on service delivery, are summarised in Table 6.1. Failure modes may include physical failure, collapse or essential service interruption.

Table 6.1 Critical Assets

Critical Asset(s)	Failure Mode	Impact
Breakwaters	Armour displacement	Damage to adjacent public and private infrastructure. Impacts on calm marina environment, wharfs and marina infrastructure.
Groynes	Armour displacement	Reduction in ability to retain beach sand resulting in damage to coastal infrastructure and dune environment.
Revetment Wall's	Armour or GSC displacement	Damage to adjacent public and private infrastructure.
Artificial Headland	Armour displacement	Reduction in ability to retain beach sand resulting in damage to coastal infrastructure and dune environment.
Beaches	Significant erosion	Reduced beach amenity, accessibility and damage to coastal infrastructure and dune environment.
Major Limestone Block Retaining Walls along the Coast	Collapse and displacement	Loss of roads and amenity that the retaining wall retains. Injury to people and damage to property.
Swimming enclosure	Significant damage to barrier components from excessive wave action and sea wrack accumulation. Movement/failure of enclosure anchoring system.	Enclosure swimming area is open to large marine animals. Unsafe swimming areas with damaged barrier components.

6.2 Risk Assessment

Critical risks are those assessed as 'Very High' (requiring immediate corrective action) and 'High' (requiring corrective action) risk ratings. The residual risk and treatment costs of implementing the selected treatment plan is shown in Table 6.2.

Table 6.2: Risks and Treatment Plans

Service or Asset at Risk	What can Happen	Risk Rating (VH, H)	Risk Treatment Plan	Residual Risk *	Treatment Costs
Coastal Protective Structures (groynes, revetment walls, artificial headland and breakwaters)	Structural damage due to extreme storm events and lack of monitoring and maintenance. Damage to adjacent assets protected by coastal protection structures. Increase in coastal erosion due to reduced or lost functionality of coastal protection structures.	H	Annual condition assessments via the City's Coastal Monitoring Program and maintenance works as required.	M	Annual coastal monitoring costs including surveys, metocean data collection and remote monitoring camera expenses - $110,000.
Jetty Infrastructure - hidden underwater components	Structural damage of non-visible components due to below water line. Unexpected, accelerated deterioration of column supports below water line. Injury to people and loss of amenity. Marina jetty - loss of public accessway and resident access to boat berths.	H	6-monthly visual inspections via the City's Coastal Monitoring Program. Condition assessment by marine structural engineer and maintenance works as required.	L	Marina jetty maintenance costs split between the City and the Marina (joint management responsibility).
Coastal Land and adjacent public and private assets.	Loss or damage to land, dune environment and adjacent assets due to erosion and/or wave and water level impacts.	H	Coastal Monitoring Program. Beach Scraping works at the Quinns Dog Beach in summer. Beach Renourishment Program.	L	Annual coastal monitoring costs including surveys, metocean data collection and remote monitoring camera expenses - $110,000. Beach scraping at Quinns Dog Beach $20,000 per year.

Service or Asset at Risk	What can Happen	Risk Rating (VH, H)	Risk Treatment Plan	Residual Risk *	Treatment Costs
					Beach Renourishment $400,000 per year.
Swimming Safety	Damage to Quinns Beach Swimming Enclosure due to lack of management and servicing. Loss of surf lifesaving patrol towers due to lack of management and servicing. Loss of beach access safety signage due to lack of signage audit and maintenance.	H	Contract to manage the enclosure over a 5-year period including fortnightly inspections, servicing, removal (April) and reinstallation (October). Contract to manage the patrol towers at Quinns Beach and Yanchep Lagoon over a 5-year period. Monthly signage audits and maintenance as required.	L	Swimming Enclosure Management - $210,000 per year. Patrol Tower Management - $45,000 per year.
Beach Access	Structural damage due to extreme storm events and lack of monitoring and maintenance. Loss of beach accessibility and increased public safety risks at beach accessways.	H	6-monthly visual inspections and 5 yearly condition assessment by structural engineering consultant via the Coastal Monitoring Program. Maintenance works as identified by inspection and condition assessments. Beach Access Renewal Program.	L	Annual budget for the beach access renewal program varies with project site and ranges from $100k to $600k per year. $150,000 per year for beach access maintenance works.

