Badu Island Master Plan

Prepared for

Department of Seniors, Disability Services and Aboriginal and Torres Strait Islander Partnerships and Torres Strait Island Regional Council

Contact Information

Cardno (Qld) Pty Ltd
ABN 57 051 074 992
15 Scott Street
Paramatta Park
Cairns QLD 4870
Australia
www.cardno.com
Phone +61 7 4034 0500

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Author(s):	Approved By:	
Helena Charlton	Stephen Whitaker	Effective Date 15/03/2022
Principal Planner	Senior Planner, Technical Lead - Planning	

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1 Introduction

1.1 Purpose

Torres Strait Island Regional Council (TSIRC), with the support of the Department of Aboriginal and Torres Strait Islander Partnerships (DATSIP), has developed the Badu Island Master Plan. The Badu Island Master Plan is intended to be used by TSIRC, Prescribed Body Corporates (PBCs), State agencies, service providers and the broader community to inform planning decisions in relation to future development.

The Badu Island Master Plan seeks to guide the future use of land on Badu Island in a manner that is cognisant of community needs, demands and aspirations. The Badu Island Master Plan identifies a range of future residential; industrial; commercial / tourism; community facilities; and recreation and open space development projects. The Master Plan has been prepared to ensure the orderly, efficient and effective use of land in a way that is reflective of relevant opportunities and constraints. The Master Plan seeks to coordinate the actions of a range of different stakeholders to maximise the benefits of new development projects to the community.

The Badu Island Master Plan is a living document endorsed by TSIRC, intended to be progressively updated as new development occurs to reflect the changing needs and aspirations of the community.

1.2 Structure

The Badu Island Master Plan includes the following elements:

- A **Master Plan Map**, provided as **Appendix A**;
- A **Vision**, provided in Chapter 2;
- **Community Aspirations**, provided in Chapter 3;
- **Master Plan Projects**, the details of which are articulated in Chapter 4; and
- An **Action Plan**, provided in Chapter 6.

The Master Plan is also supported by a separate Technical Report.

The relationship between these elements is shown in **Figure 1-1**.

1.3 Relationship to the Zenadth Kes Planning Scheme

The Badu Island Master Plan is intended to identify a high level strategic direction for the future development of Badu Island having regard to all relevant planning considerations, including the *Zenadth Kes Planning Scheme* ('the Planning Scheme').

The Master Plan does not replace or alter the Planning Scheme as it relates to Badu Island and does not change current development approval requirements. Projects or works identified by the Master Plan may require development approvals and/or changes to the Planning Scheme and these are identified in the Master Plan itself as appropriate.

The Planning Scheme forms part of the statutory town planning framework established under the *Planning Act 2016*, which provides for the regulation of development activity. The Master Plan is a non-statutory strategic planning document intended to guide decision making with regard to the long term development of Badu Island. It may be appropriate in certain circumstances for TSIRC to amend the Planning Scheme to reflect findings of the Master Plan. Recommendations in this regard are made in the Master Plan.

1.4 Acknowledgement

Gogobithiay (land, sea and sky) is fundamental to the Torres Strait Islander way of life. Gogobithiay cannot be separated into land, sea and sky and it cannot exist without the Torres Strait people.

The Badu Island Master Plan acknowledges the native title holders, Badulgal People as the traditional custodians of Badu Island. The Master Plan also acknowledges all community members.

Any person proposing to undertake development on Badu Island should pay respect to the Badulgal People's custodianship of the island by seeking permission to use its resources and ensuring that development acknowledges the special and ongoing cultural relationship of the Badu Island community with Gogobithiay.

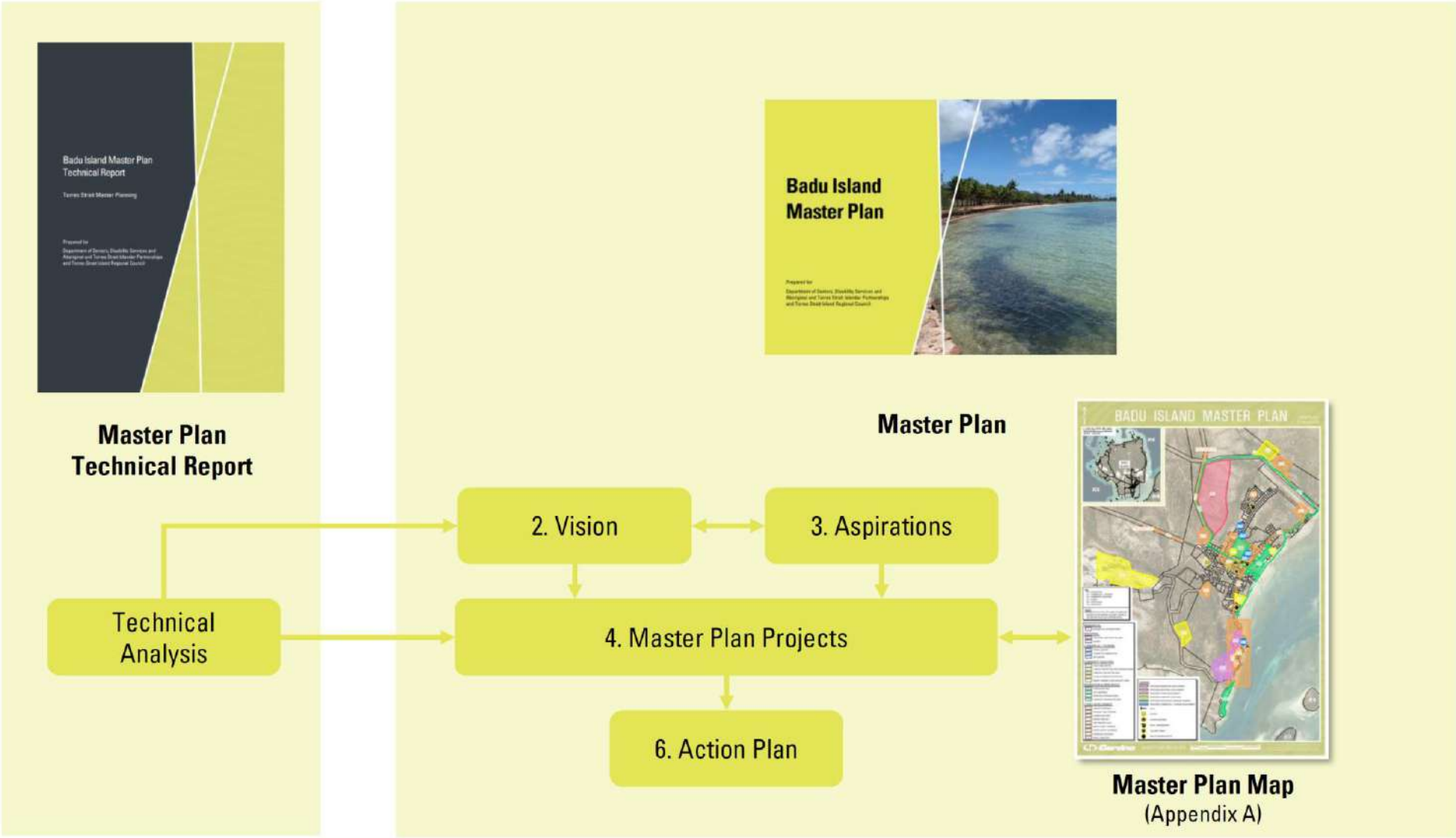


Figure 1-1 Master Plan Elements

2 Vision

Badu Island *will develop as a consolidated centre servicing the needs of the local community whilst supporting the social and economic functions of the broader Torres Strait region.*

The town centre will develop to provide a focus for enriching sense of place, community activity and connection. It is framed by and engages with the coast at the southern end of the central business district, linking to the foreshore in a parkland setting. Emphasis is placed on the protection of the culture and history of the community.

A sustainable economy is to be created that promotes sustainable tourism, education, training and local and regional business. Development will seek to promote Badu Island as a cultural destination, promoting the existing arts and cultural industries and institutes and build on those themes to encourage visitors to experience and engage with culture and the environment of Badu Island and surrounds.

Development will highlight and celebrate the islands natural features including environmental areas inland and along the foreshore. A new foreshore park will be a key place to meet and be enjoyed by locals and visitors by creating a mix of quiet and engaging experiences. Connections between the foreshore and the central business district will promote a coastal village landscape quality.

