



City of Rockingham

Coastal Facilities Strategy

August 2021



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Alternative Formats

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Community Engagement

Admin use only: Please select all special interest groups that may be interested in this strategy. Groups selected will be notified using Rock Port.

- | | |
|--|---|
| <input checked="" type="checkbox"/> Aboriginal and Torres Strait Bankers | <input checked="" type="checkbox"/> Planning and Development |
| <input checked="" type="checkbox"/> Arts and Events | <input checked="" type="checkbox"/> Roads and Footpaths |
| <input checked="" type="checkbox"/> Coastal and Marine Environment | <input checked="" type="checkbox"/> Safety Bay / Shoalwater Foreshore Revitalisation Masterplan |
| <input checked="" type="checkbox"/> Community Development | <input checked="" type="checkbox"/> Seniors Facilities and Activities |
| <input type="checkbox"/> Community Safety | <input checked="" type="checkbox"/> Sporting Clubs and Facilities |
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Disability Access and Inclusion

Admin use only: Please consider the elements from the City's current Disability and Inclusion Plan (DAIP) and identify those that are relevant to, or will be impacted by this strategy as per the table below. If you would like to discuss the impacts and relevance of the DAIP to your strategy, please contact the Manager Community Capacity Building.

The Seven Outcome Areas of the DAIP	Will the Key Element be impacted by this strategy? "Y" or "N"	If "Y", please explain how the actions under this element will be impacted by this strategy
1. <i>Access to City services and events</i>	N	
2. <i>Access to City buildings and facilities (including outdoor spaces)</i>	Y	Ensure access to beaches, boat ramps, jetties and coastal recreation is accessible.
3. <i>Access to information</i>	N	
4. <i>Access to quality service from City staff</i>	N	
5. <i>Access to equal complaints procedures</i>	N	
6. <i>Access to participation in public consultation</i>	N	
7. <i>Access to City employment opportunities</i>	N	

Acknowledgement of Country

Rockingham, ngala kaaditj moondang-ak kaaradjiny nidja boodjar, Binjareb wer Whadjuk Nyoongar moort, wer baalabang kalyogool dandjoo boodjar, kep wer moort.

The City of Rockingham acknowledges the Traditional Owners and Custodians of this land, the Binjareb and Whadjuk, Nyoongar peoples and their continuing connection to the land, waters and community. We pay our respects to all members of Aboriginal communities and their cultures; and to Elders past and present.



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1 Executive Summary

The more than 37km of City of Rockingham (City) coastline is culturally, economically, and recreationally important to its community. Locals and visitors come for swimming, using the jetties, fishing, boating and undertaking many other activities.

Recognising the importance of the coastal zone, the City provides a range of recreational coastal facilities such as boat ramps and jetties. Maintenance works are regularly undertaken and sand removal occurs to maintain open water access from the boat ramps. Beach renourishment is a key activity.

Coastal facilities also protect against the impacts of climate change and coastal processes. Sea walls and groynes protect landward infrastructure and help to manage erosion. Beach renourishment is undertaken regularly to manage coastal erosion as well as maintaining beach aesthetic for the community.

As population increases, boat ownership rises, and climate change impacts become more frequent the coastal zone and its infrastructure is becoming stressed and endangered. Maintaining the boating level of service calls for up to an additional four boat ramps in the next 15 years. However a more thorough understanding of local coastal processes is required to inform better decision making, as is a more strategic approach to provision of recreational facilities to enable their long term sustainable provision.

The City will be addressing recreational needs and planning for the long term future detailed in this strategy. Planned infrastructure upgrades will be delivered, the current infrastructure will be maintained and data will be collected regularly for informed decision making. A number of scientific studies will be delivered to enable evidence-based decision making. Finally, a more strategic approach to provision of recreational, coastal process and climate change adaptation facilities will be developed to allow for the coastal zone to be enjoyed and utilised for many decades into the future.

This strategy sets out the actions to be undertaken during the next four years in relation to coastal facilities. For the purposes of this strategy, coastal facilities are defined as the infrastructure that is seaward of the high tide mark, coastal access pathways, and the car parking supporting existing boat ramps.

Within the City, this includes:

- Boat ramps;
- Jetties;
- Coastal protection infrastructure (e.g. groynes, sea walls);
- Coastal management activities (erosion, accretion, sand movements); and
- Coastal access paths.



2 Strategic Objective

2.1 Intent

To set out how the City will continue to provide for sustainable coastal recreation throughout the City coastal precinct, whilst also taking action to adapt for the effects of climate change.

2.2 Vision

Sustainable management of coastal facilities for the current and future benefit of the City of Rockingham community.

2.3 Context

This strategy is part of delivering on the Community’s Vision as articulated in the Strategic Community Plan 2019 – 2029, specifically:

Community Aspirations for 2019-2029	How Coastal Facilities contribute
<i>Actively pursue tourism and economic development.</i>	By providing facilities to access and enjoy some of the most important attractions and activities around the City of Rockingham – including Penguin Island, swimming with wild dolphins, fishing, swimming, pristine beaches and kite surfing.
<i>Grow and nurture community connectedness and wellbeing.</i>	Provision of a variety of boat ramp options and other jetties. Supporting access for all to the foreshore and beaches.
<i>Plan for future generations</i>	Implement coastal infrastructure and techniques to mitigate climate change impacts. Develop a better understanding of our coast to allow effective planning of coastal treatments, access and infrastructure that facilitates current and future access and enjoyment of the City of Rockingham coastline and offshore water bodies.
<i>Deliver Quality Leadership and Business Expertise</i>	By being managed and updated in a life-cycle-cost effective manner cognisant of the increasing risks to coasts and coastal infrastructure associated with climate change

The Coastal Facilities Strategy is one amongst many Community Plan Strategies in support of the Strategic Community Plan. It sits within the context of these other strategies, plans and studies and other City governance documents. The principal informing documents are the:

- Strategic Community Plan
- Sustainability Strategy
- Disability Access and Inclusion Plan
- Coastal Hazard Risk Management and Adaptation Plan (CHRMAP)
- Coastal Management Study
- Strategic Asset Management Plan
- Shoalwater Islands Marine Park Management Plan
- Rockingham Beach Foreshore Master Plan
- Safety Bay Shoalwater Foreshore Master Plan

Extensive community consultation has also informed the development of this Coastal Facilities Strategy. A survey was sent to all registered boat owners within the City of Rockingham, as well as those in surrounding suburbs. Another survey was mailed out to residents around the coastline, advertised widely and made available online. 243 boat owners and 176 residents completed the surveys. Survey results made an important contribution to understanding community needs and priorities and developing this strategy accordingly.

