
TOONDAH HARBOUR PRIORITY DEVELOPMENT AREA DRAFT STRUCTURE PLAN REPORT

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1. INTRODUCTION

The Toondah Harbour Structure Plan Report represents the vision for development within the Priority Development Area (PDA). It is not definitive or final — good places never are. They adapt and evolve and respond to the social, economic and cultural pressures and circumstances that imbue and overlay a place with meaning and identity.

This structure plan report provides key inputs to inform the preparation of a Development Scheme for Toondah Harbour.

It lays the foundation for the ongoing conversion of this place into a strengthened gateway to North Stradbroke Island and focal place within the broader Cleveland area delivering long-term, sustainable economic growth for Redland City Council.

This report outlines the objectives, principles and design ideas that have influenced the shape of the structure plan. It is not intended to deliver a final outcome for this site but provide the boundaries and parameters within which good development can occur.

1.1 Joint Statement of Objectives

Toondah Harbour is the second PDA to be declared in Queensland by the State Government. The declaration provides an opportunity to support economic development and create mixed-use residential, tourism and retail based development at the gateway to North Stradbroke Island.

The Toondah Harbour PDA is approximately 67 hectares in size with major land owners including the State Government, Redland City Council and Stradbroke Ferries. Development of the PDA will seek to reinforce Toondah Harbour as a community focus and a regional gateway to Moreton Bay and North Stradbroke Island. Development will include opportunities for mixed-use and medium density residential development as well as dedicated ferry terminals, open space and the potential for a private berth marina.

Initial stakeholder scoping indicates a high level of support and interest from current land owners and interest from peak business associations and local residents bordering the site. The Quandamooka peoples of Stradbroke Island were also consulted.

Planning of the Toondah Harbour PDA will be managed by Economic Development Queensland (EDQ) in partnership with Redland City Council. Redland City Council has responsibility for development assessment.

1.2 Vision for the Priority Development Area

Toondah Harbour is the 'Gateway to Straddie' and the principal point of departure and arrival for vehicular ferry and water taxi services between the mainland and North Stradbroke Island. The harbour is utilised for the launch of recreational boats. It also comprises residential and open space lands.

The vision for delivery of the Toondah Harbour PDA includes:

- > **New water transport services** and support facilities including a commercial ferry terminal, a marina, boat industries and marine services. The existing **southern channel is widened** to accommodate water traffic
- > Pedestrian oriented **ferry terminals** are integrated into urban development
- > **Rationalised ferry services with separate terminals for passenger and vehicle departures** to avoid conflicts between modes
- > Improved **access to the waterfront** through walkway corridors and small picnic areas, large sporting areas
- > Improvements to **public open spaces** through **pedestrian foreshore links connecting the harbour to GJ Water Park**
- > An **accessible and connected place** with an efficient traffic circulation, boardwalks, cycling paths and a bus terminal
- > A **sense of place** with communal areas to provide opportunities for social interaction and recreation activities such as parks
- > **Opportunities for mixed-use and medium density residential development** including apartments, commercial offices, tourist accommodation including a boutique hotel, restaurants, cafes and shops
- > Development opportunities **complementary to the Cleveland CBD and its revitalisation**
- > Appropriate **infrastructure** that meets market expectations for safety, comfort, convenience, information and service delivery
- > **Embracing the waterfront location**, whilst maintaining the views and breezes
- > Protecting the **local marine and land-based ecology** including a vegetated corridor providing for koala habitat and movement
- > Opportunities for **aboriginal stewardship and reconciliation**
- > Creating jobs for locals and improving the local and regional **economy**.

1.3 Location

Toondah Harbour PDA is located on the southern shores of Moreton Bay in Cleveland, approximately 33 kilometres east of the Brisbane CBD (see Figure 1). It acts as the point of departure and arrival for vehicular ferry and water taxi services between the mainland and North Stradbroke Island. The area is also comprised of residential and open space lands.

The PDA covers landholdings located on Middle Street and Emmett Drive, Cleveland. This incorporates area of both land and sea with a total of approximately 67 hectares (17.5 hectares over land, and 49.5 hectares within Moreton Bay).

Cleveland and its water transport facilities at Toondah Harbour are recognised as the main gateway to North Stradbroke Island. The harbour serves as the principal base for water taxi, passenger and vehicular ferry services to and from the island. As well as bus services to the Cleveland CBD and railway station. The harbour is also utilised for the launch of recreational boats. Continuing growth of user numbers at Toondah Harbour will increase demand and place pressure on the existing small-scale harbour facilities, which may have an impact on the environment.

The PDA sits against the foreshore of Moreton Bay and affords views east to Cassim Island and further to North Stradbroke Island. The northern part of the site is dominated by a large area of green space which includes GJ Walter Park. Existing pedestrian links connect south to Oyster Point Park along the foreshore and north to the historic Grand View Hotel.

The site and the extent of the PDA boundary are shown in Figure 2.

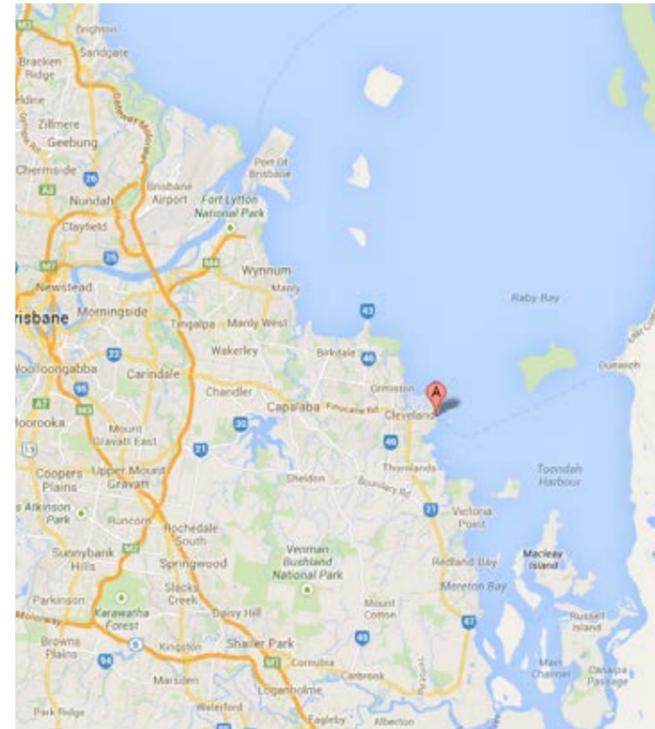


Figure 1. Toondah Harbour PDA location plan



Figure 2. Toondah Harbour PDA site aerial and boundary



Vehicle ferry service



On-street parking along Middle Street



The Grand View Hotel



GJ Walter Park

2. BACKGROUND ANALYSIS

2.1 Context

The Toondah Harbour PDA sits within an existing urban fabric of land uses, community facilities, environment and open space areas, streets and infrastructure. These, along with the physical features of the site, set the context within which the proposed structure plan has been developed. Key contextual influences on this site can be seen as:

- > Urban
- > Economic
- > Environmental
- > Movement
- > Infrastructure.

An outline of these is as follows.

Urban Context

The Toondah Harbour PDA is located on the harbour to the east of the Cleveland CBD, the principle centre for the Redland City, and surrounded immediately by predominantly low-rise residential development.

Whilst the focus for retail and commercial development within Cleveland is on the CBD, there are two smaller retail centres at the corner of Shore Street West and Wellington Street and the corner of Bloomfield and Russell Streets which provide additional convenience retail for the surrounding residential areas.

Physically, the PDA and CBD are connected via Middle Street (see Figure 3) and Shore Street West. This proximity means the retail and commercial offering at Toondah Harbour has to be focused and complimentary to that within the CBD.

Within the broader Cleveland area, there are a number of community facilities. This includes three schools located and loosely connected by existing streets and parkland along Ross Creek.

The Toondah Harbour PDA has large areas of open space to both the north and south. The Grand View Hotel to the north of the site and Oyster Point Park to the south are connected by formal and inform pedestrian links along the foreshore. The Grand View Hotel is a key historic and community gathering place in the Redland City Council area with commanding views over Toondah Harbour.

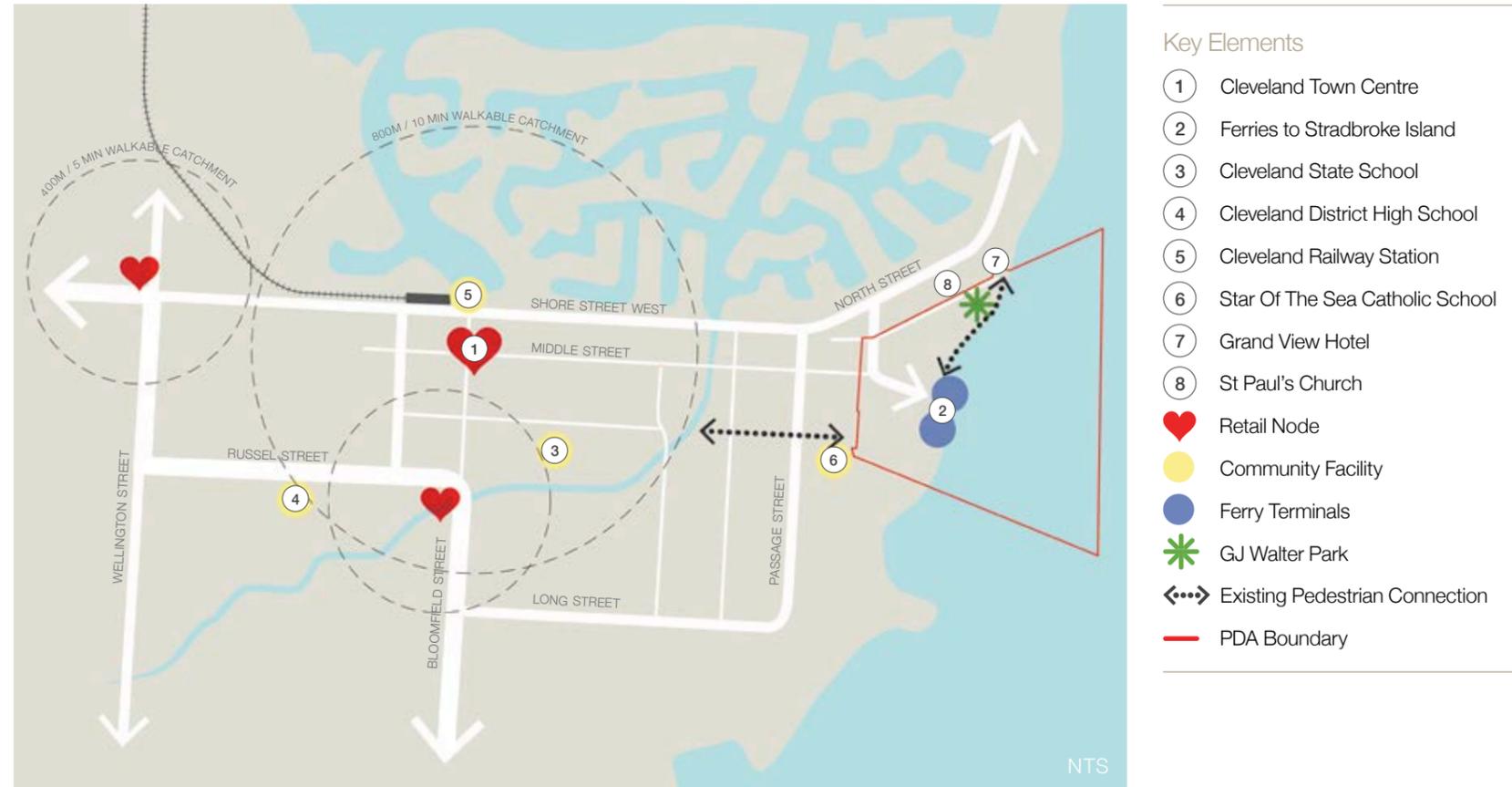


Figure 3. Context plan

Economic Context

Located around 26 km south-east of the Brisbane CBD, Redland City has a strong and diverse economy with a long history of strong economic performance. Gross Regional Product (GRP) has increased by an estimated 16% in the last six years to \$4.3 billion in 2012¹, and is forecast to continue this strong performance on the back of strong population and employment growth in the region.

Redland City has an estimated resident workforce of 75,942 as at 2012 and has low unemployment levels. The region has a relatively high level of local employment, which has increased by around 10% since 2006-07 to 44,996 in 2011-12. The key industry sectors by employment are retail trade (16.1%), health care and social assistance (14.2%), education and training (10%), and construction (8.4%) as at the 2011 Census².

The estimated resident population for the broader Redland City LGA as at 2012 was 145,507 people. Over the past 10 years the Redlands region has grown at around 2.1% per annum. Solid population growth is anticipated over the next 20 years.

Toondah Harbour, located around 1km east of the Cleveland CBD, carries great significance for both Cleveland and indeed the South East Queensland region as the gateway to one of the State's most important tourism assets, North Stradbroke Island, affectionately known as "Straddie". In recognition of this importance, the site has long been earmarked for upgrade and development over many decades.

¹ NIER Forecasts, Redland City Council

² Australian Bureau of Statistics

Environmental Context

The Toondah Harbour PDA contains marine, intertidal and terrestrial ecological values that are valued by the community, and protected at local, state and national levels. Intertidal mudflats and beds within the PDA are incorporated within the Moreton Bay Marine Park and Ramsar wetland, a wetland of international importance. These ecosystems provide foraging habitat for migratory shorebirds, fish, turtles and Dugong (*Dugong dugon*). Moreton Bay as a whole is recognised as a site of both national and international importance for migratory shorebirds, supporting a maximum abundance of nearly 36,000 migratory shorebirds that use intertidal mudflats and seagrass beds for feeding, and roost sites for resting. Marine plants within the PDA, particularly seagrass, mangroves and saltmarsh provide value to fisheries through provision of nursery habitat for fish and crabs, coastal protection from storm surge, and nutrient cycling.