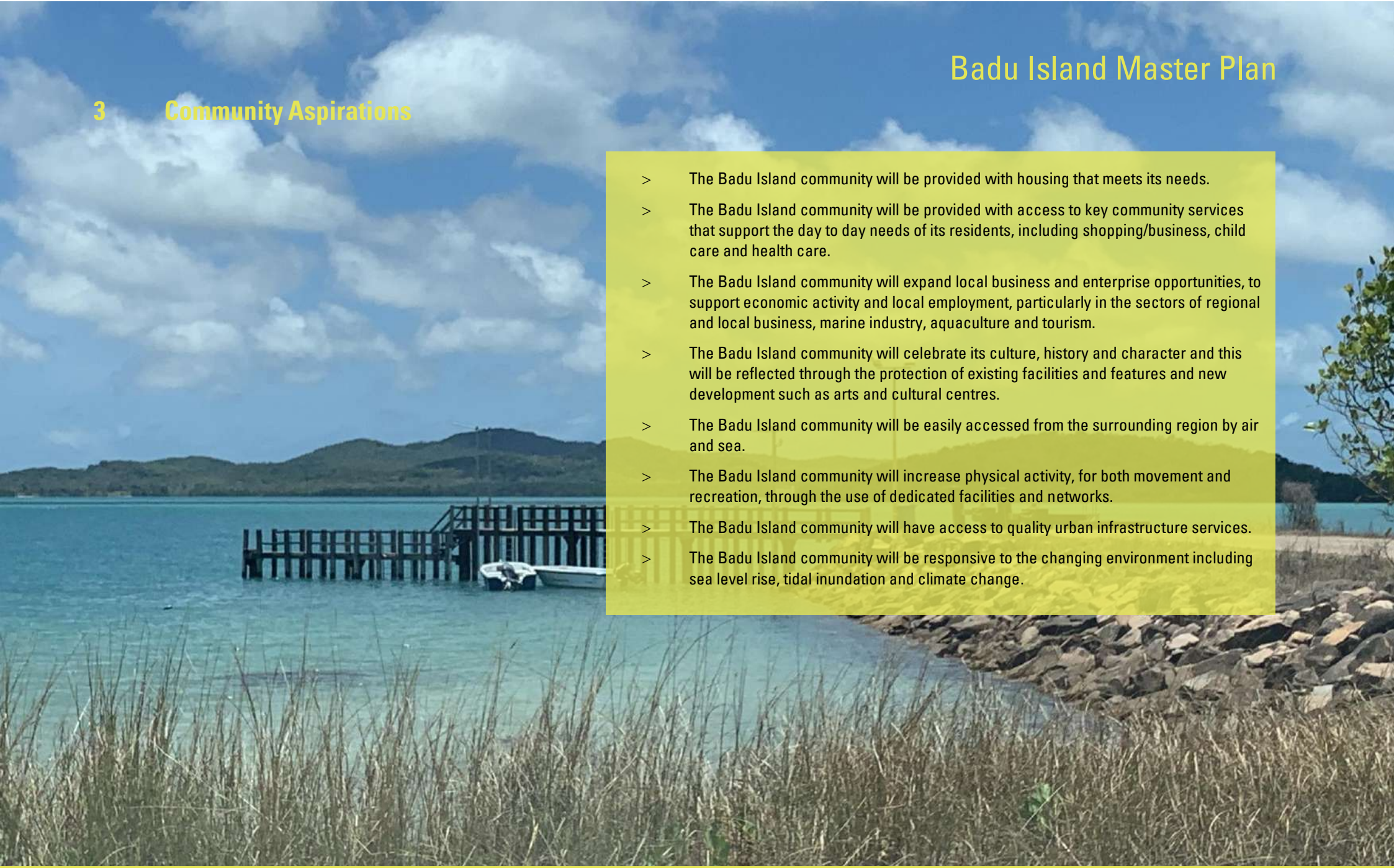
Badu Island's sporting identity will be supported and enhanced through development that improves and expands the established sporting precinct through upgrades and expansions to fields, courts and supporting infrastructure. The sporting precinct will seek to support regional events and competitions.

Residential areas on Badu Island support a high level of amenity and a unique character linked to the values of the community and a new residential expansion area is identified to consolidate growth and promote a variety of housing opportunities.

Local businesses and the establishment of new marine based industries will be promoted through a new wharf business and industry precinct shared by a new arrivals terminal that promotes Badu's identity is a point of interest.

New development should seek to improve the quality of urban services provided to the community, including water and sewerage infrastructure, roads, lighting, and telecommunications access.

3 Community Aspirations



- The Badu Island community will be provided with housing that meets its needs.
- The Badu Island community will be provided with access to key community services that support the day to day needs of its residents, including shopping/business, child care and health care.
- The Badu Island community will expand local business and enterprise opportunities, to support economic activity and local employment, particularly in the sectors of regional and local business, marine industry, aquaculture and tourism.
- The Badu Island community will celebrate its culture, history and character and this will be reflected through the protection of existing facilities and features and new development such as arts and cultural centres.
- The Badu Island community will be easily accessed from the surrounding region by air and sea.
- The Badu Island community will increase physical activity, for both movement and recreation, through the use of dedicated facilities and networks.
- The Badu Island community will have access to quality urban infrastructure services.
- The Badu Island community will be responsive to the changing environment including sea level rise, tidal inundation and climate change.

4 Projects

4.1 Land Use Categories

The consideration of land uses as part of the Badu Island Master Plan has been undertaken using a number of land use categories. An explanation of each land use category is provided below.

Residential	Commercial / Tourism	Recreation and Open Space
Residential land uses primarily relate to the provision of housing. Residential land may support a range of dwelling types of varying scale (for example, single low-rise homes, duplexes, and unit complexes). Open space is often integrated within residential areas to soften the built environment and provide land for passive and active recreation.	Commercial land uses typically involve business activities which may include the sale of goods (such as shops and cafes) or services (such as offices and medical centres). Tourism land uses also involve business activities, however these are focussed on providing goods, services, facilities and entertainment for tourists. Examples of tourism land uses include tourist parks, accommodation and businesses operating tours.	Recreation land uses support the provision of land for recreational activities, which may be organised or informal. This includes sporting facilities such as fields, courts, stadiums and arenas, rodeo grounds, walking / cycling paths and outdoor exercise equipment. Open space areas provide dedicated natural spaces throughout an urban area enhance the beauty and environmental quality of neighbourhoods. They may include formalised landscaping also comprise recreational opportunities. Recreation and open space areas are commonly collocated.

Industrial	Community Facilities	Other
Industrial land uses generally involve the manufacturing, processing, treatment or repair of goods. Industrial land uses involve varying degrees of intensity and severity, generally linked to their potential level of impact on nearby land uses associated with their emissions (such as air, noise and odour). Examples of industrial land uses include manufacturing plants, processing plants, mechanical workshops, transport depots, storage sheds and warehouses.	Community facilities land uses support the delivery of community services or provide community benefit. Community facilities include uses for health services, education (schools and colleges), arts and culture, religion, community support, civic infrastructure (water, sewer, waste, transport and other similar facilities), employment and training.	The “Other” land use category has been used to describe other uses and projects which commonly support the primary land uses. This may include infrastructure projects such as new roads or urban services and civic improvements such as beautification and landscaping.

4.2 Project Listing

Table 4-1 provides a listing of projects identified by the Master Plan. Further detail is provided in relation to each project as follows:

- The land to which each project relates is identified by the Badu Island Master Plan Map, a copy of which is provided as **Appendix A**.
- Key details relating to each project are outlined in Section 4.3 of this report.
- A summary of the Master Plan projects is provided in the project index included as **Appendix B**.
- Detailed breakdowns of the infrastructure costings for each project are provided in **Appendix D**.

Table 4-1 Project Listing

RS1	Residential Expansion Area
ID1	Industrial Investigation Area
ID2	Quarry
CT1	Arrival Centre
CT2	Tourist Accommodation
CT3	Arts Centre
CT4	Environmental Tourism
CF1	Child Care Centre
CF2	Landfill Protection and Expansion Area
CF3	Cemetery Protection Area
CF4	Place of Worship Protection
CF5	Market Garden / Food Security Area
OS1	Foreshore Park
OS2	Path Network
OS3	Sporting Expansion Area
OS4	Community Recreation Area
OT1	Airport Upgrades
OT2	Komagiw Yabu Upgrade
OT3	Connecting Road
OT4	Marine Precinct
OT5	CBD Precinct Plan
OT6	Mairu Street Upgrade
OT7	Water Supply Upgrades
OT8	Sewerage Upgrades
OT9	Public Amenities
OT10	“Back of Island” Access
OT11	Telecommunications Upgrades
OT12	Carbon and Renewable Energy Opportunities

Note: Projects CT4, OT0, OT1 and OT12 are not shown on the Master Plan Map provided as **Appendix A**.

4.3 Project Detail

Residential Projects

The Master Plan has identified a single large residential project area in order to accommodate an anticipated demand for 26 additional dwellings, along with longer term demand. The Master Plan will also seek to diversify the housing products provided on Badu Island. These key directions were identified as part of the technical analysis which is documented in the Badu Island Master Plan Technical Report. Further detail is also provided in **Appendix F**.

RS1 Residential Expansion Area

Summary

An area of land at the northern end of the township, located on the eastern side of Komagiw Yabu, has been identified as being potentially suitable for the demand of the community for residential purposes over the short, medium and long term. Development of the land is likely to be formed by a residential subdivision, which should be encouraged to include a range of dwelling types and sizes to suit demand.

The development potential of the expansion area is subject to further investigation of land constraints.

New Lots	237 Lots (estimate)	
Lot Size	1,200m^2 (average)	
Priority	Long Term	
Infrastructure Cost	$62,696,175	
Associated Projects	OS2	OT2
Key Actions	1	

Industrial Projects

The Master Plan provides opportunities for industry, enterprise and other business development. This key direction was identified as part of the technical analysis which is documented in the Badu Island Master Plan Technical Report. Further detail is also provided in **Appendix F**.