This strategy's objectives are to:

- Sustainably facilitate current and future recreational activities within the City.
- Sustainably optimise access to and recreational use of the City coastline for people with disability.
- Manage the coastline in accordance with the recommendations of the CHRMAP.
- Develop a comprehensive knowledge base to improve future decision making in respect of climate change adaptation along the City coastline.



3 Background

The coast is an attractive place to live and provides a variety of recreational activities including swimming, boating and fishing. It is an invaluable asset for the health and wellbeing of the community. The coast is vital for the State's economy in providing locations for ports and other coast-dependant facilities. It presents unique planning and management challenges due to its many uses and issues such as coastal hazards and climate change. Coastal erosion and inundation risks associated with rising sea levels are significant challenges.' (WA Department of Planning, Lands and Heritage (DPLH), 2017).

The population of the City is growing more rapidly than the state average, with an expected population increase of over 70% in the period from 2021 – 2046 (.idcommunity, 2021). Rockingham already has the second highest boat ownership in the Perth metropolitan area (Department for Planning and Infrastructure, 2009). The rapidly increasing population and high rate of boat ownership are both putting pressure on the recreational infrastructure along the City's coastline.

In supplying this infrastructure, the coast has been modified over time. There are six separate boat ramp locations along the coastline, three standalone jetties and various other infrastructure elements including groynes and sea walls. The Garden Island causeway is managed by the Department of Defence.

Cockburn Sound, Warnbro Sound and Comet Bay are a dynamic environment with substantial sand movement. The City experiences significant sand accretion at Tern Bank and significant erosion at Apex Beach (on the southern side of Point Peron) and Mersey Point. Sand movement in the vicinity of coastal infrastructure has to be managed, particularly in respect of maintaining open water access for boating facilities. A large sand trap exists at Point Peron and is regularly excavated, resulting in large volumes of sand being utilised within the City. The channel from Bent Street boat ramp to open water is maintained by excavating Tern Bank and dredging the channel as required. Disposal of this sand removes it from the local environment with unknown environmental consequences. To address erosion the City is constructing a seawall at Mersey Point, thereby protecting the shoreline.

Climate change has been shown to result in increased frequency and intensity of storm events and rising sea levels. The combined impact on the City shoreline is expected to include loss of beaches and foreshore areas, erosion – sometimes severe, inundation and damage and loss of infrastructure. Maintenance costs will also increase. The City's Coastal Hazard Risk Management and Adaptation Plan (CHRMAP) (Cardno 2019) details what we currently know and identifies risks associated with the shoreline for the next 100 years. To make decisions on properly addressing these risks requires further work to better understand the City's marine environment and sediment movement process.

The ambition is to be able to provide coastal infrastructure and environments that facilitate sustainable high quality recreational use for the increasing population, now and into the future. This is to be achieved whilst managing coastal processes and adapting for current and future climate change impacts.

National context

Over 80% of Australians live within 100km of the coast. Australians use the coastal zone for recreation, and it features heavily as part of our lifestyle. Research has demonstrated that

recreation in coastal areas results in enhanced social interaction and social networks leading to improved mental health. (Cox et. al. 2004)

Coastal areas are under pressure. Increasing populations; urbanisation; industrialisation and land use change are all impacting the coast line. Climate change impacts and threats of erosion and inundation exacerbate these pressures. (Clark & Johnston, 2017; WA DPLH, 2018)

The coast is important to the culture and lifestyles of Australians, however its size and variety make it challenging to manage. All three levels of governments in Australia play a role in coastal management, with the greatest burden and opportunity falling to local governments. Managing the coast requires balancing competing recreational, environmental, economic and social demands and impacts. (Clark & Johnston, 2016)

State context

The *WA Coastal Zone Strategy* sets the vision of ‘a sustainable coast for the long-term benefit of the community and visitors to the state’ (WA DPLH 2017). It lays out the state’s environmental, community, economic, infrastructure, and governance goals; the key issues; and the roles of national, state and local governments as well as non-government groups.

The strategy’s goals are:

- **Environment** - Conserve the State’s natural coastal values and assets through sustainable use
- **Community** - Ensure safe public access to the coast and involve the community in coastal planning and management activities
- **Economy** - Provide for the sustainable use of natural coastal resources
- **Infrastructure** - Ensure the location of facilities and infrastructure in the coastal zone is sustainable and suitable
- **Governance** - Build community confidence in coastal planning and management

In the pursuit of a climate-resilient future, national and international coastal planning practices are increasingly adopting a risk management approach to deal with the potential adverse impacts of coastal hazards. This ensures that coastal hazards are appropriately factored into decision-making processes for sustainable land use and development in the coastal zone. The State Government has adopted a risk management approach to decision making regarding the coastal zone – embedded through the *State Planning Policy 2.6 – Coastal Planning*. This provides the framework for undertaking risk management and adaptation planning for coastal hazards in Western Australia. It provides the guidelines for local governments to develop their own CHRMAP (WA DPLH 2019).

The State Government, through the Department of Biodiversity, Conservation and Attractions (DBCA), manages the Shoalwater Islands Marine Park Management Plan 2007 – 2017 (Plan). The Plan is not expected to be updated within the timeframes of the current strategy. However, the City will continue to work with DBCA about any potential impact on the City’s coastal facilities due to any change in the management plan.