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

6.3 Service and Risk Trade-Offs

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

There are some operations and maintenance activities and capital projects that are unable to be undertaken within the next 10 years. These include:

- Erosion north of the Two Rocks Marina. These issues are directly caused by the marina construction which is managed by the State Government. Coastal management studies undertaken by the City in 2015 have determined concept level management options to address the issues, however the State Government will not progress this due to long term plans to redevelop the Two Rocks Marina site.
- Resourcing and capacity issues for expansion of coastal monitoring to the whole of the City's foreshore including Developer managed locations.
- Developer managed areas can't be effectively maintained as they are not controlled by the City. This becomes a City issue when low standard or assets that are in poor condition are handed over to the City to manage over the long term.

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

- Reduction in beach usability and amenity.
- Issues with beach accessibility and an increase in public safety risks at beach access points.
- Reduction in swimmer safety related to reduction in management of the Quinns Beach swimming enclosure and surf lifesaving patrol towers.
- Increased public safety risks and the need for reduced access to coastal protective structures (groynes, breakwaters, revetments).
- Reduction in accessibility related to the Beach Matting not being available.

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

- Impacts on reputation and negative community perceptions towards coastal management activities at the City.
- Loss of dune environment (native flora and fauna loss and reduced coastal protection).
- Damage to coastal infrastructure at risk (both public and private assets).

These risks and consequences will be considered in the development of maintenance management plans for coastal infrastructure.

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:

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

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

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.

Due to the unpredictable nature of coastal effects and the critical aspects of coastal protection structures, the City maintains a Coastal Infrastructure Management Reserve to provide funding for these assets. In most instances the spikes in funding requirements predicted for the total replacement of coastal infrastructure is unlikely to be required as long as there is an ongoing coastal monitoring and asset condition inspection program in place. If all damage and deficiencies identified are repaired and/or rehabilitated promptly, these assets are unlikely to require full replacement. Thus, for coastal protection infrastructure, the ARFR is expected to be at 100%.

The forecast renewal demand along with the proposed renewal budget, and the cumulative shortfall where one exists for coastal recreational structures is illustrated in Figure 4. The renewal shortfall depicted in 2031 for the renewal of a beach access way will be funded from the proposed upgrade of the subject beach access way. In which case it is expected that the ARFR for coastal recreational structures is also 100%.

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.

7.2 Funding Strategy

The forecast renewal demand and maintenance requirements for this AM Plan is expected to be fully accommodated within the current long-term financial plan over the next 10 years.

7.3 Asset Valuation Forecasts

The financial valuation of assets in the CIAMP are:

Gross Replacement Cost	$ 55,900,000
Depreciable Amount	$ 55,900,000
Current Replacement Cost	$ 35,870,000
Annual Depreciation Expense	$ 1,060,000

At this stage, it is not anticipated that there will be significant valuation movements forecasted in the next few years.

7.4 Key Assumptions Made in Financial Forecasts

Key assumptions made in this AM Plan are:

- Future coastal and marine operational and maintenance budgets are assumed to be consistent and increase with expansion of coastal and marine asset portfolio.
- Forecasts have been made based on current asset databases and accurate rates for replacement cost.
- Forecasts do not account for an increase in assets from Developers (gifted assets) and future impacts related to climate change.

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 7.1.

Table 7.1: 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

Confidence Grade	Description
	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 7.2.

Table 7.2: 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 along the coastal corridor.
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 City recognises the importance of future improvements to the CIAMP, planning process ensuring effective AM, and informed decision making. The improvement plan generated from the CIAMP is shown in Table 8.1. Progress on this improvement actions is highly dependent upon availability of key team members and resourcing. Most of these improvements are long-term improvements along the journey maturing AM practices at the City.