ID1 Industrial Investigation Area

Summary

An area for potential business enterprise development is identified at the waterfront. This locality has a number of particular attributes that can support activities linked with waterfront industry such as a community freezer, boat repairs, live tanks and other water related business / industries. There is existing vacant and cleared land in this locality to be investigated for such opportunities. Any industrial development should be developed to a high standard as this locality is also the arrivals/visitor gateway to the island.

Recommendations

Location of new lots or buildings are subject to coastal hazard identification and mitigation works where required.

New Lots	4 Lots		
Lot Size	4,371m^2-6,402m^2		
Priority	Medium Term		
Infrastructure Cost	$2,793,242		
Associated Projects	CT1	OT4	OT6
Key Actions	1	4	8

ID2 Quarry

Summary

The existing Badu Island quarry is of local and regional significance and has the potential to support economic development for the community. The existing quarry should be protected and expanded where appropriate.

New Lots	N/A	
Lot Size	N/A	
Priority	Short Term	
Infrastructure Cost	N/A	
Associated Projects	OT4	OT6
Key Actions	4	

Commercial / Tourism Projects

The Master Plan seeks to ensure that the community is provided with sufficient access to commercial land uses. The Master Plan also seeks to promote the development of uses and infrastructure associated with tourism, in appropriate locations. These key directions were identified as part of the technical analysis which is documented in the Badu Island Master Plan Technical Report. Further detail is also provided in **Appendix F**.

CT1 Arrival Centre

Summary

The Master Plan has identified an Arrival Centre proximate to the jetty and boat ramp (**OT4**). The centre is intended to serve a variety of purposes complementing the jetty and boat ramp upgrades, including to provide local retail services, provide arrival services for tourists and visitors and provide a fuel bowser. An area for transport drop off and pick up may also be established given the scale of Badu Island and higher visitation and population numbers.

Recommendations

Coastal hazard impacts are to be investigated and mitigated as part of the establishment of any new infrastructure.

New Lots	N/A		
Lot Size	N/A		
Priority	Short Term		
Infrastructure Cost	$889,442		
Associated Projects	CT2	OT4	OT6
Key Actions	4	8	

CT2 Tourist Accommodation

Summary

This project reflects existing accommodation facilities which have been identified as being important resources for the community. These include: the motel on Chapman Street, accommodation adjacent to the Badu Hotel (opposite the sports fiels) and BRAC's accommodation on Ahmat Street. Existing accommodation should be protected and further improved to suit the needs of visitors and tourists.

New Lots	N/A		
Lot Size	N/A		
Priority	Short Term		
Infrastructure Cost	N/A		
Associated Projects	CT1	OT5	
Key Actions	3	4	

CT3 Art Centre

Summary

The Master Plan identifies that the existing Art Centre located on Ahmat Street (Lot 274 on SP253545) is an important cultural, educational and commercial asset to the community and should therefore be protected and maintained to ensure its ongoing operation. The expansion and / or improvement of the existing facility should be considered as the need arises.

New Lots	N/A	
Lot Size	N/A	
Priority	Medium Term	
Infrastructure Cost	N/A	
Associated Projects	-	
Key Actions	3	4

CT4 Environmental Tourism

Summary

Opportunity exists in various locations throughout the island for the environmental values of the area to be protected and enhanced for the benefit of tourist activities aimed at the appreciation of any unique environmental features or areas. Any tourism operations should occur in a manner that is sensitive to the fragility of the natural environment, to ensure it can be sustained over the long term.

New Lots	N/A	
Lot Size	N/A	
Priority	Medium Term	
Infrastructure Cost	N/A	
Associated Projects	CT1	CT2
Key Actions	4	6

Community Facilities Projects

The Master Plan seeks to promote the protection and expansion of key community facilities. The Master Plan also provides opportunities for the establishment of new community facilities where demand exists. These key directions were identified as part of the technical analysis which is documented in the Badu Island Master Plan Technical Report. Further detail is also provided in **Appendix F**.

CF1 Child Care Centre

Summary

The community has identified a need for child care facilities, which the Master Plan will deliver either through an expansion of any existing child care facilities or the provision of additional facilities to diversify the service. Childcare services should be expanded as demand necessitates.

Child care has been acknowledged as a regional issue which comprises significant complexity with regard to legal compliance. On this basis it is anticipated that future child care services will be delivered as a coordinated service covering multiple islands or the entire region.

Recommendations

Child care has the potential to be delivered in a new dedicated facility, improved existing dedicated facility or provided through in home child care services. The delivery model for child care is to be explored further with consultation required to ensure that specific needs are identified and aspirations are appropriately met.

New Lots	N/A	
Lot Size	N/A	
Priority	Short Term	
Infrastructure Cost	N/A	
Associated Projects	-	
Key Actions	3	6

CF2 Landfill Protection and Expansion Area

Summary

The landfill located to the south-west of the township is an important piece of infrastructure that should be protected from encroachment by incompatible development. The future needs of the community should also be identified, so that land for the expansion of this infrastructure (if required) can also be protected. Ongoing future use of the site should also seek to improve the efficiency of operations so that use of the facility is minimised where possible.

New Lots	N/A	
Lot Size	N/A	
Priority	Ongoing	
Infrastructure Cost	N/A	
Associated Projects	-	
Key Actions	3	

CF3 Cemetery Protection Area

Summary

The cemetery, located in the south of the township, should be subject to ongoing protection to ensure that the cultural and spiritual connection of the community with this land is maintained. Where appropriate, improvements such as access works and fencing may be provided, however any such works should be undertaken sensitively. As part of the protection of the area, the community value of the site should be documented.

The future needs of the community should also be met through the use of additional land that is suitable to accommodate a second cemetery. The Master Plan identifies an area of land to the north of the township (adjacent to the treatment ponds) for this purpose. Further site-specific investigations should be undertaken to determine the suitability of the land.

New Lots	N/A			
Lot Size	N/A			
Priority	Ongoing			
Infrastructure Cost	N/A			
Associated Projects	-			
Key Actions	1	3	6	9

CF4 Place of Worship Protection

Summary

The Master Plan has identified that the existing places of worship should be protected and maintained as an important asset to the local community. Further embellishment of the existing structures and grounds may be appropriate where it is in keeping with the character and nature of the site.

New Lots	N/A		
Lot Size	N/A		
Priority	Ongoing		
Infrastructure Cost	N/A		
Associated Projects	-		
Key Actions	3	9	

CF5 Market Garden / Food Security Area

Summary

An area of land west of the township has been identified as being suitable for the development of market gardens or other cropping activities that can supply the community with fresh produce. Further investigation of this land should be undertaken to identify suitable areas for the establishment of these uses. The establishment of local agricultural uses will improve the food security of the community, improve community health and provide a potential source of economic activity through the trading of surplus food with neighbouring communities.

Recommendations

The viability of the market garden will be largely dependent on a reliable supply of freshwater. Future investigations of this project would be required to determine whether such supply exists or is capable of being reasonably provided.

New Lots	N/A	
Lot Size	N/A	
Priority	Medium Term	
Infrastructure Cost	N/A	
Associated Projects	-	
Key Actions	1	6

Recreation and Open Space Projects

The Master Plan seeks to provide improved opportunities for recreation, through the provision of an integrated network of active transport infrastructure and the identification of land for dedicated sporting facilities. These key directions were identified as part of the technical analysis which is documented in the Badu Island Master Plan Technical Report. Further detail is also provided in **Appendix F**.

OS1 Foreshore Park

Summary

An embellished Foreshore Park is identified in an area along the coastline at the eastern end of the central business district and running parallel to the major through road of Mairu Street that extends from the jetty in the south-west to the airport in the north-east (**OT6**). The parkland presents a unique and significant space for recreation, tourism and cultural and arts activities. The place will be established with improved facilities, high levels of amenity and accessibility and will also be protected for its environmental attributes. Development of the parkland should integrate the Path Network (OS2) in providing connections to the north, west and south.

Recommendations

It is recommended that all future active transport and recreational facilities be coordinated in their delivery.

New Lots	N/A		
Lot Size	N/A		
Priority	Short Term		
Infrastructure Cost	To Be Costed		
Associated Projects	CF4	OS2	OT6
Key Actions	2		

OS2 Path Network

Summary

A pathway network has been identified across Badu Island, connecting the northern and southern parts of the township, whilst also providing a loop around the north of the airport.

The pathway network will serve to improve connectivity whilst also supporting recreational opportunities and enhanced access to sacred sites (where appropriate). Development of the pathway should be combined with supporting infrastructure such as seats, lighting and landscaping to improve its contribution to the community. The Path Network should be integrated where possible with new roads and upgrades (**OT2** and **OT6**).

Recommendations

It is recommended that all future active transport and recreational facilities be coordinated in their delivery.