Local context

The City has been investing in coastal management planning over a range of timeframes, from medium term (20-50 year) master plans for specific sections of coast, to long term considerations (over a 100 year timeline) in the Coastal Hazards Risk Management Adaption Plan. The Coastal Facilities Strategy is aimed at helping guide the City’s provision of coastal infrastructure and outline coastal management activities in the shorter term (over the next four years).

The City has a very dynamic coastline. A number of studies were undertaken previously to understand the dynamics which provided input into the development of this strategy. In 2019/20 the City completed a Coastal Management Study looking at different long term erosion and accretion trends. The study can help the City making appropriate decisions about infrastructure investment. In addition to that the City has undertaken a number of feasibility studies to understand the specific opportunities and constraints associated with different infrastructure projects such as boat ramp development at Donald Drive and extension at Port Kennedy.

The City's coastline is enjoyed by its residents and visitors. A survey was conducted by the City to support development of this strategy and demonstrated that the coast and its facilities are used for a wide range of recreational uses by the local community, dominated by swimming and visiting the jetties. Key findings from the survey included:

- Residents are generally satisfied with the jetties, although their cleanliness could be improved
- 22% of respondents would like to see additional fishing platforms
- Point Peron boat launching facilities are well regarded, however there are safety concerns regarding those at Port Kennedy and insufficient parking at Bent Street facilities.
- There is strong support to continue sand management for boat access to open water and to prevent the loss of Apex Beach to erosion.
- Future investment is desired for a marina, and for additional and improved beach access paths.

Figure 1 and Figure 2 summarise the responses of boat owners and residents to the question: *Imagine you are responsible for reviewing and improving future coastal infrastructure in the City. If you could invest in one thing to improve coastal infrastructure in the City, what would it be and why?*

Figure 1 Top coastal infrastructure investment priorities as identified by boat owners

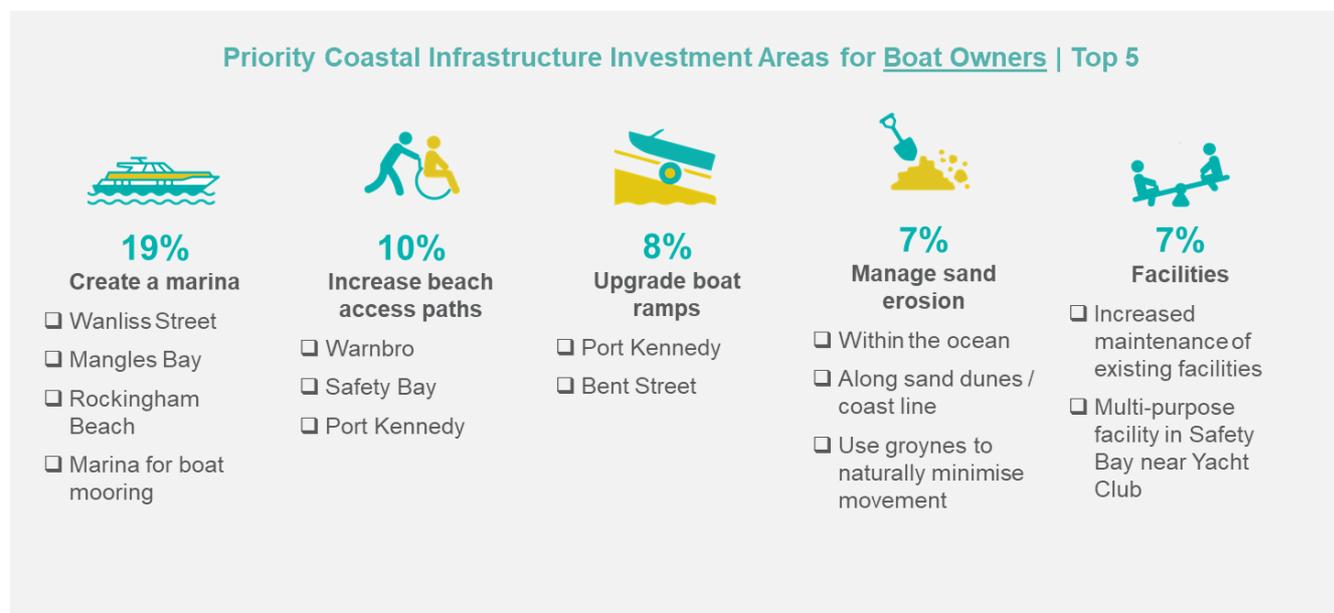
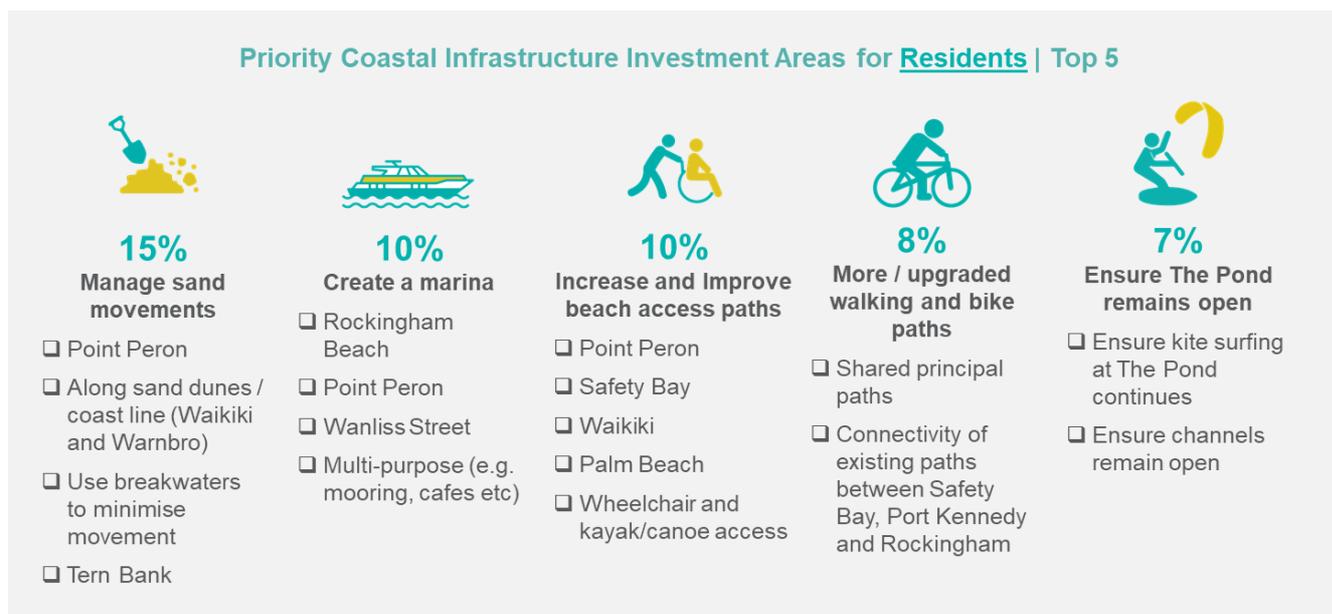