Redland City supports part of a nationally significant Koala (*Phascolarctos cinereus*) population of relatively high density and genetic distinctiveness. The number of individuals in this population has declined by 68% between 1996 and 2010, due to habitat loss and mortality associated with urbanisation. Koalas in this population utilise scattered habitat trees and parkland within the urban environment, including within the western portion of the PDA.

Future development within the site will need to respect the ongoing conservation of these ecological values, with provisions for safe fauna movement, habitat protection and enhancement, maintenance of water quality, community education and engagement, and ongoing monitoring to manage and maintain environmental values through all phases of the development.

Movement Context

The PDA of Toondah Harbour has some unique challenges due its mix of water and land-based transport requirements. Movement context in such a location requires consideration of how transport from these two areas can operate in partnership providing optimum accessibility for all users.

The key focus from a land-based perspective is providing direct connectivity to the rest of Redlands, and South East Queensland. The strategy for providing connectivity should focus on all modes of travel, including pedestrian, cyclist, public transport users as well as private vehicles.

The issue for the water-based modes focuses how the existing ferry facilities can coexist with the proposed development with effective operation, while not impacting detrimentally on local amenity.

Infrastructure Context

Transport

Transport infrastructure will be defined by two factors, the traffic capacity and active / public transport network. Road cross sections will be determined by the anticipated traffic volumes for the PDA and suitable capacity thresholds for each road classification. The active and public transport facilities will be driven by the need for an integrated and accessible network, with particular focus on connectivity between land uses and suitable roadside facilities, such as waiting areas which meet Translink standards.

Water and Sewer

Water and sewer services to the PDA are required to meet minimum service standards adopted by Redland City Council. Required upgrades for servicing the PDA have proved simplistic for water and comparatively complex for sewer.

The Alexandra Hills Low Level Zone supplies water to the PDA site via a 100mm reticulation main along Middle Street. Water supply to the PDA will meet the desired standards of service with only minor infrastructure installed.

Two sewerage pump stations service the PDA, with the downstream network of pump stations, rising mains and gravity man network transporting the sewerage to the Cleveland WWTP. The PDA will require new infrastructure upgrades as well as the increase and bring forward of additional programmed upgrades. The development will mildly influence sizing of programmed upgrades at Cleveland WWTP, which currently has 1700EP remaining capacity available for the catchment. The DEHP operating license is under negotiation to increase capacity for the catchment.

Marine History

The Toondah site has had a long history of maritime activity. An outline of these activities is as follows:

- > Jetties were built on the southern Moreton Bay Islands in the 1930s. These islands were occupied before then, but marine facilities would have been rudimentary
- > In 1953 a jetty was built just north of the current vehicle ramp to serve the Redland Bay flying boat base
- > In 1954 a new jetty was built at Victoria Point to service Coochiemudlo Island
- > In 1982 Bay Island Taxi Service (BITS), now Bay Island Transit, started operations out of Weinam Creek; later (2000s) their berth was relocated to the current purpose built harbour at the creek entrance. Bay Island Transit's maintenance facility is on Russell Island.

(Reference: Davenport, W. (1986) "Harbours and Marine Port and Harbour Development in Queensland from 1824 to 1985")

2.2 Site Analysis

Urban Design Site Analysis

A number of issues and opportunities for the Toondah Harbour Structure Plan were identified as part of the initial site analysis. These are outlined below and summarised visually in Figure 4.

The main access into the Toondah Harbour PDA and down to the foreshore is via Middle Street and Emmett Drive. Middle Street provides a direct street connection between the PDA and Cleveland CBD to the west.

Whilst configured as a large cul-de-sac, these streets provide access to the various at-grade parking areas, the vehicle and passenger ferry terminals and the public boat ramp. The Wharf Street road reserve, south of Middle Street, also provides an at-grade carparking area.

There are two bus stops on Emmett Drive which service each of the passenger ferry terminals.

On the foreshore, Gold Cat Stradbroke Flyer and Stradbroke Ferries provide passenger ferries to North Stradbroke Island, whilst the Big Red Cat, along with Stradbroke Ferries cater for vehicles movements.

The ferry terminals and large expanses of at-grade carparking dominate the central parts of this precinct. The current configuration means the passenger and vehicle movements overlap with possible conflicts between pedestrians and vehicles moving between the terminals and parking areas. In addition to this, the existing ferry buildings are fragmented along the harbour foreshore.

Fison Channel is the main southern channel providing access to Toondah Harbour for both vehicle and passenger ferries as well as recreational boats. This route directs boats south of Cassim Island and then out into Moreton Bay. Maintenance dredging of this channel is required and the current location for part of this dredge spoil is in the southern part of the PDA. The remainder is taken to the dump ground on Mud Island.

The public boat ramp, and associated carparking is also located in the southern part of the PDA, accessed via the long-term ferry parking area. The location of the ramp and nature of this water access point means it is underutilised.

Existing development on Middle Street is a 4-5 storey residential apartment building opposite the 2 storey CSIRO complex. The CSIRO site is completely fenced and as such has limited opportunities for connections through the site and a poor interface with the surrounding development.

1-2 storey detached residential dwellings are located on the southern side of Shore Street East within the PDA boundary.

Large areas of open space and parkland dominate the northern part of the Toondah Harbour PDA. GJ Walter Park contains a cricket pitch, direct foreshore access including some small picnic facilities, a dog off leash area and a small amount of off-street carparking. This area provides opportunities to improve amenity and outlook for the surrounding development.

In addition, this open space allows pedestrian access along the foreshore linking the historic precinct to the north including The Grand View Hotel and St Paul's Church south through the PDA and to the existing pedestrian path at Wharf Street onto Oyster Point Park. There are opportunities to formalise these pedestrian links through and into the centre of the PDA. As well as linking to streets adjacent, including Queen Street on which the Star of the Sea Catholic School is located.

Vegetated green corridors through the PDA currently provide for koala habitat and movement. These areas also provide opportunity for amenity for the surrounding development and can help facilitate pedestrian connections through the site.

Within the Toondah Harbour PDA there are also areas of mangroves and subtropical coastal saltmarsh which are protected and need to be considered as part of any further redevelopment. These link north and south along the foreshore. In addition, the marine environment needs consideration including any impact on seagrass and migratory shorebird feeding habitat and roost sites. Heritage elements within the PDA boundary include a house in Shore Street and significant trees in GJ Walter Park.

Given the overlapping heritage, cultural and environmental elements at Toondah Harbour and the importance for this location as a gateway to North Stradbroke Island, redevelopment will provide key opportunities to celebrate these features and provide areas / facilities where the community can learn about, engage with, and celebrate these elements. It will also provide the opportunity to rationalise carparking areas, open up the foreshore for the community and include development that can support and compliment the existing Cleveland CBD.

- Community Facility
- Interface to be Resolved
- Existing Pedestrian Connection
- Possible Pedestrian Connection
- Existing Streets
- P Carparking
- Existing Vegetation
- Parkland
- Mangroves
- Subtropical Coastal Saltmarsh
- Seagrass
- Storm Surge Line
- Previous Dredge Spoil Area
- PDA Boundary
- ① Passenger and Vehicle Ferry Terminals and Buildings (shown in black)
- ② Fison Channel
- ③ Existing Public Boat Ramp
- ④ At-grade Carparking Area
- ⑤ CSIRO Site
- ⑥ GJ Walter Park
- ⑦ The Grand View Hotel
- ⑧ St Paul's Church
- ⑨ Star of the Sea Catholic School



Figure 4. Urban Design Site Analysis

Scale: 1:5,000 @ A3

Environmental Site Analysis

The Toondah Harbour PDA contains marine and terrestrial ecological values of significance locally and in terms of State and Federal legislation. The foreshore abuts the Moreton Bay Marine Park and Ramsar Wetland (i.e. A wetland of international significance listed under the Ramsar Convention), wherein a variety of aquatic and intertidal habitat values exist and warrant consideration and protection.

Key aquatic and terrestrial ecological values and issues identified within the Toondah Harbour PDA are shown on Figure 5 and include:

- > Subtropical coastal saltmarsh, although already protected in Queensland under the Fisheries Act 1994, has recently been listed as a threatened ecological community under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)
- > Intertidal and shallow sub tidal habitat, including extensive flats supporting seagrass, mangroves and saltmarsh, that are of importance to fish and fisheries
- > Seagrass and intertidal foraging habitat important to migratory shorebirds within the Ramsar site of Moreton Bay
- > Habitat, including seagrass meadows, of importance to dugong and marine turtles
- > Koalas and koala habitat trees in an urban setting
- > Remnant vegetation
- > Potential acid sulfate soils
- > Erosion-prone shorelines.

Economic Site Analysis

Cleveland SA2, the statistical local area in which the Toondah Harbour PDA is situated in, has an aged demographic profile and this is expected to become increasingly pronounced over the long term. Significantly, 99% of population growth (1,521 persons) within this catchment from 2001 to 2011 was persons aged 55 and over. This demographic bias will influence the volume and type of new residential product offered (e.g. catering to higher proportion of single person households and smaller average household sizes) over the short to medium term.

Other key demographic information for Cleveland SA2 ("the catchment") is as follows:

- > The catchment accounts for approximately 10% of the Redland City LGA population, with 14,420 residents as at the 2011 Census
- > Population growth in the Cleveland catchment since 2001 has been 1.1% per annum, having grown at a slower rate than both Redland City LGA(1.6%) and Queensland (2.0%)
- > The catchment has a much older population than the greater Brisbane average, with 22.1% of the population aged over 65 years (Brisbane 11.8%). Conversely, the catchment has a lower proportion of children and population of working age than Brisbane
- > Lone person households account for 27.8% of all households, well above the average for both Redland (19.7%) and Brisbane (21.8%) and a reflection of its older population
- > Semi-detached housing is quite common in the catchment, with this product accounting for 23.6% of the total housing stock, compared to the Brisbane average of 8.5%. The popularity of duplex-style accommodation and single level retirement dwellings accounts for the high levels of attached housing, much of which is occupied by elderly residents
- > Cleveland SA2 has a much higher rate of home owners (37.5%) compared with Redland (32.4%) and Brisbane (27.9%)
- > Whilst average personal income is relatively consistent with the Brisbane averages, Cleveland SA2's income profile is characterised by lower levels of household, due to smaller household sizes
- > The catchment has a very high proportion of households with income between \$1-\$599 / week, at 26.4% versus greater Brisbane at 18.4%
- > Population growth in the catchment over the next 20 years is forecast to outstrip the average growth across the City, which is expected to be the result of medium density infill development in and around the Cleveland CBD. This robust population growth of 1.4% is slightly below the Queensland average at 1.8% per annum between 2011 and 2031
- > This growth equates to an additional 188 persons per annum for the next five years, or 78 new dwellings per annum in Cleveland SA2.



LEGEND

Habitat:

- Subtropical & Temperate Coastal Saltmarsh
- Migratory Shorebird Foraging Habitat
- Migratory Shorebird Roost Sites
- Seagrass
- Mangroves
- PDA Boundary

Koala Food Trees:

- Primary
- Secondary
- Other

Figure 5. Key ecological values within the Toondah Harbour PDA



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Movement and Parking

The main road link into the Toondah Harbour PDA is via Middle Street, which acts as a collector funnelling traffic from the external road network. This is complemented by residential access streets, (Wharf Street and Shore Street East) which provide access to the properties north of Middle Street, and the industrial type connection of Emmett Drive, which provides access to the ferry terminals and carparks (see Figure 6). The current annual average daily traffic (AADT) volumes are approximately 2,500 on Middle Street and around 500 on the residential streets.

Middle Street, Wharf Street and Shore Street have existing pedestrian footpaths bordering the streets; however these are only 1.2m wide and not suitable for use by cyclists. The pedestrian facilities on Emmett Street are fragmented and not suitable for high pedestrian volumes. A high quality shared pedestrian cycle path is provided along the western boundary of the PDA, linking to the south. However, once the path reaches the Wharf Street carpark, there is a lack of legibility connecting this route to the areas north of Middle Street.

Public transport facilities in the PDA consist of two bus stops, one a bus sign on a grass verge and the other a poorly maintained stop segregated from the rest of the site. The current timetables for ferry, bus and train are coordinated to reduce waiting times at Toondah Harbour. However, the current bus frequency is 1 service per hour, which is unlikely to encourage greater public transport patronage for future non-ferry land uses.

Toondah Harbour operates as a transit hub linking Cleveland to North Stradbroke Island particularly.

Parking provision on the site is provided in two types — at-grade parking at the ferry terminals and on-street parking bays (see Figure 7). The parking is distributed as follows:

- > Stradbroke Ferries secure paid customer parking – 131 spaces
- > Stradbroke Flyer passenger ferry parking – 55 spaces
- > Big Red Cat ferry parking – 231 spaces
- > Boat Ramp parking – 49 spaces
- > Council parking at GJ Walter Park – 156 spaces
- > Middle Street on-street parking – 122 spaces
- > Wharf Street parking – 104 spaces.

While anecdotal evidence suggests the carparking areas are highly utilised, it is not known how much of the parking is attributable to the existing employment located around Toondah Harbour.