New Lots	N/A		
Lot Size	N/A		
Priority	Medium Term		
Infrastructure Cost	$625 per metre (concrete) $400 per metre (gravel) $200 per metre (earth)		
Associated Projects	OS1	OT2	OT6
Key Actions	2		

OS3 Sporting Expansion Area

Summary

The Master Plan identifies that the existing sports fields located within the CBD (**OT5**) should be developed to facilitate the community's aspirations for improved sporting facilities on the island. Improvements of the land should incorporate supporting infrastructure and fencing upgrades. Any development of the land should be completed in a coordinated manner, with a focus on the shared use of supporting infrastructure.

Recommendations

It is recommended that all future active transport and recreational facilities be coordinated in their delivery. Consultation will be required to identify the demand for the expansion and the facilities to be provided.

New Lots	N/A		
Lot Size	N/A		
Priority	Medium Term		
Infrastructure Cost	$3,149,704		
Associated Projects	OT5		
Key Actions	2	3	6

OS4 Community Recreation Area

Summary

The community have identified a desire to establish a formal recreation and camping area over a coastal strip of land south of the industrial area. This project seeks to support the community's aspirations for improved and accessible recreational facilities outside the township area (**OT10**).

Development of the community recreation area may be combined with supporting infrastructure such as seating, pathways, taps and landscaping to encourage community use.

New Lots	N/A		
Lot Size	N/A		
Priority	Medium Term		
Infrastructure Cost	N/A		
Associated Projects	OT10		
Key Actions	2	5	6

Other Projects

The Master Plan identifies a range of other projects intended to ensure the community is serviced with appropriately located facilities and infrastructure. These projects have been identified in response to direct community needs and include precinct plans, further investigations and new/upgraded infrastructure. These key directions were identified as part of the technical analysis which is documented in the Badu Island Master Plan Technical Report. Further detail is also provided in **Appendix F**.

OT1 Airport Upgrades

Summary

In order to improve access to Badu Island and the utility of airport infrastructure, further upgrades to the airstrip should be investigated. These upgrades may include night time lighting for night landing; terminal and waiting area facilities; storage and maintenance facilities; car parking and ancillary facilities; improving the arrival experience and improving the interface with surrounding land.

New Lots	N/A		
Lot Size	N/A		
Priority	Medium Term		
Infrastructure Cost	To Be Costed		
Associated Projects	OS2	OT6	
Key Actions	6		

OT2 Komagiw Yabu Upgrade

Summary

This project identifies that Komagiw Yabu is a key connecting road to the north of Badu Island. This road corridor and its upgrade can provide opportunities for establishment of a number of new activities and land use opportunities, particularly new residential development (**RS1**) and "back of island" access (**OT9**). The road upgrade may also integrate elements of the Path Network (**OS2**).

New Lots	N/A			
Lot Size	N/A			
Priority	Medium Term			
Infrastructure Cost	$9,442,180			
Associated Projects	RS1	OS2	OT10	
Key Actions	-			

OT3 Connecting Road

Summary

The Master Plan supports investigation of any new development and use opportunities to the west/inland of the existing township through the provision of a new connecting road. The extent and timing of the road would be dependent on access requirements for future land uses.

New Lots	N/A
Lot Size	N/A
Priority	Medium Term
Infrastructure Cost	To Be Costed
Associated Projects	OT10
Key Actions	-

OT4 Marine Precinct

Summary

The Master Plan identifies a Marine Precinct that encompasses the jetty/boat ramp area and the broader locality. Improvements of the jetty and boat ramp will support the efficient and safe use of this facility, whilst also expanding the ability for it to be used in a manner that supports economic activity.

This project has identified that there are large vacant areas in and around the jetty/boat ramp that could accommodate a range of land uses including the separately identified industrial precinct (**ID1**) and arrival centre (**CT1**) along with supporting infrastructure. The identification of the Marine Precinct is intended to ensure that any development in the area occurs in a coordinated manner. Development in the area should not jeopardise the operation or expansion of the existing quarry (**ID2**).

Jetty and boat ramp upgrades are a common project across all communities within the region. It is anticipated that required upgrades may be delivered as a regional work package which is progressively rolled out across each community.

Recommendations

Development of the precinct would be subject to coastal hazard investigation.

New Lots	N/A			
Lot Size	N/A			
Priority	Medium Term			
Infrastructure Cost	N/A			
Associated Projects	ID1	ID2	CT1	OT6
Key Actions	4	6	8	

OT5 CBD Precinct Plan

Summary

The Master Plan has identified a CBD Precinct for the focus of business and administrative facilities. The precinct comprises the existing sports fields (**OS3**), which are located centrally, and the path network (**OS2**) which will facilitate the creation of pedestrian linkages and positively contribute to the amenity and character of the area. This location accommodates a range of existing and potential new businesses and administrative uses which includes child care facilities, government offices, the cart centre, retail services, tourist accommodation, health care and emergency services. New facilitates should be progressively developed in a manner that considers the linkage between services. Further planning of the land should also consider its interface with existing surrounding residential land uses.

A copy of a preliminary Precinct Plan is provided as **Appendix E**.

New Lots	N/A					
Lot Size	N/A					
Priority	Medium Term					
Infrastructure Cost	N/A					
Associated Projects	CT2	CT3	CF1	OS2	OS3	OT6
Key Actions	4	6				

OT6 Mairu Street Upgrade

Summary

Mairu Street is the main road extending north- south through the township. It is the main connection for the jetty/boat ramp and the airport and connects both these facilities with the CBD. The road is strategically important to Badu Island and is the main spine that all arrivals to the island will travel along. Its upgrade and embellishment will facilitate a safe and efficient road network. The road upgrade may also integrate elements of the Path Network (**OS2**).

New Lots	N/A			
Lot Size	N/A			
Priority	Medium Term			
Infrastructure Cost	$18,583,760			
Associated Projects	ID2	OS2	OT1	OT4
Key Actions	-			

OT7 Water Supply Upgrades

Summary

The water supply network should be upgraded to meet current and future demand and treatment standards. Details of specific works and upgrades required upgrades are provided in Chapter 5 of the Master Plan.

New Lots	N/A
Lot Size	N/A
Priority	Short Term
Infrastructure Cost	To Be Costed
Associated Projects	-
Key Actions	3

OT8 Sewerage Upgrades

Summary

The sewerage network should be upgraded to meet current and future demand and treatment standards. Details of specific works and upgrades required upgrades are provided in Chapter 5 of the Master Plan.

New Lots	N/A
Lot Size	N/A
Priority	Short Term
Infrastructure Cost	To Be Costed
Associated Projects	-
Key Actions	3

OT9 Public Amenities

Summary

The Master Plan identifies the provision of public amenities within a community park located at the northern end of the township on Majlale Yabu. The nature and scale of public amenities in this location should be commensurate to the context of the site and level of community use.

New Lots	N/A
Lot Size	N/A
Priority	Medium Term
Infrastructure Cost	
Associated Projects	-
Key Actions	3

OT10 "Back of Island" Access

Summary

A range of opportunities are available for recreational and community activities to occur in areas of the island outside the established township. These opportunities should be further investigated in consultation with the community. Access is a primary constraint and any planned areas should be coordinated with road upgrades.

New Lots	N/A		
Lot Size	N/A		
Priority	Medium Term		
Infrastructure Cost	To Be Costed		
Associated Projects	OS4	OT2	OT3
Key Actions	5	6	

OT11 Telecommunications Upgrades

Summary

The community's access to telecommunications should be improved to ensure that coverage is available throughout the township, its immediate surrounds where activity occurs and within the surrounding ocean to allow ease of communication with vessels, particularly in an emergency. Various upgrades should be identified in consultation with service providers.

New Lots	N/A
Lot Size	N/A
Priority	Short Term
Infrastructure Cost	To Be Costed
Associated Projects	-
Key Actions	6

OT12 Carbon and Renewable Energy Opportunities

Summary

As explained in the Badu Island Master Plan Technical Report, the Queensland Government has identified a target to be carbon neutral by 2050. A variety of opportunities exist across Badu Island to implement carbon initiatives that can assist in achieving this target. Key opportunities including renewable energy installations (wind and solar), reductions in fossil fuel use, carbon burning and blue carbon. Further investigations should be undertaken to identify suitable initiatives and potential sites. These opportunities also provide the potential to generate employment for the local community.

New Lots	N/A
Lot Size	N/A
Priority	Medium Term
Infrastructure Cost	To Be Costed
Associated Projects	-
Key Actions	6

5 Infrastructure

In order to support future residential, industrial, commercial, tourism, community facilities, recreation and open space development on Badu Island in accordance with the Master Plan, upgrades to existing infrastructure networks and new infrastructure will be required as detailed below. High level costings of supporting infrastructure are included in **Appendix D**.

5.1 Topography/Climate Change

The township on Badu Island is generally located on the coastal foreshore with limited development on the hill slopes. All new development should be constructed at a sufficient height above highest astronomical tide (HAT) to protect residents and the community from the impacts of forecast climate change rises in sea level.

5.2 Roads

Some existing roads within the community are gravel paved and bitumen surfaced. For durability, new roads are to be either constructed six (6) metres wide in either 150 mm thick fibre reinforced concrete, or gravel paved and bitumen surfaced, depending on construction costs. Roads are to be provided with either a 300 mm wide concrete edge strip or mountable kerb and channel either side as appropriate.