Figure 2 Top coastal infrastructure investment priorities as identified by residents



The City has been active for a long period of time in providing and maintaining high quality recreational and coastal protection facilities along the coast. These are detailed in Table 1 and locations shown in Figure 3.

Table 1 Summary of recreational and coastal protection facilities along the City of Rockingham coastline

Boat Ramps (Each formal boat ramp complex includes at least one finger jetty)	
	Palm Beach (4 ramps)
	Point Peron (6 ramps)
	Bent Street (2 ramps)
	Port Kennedy (2 ramps)
	Donald Drive (informal – over-sand)
	Carlisle Street (informal – over-sand)
Jetties (additional to those at boat ramps)	
	Val Street
	Palm Beach
	Mersey Point
Sea Walls	
	Rockingham Beach Foreshore
	Mersey Point
	Waikiki

Figure 3 City of Rockingham coastal infrastructure map



Recreational uses of the coastal environment, and the land abutting the coastal zone are under threat. The impacts of climate change are being felt, with erosion hotspots such as

Mersey Point requiring emergency protection works. Other erosion hotspots are resulting in loss of favoured beaches, such as Apex beach near Point Peron, and threatening the stability of coastal protection areas such as Tern Bank at its western end.

Sand movement at the eastern side of Tern Bank is highly dynamic impacting on the costs and the ability to maintain open water access from favoured boat ramps. It may also threaten the long term viability of The Pond and its associated high recreational value.

The Shoalwater Islands Marine Park is a much loved area of the City of Rockingham coastline and hosts the iconic little penguins as well as other important wildlife. The DBCA manages the Shoalwater Islands Marine Park to protect the high value marine flora and fauna. While the Marine Park offers an invaluable attraction and benefit to the community it comes with increased environmental restrictions that the City needs to navigate through for maintaining its marine infrastructure and coastal processes.

The City is bringing scientific research and good designs together for the future development of its coastal facilities. Recent research and planning has been encapsulated in the City CHRMAP, Safety Bay/Shoalwater Coastal Management Study, and the feasibility study for upgrading and expanding the Port Kennedy boat ramps.

This planned future development will be undertaken within the context of the City of Rockingham's strategies and plans. As an example, the Heritage Strategy is assisting with future development planning by ensuring that City of Rockingham foreshore heritage is identified and mapped.

The CHRMAP study developed a set of community success criteria for management of the foreshore, which will inform all future coastal facilities development, operation and maintenance. These success criteria are

- Conserve natural attributes (e.g. clear water, vegetated dunes and sandy beaches)
- Ensure public safety and access
- Minimise impacts on existing residential areas
- Provision and maintenance of public amenities
- Conserve areas for recreational and passive use
- Provision of foreshore areas for local economic benefit
- Provision of access infrastructure (e.g. roads, carparks, paths)
- Maintenance and preservation of indigenous and cultural heritage sites.

The CHRMAP looks ahead across a 100 year timeframe, whilst this strategy is for the next four years, laying foundations for longer term decision making and activities.



4 Current situation

4.1 Boating recreation

Key achievements in boating recreation in the last four years

- Construction of Mersey Point jetty.
- Construction of two additional boat ramps at Point Peron with planned increase of car parking.
- Feasibility study of Port Kennedy Drive boat ramp extension.
- Successful trial of dedicated launch and retrieval ramps at Point Peron and Port Kennedy boat ramps.
- Design of Mersey Point Seawall stages 1 and 2 and planned construction
- Continued management of six distinct boat ramp locations to maintain year-round useability.

Key issues

Increasing population is putting pressure on existing boating infrastructure, particularly in peak periods. Overall population is expected to increase by 13% in the next five years, and 28% over the next 10 years (.idcommunity 2021). Growth will occur most rapidly in Baldivis, Rockingham City Centre and the southern coastal suburbs. The City has more than 10% of all registered recreational boats within the Perth Metropolitan Area, and the number of recreational boats in the region is anticipated to grow by 30 – 50% in the next 15 years if current trends on boat ownership continue. Construction of four new boat ramps in the City will be required within the next 15 years to maintain the current level of service.

The nature of recreational boating is changing. Comparing data from a recent survey to a similar one in 2015 suggests that boats are getting larger and requiring deeper channels to access open water. The boats are also being launched more frequently. These changes impact on the usability of existing boat ramps and their maintenance requirements. (Metrix Consulting, 2015 and 2020).