Figure 6. Existing traffic conditions

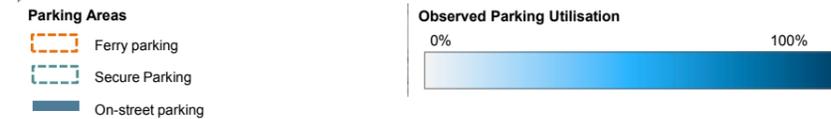


Figure 7. Existing parking conditions

2.3 Community

The purpose of engagement for the Toondah Harbour PDA was to engage proactively with the community in advance of planning for the Toondah Harbour PDA and inform residents of the PDA process. The process of engagement with the community included information sessions and direct individual engagement.

Three different engagement techniques were used to maximise community knowledge and participation in this stage of the Toondah Harbour PDA project. These were targeted stakeholder meetings, Open House community forums and online surveys.

Key Themes and Learnings

Better carparking — Carparking at Toondah Harbour was seen as the greatest issue / constraint. The community raised the issue of carparking for both visitors and Island residents currently, and wanted to ensure that any additional development and tourism would not compromise the existing level of free carparking or secure parking at a reasonable cost. Suggestions included multi-level carparking, underground carparking, car hire schemes and the desire for parking to remain free.

Balance development with ecological values — People felt development should embrace the waterfront location while maintaining the views and bay breezes. There was some support for apartments and commercial development, but there was preference for low-rise development with a separation between residential and commercial uses to manage noise complaints.

The purpose of Toondah Harbour — There was community support for Toondah Harbour as both a destination and a transport hub. Many North Stradbroke Island residents favoured keeping Toondah Harbour as a natural environment rather than developed.

Tourism opportunities — There was strong support for incorporating tourism facilities into any Toondah Harbour development to create local jobs, to embrace its waterfront location, and in recognition of its ecological values. Facilities to support tourism operators were suggested.

New uses suggested for Toondah Harbour to enhance local's lifestyle and tourism — Suggestions included fishing facilities, netted seawater pools extending into the Bay, carparking to support day trippers and island visitors, sustainable tourism ventures, more cafes and dining. Many of the suggestions would provide amenity to both locals and tourists.

Impact on North Stradbroke Island — Island residents were concerned about the impact on free carparking on the mainland, as well as the impact of increased tourism to the island.

Maintain off-leash dog park — There is high community use and love of the GJ Walter Park, its off-leash dog area and its recreational uses for families, local community groups and residents.

Native title — QYAC representatives attended meetings with Council on the site and shared thoughts and ideas.

Key issue / constraint	Details
Carparking	<ul style="list-style-type: none"> > Need for free trailer / boat parking > Current proposal looks 'favourable', however this should not compromise the current free parking allocation that is provided for in this area
Construction	<ul style="list-style-type: none"> > Concerned that construction traffics has a big impact on current residents and disturb the "status quo"
Dredging	<ul style="list-style-type: none"> > Continued dredging needed to maintain ferry and barge services
Environment	<ul style="list-style-type: none"> > Maintain seagrass beds and fish habitat > There should be limited building over the water and definitely no reclaiming of the bay in front of the park > Must protect current open space, seagrass beds, Ramsar sites and mangroves
Ferries and Barges	<ul style="list-style-type: none"> > Ferry and barge service providers should remain, ensuring no monopoly
Fishing	<ul style="list-style-type: none"> > Lack of fishing amenities such as cleaning areas and mooring for small boats
GJ Walter Park	<ul style="list-style-type: none"> > GJ Walter Park is well used by cricketers, young kids and local school (Star of the Sea), Probus for picnic events twice a year and dog-lovers
Green Space	<ul style="list-style-type: none"> > Need to balance between population and open space
Height	<ul style="list-style-type: none"> > Concerns over five storeys would detract from current amenity
Lifestyle	<ul style="list-style-type: none"> > Value the quiet lifestyle > Keep the sea breezes > Currently strong sense of community
Marketing	<ul style="list-style-type: none"> > Clear signage for visitors to discover areas of the Toondah Harbour - Cleveland Point and Oyster Point
No development	<ul style="list-style-type: none"> > No development of hotels or apartments within 3-5km of shoreline to maintain our beautiful scenery and natural advantage over other areas
Residential development	<ul style="list-style-type: none"> > Current good buffer between residents and ferries. This is an important constraint to factor into future development > No apartment or large business building
Tourism	<ul style="list-style-type: none"> > Redlands suffers from lack of hotel accommodation - giving opportunity for more opportunity
Traffic flow	<ul style="list-style-type: none"> > Keep car traffic and people separate as much as possible > Better pedestrian / vehicle integration
Under-utilised land	<ul style="list-style-type: none"> > Development to encourage and promote tourism. This will create jobs for locals and improve the local economy
Noise	<ul style="list-style-type: none"> > Impact of noise from ferries and other boats on residential areas > Noise during construction
Quality of amenity	<ul style="list-style-type: none"> > Anything would have to be an improvement to existing facilities > Better café environment
Impact on North Stradbroke Island	<ul style="list-style-type: none"> > If the attraction of an enhanced Gateway to Stradbroke results in increased visitors to the island (e.g. official figures estimated annual visitations at 500,000) development planning must include expansion of the landing points on the island.

3. STRUCTURE PLAN DESIGN

The development of a preferred structure plan option for Toondah Harbour has been informed by a succinct design, review and evaluation process. This process involved urban design, environmental, economic, traffic and infrastructure input as well as that of the community, Council and State Government agencies.

This information has been collated and developed over a series of workshops in which issues and opportunities were identified and analysed, structure plan options developed and assessed.

The following section of the report summarises this design process and assessment of options.

3.1 Options Development

Workshop 1 — Options Development Workshop

The options development workshop was held with key State and local stakeholders on Tuesday the 16 July 2013. The intention of this session was to clarify the key design issues and opportunities and to establish a series of structure plan options for each PDA.

Workshops for both the Toondah Harbour and Weinam Creek PDAs were held on the same day with a combined briefing. The workshop agenda is shown in Figure 8.

The workshop was attended by the consultant team, representatives from Redland City Council and State Government agencies as listed below.

- > **Consultant team** — Deicke Richards, Jones Lang LaSalle, BAAM, frc environmental and Cardno
- > **Redland City Council** officers including the following departments — City Planning and Assessment, Environment and Regulation, Corporate Governance, Communications, Water and Waste Infrastructure, City Infrastructure and City Spaces
- > **State agencies** — Economic Development Queensland, Translink, Transport and Main Roads, Maritime Safety Queensland, Environment and Heritage Protection, Natural Resources and Mines, National Parks Recreation Sport and Racing and State Development Infrastructure and Planning.

The objective of the workshop was to:

1. Develop a shared understanding of the key issues of the project
2. Identify and document the most important issues and constraints that will uniform design responses for the precinct
3. Generate a range of ideas, principles and design concepts that can inform more detailed testing of key issues e.g. public realm, transit, land-uses, density, parking etc.

The outcomes of the workshop process are shown in Figure 9.

These outcomes of this workshop were refined following review and further analysis into two structure plan options which formed the basis of workshop 2.

Workshop 1 — Options Development Workshop

8:00 am	Assemble in the venue (coffee provided)
8:30 am	Workshop welcome & introduction (plenary session) Project introduction (Scott Hutchison & John Loneragan) Participant introductions — all participants to introduce themselves Purpose of the workshop sessions — expected outcomes, what will be produced etc. (John Loneragan) Workshop agenda — how the workshop will be run, timing & report back stages, house rules etc.
8:45 am	Welcome from Redland City Council (plenary session) Welcome and introduction (Nick Clarke, General Manager, Organisation Services, Redland City Council)
Session 1: Background Briefings	
9:00 am	Site specific design priorities > Traffic & infrastructure — carparking, Translink interchange at Weinam Creek, vehicle access & road hierarchy (Cardno, 15 mins) > Environment & ecology — terrestrial & marine (e.g. Ramsar), marine parks, koalas, other habitat, open space & recreation (BAAM / frc environmental / NPRSR, terrestrial 15 mins, marine 15 mins) > Market / economics (JLL, 15 mins) > Initial site analysis, urban form & harbour exemplars (Peter Richards 15 mins, Cameron Davies 15 mins)
Session 2: Weinam Creek	
10:30 am	Weinam Creek Structure plan opportunities (in 3 design teams) Designing at a strategic scale working over consolidated site analysis drawings, consider: > Opportunities, carparking strategy, public transport & transit integration, development footprint, public realm & environmental enhancement, ecology, flooding & storm surge, pedestrian movement & connectivity (cycleways, footpaths), social infrastructure, tourism opportunities, centre strategy, identify any additional constraints.
12:30 pm	Report back (desktop review around the room) Each design team to give a 10mins. presentation of their team's approach. Discussion to consolidate the direction for up to 3 structure plan options.
1:15 pm	Lunch
Session 3: Toondah Harbour	
2:00 pm	Toondah Harbour Structure Plan opportunities (in 3 design teams) Designing at a strategic scale working over consolidated site analysis drawings, consider: > Opportunities, ferry operations, tourism opportunities & marina, built form & scale, public realm & environmental enhancement, flooding & storm surge, pedestrian movement & connectivity (cycleways, footpaths), public transport and integration, including carparking, integration with Cleveland & complimentary uses / measures, identify any additional constraints.
4:00 pm	Toondah Harbour Report back (desktop review around the room) Each design team to give a 10mins. presentation of their team's approach. Discussion to consolidate the direction for up to 3 structure plan options.
4:45 pm	Wrap up / where to from here (plenary session)
5:00 pm	Workshop close

Figure 8. Workshop 1 agenda



Figure 9. Workshop 1 outcomes



Participants at Workshop 1

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3.2 Structure Plan Options

Two structure plan options were developed as a result of the discussion and further refinement following the options development workshop. These are used to describe the two alternative futures for the Toondah Harbour PDA and were further considered during workshop 2.

Option 1 — Urban Harbour with Marina and Northern Channel

The key elements of Option 1 are summarised below and shown in Figure 10.

- ① Option 1 develops an urban harbour with a 400-700 berth marina as its central feature.
- ② Extensive land reclamation allows the construction of the marina and additional higher density residential development on the southern side of the marina.
- ③ A public plaza at end of Middle Street allows clear views to the bay when entering the precinct.
- ④ The passenger ferry terminals are relocated centrally within the precinct and are clearly visible as part of the active, mixed-use core.
- ⑤ Wharf Street is connected through to Emmett Drive to provide a 'loop' through the precinct allowing street efficiency and access to at-grade parking areas.
- ⑥ Middle Street forms a 'main street' and is connected north to Shore Street East creating a mixed-use development parcel on the foreshore which can take advantage of the amenity of the future marina development.
- ⑦ This option relocates the vehicle ferry terminal to the northern part of the PDA at the end of Shore Street East.
- ⑧ A northern channel is dredged in order to accommodate both vehicle and passenger ferries as well as recreational boats from the marina. This dedicated channel provides a faster ferry route. Fison Channel is not used in the long term. The existing boat ramp is removed due to close proximity of additional ramps at Raby Bay and Cleveland Point
- ⑨ Terrace housing development on the corner of Middle and Wharf Street marks the entrance to the harbour precinct.
- ⑩ High quality north-south pedestrian connection links the passenger ferry terminals and GJ Walter Park along the foreshore. A pedestrian connection to Queen Street is proposed linking to the Star of the Sea Catholic School.
- ⑪ The existing mangroves are respected with some areas of revegetation where possible.
- ⑫ The current dredge spoil area site is maintained in the interim.



Figure 10. Structure Plan Option 1



Figure 11. Structure Plan Option 2

Option 2 – Urban Harbour with Marina

The key elements of Option 2 are summarised below and shown in Figure 11.

- ① Option 2 develops a 300-400 berth marina as central feature of development accessed via a smaller, shallower northern channel for recreation boats only.
- ② Extensive land reclamation is required to construct marina and harbour creates opportunities for urban development over water on northern side of the marina.
- ③ High density mixed-use development overlooks the marina and central plaza space with opportunities for a hotel and function centre to be incorporated. Urban focal place and plaza is created where Middle Street connects to the marina.
- ④ Emmett Drive acts as a 'main street' and is extended north to Shore Street West and creates additional residential development opportunities overlooking the foreshore and the bay. This continuous street provides excellent public access to the foreshore and marina. Vehicle access is via a rear lane that also provides access to additional at-grade carparking within the urban block.
- ⑤ Wharf Street is connected through to Emmett Drive to provide a 'loop' through the precinct allowing street efficiency and access to at-grade parking areas and the boat ramp which is retained in its current location.
- ⑥ The ferry terminals are rationalised with the pedestrian ferry, drop off and transit interchange located separately to vehicle ferry, in to the heart of the precinct.
- ⑦ Fison Channel continues to accommodate pedestrian and vehicle ferry movements as well as recreational boats using the public boat ramp. Maintenance dredging will continue to be required.
- ⑧ Residential development transitions back to Wharf Street with additional carparking integrated into the urban block.
- ⑨ High quality north-south pedestrian connection links the passenger ferry terminals and GJ Walter Park along the foreshore. A pedestrian connection to Queen Street is proposed linking to the Star of the Sea Catholic School.
- ⑩ The land reclamation north of the marina may result, in the long-term, in additional parkland and a possible beach.
- ⑪ The existing mangroves are respected with some areas of revegetation where possible.
- ⑫ The current dredge spoil area site is maintained in the interim.

3.3 Assessment of Structure Plan Options

Workshop 2 — Options Selection and Refinement Workshop

The options selection and refinement workshop was held on Monday 9 September 2013 again with a number of key State and local stakeholders. The first part of this session took the two developed structure options and assessed them against a number of criteria in order to select a preferred structure plan option for the PDA. The second part of the workshop involved discussion and refinement of the preferred option.

Sessions for both the Toondah Harbour and Weinam Creek PDAs were held on the same day. The workshop agenda is shown in Figure 12.