Culverts along the airport access road require upgrading to improve safety and reduce accidents.

5.3 Stormwater

The Queensland Urban Drainage Manual (QUDM) provides current criteria for the design of stormwater drainage in urban residential developments. QUDM generally requires systems for primary drainage in streets to carry 39% Annual Exceedance Probability (AEP) (1 in 2 yr. ARI) runoff, and 1% AEP (1:100 yr. ARI) runoff for major drainage paths and cross road culverts, to limit flooding of public and private property to acceptable levels.

To avoid expensive underground drainage systems and the recurrent cost of ongoing maintenance of pipe systems, open table drains and drainage swales could be provided where appropriate for both primary and secondary drainage.

Due to the steeper grades of future roads in some locations, care needs to be exercised to ensure that the stormwater drainage system performs in accordance with the requirements of QUDM.

Stormwater runoff captured from newly developed areas is required to be treated to remove nutrients from the runoff prior to discharge to waterways.

5.4 Water Supply

Raw water is sourced from three (3) shallow groundwater wells each comprising of a number of infiltration galleries connected to a central pump well. Raw water is pumped directly from the wells to the treatment plant. The supply of raw water for treatment is sufficient to meet current demand without augmentation. The pH of the raw water varies between 4.2 and 6.6 which is less than the guideline's recommended range of 6.5 to 8.5. pH correction is undertaken using soda ash. The turbidity of the raw water varies between 1.5 NTU and 7 NTU, which exceeds the recommended maximum turbidity value of 1.0 NTU. Levels of iron, manganese, and aluminium are within guideline values.

The existing water treatment plant capacity of 720 kL per day is adequate to meet future demand. The current storage capacity for treated water is 1.83 ML, which is is adequate to meet current and future demand.

The existing raw water coagulation system using aluminium sulphate is considered to be not sufficiently effective.

Emergency standby power generation equipment should be installed to all critical infrastructure in the water supply system to maintain supply during loss of electricity supply.

Reticulation mains of adequate size are to be extended to all new development and be provided with fire hydrants and metered service connections.

Current per capita consumption of 546 litres per day, based on a population of 813 persons for supply to residences and non-residential users, exceeds the TSIRC's target consumption of 350 litres per person per day. Demand may be reduced through demand and leak detection management.

The following upgrades to the existing water supply network will be required to support planned future development:

- Construct a 40 ML covered raw water storage lagoon to harvest and store water during the wet season and to provide a reserve supply for the treatment plant when supply is from the bores;
- Improve raw water coagulation/flocculation equipment to reduce turbidity to guideline recommended levels;
- Undertake leakage detection in the reticulation system to reduce wastage;
- Install SCADA equipment to permit remote monitoring of system performance to enable prompt rectification of breakdowns that occur from time to time;
- Install emergency power supply generators at all critical infrastructure; and
- Provide adequate training for operators.

5.5 Sewerage

The sewerage system comprises of gravity sewers, manholes, effluent pump stations, rising mains and a facultative lagoon treatment plant, which provides treatment prior to the discharge of effluent to the ocean. The treatment plant capacity is significantly oversized for the current population, which results in operating problems due to low influent strength and long lagoon detention times. Effluent discharged from the treatment plant to the ocean currently does not meet licence discharge standards. The treatment plant is considered to be in good serviceable condition. The outfall from the treatment plant discharges to a creek with effluent only being able to be discharged on an outgoing tide.

All newly developed are to be connected to the existing sewerage network and will require the installation of additional pump stations and rising mains depending on the location of new developments.

The following upgrades to the existing sewerage network will be required to support planned future development:

- Install solar powered aerators in the lagoons to increase plant operational efficiency;
- Extend effluent outfall pipeline to allow effluent to be discharged regardless of the tidal cycle;
- Undertake CCTV inspections of sewers to locate and rectify sources of ingress of saline water;
- Improve treatment plant management to ensure effluent discharged meets licence requirements.
- Install safety signage and fall prevention equipment at pump stations to protect operators;
- Install emergency power supply generators at all pump stations;
- Install SCADA equipment to pump stations to permit remote monitoring of system performance to enable prompt rectification of breakdowns that occur from time to time; and
- Provide adequate training for operators.

5.6 Electricity Supply and Street Lighting

Reticulated electricity to the community is provided from an unmanned isolated fully automated multi-unit diesel generators installed in a power station owned and operated by Ergon.

New development to be delivered under the Master Plan will need to be provided with underground electricity reticulation supplied from new pad mounted transformers where required, installed to Ergon standards.

New street lighting shall comply with Ergon standards for urban residential developments.

5.7 Telecommunications

New development is to be provided with connections for landline and internet services supplied from underground cabling in the street, and mobile services where available, all installed by Telstra.

6 Action Plan

The Action Plan is summarised in **Table 6-1** and identifies future actions arising from the Master Plan. Actions listed in the Action Plan are identified as Key Actions for each project.

Table 6-1 Action Plan

1	**Undertake further investigations in relation to specific land parcels** The Master Plan has identified a number of locations that may be suitable for further development, subject to specific on-site investigations, which will likely identify developable and constrained land.
2	**Develop a Recreation Strategy** A strategy should be developed to guide the provision of active travel and recreational infrastructure so that it may form part of a coordinated and integrated network. This is of particular importance for walking and cycling paths.
3	**Protection of Community Facilities and Infrastructure** The Master Plan identifies a number of community facilities and infrastructure that are to be protected and maintained for the benefit of the community. The ongoing maintenance of these facilities should be prioritised, with further expansion or embellishment considered when necessary.
4	**Encourage Economic Activity** The Master Plan identifies a number of locations which will support economic activity, however there is a need to encourage businesses to take up the opportunities provided by this land, particularly relating to industry and tourism.
5	**Investigate Cultural, Economic and Recreational Areas** Further investigation of potential cultural, economic and recreational areas beyond the township should be undertaken.
6	**Consultation with Key Stakeholders** The Master Plan identifies a number of conceptual opportunities which require consultation with stakeholders relevant to these projects, in order to determine more detailed design requirements to support the delivery of these projects.
7	**Planning Scheme Amendments** In a number of instances it may be necessary for the Planning Scheme to be amended to reflect the Master Plan projects identified and ultimately support the delivery of these projects.
8	**Coastal Inundations Investigations and Works** Undertake specific investigations into coastal inundation required to identify land that may be suitable for future projects identified by the Master Plan, subject to specific mitigation and protection works.
9	**Documentation of Cultural Values** The cultural and spiritual values of significant sites such as churches and cemeteries should be documented for the community.

APPENDIX

A

MASTER PLAN MAP

BADU ISLAND MASTER PLAN

North

VERSION 003
31 January 2022

LOCALITY PLAN
SCALE 1:200,000

KEY:
RS = RESIDENTIAL
CT = COMMERCIAL / TOURISM
CF = COMMUNITY FACILITIES
OT = OTHER
OS = OPEN SPACE
ID = INDUSTRIAL

NOTES:
- PROJECTS CT4, OT10, OT11 AND OT12 ARE NOT SHOWN ON THE MASTER PLAN MAP. REFER TO THE MASTER PLAN FOR FURTHER DETAIL.

RESIDENTIAL:
- RS1 RESIDENTIAL EXPANSION AREA

INDUSTRIAL:
- ID1 INDUSTRIAL INVESTIGATION AREA
- ID2 QUARRY

COMMERCIAL / TOURISM:
- CT1 ARRIVAL CENTRE
- CT2 TOURIST ACCOMMODATION
- CT3 ART CENTRE

COMMUNITY FACILITIES:
- CF1 CHILD CARE CENTRE
- CF2 LANDFILL PROTECTION AND EXPANSION AREA
- CF3 CEMETERY PROTECTION AREA
- CF4 PLACE OF WORSHIP PROTECTION
- CF5 MARKET GARDEN / FOOD SECURITY AREA

RECREATION & OPEN SPACE:
- OS1 FORESHORE PARK
- OS2 PATH NETWORK
- OS3 SPORTING EXPANSION AREA
- OS4 COMMUNITY RECREATION AREA

OTHER DEVELOPMENT:
- OT1 AIRPORT UPGRADES
- OT2 KOMAGIW YABU UPGRADE
- OT3 CONNECTING ROAD
- OT4 MARINE PRECINCT
- OT5 CBD PRECINCT PLAN
- OT6 MAIRU STREET UPGRADE
- OT7 WATER SUPPLY UPGRADES
- OT8 SEWERAGE UPGRADES
- OT9 PUBLIC AMENITIES

LEGEND
- PROPOSED RESIDENTIAL DEVELOPMENT
- PROPOSED INDUSTRIAL DEVELOPMENT
- PROPOSED OTHER DEVELOPMENT
- PROPOSED COMMUNITY FACILITIES
- PROPOSED OPEN SPACE / DRAINAGE RESERVE
- PROPOSED COMMERCIAL / TOURISM DEVELOPMENT
- JETTY
- SCHOOL
- COUNCIL BUILDING
- SHOP / SUPERMARKET
- TELSTRA TOWER
- HEALTH CENTRE FACILITY

LINK TO TRADITIONAL LANDS - REFER TO PROJECT OT9.
LINK TO TRADITIONAL LANDS - REFER TO PROJECT OT9.
RS1 35.58 Ha
TIK ISLAND
YARGAS ISLAND

Cardno®

Q194171-MP-BD-04 003

0 250m 500m 750m 1000m
Scale - 1:12,500 @ A3

This plan is conceptual and for discussion purposes only. All areas, dimensions and land uses are preliminary, subject to investigation, survey, engineering, and Local Authority and Agency approvals.