Recreational boating and the supporting infrastructure potentially have adverse effects on the local environment. Recent research has highlighted that along with other reasons associated with climate change a cause of the decline of the local little penguin colonies is due to collisions between recreational users (boats, kite surfers) and penguins. (Cannell et. al. 2016)

Key Issue 1: Provision and management of boating infrastructure is becoming increasingly costly in economic, social and environmental terms due to increased demand; increased boat draughts; heightened threats to the local little penguin colony; dispersed maintenance requirements across a number of boat ramp locations and needing to maintain access to open water.



4.2 Near shore recreation

Key achievements in near shore recreation

- Construction of accessible beach access at Rockingham Beach.
- Accessible jetties at Val Street, Palm Beach and Mersey Point.
- Improved beach access from Singleton Beach carpark to the beach with an accessible pathway.

Key issues

Residents prioritised investment in additional beach access paths – both for people with disability and for easier launching of kayaks and canoes. They noted that maintenance of existing paths could be improved to assist access for the people with disability. This will be particularly important around Warnbro sound where the population is expected to age in coming years.

Key Issue 2: Beach access isn't adequate for all users and is an inhibitor to diversifying recreation along the coast.



4.3 Coastal process management

Key achievements in coastal process management

- Regular excavation and dredging activities at Point Peron and Bent Street to maintain safe access to open water.
- Substantial and ongoing renourishment of beaches along the coastline.
- Residents and boat owner survey demonstrating awareness of coastal processes and desire to retain open water access for boats and retention of beaches.
- Undertaking coastal modelling as part of all new infrastructure design to account for the coastal processes.

Key issues

The Rockingham near shore coastal environment is dynamic with large volumes of sediment transport. These flows and processes result in erosion of some coastal areas, accretion in others, and filling in of boat launching facilities and navigation channels.

Regular sand removal is required to maintain open water access from Point Peron and Bent Street boat ramps. Sand is excavated from the Point Peron sand trap and used for the purpose of beach renourishment throughout the City. The sand removed from the Bent Street navigation channel is costly to dispose of as it's discolouration by organics and tannins means that it is currently taken to landfill.

Erosion and accretion occur at several points along the coastline. Apex Beach is frequently renourished to reverse the effects of erosion. Construction of a sea wall is required to protect Arcadia Drive from erosion. Accretion at the eastern end of Tern Bank continues to impact on the Pond and the Bent Street boating channel. Erosion at the western end of Tern Bank is causing instability with potential future loss of its protection of this section of coast.

Key Issue 3: Natural sand movement is impacting negatively on recreation, leading to shallow boat channels and eroded beaches.

4.4 Climate change adaptation

Key achievements in climate change adaptation

In recent times the City has:

1. Completed the Coastal Hazard Risk Management and Adaptation Plan (CHRMAP)
2. Constructed an interim limestone seawall at Mersey Point to protect Arcadia Drive.
3. Constructed a set of concrete sea walls and geotextile erosion protection at Rockingham Beach Foreshore to protect the high value infrastructure in that area.

Key issues

Climate change is leading to an increasing number of higher intensity storm events. These impact the coastline with potential to cause severe erosion, as seen in 2020 when a storm event eroded Mersey Point so badly that part of the footpath was lost and a section of Arcadia Drive had to be temporarily closed. The Intergovernmental Panel on Climate Change (IPCC) (2019) estimates that current severe weather events that occur only once every 100 years will occur up to annually by 2050.

The IPCC (2019) predicts sea level rises of up to 0.6m by 2050 and 1.1m by 2100. This will result in retreat from coastal areas, in some areas of many metres, with consequent loss of amenity and infrastructure. This will be addressed over time through decisions around

protection vs. managed retreat. It will also impact on decision making regarding the location of future infrastructure and the type of infrastructure that is installed.

Climate change impacts on infrastructure will include increased maintenance, repair, and replacement costs; increased preventative expenditure; and reduction in use due to inundation, flooding, ground movement and loss of infrastructure.

Coastal protection is lowest in the hierarchy of climate change risk management. The City already has significant coastal protection infrastructure in place including sea walls, groynes and subsurface geotextile installations to protect against erosion. The location, number, condition and value of these structures are not yet fully documented in a single location to facilitate future planning. Coastal protection infrastructure can also have other detrimental effects – such as erosion on the lee side of groynes, and splintering of limestone walls. Their relative cost and efficacy in the City environment is also not known sufficiently to support informed decision making.

Key Issue 4: Coastal protection infrastructure isn't fully captured in the asset register, exacerbating issues in responding to coastal vulnerability.

Key Issue 5: Coastal infrastructure will become increasingly vulnerable to damage or loss as climate change impacts develop.



5 The way forward

5.1 Maintaining and improving the boating recreation level of service

Goals

- ✓ Provide sufficient recreational boating infrastructure to meet current and future demand.
- ✓ Provide boat ramps of sufficient channel depth to facilitate the increased size of boats being launched.
- ✓ Boat ramps be provided in locations so as to minimise environmental impact and any negative impact on other coastal recreational users.
- ✓ Maintain the standard of the boat ramps and renew in a timely manner

Key Issue 1: Provision and management of boating infrastructure is becoming increasingly costly in economic, social and environmental terms due to increased demand; increased boat draughts; heightened threats to the local little penguin colony; dispersed maintenance requirements across a number of boat ramp locations and needing to maintain access to open water.

Action

- Develop a strategic approach to retention, maintenance, upgrade and acquisition of boat ramps across the City to provide sustainable access to open water for boat owners taking into consideration at least:
 - Location relative to offshore destinations.
 - Location relative to boat owning population.
 - Options analysis for provision of facilities supporting all boat trailer types.
 - Options analysis for minimising long term maintenance costs.
 - Ability to provide high quality supporting infrastructure such as shelter from sea swell and wind; sufficient parking; boat wash down bays and suitable fish cleaning stations.
 - Impact on local residents.
 - Conflict with other users (swimmers, fishers).
 - Safety.
- Support development of an appropriate, planning approved and environmentally sound Marina and consider any other private infrastructure that will support the City's boating community within the City subject to detail assessment and environmental and planning requirements being met.
- Undertake boat ramp and car parking renewal and upgrades as required.