Table 8.1: Improvement Plan

Task	Task	Responsibility
1	Beach renourishment data to be migrated into QGIS/AMIS.	APlan and AMtce
2	Create Condition Assessment Forms within Assetic for all Coastal and Marine Assets including GSC Revetment, Camera Poles and Jetty Structures.	AMtce
3	Review current Coastal and Marine Asset data within AMIS to identify data gaps (including assets not currently mapped) and update data to improve data reliability and confidence.	APlan and AMtce
4	Audit and condition assess all coastal assets not currently included in AMIS including coastal retaining walls, and beach accessways to improve data reliability and confidence.	APlan and AMtce
5	Coastal Monitoring data collection, analysis and reporting to be expanded to include developer managed areas and future areas of coastal vulnerability.	AMtce
6	Determine Mindarie Marina asset responsibilities and funding requirements, including the process of managing these assets (Jetty's, Breakwater, lighting and retaining walls).	APlan, PServ and AMtce
7	Inclusion of a generic renewal PR number for Coastal and Marine assets in the LTFP (BAW's to be excluded).	APlan and AMtce
8	Investigation and mapping of all Developer-managed Coastal and Marine Assets (e.g. Shorehaven Limestone Seawall)	APlan and LDev
9	Investigate long term budget requirements for coastal management based on CHRMAP recommendations, condition assessments and coastal monitoring recommendations to inform annual contributions to Coastal Infrastructure Management Reserve.	AMtce and APlan
10	Investigate cost tracking for coastal works against coastal assets undertaken by Contractors via Purchase Order.	AMtce and FAcc
11	Investigate the creation of Maintenance specifications for new and existing assets, including frequency of inspections.	AMtce and APlan
12	Undertake structural assessments of Mindarie Marina's jetty, lighting and retaining ways and determine future assessment frequency.	AMtce
13	Investigate the inclusion of Coastal and Marine Asset's within future Wanneroo Liveability Survey's to determine their performance and assess how customers value these assets.	CPPI, AMtce and APlan
14	Investigate the inclusion of measuring service delivery resilience in future CIAMP revisions.	APlan

Task	Task	Responsibility
15	Coastal and marine asset useful life will be reviewed and determined for City assets covered by the CIAMP.	AMtce and APlan
16	Formalise condition assessment process for Mindarie Jetty's Revetment Wall's and Camera Poles.	AMtce
17	Investigate inclusion of coastal monitoring report and data within QGIS/AMIS for internal City stakeholders.	AMtce and APlan
18	Investigate and determine the responsibilities for inspecting and maintaining the City's Beach Wheelchair.	APlan
19	Condition rating systems for coastal and marine assets will be reviewed and determined for City assets covered by the CIAMP.	AMtce
20	Coastal and marine asset disposal processes will be reviewed and determined for City assets covered by the CIAMP.	AMtce
21	Investigate and determine the responsibilities for inclusion of BEN Signs and Coastal Beach Signage in future CIAMPs.	AMtce
22	Investigate and determine insurance responsibilities and requirements for City assets covered by the CIAMP.	APlan and ERM
Service Unit Abbreviation: APlan - Asset Planning; AMtce – Asset Maintenance; CPPI -Corporate Planning Performance & Improvement; ERM – Enterprise Risk Management, FAcc – Financial Accounting; LDev - Land Development; PServ - Property Services.		

8.2 Monitoring and Review Procedures

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

The annual and LTFP projections detailed in this CIAMP represents the state of coastal and marine assets at the time of CIAMP development. The asset data and lifecycle cost projections are stored separately in the City's Content Manager (CM) 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 25/44761* and will be updated annually as new versions to inform subsequent LTFPs and annual budget developments.

8.3 Performance Measures

The effectiveness of the CIAMP can be measured in the following ways:

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

9. REFERENCES

External References

- IPWEA, 2018, Practice Note 12.1, 'Climate Change Impacts on the Useful Life of Assets', Institute of Public Works Engineering Australasia, Sydney
- IPWEA, 2020, 'International Infrastructure Management Manual', Institute of Public Works Engineering Australasia, Sydney, www.ipwea.org/IIMM
- Coastal Hazard Risk Management and Adaptation Planning Guidelines 2014
- Coastal Engineering Manual (USACE 2002)