Workshop 2 was again attended by the consultant team, representatives from Redland City Council and State Government agencies as listed below.

- > **Consultant team** — Deicke Richards, Jones Lang LaSalle, BAAM, frc environmental, Cardno and KBR
- > **Redland City Council** officers including the following departments — City Planning and Assessment, Environment and Regulation, Corporate Governance, Communications, Water and Waste Infrastructure, City Infrastructure and City Spaces
- > **State agencies** — Economic Development Queensland, Translink, Transport and Main Roads, Maritime Safety Queensland, Environment and Heritage Protection, Natural Resources and Mines, National Parks Recreation Sport and Racing and State Development Infrastructure and Planning.

This workshop was also attended by representatives from QYAC.

The options and assessment criteria are detailed in the following sections.

Options Assessment

The assessment criteria were developed using a combination of elements detailed within the RCC's 2030 Community Plan and EDQ's Strategic Direction. It should be noted that the community plan is an extensive document so only relevant criteria were included and that the criteria has been adapted to suit the specific role of the PDA within the context of Redland City.

The structure plan options for Toondah Harbour were initially assessed by the project team and then reviewed and recalibrated as part of the options assessment and refinement workshop with the additional stakeholders.

Table 1 details the assessment of the options.

Within the table each structure plan option has been assessed against each criteria on a sliding scale using shades of blue to indicate the score. A light blue cell indicates where an option does not meet the criteria and a dark blue cell indicates where an option strongly meets the criteria. The mid blue indicates a moderate score.

The cells within the table are coloured according to the score and a commentary of the rationale also provided within.

Workshop 2 — Options Selection & Refinement Workshop

8:00 am	Assemble in the venue (coffee provided)
8:30 am	Workshop welcome & introduction (plenary session) Project introduction (Scott Hutchison & Phil Smith) Participant introductions — all participants to introduce themselves Purpose of the workshop sessions — expected outcomes, what will be produced etc. (Phil Smith) Workshop agenda — how the workshop will be run, timing & report back stages, house rules etc.
8:45 am	Welcome from Redland City Council (plenary session) Welcome and introduction (Nick Clarke, General Manager, Organisation Services, Redland City Council)
Session 1: Toondah Harbour	
9:00 am	Presentation of structure plan options (plenary session) Heritage & Country (QYAC representative, 15 mins) Distillation of previous urban analysis (DR, 10 mins) Market / economics (JLL, 10 mins) Harbour & marina engineering (KBR, 10 mins)
9:45 am	Option selection & refinement (plenary session facilitated by DR) Review of options assessment table and updates as required. Facilitated discussion to select preferred structure plan option.
10:45 am	Detailed investigations (in 3 design teams) Further investigation and detailed design of specific elements of the preferred structure plan option.
12:00 pm	Report back (desktop review around the room) Each design team to give a 10mins. presentation of their team's approach. Discussion on implications for preferred structure plan option (if any).
12:30 pm	Lunch
Session 2: Weinam Creek	
1:00 pm	Presentation of structure plan options (plenary session) Heritage & Country (QYAC representative, 15 mins) Distillation of previous urban analysis (DR, 10 mins) Market / economics (JLL, 10 mins) Harbour & marina engineering (KBR, 10 mins)
1:45 pm	Option selection & refinement (plenary session facilitated by DR) Review of options assessment table and updates as required. Facilitated discussion to select preferred structure plan option.
2:45 pm	Detailed investigations (in 3 design teams) Further investigation and detailed design of specific elements of the preferred structure plan option.
4:00 pm	Report back (desktop review around the room) Each design team to give a 10mins. presentation of their team's approach. Discussion on implications for preferred structure plan option (if any).
4:30 pm	Wrap up / where to from here (plenary session)
5:00 pm	Workshop close



Figure 12. Workshop 2 agenda

Participants at Workshop 2



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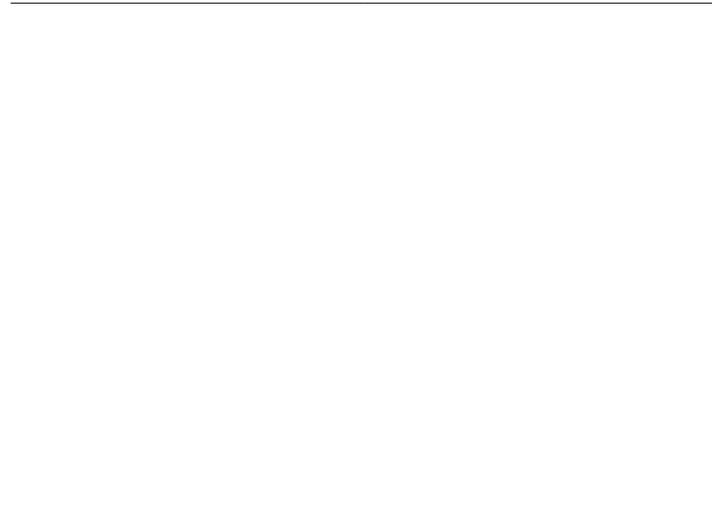
Toondah Harbour Structure plan options assessment table		Option 1 Urban Harbour with Marina & Northern Channel	Option 2 Urban Harbour with Marina
			
Local and State Economy	Short Term Opportunities for Economic Growth	<ul style="list-style-type: none"> - Relocation of car ferry limits short term development. - Redevelopment of the CSIRO site - Improved experience for visitors accessing Stradbroke Island supports economic growth on Island - Cost of northern channel can't easily be absorbed by development in short term 	<ul style="list-style-type: none"> - Some residential redevelopment of existing parkland to north of Middle Street - Redevelopment of the CSIRO site - Improved experience for visitors accessing Stradbroke Island supports economic growth on Island - Southern channel to be straightened and widened over time
	Long Term Opportunities for Economic Growth — 10 years plus	<ul style="list-style-type: none"> - Relocation of ferry services with new marina will enable space for high density development on the site - Larger long-term benefit, larger land mass to be developed on - ultimate greater economic return 	<ul style="list-style-type: none"> - New marina will enable good quantum of high density development on the site with significant amenity overlooking marina
Traffic and Parking	Street Efficiency	<ul style="list-style-type: none"> - 12,000 VPD - Intersection upgrade at Wharf and Middle Streets and additional connectivity within site - Car ferry traffic movements impact on residential areas to north 	<ul style="list-style-type: none"> - 12,000 VPD - Intersection upgrade at Wharf and Middle Streets and additional connectivity within site
	Effective Parking	<ul style="list-style-type: none"> - 1,840 carparks required - Many of the existing parking areas retained as parking areas - Multi-deck parking required south of Middle Street - On-street parking on Shore St East may be an issue for residents 	<ul style="list-style-type: none"> - 1,700 carparks required - Many of the existing parking areas retained as parking areas - Multi-deck parking required south of Middle Street
	Effectiveness of vehicle ferry services	<ul style="list-style-type: none"> - Northern channel provides dedicated and faster ferry route 	<ul style="list-style-type: none"> - Southern channel provides level of service commensurate with existing operator needs
Environment and Heritage	Protect, Restore & Enhance Environment	<ul style="list-style-type: none"> - Deeper northern channel and larger marina has impacts on marine environment, especially existing mangroves, seagrass and migratory shorebird habitats - Some koala offsets required and safe road crossings required 	<ul style="list-style-type: none"> - Northern channel and marina has impacts on marine environment, especially existing mangroves, seagrass and migratory shorebird habitats - Some koala offsets required and safe road crossings required
	Opportunities to interact with nature	<ul style="list-style-type: none"> - New centre and marina enables more people to interact with Toondah Harbour - Tidal interaction possible with harbour in long term only - Parks enable interaction with koalas if food trees planted 	<ul style="list-style-type: none"> - New centre and marina enables more people to interact with Toondah Harbour - New beach provides tidal interaction with harbour - Parks enable interaction with koalas if food trees planted
	Opportunities for Aboriginal stewardship and reconciliation	<ul style="list-style-type: none"> - Requires clarification - For consideration – ticketing centre permitting tourism, education, information centre, aquaculture & marine based tourism - Need to acknowledge and respond to the heritage on the site 	<ul style="list-style-type: none"> - Requires clarification - For consideration – ticketing centre permitting tourism, education, information centre, aquaculture & marine based tourism - Need to acknowledge and respond to the heritage on the site

Table 1 Structure plan options assessment table

Toondah Harbour
Structure plan options assessment table

Option 1
Urban Harbour with Marina & Northern Channel

Option 2
Urban Harbour with Marina



Sustainable Transport	Effective Passenger Ferry & Bus Services
	Effective Cycle and Pedestrian Connectivity
Community and Recreation	Effectiveness of community facilities
	Support for recreational boating (boat ramps & marinas)
	Creating green recreational opportunities
Character and Livability	Vibrancy of centres and gathering places and residential amenity
	Strengthening Physical Character & Heritage
Risk and Cost	Efficient cost of infrastructure
	Likeliness to succeed

- Better integration of bus and passenger ferry services
- Improved passenger ferry trip time due to northern channel
- Continuous north-south link completed through site from Grand View Hotel to Queen Street
- Opportunity for community facility with close interaction with Toondah Harbour
- New 400-700 berth marina
- No new boat ramp
- Some reduction in existing parkland area
- Additional parkland only possible with long term with land reclamation
- A significant improvement to the vibrancy of Toondah Harbour
- Impact on the amenity of GJ Walter Park, existing residential areas and Grand View Hotel
- Potential impact on heritage citation for Grand View Hotel
- Impact of dredge spoil area on residential amenity
- Opportunity to develop a language and architectural merit of higher density mixed-use buildings
- \$45 million to dredge northern channel required in short term to relocate car ferry services
- \$200 million in staged dredging to achieve marina
- Substantial offsets required for loss of marine habitat
- Reduction in operating costs - shorter channel, travel time savings, perhaps not for tourism and the experience
- Maintenance dredging cost - northern channel less maintenance but more capital cost
- Restricted capacity in residential market until long term
- Barge noise impacts existing residents
- Improved movement economy to NSI
- Approval challenges for marina and car ferry
- Funding of northern channel - ferry operator would need to provide

- Better integration of bus and passenger ferry services
- Improved passenger ferry trip time due to northern channel
- More long-term flexibility as ferry services close together
- Continuous north-south link completed through site from Grand View Hotel to Queen Street
- Opportunity for community facility with close interaction with Toondah Harbour
- New 300-400 berth marina
- Boat ramp remains in current location
- No nett reduction in existing parkland area
- New beach created to north of GJ Walter Park
- A significant improvement to the vibrancy of Toondah Harbour
- Impact of dredge spoil area on residential amenity
- Opportunity to develop a language and architectural merit of higher density mixed-use buildings
- Limited short term dredging required
- Staged dredging to achieve marina
- Substantial offsets required for loss of marine habitat
- Maintenance dredging cost
- Restricted capacity in residential market until long term
- Barge noise impacts future residential with PDA
- Approval challenges for marina

Table 1 Structure plan options assessment table (continued)



3.4 Preferred and Refined Structure Plan Option

The assessment and discussions held as part of the options assessment and refinement workshop resulted in a preference for Option 2 for the Toondah Harbour PDA structure plan which focused on an urban harbour with a smaller 300-400 berth marina as central feature of development.

Following the selection of the preferred option, a number of elements and items to refine the structure plan were discussed. These include:

- > Marine engineering and a dredge spoil disposal strategy
- > Staging of the marina
- > The inclusion of an additional marine servicing area.

The refined structure plan option for the Toondah Harbour PDA is shown at Figure 13. This forms the outcome of workshop 2 and the basis of the structure plan documented in Section 4.0.

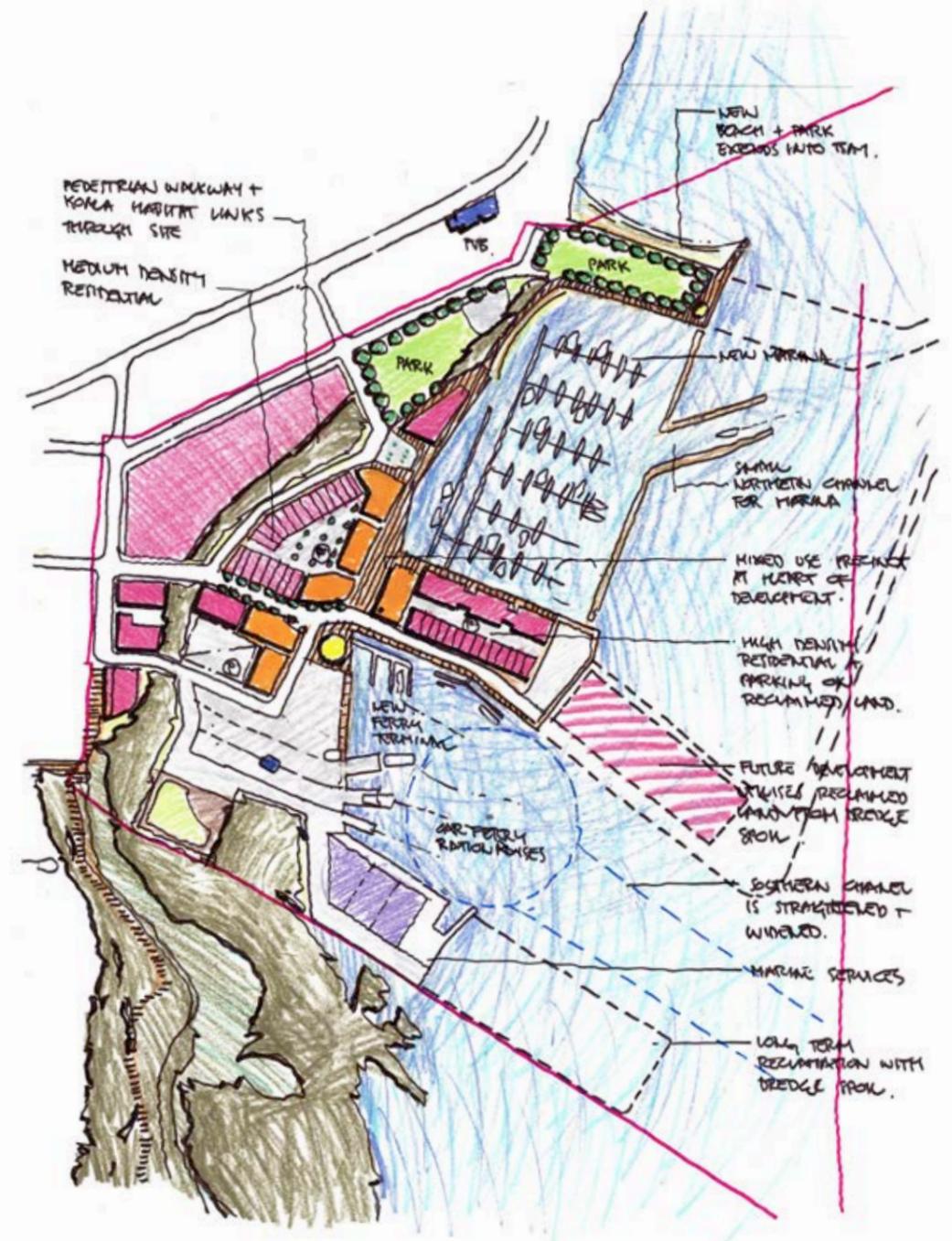


Figure 13. Toondah Harbour PDA preferred structure plan option

4. STRUCTURE PLAN

The structure plan describes the physical economic responses within the PDA. It distills the analysis and design phases of the master planning process into a concise structure for the Toondah Harbour PDA area. The structure plan has the following key elements:

- > Principles – the key design principles that have guided decision-making and within the development area
- > Economic strategy – the strategic economic initiatives that will drive growth within the PDA
- > Movement and access – an outline of the vehicle and pedestrian movement functionality also integrating car ferry and passenger ferry activity
- > Land use and urban form – the integration of built form opportunity with land use outcomes
- > Open space and public realm
- > Environmental strategy
- > Infrastructure strategy.

The implementation of this plan is further explored in Section 5.0.

4.1 Design Principles

The many opportunities for change within the Toondah Harbour PDA have broader economic implications for Redland City and the City's island population. To guide the decision making around the opportunities the structure plan proposes four key design principles. Principles are relevant to all functional and experiential aspects of the development area. These are described and illustrated to the right.

Leading through Innovation

Due to the high visibility of this site both within the city and outside the city there is an opportunity to demonstrate leadership through innovation. Solutions at Toondah Harbour will express the quality of the city and inform future outcomes within the broader city.

A Prosperous Harbour Village

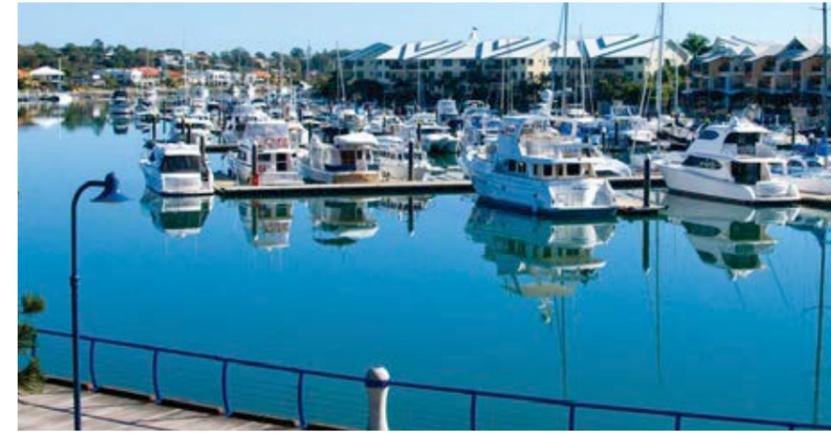
The creation of a more complex and prosperous urban village on the site of the existing Toondah Harbour will attract investment in the surrounding city and its island community. The village will facilitate exchange of ideas, knowledge and wealth for the community.

Connecting with the Bay

Toondah Harbour is a place to experience the interface between land and sea. It will convey a range of biophysical experiences that connect users with the bay and bay island ecologies. It will also become a well known and well used meeting point.

Launching Point

Toondah Harbour is a place to pause and contemplate travel and exploration within the city. It is a space that reveals the rich pathways and knowledge of Moreton Bay and Stradbroke Island. A high quality experience is offered to once off and regular travellers.





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4.2 Overall Structure Plan

The overall structure plan for Toondah Harbour provides for a new urban village flanked by a working harbour and recreational marina. Both provide alternative outlooks and settings for associated commercial and residential activities (see Figure 14). At the heart of these key areas are a new ferry terminal, interpretive centre and terminal plaza. The structure plan has a number of key elements:

1 Toondah Harbour Plaza

At the heart of Toondah Harbour is a new plaza and passenger ferry terminals that also acts as a ticketing and information centre for Moreton Bay and Stradbroke Island. The plaza provides the interface between the commercial ferry operations and the mixed-use urban village and marina precinct. Local bus services stop on the edge of the plaza and are visible from departing and arriving ferry services. A landmark terminal building clearly visible at the end of Middle Street on approach to the Toondah Harbour precinct anchors the plaza. The building houses ticketing and interpretative centre functions for Moreton Bay, Toondah Harbour and Stradbroke Island. From the ferry terminal the plaza extends north to provide visual links between Middle Street and the new marina.

2 Working Harbour

Vehicle and passenger ferry services are rationalised at Toondah Harbour. Passenger services are integrated into a more comprehensive and accessible facility at the northern end of the harbour while vehicle ferry services are allowed to operate uninterrupted to the south. The harbour has a separate channel to the marina to avoid conflict between recreational and commercial boating activity. The existing swing basin is extended to meet the needs of the existing and future vehicle ferry fleet. Fison Channel, in the south, is gradually straightened and widened over time through maintenance dredging activity.

3 Marina

A staged marina is established at Toondah Harbour. The marina provides additional destination qualities to the development area and expands the range of recreational activities currently available. The marina is designed to enable gradual expansion up to 800 berths within the declared PDA boundary. It is accessed from a new narrow and shallow channel.

4 Mixed-use Urban Village Core

An early stage of development for the PDA is the mixed-use village flanking Middle Street. The village has frontage to the ferry harbour, marina, Middle Street and the koala habitat areas to the west. The village will have retail uses concentrated at ground level around the new ferry terminal and marina plaza. Surrounding this, both around and over, will be a variety of residential solutions aiding increasing in density on proximity to the marina. The urban core area provides additional vehicle and pedestrian connectivity between Middle Street and Shore Street East to the north.

5 Toondah Harbour Pier

Extending into the marina and harbour will be a new high density mixed-use pier with a focus on marine associated retailing and business along with marina residential. The northern side of the pier is a pedestrian boardwalk providing access to the marina. On the southern side the extension of Middle Street provides vehicle and service access. The highest density buildings overlook the marina. Lower density live / work dwellings will have an address on the southern access street beside the ferry harbour. This new mixed-use precinct will be established through gradual reclamation of land from marina cut and fill and longer term dredge spoil disposal. Marina parking, boat stacking and fenced dredge spoil disposal areas are located at the end of the pier. It is anticipated the boat stacking and dredge spoil disposal activity will be relocated to the end of the pier area each time suitable land is reclaimed.

6 GJ Walter Park

GJ Walter Park is located in the northern part of the PDA, overlooked by the historic Grand View Hotel. This traditional park is expanded and extends into the bay creating a north facing tidal area. As well as recreational activities and a dog park, GJ Walter Park reveals the heritage and ecology of Moreton Bay. It also provides opportunities to interact with koala habitat areas to the south.

7 Residential Frame

Residential housing intensifies around the frame of the Toondah Harbour PDA. This intensification will be ongoing and accommodate a range of housing solutions. Frame areas include the CSIRO site.

8 Parking and Car Ferry Precinct

The area south of the passenger ferry terminals is a parking and car ferry precinct. This area aims to separate and concentrate long-term visitor parking and ferry movements associated with access to Stradbroke Island. The precinct is accessed from the extension of Wharf Street at a new upgraded intersection with Middle Street. The precinct is legible for tourists and keeps essential vehicle movements away from the more highly pedestrianised parts of the development area. Facilities for two independent ferry operators are provided along with at-grade and multi-deck carparking areas. At the southern end of the precinct, the existing boat ramp is retained to provide convenient recreational boat access. Within this area the existing dredge spoil area location is also retained for maintenance dredging.

9 Marine Services Area

Land reclamation, through the ongoing settlement of dredge spoil, creates land that will be utilised for marine services and marine based maintenance service industries. The area, in the southern part of the PDA, is less visible than other parts of the development area and has shared circulation areas for dry docking of boats, service vehicles and employees.

- Mixed-use
- High Density Residential
- Marine Services
- Future Development
- Park / Open Space
- Vegetation
- Plaza
- Beach
- Community Node
- P Carparking
- PDA Boundary
- Boat Ramp
- Passenger Ferries
- Vehicle Ferries
- 1 Toondah Harbour Plaza
- 2 Working Harbour
- 3 Marina
- 4 Mixed-use Urban Village Core
- 5 Toondah Harbour Pier
- 6 GJ Walter Park
- 7 Residential Frame
- 8 Parking and Car Ferry Precinct
- 9 Marine Services Area



Figure 14. Structure Plan Scale: 1:5,000 @ A3

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4.3 Economic Strategy

Residential Market

The existing Cleveland market has two distinct sub-markets: a premium residential market comprising of the Raby Bay development and the broader Cleveland region. Median sales price for houses within Cleveland were \$535,000 during YTD 2013, compared to \$1.2 million for houses within Raby Bay over the same period.

This significant difference highlights the potential premium available for waterfront dwellings in a quality master-planned estate.

In the last decade there has been a clear shift towards attached product over houses in Cleveland, which has been largely driven by an aged demographic profile of the area and limited opportunities for new supply of detached dwellings in close proximity to the Cleveland CBD. However, this medium density market is still relatively shallow and the attached product market is in the early stages of acceptance.

The broader slowdown in the residential market across South East Queensland has similarly impacted the Cleveland apartment market with slow sales activity levels. There have been no new apartment project commencements for over 2 years. However, the market is moving through a rebalancing phase and adjusting to better matched supply of medium density product to the local market with well-designed and well-priced product as well as sites that have been re-based at current market prices compared to the peak of the market.

Toondah Harbour will provide a strong focus on medium density housing supply. The initial target demographic for product will be local owner occupiers, including both the affluent older demographic currently residing within Raby Bay and middle income earners seek a more affordable medium density product. Over time, local investors are expected to embrace the project more as it gathers momentum.

Marina Market

Toondah Harbour presents a strong opportunity for a potential marina with the catchment area exhibiting long term robust levels of growth in vessel registrations. As at June 2012, there were a total of 79,660 boats registered in the broader catchment area, with approximately 32% in Brisbane and 14% in the Redland LGA. An analysis of recreational boat registrations for the primary catchment area indicates strong growth over the last 10 years to June 2012, averaging around 2,600 per annum. While growth has slowed more recently in line with the wider market, there has been positive growth each year and increased growth from 2011.

The nature of boat registration growth for vessels greater than 10 metres is in part influenced by availability of wet and dry storage options within proximity for the registered owner. Additional marina berth supply in the catchment may therefore influence demand. Depth of demand for wet berths in the catchment area is expected see take-up of 400 berths within 10 to 20 years. Dry stacking facilities may also be supportable and a provision for around 100 vessels is appropriate.

The Toondah Harbour Structure Plan enables a 400 berth marina and dry storage areas.

Retail Market

The success of retailing at Toondah Harbour will create a strong identity for the project and as such will be highly influential on the success of other uses within the PDA. The retail solution is holistically incorporated as part of the broader strategy, with careful consideration of staging to ensure each phase is a success and that the outcome is economically sustainable over the long term.

Retailing at Toondah Harbour should build on or complement Cleveland CBD – not compete with it. The retail component of the PDA should have a dual role:

- > Caters to locally generated demand from within the new residential component in the project
- > Has a strong destinational role.

The prime ocean front location provides a major differentiator to the retail offering in Redland LGA.

The amount of supportable retail space for the Toondah Harbour PDA is estimated to be a total of between 1,500sqm and 2,500sqm depending on the extent to which a marina is developed and excluding the function centre.

The site presents a strong opportunity for the retail anchor to be a well-designed waterfront pub / hotel with potential function / event facilities that may cater to corporate and social / wedding functions and events. There is a significant market gap for such waterfront facilities in South East Queensland. A high quality designed facility in this location would play an important role in providing a strong identity for Toondah Harbour and the surrounding Cleveland area. In time, this may also incorporate complementary short-term accommodation facilities. This component has the potential to play a strong destinational role for Toondah Harbour and Cleveland in attracting a market from across greater Brisbane and South East Queensland.

The supportable mix for a dynamic retail village includes:

- > Local convenience grocery shopping serving local residents within a 400m radius (short walk) and ferry passengers. The Cleveland CBD performs the role of major grocery shopping
- > An 'Eat street' with focus on restaurants, cafes and small format bars providing village and waterfront dining opportunities. This delivers an amenity level expected from local buyers of apartments / terraces and caters to a broad market from across Redland LGA and beyond
- > Leisure / lifestyle retailing supporting the marina precinct and patrons.