5.2 Maintaining and improving the near shore recreation level of service

Goals

- ✓ The City optimises the opportunities for recreation along the City coastline for both residents and visitors. The opportunity includes access to City beaches, marine water bodies and jetties for people with disability.

Key Issue 2: Beach access isn't adequate for all users and is an inhibitor to diversifying recreation along the coast.

Action

- Develop long term plan for location and level of maintenance of beach access paths being cognisant of changing populations, changing near-shore recreation usage, accessibility requirements, and access to existing beaches and near-shore attractions.
- Consider the impact of environmental conditions and coastal processes on feasibility of new accesses.



5.3 Management of coastal processes to facilitate coastal recreation

Goals

- ✓ Develop a sound understanding of local marine sand movements sufficient to inform future decision making in respect of coastal infrastructure and sand maintenance operations
- ✓ Manage coastal processes so as to maintain or enhance coastal recreation through retention of key beaches, prevention of loss of key coastal infrastructure to erosion, and maintenance of essential boating channels.

Key Issue 3: Sand movement is impacting negatively on recreation, leading to shallow boat channels and eroded beaches.

Action

- Develop long term approach to management of coastal processes based on a sound understanding of sand movements within the local marine environment, including:
 - Study to understand local sand movement processes and how they can be expected to change with time and any proposed infrastructure development.
 - Study into the effectiveness of sand renourishment program.

5.4 Determining sustainable approach to Climate Change Adaptation

Goals

- ✓ Understanding costs, issues and opportunities of coastal protection vs. managed retreat

Key Issue 4: Coastal protection infrastructure isn't fully captured in the asset register, exacerbating issues in responding to coastal vulnerability.

Action

- Document all coastal protection infrastructure within the asset management framework by undertaking a study that documents coastal protection infrastructure, its location, type, estimated value and expected useful life.

Action

- Generate a robust foundation for future decision making with respect to coastal protection vs. managed retreat by taking into account the City's CHRMAP.
 - Report detailing efficacy of various coastal protection measures, expected lifetime costs, and other impacts thereof.
 - Investigation and options analysis into areas of high erosion and high value (infrastructural, economic, social, environmental) along the City coastline.

Key Issue 5: Coastal infrastructure will become increasingly vulnerable to damage or loss as climate change impacts develop.

Action

- For all coastal infrastructure renewals, new installations and major maintenance works to be taken in cognizance of the information and recommendations included within the CHRMAP.

Action

- Monitor Coastal erosion near Hymus Street and Esplanade intersection and construct seawall when required.

Action

- Update the existing asset inventory to identify vulnerable assets and prepare an emergency/damage response plan to respond to potential coastal impacts.

Action

- Initiate a long term coastal monitoring program, incorporating ad hoc storm and metocean monitoring, and coastal asset condition assessments.

Action

- Undertake a detailed sediment transport analysis to establish a detailed sediment budget for the City.

6 Measuring success

What will be measured?	The City recreational boat users level of satisfaction with recreational boat launch and retrieval facilities.
When will it be measured?	As part of next strategy development
How will it be reported to Council?	As part of the Council Bulletin

What will be measured?	Community satisfaction with accessibility of coastal recreation within the City
When will it be measured?	Annually, through the Customer Satisfaction Survey
How will it be reported to Council?	Within communication of the Customer Satisfaction Survey results.

What will be measured?	Community satisfaction with boat ramps and jetties
When will it be measured?	Annually, through the Customer Satisfaction Survey
How will it be reported to Council?	Within communication of the Customer Satisfaction Survey results.

What will be measured?	Completion of CHRMAP actions identified within this strategy
When will it be measured?	By the end of 2025
How will it be reported to Council?	As part of the Council Bulletin



7 Risk management

Risk	Increased regulation of Shoalwater Islands Marine Park resulting in more time consuming and expensive coastal projects approval process		
Overall risk level	Medium	Impact area	Project Management
Action Required	<p>Remain actively involved with DBCA regarding future plans and their activities through regular meetings and Coastal Facilities Advisory Committee.</p> <p>Appropriate project planning to allow the additional time and resources required.</p> <p>Increase knowledge and awareness about Shoalwater Islands Marine Park Management Plan to understand DBCA decision making process.</p>		

Risk	Reduced level of service with boating channels if excavation or dredging can't be undertaken when required due to environmental constraints or resource unavailability		
Overall risk level	Medium	Impact area	Customer Service
Action Required	<p>Monitor the site by regular data collection.</p> <p>Consider environmental constraints for timeframe and be aware of any potential restriction by staying in touch with DBCA.</p> <p>Seek advice from Conservation and Parks Commission as required.</p> <p>Predict future dredging/excavation requirements and book dredging companies well in advance.</p> <p>Maintain Licence for maintenance dredging from DBCA.</p> <p>Work with relevant stakeholders to receive required permits in time.</p>		

Risk	Significant storm event damaging marine infrastructure and making it unusable		
Overall risk level	Low	Impact area	Financial
Action Required	<p>Undertake regular condition assessment and maintenance of marine infrastructure.</p> <p>Take action as soon as possible after any storm event.</p> <p>Ensure new marine infrastructure meets relevant standards and guidelines requirements and with the understanding of climate change and weather impacts and engineer accordingly.</p>		

Risk	Marine Infrastructure projects impacting heritage sites including aboriginal heritage sites		
Overall risk level	Low	Impact area	Project management
Action Required	<p>Undertake appropriate research for presence of heritage sites as part of designing marine infrastructure.</p> <p>Undertake appropriate community engagement and seek relevant approval prior to proceeding to construction.</p>		

Risk	Bent Street navigation channel and Point Peron Harbour can't be used due to a significant storm event.		
Overall risk level	Medium	Impact area	Customer Service
Action Required	Undertake regular monitoring and maintain marine infrastructure to withstand storm events. Undertake regular sand excavation to minimise impact. Maintain licence agreement for maintenance excavation with DBCA. Build relationships with the Department of Transport (DoT) and dredging companies to facilitate rapid response.		