Council Internal Documents

- Asset Management Policy ((CE03-06/23, CM: 16/106984)
- Asset Management Strategy 2024-2030 (CM: 16/279441)
- Strategic Community Plan (SCP) 2021-2031 (CM: 21/306831)
- Corporate Business Plan (CBP) 2022/23 - 2025/26 (CM: 24/317205)
- Long Term Financial Plan (LTFP) 2023/24–2042/43 (CM: 22/454666)
- City of Wanneroo Community Development Plan 2021/22 - 2025/26 (CM 22/366267)
- Climate Change Adaptation and Mitigation Strategy 2020/21-2025/26
- Coastal Hazard Risk Management Adaptation Plan Part 1 (2018)
- Coastal Hazard Risk Management Adaptation Plan Part 2 (2018)
- Coastal Management Plan 2021 (PS02-05/22, CM: 22/147307)
- Local Planning Policy 4.21 Coastal Assets
- Coastal Aquatic Safety Policy (CP02-08/23, CM: 16/280596v03)
- Northern Coastal Growth Corridor - Community Facilities Plan (CM: 20/131624)
- Foreshore Management Plan Guidelines
- Population Forecast - City of Wanneroo Community Profile *http://profile.id.com.au/wanneroo/population*)
- Final 2023 Infrastructure Revaluation Report – Brightly (CM: 23/297446)
- Wanneroo Liveability Survey - Baseline Report 2023 (CM: 24/12633)

10. Glossary of Terms and Abbreviations

(Source IPWEA)

Asset class

Grouping of assets of a similar nature and use in an entity's operations (AASB 166.37).

Asset condition assessment

The process of continuous or periodic inspection, assessment, measurement and interpretation of the resultant data to indicate the condition of a specific asset so as to determine the need for some preventative or remedial action.

Asset Management (AM)

The combination of management, financial, economic, engineering and other practices applied to physical assets with the objective of providing the required level of service in the most cost-effective manner.

Assets

Future economic benefits controlled by the entity as a result of past transactions or other past events (AAS27.12). Property, plant and equipment including infrastructure and other assets (such as furniture and fittings) with benefits expected to last more than 12-months.

Capital expenditure

Relatively large (material) expenditure, which has benefits, expected to last for more than 12-months. Capital expenditure includes renewal, expansion and upgrade. Where capital projects involve a combination of renewal, expansion and/or upgrade expenditures, the total project cost needs to be allocated accordingly.

Capital funding

Funding to pay for capital expenditure.

Capital grants

Monies received generally tied to the specific projects for which they are granted, which are often upgrade and/or expansion or new investment proposals.

Component

An individual part of an asset which contributes to the composition of the whole and can be separated from or attached to an asset or a system.

Cost of an asset

The amount of cash or cash equivalents paid or the fair value of the consideration given to acquire an asset at the time of its acquisition or construction, plus any costs necessary to place the asset into service. This includes one-off design and project management costs.

Current replacement cost (CRC)

The cost the entity would incur to acquire the asset on the reporting date. The cost is measured by reference to the lowest cost at which the gross future economic benefits could be obtained in the normal course of business or the minimum it would cost, to replace the existing asset with a technologically modern equivalent new asset (not a second hand one) with the same economic

benefits (gross service potential) allowing for any differences in the quantity and quality of output and in operating costs.

Depreciable amount (DA)

The cost of an asset, or other amount substituted for its cost, less its residual value (AASB 116.6)

Depreciated replacement cost (DRC)

The current replacement cost (CRC) of an asset less, where applicable, accumulated depreciation calculated on the basis of such cost to reflect the already consumed or expired future economic benefits of the asset

Depreciation / amortisation

The systematic allocation of the depreciable amount (service potential) of an asset over its useful life.

Expenditure

The spending of money on goods and services. Expenditure includes recurrent and capital.

Fair value

The amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties, in an arm's length transaction.

Infrastructure assets

Physical assets of the entity or of another entity that contribute to meeting the public's need for access to major economic and social facilities and services, e.g. roads, drainage, footpaths and cycle ways. These are typically large, interconnected networks or portfolios of composite assets The components of these assets may be separately maintained, renewed or replaced individually so that the required level and standard of service from the network of assets is continuously sustained. Generally the components and hence the assets have long lives. They are fixed in place and are often have no market value.

Level of service

The defined service quality for a particular service against which service performance may be measured. Service levels usually relate to quality, quantity, reliability, responsiveness, environmental, acceptability and cost).

Life Cycle Cost

The life cycle cost (LCC) is the total cost to provide the service over the longest asset life cycle. It comprises annual maintenance and asset consumption expense, represented by depreciation expense. The Life Cycle Cost does not indicate the funds required to provide the service in a particular year.

Maintenance and renewal gap

Difference between estimated budgets and projected expenditures for maintenance and renewal of assets, totalled over a defined time (eg 5, 10 and 15 years).