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Indicative illustrative perspective looking west

4.4 Movement and Access

The structure plan provides an integrated network of roads, public transport, pedestrian and cycle pathways that facilitates the safe and efficient movement of private vehicles, buses, cyclists and pedestrians. A key focus of the transport network is the ferry terminal comprised of two passenger ferries and a two car ferries which provides regular services between Toondah Harbour and North Stradbroke Island.

The structure plan promotes pedestrian movement through the site and aligns this with the transport options provided in the PDA. A balance is achieved between the place and movement function of streets. Streets within the PDA have multiple functions. Where movement functions of a street conflict with place functions, the place function will take priority.

The Toondah Harbour access and movement strategy has been designed to:

- > Promote pedestrian movement as the priority form of movement within, to and through the PDA
- > Provide a legible network of streets, spaces and linkages within the PDA
- > Civilise the ferry and marina infrastructure making the infrastructure adapt to the urban environment and conditions, not adapting the urban environment to the infrastructure
- > Provide safe and attractive connections to adjoining uses and places. In particular facilitating a coastal edge connection from the north to the south of the PDA
- > Deliver direct and effective public transport connections and facilities that promote the PDA as a convenient destination and interchange point for services connecting with Stradbroke Island
- > Ensure public and passenger transport access is legible and clear and forms part of the PDA experience
- > Actively manage on-site carparking to encourage alternative forms of travel to and from the PDA without creating impacts on the movement economy to Stradbroke Island
- > Carefully arrange the street network and land uses to achieve a grid system of street connections. Ensure access to the site does not detrimentally impact on the amenity and safety of residents and visitors to the site will be a priority
- > Use of industry best practice with regards movement to ensure optimum accessibility for pedestrians, cyclists and public transport users
- > Ensure compatibility of the different land uses predicted on vehicle types associated with different land uses will be segregated as much as practical, while still maintaining pedestrian / cycle links.

Key elements of the access and movement network are detailed in the following sections.

Street Network

Figure 15 presents the street network. The street network supports the additional population of approximately 3,450 persons.

The basis for the street network is a grid system of street connections. The existing road network is upgraded in addition to providing additional street links to improve circulation.

The function of Middle Street as a trunk collector is key to the operation of the PDA. This will continue to function as the major traffic route into the site and will provide a focus for access and connectivity for the proposed development.

Currently the residential areas to the north of the PDA are segregated from the south of the site, where the mixed-use, marina, ferry terminals, marine industry and boat ramp are located. An additional north south road link connects the heart of the development to Shore Street east. This provides access to the proposed dwellings and marina parking area. The addition of the additional street maintains the existing people friendly and safe environment, by not concentrating too much traffic on any single residential access street.

A transport planning challenge is to effectively manage the land use / transport interface and to provide segregation where possible of freight and general traffic. The structure plan segregates the heavy vehicle traffic, and large concentration of early morning traffic, associated with the ferry, marine industry and boat ramp. Wharf Street is extended to the south and east to connect to the ferry / marine ramp zone. This link reroutes traffic as early as possible, removing its detrimental impact to residential and visitor amenity and improves safety to road users.

Careful treatment of traffic in the vicinity of the ferry and marine industry is important. However, the street network must still connect this zone to the rest of the PDA to ensure that it feels like a single community. The structure plan achieves this by locating the marine industry and queuing areas associated with the ferry terminals to the extreme south of the site, while the passenger ferry terminals is located in the heart of the development. Private vehicle, public transport, cycle and pedestrian connections are maintained and strengthened by linking Middle Street to the ferry / marine industry / boat ramp area.

Pedestrians and Cyclists

The PDA is proposed as a walkable and very active urban environment, rich in transport options. A network of footpaths, open space, plazas, boardwalks, mid-block linkages and cycle ways provide high levels of connectivity internally and externally.

The pedestrian and cycle network is well connected with land and water transport facilities to ensure excellent access to buses and ferries for longer journeys.

Pedestrians are catered for with a generous pedestrian realm created at the Toondah Harbour Plaza. Footpaths and boardwalks are wide, comfortable spaces, protected from the sun and rain by awnings and street trees reflecting the subtropical feel and nature of the place.

Conflicts between pedestrian movement and marina access will need to be managed. It is imperative that views are retained therefore marina access points will enable clear views of marina from the promenade and the surrounding development. The minimum width of pedestrian waterfront promenade is to be 4.5m.

Formal street crossings will be provided along the preferred pedestrian desire lines such as along, and across, Middle Street.

- Park / Open Space
- Vegetation
- Plaza
- P Carparking
- PDA Boundary
- Street Network
- Cycle Path
- Pedestrian Connection
- Service Lane
- Indicative Carpark and Service Access Point
- Boat Ramp
- Passenger Ferries
- Vehicle Ferries



Figure 15. Movement and Access Plan

Scale: 1:5,000 @ A3

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The major pedestrian and cycle facilities which are critical to the success of the PDA include:

- > A link into the existing Eddie Santagiuliana Way shared path to the Oyster Point park and ferry terminal of the PDA
- > Pedestrian connectivity along the waterfront improving recreational aspects of the development
- > On and off road cycle facilities along Middle Street.

These improvements help merge the PDA into the wider community surrounding Toondah Harbour, providing links to Cleveland CBD, residential areas to the north of the PDA and the residential and community uses situated to the south and west.

Public Transport

The ferry terminals at Toondah Harbour are a vital link in the public transport network for the northern Moreton Bay Islands (particularly Stradbroke Island). In order to highlight its importance, as well as providing a focal point for the service of the mixed-use and residential zones, a major improvement is the implementation of a central public transport hub.

The provision of a loop road network which will take traffic along Middle Street, past the ferry terminals and north onto Wharf Street, will promote an efficient public transport route with the opportunity to provide one or two additional bus stops within the PDA.

Parking and Vehicle Ferry

In the structure plan the ferry terminal is situated to the southern edge of the PDA, with the industrial land uses, this provides an opportunity to accommodate the queuing and waiting facilities associated with a car ferry separate from the residential & mixed-use, whilst focusing the passenger waiting areas & building close to the centre of the site.

The parking associated with the ferry terminal is located close to these facilities in a decked arrangement to save on valuable land. The marina also has segregated facilities for parking, as required by the operation of this land use.

Where possible within the PDA parking is sleeved by buildings with the parking in the centre, this is a key improvement from the existing situation where the vast expanse of at grade carparking dominates the area. Residential parking provision is provided within the properties to save on parking provided within the PDA.

Acceptable Solutions

Parking provision for development is required to be provided in line with Redland City Council's Planning Scheme to ensure that the area is not adversely impacted by illegal on street parking.

Development in excess of that anticipated by the structure plan will require detailed traffic and transport capacity assessment to ensure its suitability.

Street hierarchy and function should be in line with that outlined in Table 2.

Table 2 Street hierarchy and function

Road Classification	AADT	Equivalent Residential Lots	Design Speed	Number of Lanes	Carriageway Width	Minimum Verge Width	Reserve Width
Access Street	1,000	100	30 km/h	2	6m	4m	15m
Local Collector	<3,000	300	40 km/h	2	7m	4m	18m
Trunk Collector	3,000 – 10,000	1,000	50 km/h	2	11 to 14m	4 to 6.5m	19 to 27m
Sub-arterial	<15,000 – 20,000	2,000	60 km/h	2 or 4	12 to 20m	4 to 6.5m	20 to 33m

4.5 Land Use and Built Form

Land uses at Toondah Harbour are intended to reflect a shift in focus for this part of Redland City from a singular commercial harbour to a mixed-use urban village offering a broad range of maritime related activities and positive economic opportunities. Within this mix, there is a focus on residential and destination activities along with ancillary commercial and retail. Community facilities are largely recreational with a focus on marine and land based habitat areas.

Land Use

Land uses and their location within the village core (see Figure 16) will deliver the following outcomes:

- > Generate economic activity within the existing and future development markets
- > Be transit supportive — maximise use of active and public transport by locating workers and residents within walking distance of the transit options and convenience retailing
- > A mix of land use that promotes activity day and night
- > Retail destination activities provide for the ancillary convenience needs to PDA residents as well as providing opportunities for cafes, restaurants and marina related retailing
- > Commercial uses provide employment related to harbour and tourism economies
- > A range of residential housing options, which contribute to village activation and generate on going economic activity
- > Marina berths and associated access ways
- > Commercial harbour and marine services areas meet the service needs of the marina and ferry traffic.

Ultimately, the private sector will develop the PDA and deliver the land use mix. Due to the varied and cyclical nature of property markets, developers will need a certain level of flexibility to accommodate changing demand and supply. However, they will be required to deliver the outcomes described above.

The proposed land use location and mix is based on advice and research of the current market conditions.

Height and Intensity

The Toondah Harbour PDA will be characterised by building forms generally ranging in height from 7 – 15 storeys. Taller buildings are generally cluster towards the marina and harbour containing retail, residential and employment opportunities. Maximum building heights in storeys are shown in Figure 16.

Built Form

Buildings are not the same from roof to street level — they have a distinct bottom, middle and roof. Buildings with continuous undifferentiated facades from top to bottom are not appropriate within the Toondah Harbour PDA. Façades may maintain a zero setback to these streets for the full height of the building provided that some form of differentiation is maintained between bottom (podium), middle and top. This may include changes in storey height, the inclusion of a building waist, materials etc.

Ground levels are built to the street frontage along Middle Street. On-site carparking areas, loading bays and service areas are either integrated within, or under, buildings and sleeved by active frontages, or are located away from the public realm behind buildings. The use of large blank screens to mask loading areas is not appropriate. Basement carparking is unlikely due to geological constraints.

Perimeter buildings reinforce street edges regardless of their inherent land use and provide year round weather protection along all active street frontages. Regardless of height, buildings maintain a strong relationship with the street by defining the public realm through podiums or other façade elements. Towers in plazas are not acceptable.

Gateways and Landmarks

To improve legibility a clear hierarchy of spaces and streets within the Toondah Harbour PDA is proposed. The hierarchy relates to the pattern of movement, creating a clear legible structure. The following urban design ideas are integrated into the structure for the PDA.

At the main vehicle accesses to the PDA from Middle Street, buildings reinforced by landscape and public realm treatment will create a new gateway. At the end of this gateway the ferry terminal landmark buildings increase the legibility of the public open space hierarchy and compose a memorable view at the end of Middle Street. Landmark qualities may be created through measures such as a change of scale, materials and / or architectural treatment. A new landmark building will mark the heart of the PDA at the end of Middle Street adjoining the Toondah Plaza as shown in Figure 16.

Frontages

Three frontage types are proposed to deliver built form with a graduation of definition and activity from high to low. The frontage types proposed are primary active frontages, secondary active frontages and tertiary frontages.

Primary Active Frontage

Primary active frontages refer to ground level facades which face streets, plazas and boardwalks. They are built up to, or near, the public realm edge, are generally parallel to streets alignment and contain uses characterised by high pedestrian footfall such as retail. They are visually and physically permeable containing many windows and entrances. They do not include blank walls, louvre grills for plant rooms or parking areas and rows of fire escapes. Upper floors of a primary active frontage provide opportunities to overlook the street, increasing surveillance and reinforcing the active frontage. The location of primary active frontages within the PDA is illustrated in Figure 16.

Secondary Active Frontage

Secondary active frontages are located away from major gateways and more intense pedestrian spaces. In these areas, buildings are setback slightly from their front alignments to define streets and public spaces. Frontages contain landscaping and well-detailed and articulated access points at frequent intervals along pedestrian networks. Awnings are generally not continuous with an emphasis on key entry points. Secondary frontages may be activated by commercial uses or residential uses. Entries are emphasised through architectural and landscape treatment, pedestrian movement paths, awnings and height. The location of secondary active frontages within the PDA is illustrated in Figure 16.

Open Space Frontage

Tertiary frontages in the PDA maintain strong setbacks and are generally against areas of vegetation. They promote surveillance of the associated open space through The location of tertiary frontages within the PDA is illustrated in Figure 16.

- Mixed-use
- High Density Residential
- Marine Services
- Park / Open Space
- Vegetation
- Plaza
- ✱ Landmark Building
- Community Node
- P Carparking
- PDA Boundary
- Reclamation
- Primary Active Frontage
- Secondary Active Frontage
- Open Space Frontage
- Pedestrian Entry Point
- 15 Maximum Height in Storeys



Figure 16. Land Use and Built Form Plan

Scale: 1:5,000 @ A3

Building Interface

The interface between buildings and streets is important to create a vibrant village. Figure 17 provides an example of typical interfaces which aim to:

- > Activate the street
- > Visually and physically connect the buildings to the street
- > Ensure carparking and service areas are screened.

Built Form Typologies

A variety of retail, mixed-use and residential uses within the PDA ensures a suitable mix and intensity of population and activity. Several built form typologies are required to cater for these uses in a compatible manner, deliver street activation and amenity and support the differing intensities of development. Figure 18 provides examples of built form typologies which may be developed as part of the Weinam Creek PDA, including:

- > 7 – 15 storey medium rise mixed-use housing over retail / commercial
- > 3 storey lift / walk up
- > Sleeved multi-deck carpark
- > 2 – 3 storey row house / live / work.

Character

Subtropical design

South East Queensland is Australia's only subtropical metropolitan region. The buildings within the Toondah Harbour PDA will exhibit a strong urban and subtropical character.

Building design will be climatically responsive, and will:

- > Incorporate light and shade providing well detailed and articulated façades
- > Be orientated to promote seasonal solar access
- > Enable cross ventilation and support a naturally ventilated and comfortable environment
- > Provide weather protection and sun shading (including eaves and overhangs) into façades and roof forms
- > Have visible and expressive roof forms
- > Integrate indoor and outdoor spaces through the use of balconies, courtyards and large windows creating open facades.