Risk	Unable to deliver part or all of the proposed infrastructure upgrades due to regulatory bodies not supporting the City's infrastructure or coastal management proposal		
Overall risk level	Low	Impact area	Project Management
Action Required	Understand DBCA, DoT requirements prior to commencing design and maintain information flows with these organisations at all times. Undertake detailed metocean, sediment and water quality analysis to determine environmental impacts.		

Risk	Maintenance costs for existing boat ramp facilities becoming prohibitive due to sand movement impacting access to open water		
Overall risk level	Low	Impact area	Financial
Action Required	Tracking year-on-year costs for maintaining open water access from each boat ramp and analysing trends and future additional cost risks. Regularly monitor and maintain the boat ramp depth.		

Risk	Restrictions on some forms of recreational access from the vicinity of Penguin Island for preservation of the penguin population.		
Overall risk level	Medium	Impact area	Customer service
Action Required	Participate in research with Department of Biodiversity, Conservation and Attraction, Murdoch University and other relevant stakeholders to determine reasons for negative impact on penguin population and work collaboratively with all stakeholders to achieve a balanced outcome. Increase community awareness about negative impacts of recreational activities on penguin population.		

8 Actions

8.1 New actions

Boat ramps

Ref	Task	Cost Estimate	Team	Commence	Complete
BR1.	Develop a strategic position for the provision of boat ramps within the City for the next 10 years	\$30,000	Coastal Engineering	2021/22	2022/23
BR2.	Car Park extension and street lighting improvement at Point Peron boat ramps facility	\$1,400,000	Road Construction	2020/21	2021/22
BR3.	Detailed design of boat ramp and car parking extension at Port Kennedy as per the recommendation of the feasibility study undertaken in 2020/21	\$200,000	Coastal Engineering	2022/23	2023/24
BR4.	Palm Beach West - Boat ramp redevelopment design and documentation	\$80,000	Coastal Engineering	2022/23	2022/23
BR5.	Undertake Palm Beach west boat ramp redevelopment	\$700,000	Coastal Engineering	2023/24	2023/24
BR6.	Point Peron - Replace boat ramp piles & install protective sleeves	\$150,000	Coastal Engineering	2023/24	2023/24
BR7.	Feasibility study of additional boat ramps based on the recommendation of strategic position for the provision of boat ramps within the City for the next 10 years	\$160,000	Coastal Engineering	2024/25	2024/25

Jetties

Ref	Task	Cost Estimate	Team	Commence	Complete
J1.	Palm Beach jetty 10 year refurbishment Design and Documentation	\$50,000	Coastal Engineering	2021/22	2021/22
J2.	Palm Beach jetty 10 year refurbishment	\$350,000	Coastal Engineering	2022/23	2022/23
J3.	Val Street Jetty refurbishment – Design and Documentation	\$80,000	Coastal Engineering	2022/23	2022/23
J4.	Val Street Jetty refurbishment – construction	\$450,000	Coastal Engineering	2023/24	2023/24

Beach access paths

Ref	Task	Cost Estimate	Team	Commence	Complete
BP1.	<i>Develop a beach access plan, building upon work already included in the RBFMP and the SBSMP.</i>	\$80,000	<i>Parks Services; Community Development</i>	2022/23	2022/23

Coastal processes, accretion and erosion management

Ref	Task	Cost Estimate	Team	Commence	Complete
CP1.	<i>Complete environmental study regarding potential sites for offshore placement of Bent Street dredged material.</i>	\$150,000	<i>Coastal Engineering</i>	2021/22	2022/23
CP2.	<i>Develop a coastal sediment management plan including beach renourishment</i>	\$10,000	<i>Coastal Engineering</i>	2021/22	2021/22
CP3.	<i>Upgrade the spur groyne and revetment wall at Point Peron</i>	\$1,000,000	<i>Coastal Engineering</i>	2021/22	2021/22
CP4.	<i>Prepare a report on anticipated costs of preferred coastal adaptation options outlined in the CHRMAP</i>	\$100,000	<i>Strategic Planning</i>	2021/22	2021/22
CP5.	<i>Construct additional Geotextile Sand Container (GSC) groyne at Point Peron to the west of existing spur groyne</i>	\$650,000	<i>Coastal Engineering</i>	2022/23	2022/23
CP6.	<i>Complete harbour dredging at Point Peron</i>	\$400,000	<i>Coastal Engineering</i>	2021/22	2021/22
CP7.	<i>Construct buried seawall at Hymus Street and Esplanade</i>	\$1,000,000	<i>Coastal Engineering</i>	2024/25	2024/25
CP8.	<i>Undertake a study to review the effectiveness of sand renourishment program based on coastal sediment analysis</i>	\$100,000	<i>Coastal Engineering</i>	2024/25	2024/25

General activities

Ref	Task	Cost Estimate	Team	Commence	Complete
GA1.	<i>Develop a program to undertake regular condition assessment of existing marine infrastructures</i>	\$20,000	<i>Coastal Engineering</i>	2023/24	2023/24
GA2.	<i>Update the existing asset inventory to identify critical assets and prepare an emergency/damage response plan to respond to potential coastal impacts</i>	\$50,000	<i>Asset Services Coastal Engineering Parks Services</i>	2024/25	2024/25
GA3.	<i>Ensure all Marine Infrastructure is captured in the asset register</i>	\$20,000	<i>Asset Services Coastal Engineering</i>	2024/25	2024/25

Ref	Task	Cost Estimate	Team	Commence	Complete
GA4.	Update Coastal Management Study	\$100,000	Coastal Engineering	2023/24	2023/24
GA5.	Infrastructure projects stemming from a number of studies undertaken in the previous years	\$1,314,000	Coastal Engineering	2024/25	2024/25