APPENDIX

B

MASTER PLAN PROJECT INDEX

BADU ISLAND MASTER PLAN
PROJECT INDEX

The below table provides a summary of the projects identified in the Master Plan.

ID	Project Name	New Lots	Lot Sizes	Priority	Infrastructure Cost	Associated Projects	Key Actions
RS1	Residential Expansion Area	237 Lots (estimate)	1,200m^2 (average)	Long Term	$62,696,175	OS2, OT2	1
ID1	Industrial Investigation Area	4 Lots	4,371m^2-6,402m^2	Medium Term	$2,793,242	CT1, OT4, OT6	1, 4, 8
ID2	Quarry	N/A	N/A	Short Term	N/A	OT4, OT6	4
CT1	Arrival Centre	N/A	N/A	Short Term	$889,442	CT2, OT4, OT6	4, 8
CT2	Tourist Accommodation	N/A	N/A	Short Term	N/A	CT1, OT5	3, 4
CT3	Arts Centre	N/A	N/A	Medium Term	N/A	-	3, 4
CT4	Environmental Tourism	N/A	N/A	Medium Term	N/A	CT1, CT2	4, 6
CF1	Child Care Centre	N/A	N/A	Short Term	N/A	-	3, 6
CF2	Landfill Protection and Expansion Area	N/A	N/A	Ongoing	N/A	-	3
CF3	Cemetery Protection Area	N/A	N/A	Ongoing	N/A	-	1, 3, 6, 9
CF4	Place of Worship Protection	N/A	N/A	Ongoing	N/A	-	3, 9
CF5	Market Garden / Food Security Area	N/A	N/A	Medium Term	N/A	-	1, 6
OS1	Foreshore Park	N/A	N/A	Short Term	To Be Costed	CF4, OS2, OT6	2

ID	Project Name	New Lots	Lot Sizes	Priority	Infrastructure Cost	Associated Projects	Key Actions
OS2	Path Network	N/A	N/A	Medium Term	$625 per metre (concrete) $400 per metre (gravel) $200 per metre (earth)	OS1, OT2, OT6	2
OS3	Sporting Expansion Area	N/A	N/A	Medium Term	$3,149,704	OT5	2, 3, 6
OS4	Community Recreation Area	N/A	N/A	Medium Term	N/A	OT10	2, 5, 6
OT1	Airport Upgrades	N/A	N/A	Medium Term	To Be Costed	OS2, OT6	6
OT2	Komagiw Yabu Upgrade	N/A	N/A	Medium Term	$9,442,180	RS1, OS2, OT10	-
OT3	Connecting Road	N/A	N/A	Medium Term	To Be Costed	OT10	-
OT4	Marine Precinct	N/A	N/A	Medium Term	N/A	ID1, ID2, CT1, OT6	4, 6, 8
OT5	CBD Precinct Plan	N/A	N/A	Medium Term	N/A	CT2, CT3, CF1, OS2, OS3, OT6	4, 6
OT6	Mairu Street Upgrade	N/A	N/A	Medium Term	$18,583,760	ID2, OS2, OT1, OT4	-
OT7	Water Supply Upgrades	N/A	N/A	Short Term	To Be Costed	-	3
OT8	Sewerage Upgrades	N/A	N/A	Short Term	To Be Costed	-	3
OT9	Public Amenities	N/A	N/A	Medium Term	$725,949	-	3
OT10	“Back of Island” Access	N/A	N/A	Medium Term	To Be Costed	OS4, OT2, OT3	5, 6
OT11	Telecommunications Upgrades	N/A	N/A	Short Term	To Be Costed	-	6

ID	Project Name	New Lots	Lot Sizes	Priority	Infrastructure Cost	Associated Projects	Key Actions
OT12	Carbon and Renewable Energy Opportunities	N/A	N/A	Medium Term	N/A	-	6

APPENDIX

C

ACTION PLAN SUMMARY

BADU ISLAND MASTER PLAN
ACTION PLAN SUMMARY

The below table provides a summary of the relationship between the Action Plan and the projects identified in the Master Plan.

ID	Action	RS1	ID1	ID2	CT1	CT2	CT3	CT4	CF1	CF2	CF3	CF4	CF5	OS1	OS2	OS3	OS4
1	Undertake further investigations in relation to specific land parcels	RS1	ID1								CF3		CF5				
2	Develop a Recreation Strategy													OS1	OS2	OS3	OS4
3	Protection of Community Facilities and Infrastructure					CT2	CT3		CF1	CF2	CF3	CF4				OS3	
4	Encourage Economic Activity		ID1	ID2	CT1	CT2	CT3	CT4									
5	Investigate Cultural, Economic and Recreational Areas																OS4
6	Consultation with Key Stakeholders						CT3	CT4	CF1		CF3		CF5			OS3	OS4
7	Planning Scheme Amendments																
8	Coastal Inundations Investigations and Works		ID1		CT1												
9	Documentation of Cultural Values										CF3	CF4					

ID	Action	OT1	OT2	OT3	OT4	OT5	OT6	OT7	OT8	OT9	OT10	OT11	OT12
1	Undertake further investigations in relation to specific land parcels												
2	Develop a Recreation Strategy												
3	Protection of Community Facilities and Infrastructure							OT7	OT8	OT9			
4	Encourage Economic Activity				OT4	OT5							
5	Investigate Cultural, Economic and Recreational Areas										OT10		
6	Consultation with Key Stakeholders	OT1			OT4	OT5					OT10	OT11	OT12
7	Planning Scheme Amendments												
8	Coastal Inundations Investigations and Works				OT4								
9	Documentation of Cultural Values												

APPENDIX

D

INFRASTRUCTURE COSTINGS

TORRES STRAIT MASTER PLANNING

INFRASTRUCTURE COST ESTIMATES

Prepared for the Department of Aboriginal and Torres Strait Islander Partnerships

04BD
BADU ISLAND

Last Update: 11-Mar-22

Project			RS1		ID1		CT1		OS3		OT2		OT6	
Yield (Number of Lots)			237		4		1		N/A		N/A		N/A	
Item	Unit	Rate	Qty	Amount	Qty	Amount	Qty	Amount	Qty	Amount	Qty	Amount	Qty	Amount
HEADWORKS INFRASTRUCTURE UPGRADES														
Sewage Treatment Plant Upgrade	Item													
Water Treatment Plant Upgrade	Item													
Reservoirs Upgrade	Item													
DEVELOPMENT														
Earthworks														
Site clearing and disposal of material	Ha	$ 14,000	35.58	$ 498,120	2.0	$ 28,000	0.5	$ 7,000	5	$ 70,000	2.5	$ 35,000	0	$ -
Erosion and sediment control	m	$ 40	1,200	$ 48,000	350	$ 14,000	100	$ 4,000	450	$ 18,000	1250	$ 50,000	2600	$ 104,000
Strip topsoil and respread	m^3	$ 30	35,500	$ 1,065,000	2,000	$ 60,000	500	$ 15,000	5000	$ 150,000	2500	$ 75,000	0	$ -
Cut to fill on lots	m^3	$ 40	55,000	$ 2,200,000	2,500	$ 100,000	1000	$ 40,000	5000	$ 200,000	7500	$ 300,000	4000	$ 160,000
Cut in open drains to fill on lots	m^3	$ 40	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
Cut in roads and table drains to fill on lots	m^3	$ 40	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
Roadworks														
Concrete Road (7.0 m)	m	$ 3,000	3,100	$ 9,300,000	0	$ -	0	$ -	0	$ -	1,250	$ 3,750,000	2600	$ 7,800,000
Stormwater Drainage														
Concrete edge strips/K & C to road pavement	m	$ 400	6,200	$ 2,480,000	0	$ -	0	$ -	0	$ -	2500	$ 1,000,000	5200	$ 2,080,000
Concrete invert to table drain	m	$ 1,500	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
1200 x 450 RCBC incl conc base/invert crossing	m	$ 3,000	220	$ 660,000	12	$ 36,000	11	$ 33,000	0	$ -	100	$ 300,000	220	$ 660,000
Headwalls, Wingwalls and Aprons	m^3	$ 3,600	75	$ 270,000	5	$ 18,000	5	$ 18,000	0	$ -	40	$ 144,000	90	$ 324,000
Bio-Basins	m^2	$ 900	7,350	$ 6,615,000	500	$ 450,000	125	$ 112,500	1250	$ 1,125,000	0	$ -	0	$ -
Bio basin concrete spillway	m^2	$ 700	450	$ 315,000	75	$ 52,500	75	$ 52,500	150	$ 105,000	0	$ -	0	$ -
Water Reticulation														
100 dia, PVC pipe	m	$ 400	3,500	$ 1,400,000	700	$ 280,000	140	$ 56,000	150	$ 60,000	0	$ -	0	$ -
150 dia. PVC pipe	m	$ 500	800	$ 400,000	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
200 dia PVC pipe	m	$ 650	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
SV's	No	$ 3,000	28	$ 84,000	2	$ 6,000	2	$ 6,000	1	$ 3,000	0	$ -	0	$ -
Hydrants	No	$ 4,550	60	$ 273,000	2	$ 9,100	2	$ 9,100	1	$ 4,550	0	$ -	0	$ -
Single house connections	No	$ 2,000	237	$ 474,000	6	$ 12,000	1	$ 2,000	1	$ 2,000	0	$ -	0	$ -
Connect to existing main	No	$ 6,000	1	$ 6,000	1	$ 6,000	2	$ 12,000	0	$ -	0	$ -	0	$ -
VSD Pump Building	Item	$ 300,000	1	$ 300,000	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
Variable speed drive pump set	Item	$ 200,000	1	$ 200,000	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
Standby generator	Item	$ 100,000	1	$ 100,000	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -