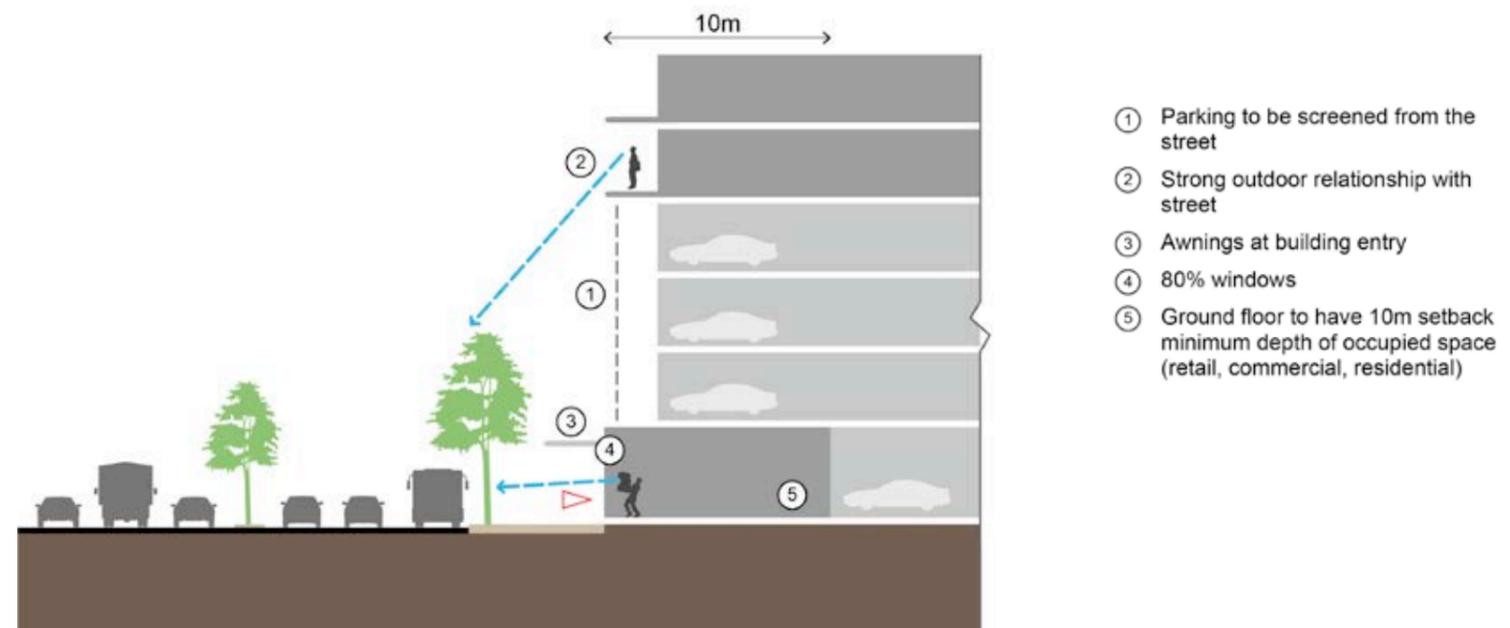
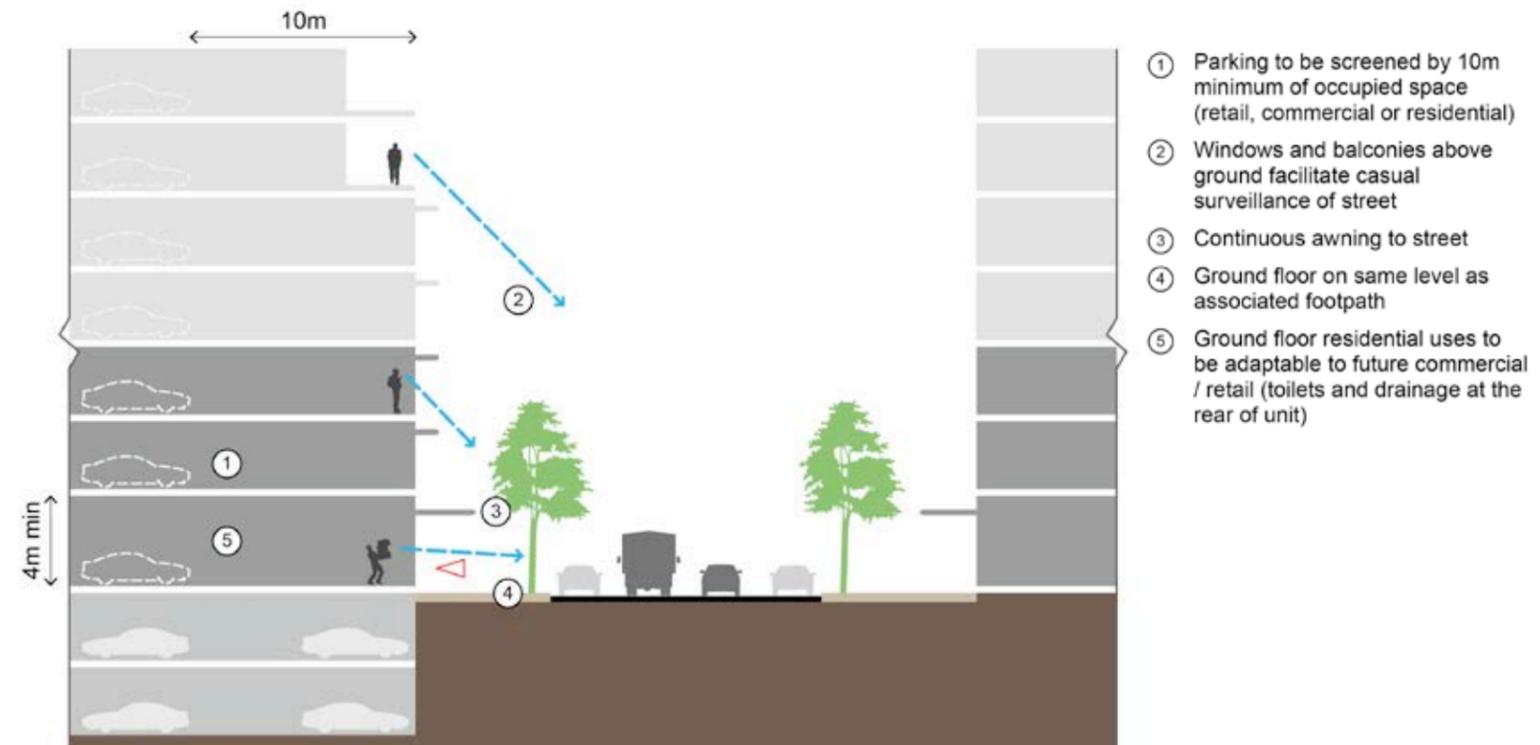
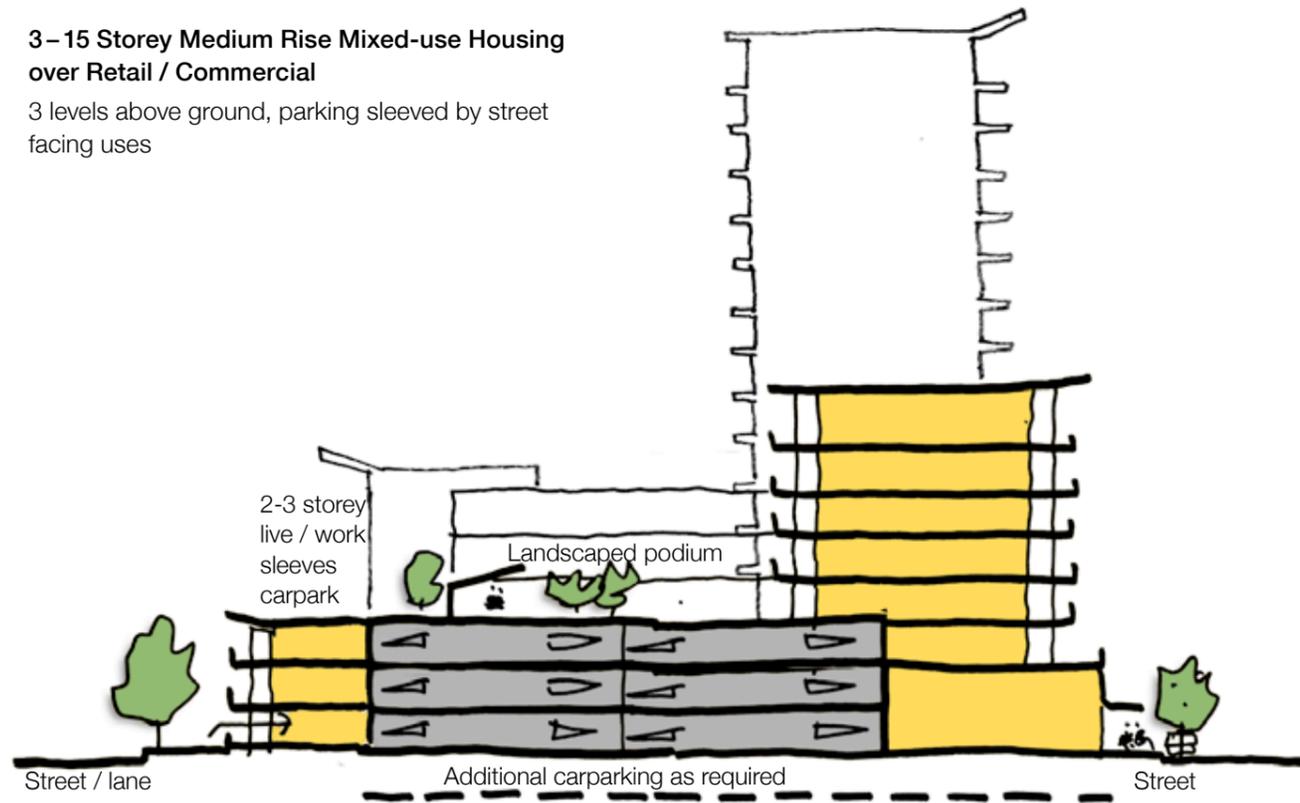


Figure 17. Typical Building Interface

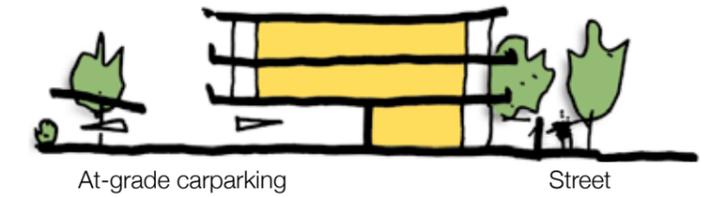
3-15 Storey Medium Rise Mixed-use Housing over Retail / Commercial

3 levels above ground, parking sleeved by street facing uses



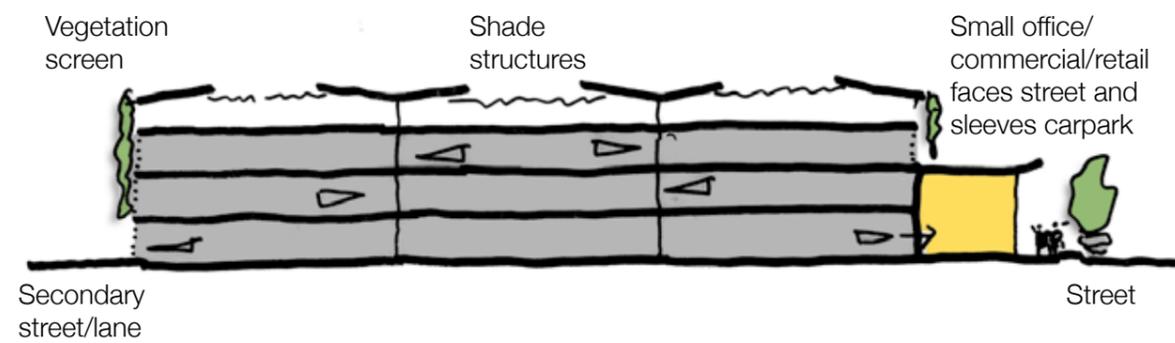
3 Storey Lift / Walk Up

Parking at-grade at rear under building and in car ports



Sleeved Multi-deck Carpark

Car access from rear



2-3 Storey Row House / Live / Work



Figure 18. Built Form Typologies

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Land Budget

The following land budget table gives an indication of potential population capacity within the Toondah Harbour PDA. It is based on a number of assumptions including number of residents / dwelling and average dwelling sizes within the PDA.