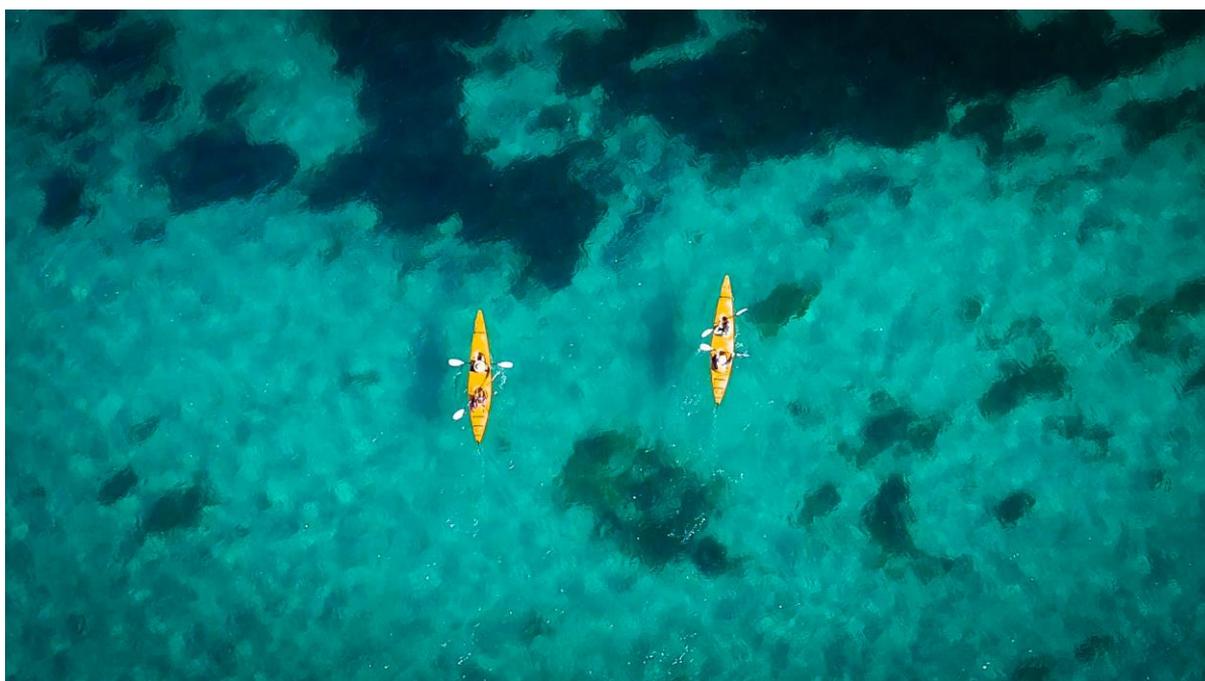
8.2 Ongoing actions

Ref	Task	Cost	Team
OA1.	Coastal monitoring at key locations incorporating ad hoc storm and metocean monitoring	\$150,000	Coastal Engineering
OA2.	Regular maintenance of all marine infrastructure such as boat ramps, jetties, sea walls, groynes etc.	varying	Coastal Engineering
OA3.	Regular condition assessment of existing assets.	varying	Coastal Engineering
OA4.	Coastal sediment excavation and dredging to maintain navigability	\$600,000	Coastal Engineering
OA5.	Undertake sand renourishment at various locations	\$180,000	Coastal Engineering
OA6.	Maintain regular communication with relevant stakeholders such as DBCA, DoT and excavation and dredging companies	Nil	Coastal Engineering
OA7.	Build new infrastructure meeting relevant standards and guidelines requirements and with the understanding of climate change and weather impacts and engineer accordingly. Consider CHRMAP recommendations as part of the design. Review should also consider any heritage implication including Aboriginal heritage.	Nil	Coastal Engineering
OA8.	Support development of a Marina and consider any other private infrastructure that will support the City's boating community within the City subject to detail assessment and environmental and planning requirements being met.	Nil	Strategic Planning and Statutory Planning
OA9.	Ongoing seasonal provision of beach access matting, provision of beach wheelchairs and beach walkers	varying	Community Capacity Building, Parks Services

9 Stakeholder engagement

Key Stakeholders invited to participate	Contributed? (Yes/No)	Engagement method used
Community	Yes	Surveying by website, social media and media release. Direct mail notification of survey to those nearest the coast. Share your thoughts, email and telephone submissions on the draft strategy. Strategy consultation period promoted with a newspaper advertisement, media release, multiple facebook posts, via Rockport, and by direct email to user groups.
Community Infrastructure Planning Strategic Planning Land and Development Infrastructure Major Planning Projects Health Services Parks Services Assets Services Engineering Services Infrastructure Project Delivery Community Capacity Building Strategy, Marketing and Communication	Yes	Email and workshop
Council	Yes	Council report, Councillor Engagement Session
Coastal Facilities Advisory Committee (CFAC)	Yes	Email and discussion in CFAC meetings
Department of Biodiversity, Conservation and Attraction (DBCA)	Yes	Face-to-face meeting and Email
Department of Transport (DoT)	Yes	Face-to-face meeting and Email
Department of Fisheries (DoF)	No	Online feedback form
Department of Water and Environmental Regulation (DWER)	Yes	Email
Department of Primary Industries and Regional Development (DPIRD)	No	Email
Water Corporation	No	Email
Marine rescue Rockingham	No	Notified of online survey for draft strategy by Email
Kiteboarding Western Australia	No	Notified of online survey for draft strategy, and consultation on draft strategy by Email
The Cruising Yacht Club (TCYC)	No	Notified of online survey for draft strategy by Email

Safety Bay Yacht Club (SBYC)	No	Notified of online survey for draft strategy by Email
Mangles Bay fishing club	No	Notified of online survey for draft strategy by Email
Secret Harbour Surf Life Saving Club	No	Email
Naval Association	No	Email
Perth Wildlife Encounters	No	Email
Windsurfing Western Australia	No	Email



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