TORRES STRAIT MASTER PLANNING

INFRASTRUCTURE COST ESTIMATES

Prepared for the Department of Aboriginal and Torres Strait Islander Partnerships

04BD
BADU ISLAND

Last Update: 11-Mar-22

Project			RS1		ID1		CT1		OS3		OT2		OT6	
Yield (Number of Lots)			237		4		1		N/A		N/A		N/A	
Item	Unit	Rate	Qty	Amount	Qty	Amount	Qty	Amount	Qty	Amount	Qty	Amount	Qty	Amount
Sewerage Reticulation														
150 dia. PVC	m	$ 400	4000	$ 1,600,000	700	$ 280,000	100	$ 40,000	150	$ 60,000	0	$ -	0	$ -
Manholes	No	$ 10,000	50	$ 500,000	10	$ 100,000	2	$ 20,000	2	$ 20,000	0	$ -	0	$ -
Lot connections	No	$ 1,500	237	$ 355,500	6	$ 9,000	1	$ 1,500	1	$ 1,500	0	$ -	0	$ -
FRP Pump Station	Item	$ 950,000	1	$ 950,000	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
Standby Generator	Item	$ 100,000	1	$ 100,000	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
90 OD polyethylene pressure main	m	$ 400	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
110 OD polyethylene pressure main	m	$ 600	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
140 OD polyethylene pressure main	m	$ 700	500	$ 350,000	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
Electricity Supply														
Conduits, pits and pole bases	Lots	$ 12,000	237	$ 2,844,000	6	$ 72,000	2	$ 24,000	1	$ 12,000	0	$ -	0	$ -
Cabling and street lights	Lots	$ 15,000	237	$ 3,555,000	6	$ 90,000	2	$ 30,000	1	$ 15,000	0	$ -	0	$ -
Transformer	No	$ 200,000	3.0	$ 600,000	0.25	$ 50,000	0.25	$ 50,000	0.2	$ 40,000	0	$ -	0	$ -
Sub Totals				$ 37,542,620		$ 1,672,600		$ 532,600		$ 1,886,050		$ 5,654,000		$ 11,128,000
Contingencies	Item	30%		$ 11,262,786		$ 501,780		$ 159,780		$ 565,815		$ 1,696,200		$ 3,338,400
Preliminaries														
Establishment, insurance, As-constructed	Item	22%		$ 8,259,376		$ 367,972		$ 117,172		$ 414,931		$ 1,243,880		$ 2,448,160
Project Management														
Survey, design, and construction administration	Item	15%		$ 5,631,393		$ 250,890		$ 79,890		$ 282,908		$ 848,100		$ 1,669,200
TOTALS				**$ 62,696,175**		**$ 2,793,242**		**$ 889,442**		**$ 3,149,704**		**$ 9,442,180**		**$ 18,583,760**

TORRES STRAIT MASTER PLANNING

INFRASTRUCTURE COST ESTIMATES

Prepared for the Department of Aboriginal and Torres Strait Islander Partnerships

Project				OT9	
Yield (Number of Lots)				N/A	
Item	Unit	Rate		Qty	Amount
HEADWORKS INFRASTRUCTURE UPGRADES					
Sewage Treatment Plant Upgrade	Item				
Water Treatment Plant Upgrade	Item				
Reservoirs Upgrade	Item				
DEVELOPMENT					
Earthworks					
Site clearing and disposal of material	Ha	$	14,000	0.75	$ 10,500
Erosion and sediment control	m	$	40	175	$ 7,000
Strip topsoil and respread	m^3	$	30	770	$ 23,100
Cut to fill on lots	m^3	$	40	770	$ 30,800
Cut in open drains to fill on lots	m^3	$	40	0	$ -
Cut in roads and table drains to fill on lots	m^3	$	40	0	$ -
Roadworks					
Concrete Road (7.0 m)	m	$	3,000	0	$ -
Stormwater Drainage					
Concrete edge strips/K & C to road pavement	m	$	400	0	$ -
Concrete invert to table drain	m	$	1,500	0	$ -
1200 x 450 RCBC incl conc base/invert crossing	m	$	3,000	0	$ -
Headwalls, Wingwalls and Aprons	m^3	$	3,600	0	$ -
Bio-Basins	m^2	$	900	190	$ 171,000
Bio basin concrete spillway	m^2	$	700	1	$ 700
Water Reticulation					
100 dia, PVC pipe	m	$	400	150	$ 60,000
150 dia. PVC pipe	m	$	500	0	$ -
200 dia PVC pipe	m	$	650	0	$ -
SV's	No	$	3,000	2	$ 6,000
Hydrants	No	$	4,550	2	$ 9,100
Single house connections	No	$	2,000	1	$ 2,000
Connect to existing main	No	$	6,000	1	$ 6,000
VSD Pump Building	Item	$	300,000	0	$ -
Variable speed drive pump set	Item	$	200,000	0	$ -
Standby generator	Item	$	100,000	0	$ -

TORRES STRAIT MASTER PLANNING

INFRASTRUCTURE COST ESTIMATES

Prepared for the Department of Aboriginal and Torres Strait Islander Partnerships

Project			OT9	
Yield (Number of Lots)			N/A	
Item	Unit	Rate	Qty	Amount
Sewerage Reticulation				
150 dia. PVC	m	$ 400	100	$ 40,000
Manholes	No	$ 10,000	2	$ 20,000
Lot connections	No	$ 1,500	1	$ 1,500
FRP Pump Station	Item	$ 950,000	0	$ -
Standby Generator	Item	$ 100,000	0	$ -
90 OD polyethylene pressure main	m	$ 400	0	$ -
110 OD polyethylene pressure main	m	$ 600	0	$ -
140 OD polyethylene pressure main	m	$ 700	0	$ -
Electricity Supply				
Conduits, pits and pole bases	Lots	$ 12,000	1	$ 12,000
Cabling and street lights	Lots	$ 15,000	1	$ 15,000
Transformer	No	$ 200,000	0.1	$ 20,000
Sub Totals				$ 434,700
Contingencies	Item	30%		$ 130,410
Preliminaries				
Establishment, insurance, As-constructed	Item	22%		$ 95,634
Project Management				
Survey, design, and construction administration	Item	15%		$ 65,205
TOTALS				**$ 725,949**

APPENDIX

E

PRECINCT PLANS

BADU ISLAND MASTER PLAN
CBD PRECINCT PLAN

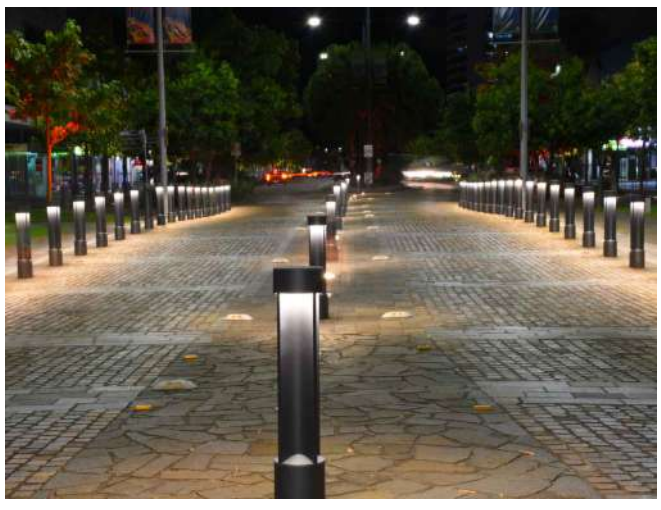
North

VERSION 002
15 February 2022

LEGEND

1. COMMUNITY PARK
2. SHARED ZONE
3. CAR PARKING
4. SPORTING FIELD
5. LANEWAY
6. PEDESTRIAN PLAZA
7. PEDESTRIAN PATH
8. ART CENTRE
9. CHILD CARE CENTRE
10. SUPERMARKET

1 COMMUNITY PARK



2 SHARED ZONE

6 PEDESTRIAN PLAZA

Cardno®

Q194171-PP1-BD-04 002

0 60m 120m 180m 240m

Scale - 1:3,000 @ A3

This plan is conceptual and for discussion purposes only. All areas, dimensions and land uses are preliminary, subject to investigation, survey, engineering, and Local Authority and Agency approvals.