Maintenance expenditure

Recurrent expenditure, which is periodically or regularly required as part of the anticipated schedule of works required to ensure that the asset achieves its useful life and provides the required level of service. It is expenditure, which was anticipated in determining the asset's useful life.

Operating expenditure

Recurrent expenditure, which is continuously required excluding maintenance and depreciation, e.g. power, fuel, staff, plant equipment, on-costs and overheads.

Rate of annual asset consumption

A measure of average annual consumption of assets (AAAC) expressed as a percentage of the depreciable amount (AAAC/DA). Depreciation may be used for AAAC.

Rate of annual asset renewal

A measure of the rate at which assets are being renewed per annum expressed as a percentage of depreciable amount (capital renewal expenditure/DA).

Rate of annual asset upgrade

A measure of the rate at which assets are being upgraded and expanded per annum expressed as a percentage of depreciable amount (capital upgrade/expansion expenditure/DA).

Reactive maintenance

Unplanned repair work that carried out in response to service requests and management/supervisory directions.

Remaining life

The time remaining until an asset ceases to provide the required service level or economic usefulness. Age plus remaining life is economic life.

Renewal

Expenditure on an existing asset, which returns the service potential or the life of the asset up to that which it had originally. It is periodically required expenditure, relatively large (material) in value compared with the value of the components or sub-components of the asset being renewed. As it reinstates existing service potential, it has no impact on revenue but may reduce future operating and maintenance expenditure if completed at the optimum time, e.g. resurfacing or re-sheeting a material part of a road network, replacing a material section of a drainage network with pipes of the same capacity, resurfacing an oval. Where capital projects involve a combination of renewal, expansion and/or upgrade expenditures, the total project cost needs to be allocated accordingly.

Risk management

The application of a formal process to the range of possible values relating to key factors associated with a risk to determine the resultant ranges of outcomes and their probability of occurrence (refer also to ISO 31000).

Sub-component

Smaller individual parts that make up a component part.

Useful life

Either:

(a) the period over which an asset is expected to be available for use by an entity, or

(b) the number of production or similar units expected to be obtained from the asset by the entity.

It is estimated or expected time between placing the asset into service and removing it from service, or the estimated period of time over which the future economic benefits embodied in a depreciable asset, are expected to be consumed by the council. It is the same as the economic life.

Abbreviations

AM – Asset Management
AMIS – Asset Management Information System
AMS – Asset Management System
AMSG – Asset Management Steering Group
AMtce – Asset Maintenance (CoW)
APlan – Asset Planning (CoW)
ARFR – Asset Renewal Funding Ratio
CBP – Corporate Business Plan
CHRMAP – Coastal Hazard Risk Management and Adaptation Plan / Planning
CIAMP – Coastal Infrastructure Asset Management Plan
CM – Content Manager
CoW – City of Wanneroo
CPPI -Corporate Planning Performance & Improvement (CoW)
DA – Development Application
DBCA – Department of Biodiversity, Conservation and Attractions (State govt)
DCCEEW – Department of Climate Change, Energy, the Environment and Water (Fed govt)
DoT – Department of Transport (State govt)
DPLH – Department of Planning, Lands and Heritage (State govt)
DWER – Department of Water and Environmental Regulation (State govt)
ESL – Emulsion Stabilised Limestone
FAcc – Financial Accounting (CoW)
FMP – Foreshore Management Plan
FY – Financial Year
GIS – Geographical Information System
GSC – Geosynthetic Sand Container
IIMM – International Infrastructure Management Manual
IPR – Integrated Planning Framework
IPWEA – Institute of Public Works Engineering Australia
LDev – Land Development (CoW)
LFR – Lifecycle Funding Ratio

LGA – Local Government Association
PServ – Property Services (CoW)
LPP – Local Planning Policy
LTFP – Long Term Financial Plan
MMS – Maintenance Management Plan
MNES – Matter of National Environmental Significance
NEMA - National Emergency Management Agency
USACE – United States Army Corp of Engineers
PC – Practical Completion
QGIS – Free and Open-Source GIS Program
SCP – Strategic Community Plan
SLUPE – Strategic Land Use Planning and Environment (CoW)
SPP – State Planning Policy
WALGA – West Australian Local Government Association