APPENDIX

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ANALTYICAL TRANSLATION

BADU ISLAND MASTER PLAN
ANALYTICAL TRANSLATION

#	Direction	Technical Report	Master Plan Projects	Notes
1.	The Master Plan will need to cater for an increase in housing (26 additional dwellings) to reduce overcrowding and cater for population growth and changes to community needs.	4 Demographic Analysis 8.1 Aboriginal and Torres Strait Islander Housing Action Plan 2019-2023 8.10 Torres Strait and Northern Peninsula Regional Plan 2009-2029 8.12 TSIRC Corporate Plan 2020-2025	RS1	
2.	The Master Plan should seek to diversify the available housing products, particularly the provision of smaller housing types. Dwelling types can be supported as infill housing, which will allow them to be well located proximate to key services and facilities.	4 Demographic Analysis 8.1 Aboriginal and Torres Strait Islander Housing Action Plan 2019-2023 8.10 Torres Strait and Northern Peninsula Regional Plan 2009-2029 8.12 TSIRC Corporate Plan 2020-2025	RS1	
3.	The Master Plan should support the provision of facilities for ageing in place and accessible living including accommodation for independent living (for persons of any age who may need care).	4 Demographic Analysis 8.10 Torres Strait and Northern Peninsula Regional Plan 2009-2029 8.12 TSIRC Corporate Plan 2020-2025	RS1, OT5	
4.	The Master Plan should consider select areas for potential housing.	5 Planning Analysis 8.10 Torres Strait and Northern Peninsula Regional Plan 2009-2029	RS1	

#	Direction	Technical Report	Master Plan Projects	Notes
5.	The Master Plan should seek to facilitate the provision of active transport infrastructure (walking / cycling paths) to connect important parts of the community and promote healthy living through physical activity.	2.5 Services and Facilities 8.5 Healthy by Design / Walkability 8.10 Torres Strait and Northern Peninsula Regional Plan 2009-2029 8.12 TSIRC Corporate Plan 2020-2025	OS1, OS2, OS3, OT5	
6.	The Master Plan should seek to protect places of worship and cemeteries and facilitate the identification of additional land to support future community needs.	2.5 Services and Facilities 8.12 TSIRC Corporate Plan 2020-2025	CF3, CF4	
7.	The Master Plan should locate development in a manner that is reflective of the potential effects of coastal processes.	5 Planning Analysis 8.10 Torres Strait and Northern Peninsula Regional Plan 2009-2029 8.11 Torres Strait Regional Adaptation and Resilience Plan 2016-2021 8.12 TSIRC Corporate Plan 2020-2025	All projects	
8.	The Master Plan should support the protection and expansion (if required) of the existing landfill site.	2.5 Services and Facilities 6 Infrastructure Analysis 8.10 Torres Strait and Northern Peninsula Regional Plan 2009-2029 8.12 TSIRC Corporate Plan 2020-2025	CF2	
9.	The Master Plan should investigate the provision of land for potential food production, which may include community or market gardens.	5 Planning Analysis 8.9 Food Security 8.10 Torres Strait and Northern Peninsula Regional Plan 2009-2029 8.12 TSIRC Corporate Plan 2020-2025	CF5	

#	Direction	Technical Report	Master Plan Projects	Notes
10.	The Master Plan should support the efficient use and embellishment of the jetty and boat ramp. This will likely include supporting improvements to vessel access through new or improved marine infrastructure and the provision of new land-based infrastructure, such as facilities that support tourism enterprises such as inter-island tourist ventures and game fishing as desired by the community.	2.5 Services and Facilities 5 Planning Analysis 8.10 Torres Strait and Northern Peninsula Regional Plan 2009-2029 8.12 TSIRC Corporate Plan 2020-2025 8.13 Warpil – Fishing for Our Future	OT4	
11.	The Master Plan should support improved access to the island by air and sea, through investigations into airport and barge ramp/pontoon upgrades.	6 Infrastructure Analysis 8.10 Torres Strait and Northern Peninsula Regional Plan 2009-2029 8.12 TSIRC Corporate Plan 2020-2025	OT1, OT4	
12.	The Master Plan should support the development of new recreational facilities, which may include sporting fields, swimming pool and soccer pitch. Any such facility should be appropriately located on accessible land near compatible land uses.	5 Planning Analysis 8.10 Torres Strait and Northern Peninsula Regional Plan 2009-2029 8.12 TSIRC Corporate Plan 2020-2025	OS3	
13.	The Master Plan should support the development of tourism opportunities that are compatible with the aspirations of the community.	2.5 Services and Facilities 5 Planning Analysis 8.10 Torres Strait and Northern Peninsula Regional Plan 2009-2029 8.12 TSIRC Corporate Plan 2020-2025	CT1, CT2, CT3, CT4	

#	Direction	Technical Report	Master Plan Projects	Notes
14.	The Master Plan should ensure that new commercial and community facilities are located in a manner that maximises ease of access for the community.	2.5 Services and Facilities 5 Planning Analysis 8.10 Torres Strait and Northern Peninsula Regional Plan 2009-2029 8.12 TSIRC Corporate Plan 2020-2025	OT5	
15.	The Master Plan shall reinforce the town centre core which extends along Nona Street from Chapman Street to Mairu Street as a focal point for new commercial development and the consolidation of government administrative offices, health care and shops.	2.5 Services and Facilities 5 Planning Analysis 8.12 TSIRC Corporate Plan 2020-2025	OT5	
16.	The Master Plan should protect the ongoing operation and future expansion of the quarry.	5 Planning Analysis	ID2	
17.	The Master Plan should investigate the future establishment of industries that meet community aspirations such as a sawmill, abattoir and aquaculture.	5 Planning Analysis 8.10 Torres Strait and Northern Peninsula Regional Plan 2009-2029 8.12 TSIRC Corporate Plan 2020-2025 8.13 Warpil – Fishing for Our Future	ID1, ID2	
18.	The Master Plan should support the provision of additional child care facilities.	2.5 Services and Facilities 5 Planning Analysis 8.10 Torres Strait and Northern Peninsula Regional Plan 2009-2029 8.12 TSIRC Corporate Plan 2020-2025	CF1	

#	Direction	Technical Report	Master Plan Projects	Notes
19.	The Master Plan should support the development of cultural centres and arts centres including a multi-purpose venue.	2.5 Services and Facilities 5 Planning Analysis 8.10 Torres Strait and Northern Peninsula Regional Plan 2009-2029 8.12 TSIRC Corporate Plan 2020-2025	CT3, OT5	
20.	The Master Plan should investigate opportunities to improve community access to other areas of the island (beyond the township), particularly for recreation, economic and cultural purposes.	8.10 Torres Strait and Northern Peninsula Regional Plan 2009-2029 8.12 TSIRC Corporate Plan 2020-2025	OS4, OT10	
21.	The Master Plan should investigate opportunities for carbon offsetting, both in land and sea areas.	8.2 Queensland Climate Transition Strategy 8.4 Carbon 8.10 Torres Strait and Northern Peninsula Regional Plan 2009-2029 8.12 TSIRC Corporate Plan 2020-2025	OT12	
22.	The Master Plan should identify potential opportunities for alternative energy projects.	8.2 Queensland Climate Transition Strategy 8.4 Carbon 8.8 Renewable Energy 8.10 Torres Strait and Northern Peninsula Regional Plan 2009-2029 8.12 TSIRC Corporate Plan 2020-2025	OT12	
23.	The Master Plan should investigate opportunities to improve communications infrastructure (telephone and internet).	8.10 Torres Strait and Northern Peninsula Regional Plan 2009-2029 8.12 TSIRC Corporate Plan 2020-2025	OT11	

#	Direction	Technical Report	Master Plan Projects	Notes
24.	The Master Plan should support the provision of appropriate lighting in key locations in the town.	8.12 TSIRC Corporate Plan 2020-2025	CT1, OS1, OS2, OS3, OT5	
25.	The Master Plan should facilitate upgrades to the water supply network in order to increase capture and storage capacity to meet demand and ensure that appropriate treatment occurs.	6 Infrastructure Analysis 8.10 Torres Strait and Northern Peninsula Regional Plan 2009-2029 8.12 TSIRC Corporate Plan 2020-2025	OT7	
26.	The Master Plan should facilitate upgrades to the sewerage network, specifically with regard to detention time and outlet design at the treatment plant.	6 Infrastructure Analysis 8.10 Torres Strait and Northern Peninsula Regional Plan 2009-2029 8.12 TSIRC Corporate Plan 2020-2025	OT8	
27.	The Master Plan should be updated to reflect the outcomes of community consultation activities undertaken.	7 Consultation	CT2, CT3, CF3, OS3, OS4, OT4, OT9	