No.	Description	% of Total Area	Area (m ²)	Residential (Dwelling Units)	Residential Population (2.0pp/dwelling)	Residential GFA (120m ² /unit)	Retail GFA (m ²)	Commercial GFA (m ²)	Marine Services GFA (m ²)	Community Use GFA (m ²)	Total GFA (m ²)	Total GFA/ Area (Plot Ratio)
1	Public Streets	18.00	55,225	0	0	0					0	0.00
2	Recreational Parkland and Plazas	12.25	37,596	0	0	0	0	0		50	50	0.00
3	Environment—Vegetation	8.87	27,227	0	0	0					0	0.00
6	Mixed-Use	7.01	21,496	295	590	35,400	2,000	800			38,200	1.78
7	Mixed-Use	6.19	18,994	230	460	27,600	2,000	700			30,300	1.60
8	Mixed-Use	3.56	10,927	70	140	8,400	1,000	1,000			10,400	0.95
9	Mixed-Use & Ferry Terminal	1.72	5,282	50	100	6,000	0	0		1000	7,000	1.33
10	Residential	9.75	29,920	250	500	30,000					30,000	1.00
11	Residential	1.89	5,790	140	280	16,800					16,800	2.90
12	Residential	0.74	2,270	40	80	4,800					4,800	2.11
13	Residential	0.70	2,161	90	180	10,800					10,800	5.00
14	Carpark and Vehicle Ferries	6.33	19,409	0	0	0			300		300	0.02
15	Carpark	2.42	7,429	0	0	0					0	0.00
16	Maritime Services	5.45	16,730	0	0	0			6,000		6,000	0.36
17	Long Term Land Reclamation	15.11	46,374	540	1,080	64,800	0	3,000			67,800	1.46
		100	306,830	1,705	3,410	20,4600	5,000	2,500	9,300	1050	222,450	
Water Areas												
4	Environment—Water		18,3076									
5	Marina		19,2182									

Key Statistics

Population: 3,450
64.8 dwellings / ha*
21% passive and recreational open space#

NOTES:

* Density is based on all areas within the PDA excluding areas that have regional purpose such as Moreton bay, vehicle and ferry services associated with the Stradbroke Island, Boat Ramp and Maritime services.

Passive and recreational open space includes areas of parkland and areas of environment vegetation on land.

The land budget is based on 3–6 storey built form generally.

Residential population assumes 2.0 people per dwelling unit on average across the PDA.

Residential GFA assumes an average of 120m² of residential GFA per dwelling unit across the PDA.

- Mixed-use
- High Density Residential
- Community
- Marine Services
- Future Development
- Park / Open Space
- Vegetation
- Plaza
- Beach
- Community Node
- PDA Boundary
- Land Budget Boundaries

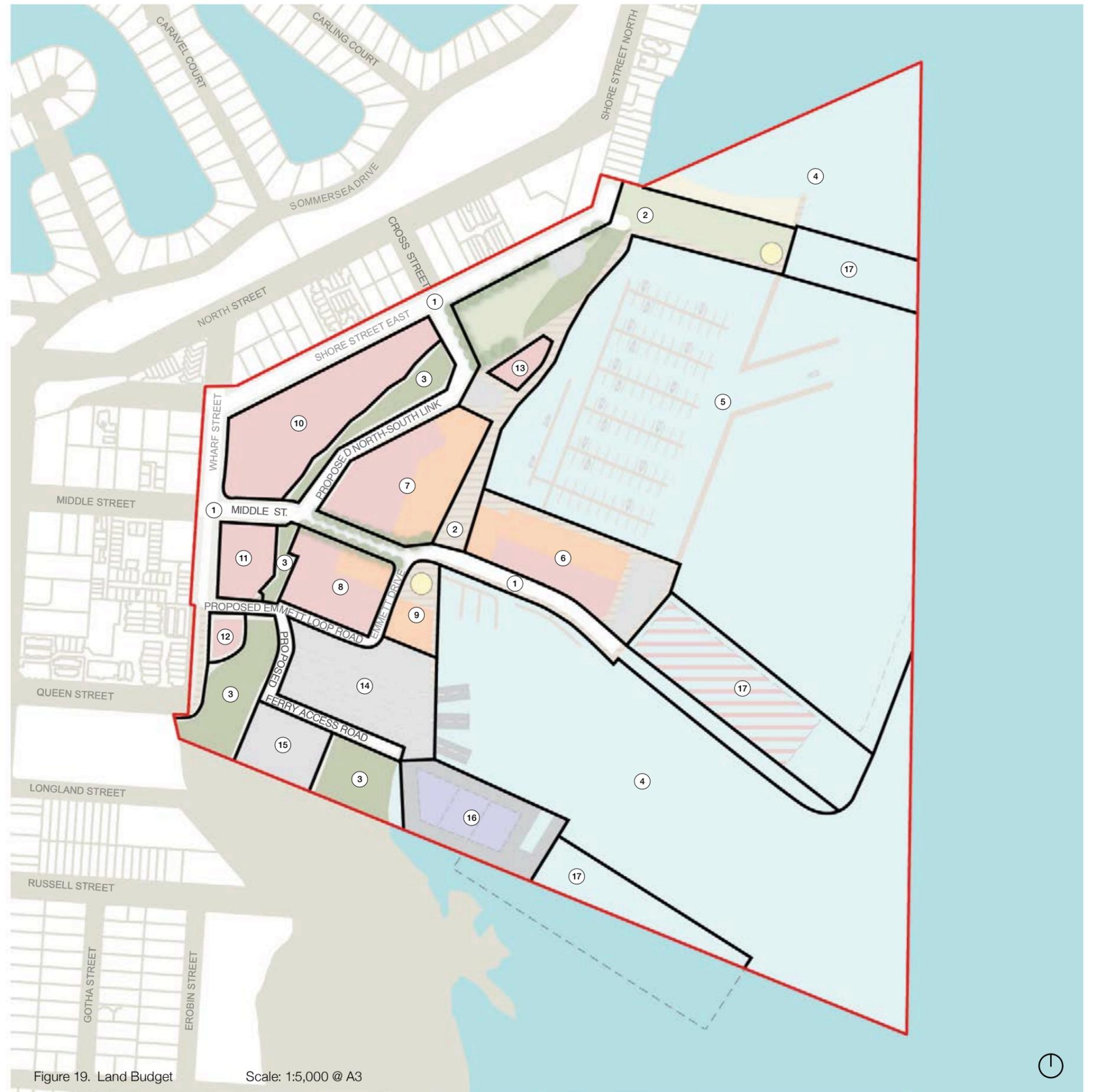


Figure 19. Land Budget

Scale: 1:5,000 @ A3

4.6 Open Space and Public Realm

The aim of the open space and public realm strategy for the Toondah Harbour PDA is to create a range of high quality spaces with a strong sense of place and rich variety of open space experiences. The public spaces of the PDA provide a focal point for the existing and new a community with places that are both active and vibrant. They will be memorable spaces that attract people from beyond the City to interact with Moreton Bay. They will also provide opportunities for education and interaction between both local and surrounding communities.

This will be achieved through innovative design and a strong promotion of a pedestrian scale throughout the area. As movement corridors, these spaces allow visitors and users to traverse the site. They will link into the major public open space area and create pockets of activity and range of experiences within the site.

Key places and spaces within the PDA are shown in Figure 20 and summarised as follows:

1 Toondah Plaza

This plaza is an attractive arrival point into the PDA. It is a space which allows people to make an easy transition between land and water and where they can meet and greet others upon arrival and departure. Circulation areas are generous and there is an abundance of shaded seating protected from inclement weather. Clear sight lines to and from the plaza reveal other key public realm spaces within the PDA.

2 GJ Walter Park

This park fulfils a number of roles. It provides 'breathing space' for the community as well as social space for informal gathering and activity. Existing active recreational functions, and the dog off-leash area, are retained. These will be augmented with a new park extension into Moreton Bay allowing interaction with the tidal area of the bay. Items of heritage significance are framed and celebrated.

3 Marina and Boardwalk

Despite the tight scale of the marina and the proposed intensity of the development surrounding it, the boardwalk will become a unique and memorable aspect of Toondah Harbour. It facilitates exchange and is a vibrant space with genuine marina based activities.

Spaces will be constructed using forms and textures and materials which tangibly relate to the character and features of Moreton Bay, its history and development as a place. A base pallet of materials and colours unify spaces and reinforce a clear identity.



Indicative illustrative perspective looking east over the proposed marina

- Park / Open Space
- Vegetation
- Plaza
- Private Marina
- P Carparking
- PDA Boundary
- Pedestrian Connection
- Street Network
- Key Pedestrian Realm
- 1 Toondah Plaza
- 2 GJ Walter Park
- 3 Marina and Boardwalk



Figure 20. Open Space and Public Realm Plan

Scale: 1:5,000 @ A3

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4.7 Environmental Strategy

Habitat trees important for koala (*Phascolarctos cinereus*) are scattered across the western portion of the PDA as a component of the urban environment. Koala habitat trees within the PDA comprise 149 primary food trees and 137 other habitat trees. There is no net loss of koala habitat trees, particularly primary food trees available to the local koala population and no net increase in koala mortality, particularly from vehicle strike.

A koala habitat buffer and tree corridor runs through the Toondah Harbour PDA and is 10m wide at its narrowest.

Intertidal mud flats and seagrass beds in the north-eastern and south-eastern portion of the PDA provide foraging habitat for migratory shorebirds, and are adjacent to migratory shorebird roost sites, notably a mangrove roost site to the east and a claypan roost site to the south of the PDA. Negative impacts on foraging habitat and roost sites are avoided; however, when unavoidable (e.g. those likely associated with the development options of a 400 to 700 berth marina), the proposed action will be referred to the Commonwealth as required. The incorporation of appropriate habitat buffer will reduce impacts to migratory shorebird species.

Intertidal and shallow sub-tidal seagrass beds also provide potential forage areas for dugongs (*Dugong dugon*) and marine turtles (particularly *Chelonia mydas*) at high tide. The seagrass beds are located in the north-eastern and central-eastern parts of the PDA area. Large populations of marine vertebrates occur in Moreton Bay, including dugongs, dolphins and marine turtles, and are likely to occur in low numbers over the seagrass and shallow sub tidal habitats to the east of the PDA (they are each typically more abundant in the eastern bay). Each of these species is susceptible to boat strike, which can cause injury and death. Although dugongs, dolphins and marine turtles are rarely abundant within 1 km of the PDA, increasing the marine traffic during construction, or as a direct result of the development of a marina and ferry terminal, has the potential to result in increased boat strike of federally listed species. A focused and rigorously implemented environmental management plan substantially reduces this risk.

The mangroves in the PDA have moderate to good fisheries value, with the continuous mangrove habitat south of the PDA displaying the greatest value. Similarly, seagrass in the area provides moderate value to fisheries; however, the value is lower than in nearby seagrass beds further south, which have a more continuous distribution, higher percentage of cover and are also part of a mosaic of marine habitats (i.e. are in close proximity to mangroves). There are no major fisheries that operate within the PDA, largely due to the degree of existing disturbance and commercial vessel traffic; however, some recreational and commercial fishers launch boats from the area.

Elements of the environmental strategy are shown in Figure 21.

4.8 Infrastructure Strategy

Marine Infrastructure

The existing marine infrastructure has significant upgrades. Assumptions and findings on the extent of the required infrastructure is set out below:

Staged marina development

- > The marina is developed in stages, with an initial breakwater stub growing out from the shore incorporating a dredged mud bund
- > Each stage with a balance between cut (dredging) and fill volumes avoids the cost and other issues associated with the import or export of large volumes of material
- > A small initial marina is placed to the north. It has protection from the north. Protection from the north is provided by a floating breakwater, which can be relocated in the future.

Separating water traffic

- > The car ferry and marina has separate entrance channels for safety, or a single channel wide enough to accommodate 2 way traffic for both
- > The passenger ferry and marina can share a narrower channel.

Marina channel

- > A separate marina channel – initially a single lane 15m wide, 2.0m deep at LAT
- > While 2.0m is about the minimum for navigation, dredging 2.5m deep at LAT would allow for siltation between dredging campaigns
- > Dredging to 2.5m deep would and not limit the number / size of sailing yachts which would want to use the facility.

Siltation and dredging

- > A heavily trafficked channel requires less dredging than a lightly trafficked channel
- > Assume $10,000\text{m}^3/\text{a}$ @ $\$50/\text{m}^3 = \$0.5\text{M}/\text{a}$ per channel.

Recreational channel

- > Is a separate channel
- > A recreational boating 2 way channel is 30m wide.

Breakwater

- > A wrap around breakwater is planned for
- > The size depends on the size of the marina basin.

Toondah Channel width

- > 50m wide one way channel toe to toe.

Toondah channel bends

- > 600m radius channel bends (6 times the vessel length).

Toondah swing basin

- > 200m diameter swing basin (2 times vessel length).

Toondah dredging swing basin depth

- > Dredge channel and swing basin to RL -3.0mLAT (2.0m draft + 0.5m siltation allowance + 0.5m under keel clearance) (i.e. all tide).

Toondah dredge disposal

- > Hundreds of thousands of dredging at insitu volume
- > The onsite bund area required for dredge disposal is 2 (bulking factor) potentially up to 20ha. 20ha is not available hence other disposal methods required.



Figure 21. Environmental strategy elements



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5. IMPLEMENTATION

5.1 Staging

The implementation strategy identifies a number of geographical areas within the Toondah Harbour PDA that are dependent to differing degrees on infrastructure and market conditions. Implementation stages are broad and are split between catalyst projects, short term and long term opportunities. A general description of these is as follows and shown in Figure 22.

Core Catalyst Project

The key catalyst project for the Toondah Harbour PDA is redevelopment of the site owned and controlled by Redland City Council and the State Government at the end of Middle Street. A mixed-use outcome on this site containing residential and retail can be used to change overall perceptions of the Toondah Harbour PDA and requires less infrastructure investment up front. Development of this project includes construction of the first stage of the Toondah Plaza.

Short Term Opportunities

Mixed-use Expansion and GJ Walter Park

Expanding the catalyst project with additional mixed-use and residential development and upgrades to the existing GJ Walter Park will complete the land-based elements at the northern end of the PDA. It will also provide additional vehicle connectivity to the north of the PDA.

Frame Intensification

While it is possible to intensify within the frame of the PDA currently this will be more attractive once the core catalyst project is complete. Intensification will be ongoing and will spread across other subsequent development stages. Frame areas include the CSIRO site properties on Middle Street.

Commercial Activity and Multi-deck Carparking

Higher values and amenity within the PDA will improve the viability of commercial development and multi-deck carparking solutions. There will be short term opportunities to develop these against the harbour on the southern side of Middle Street.

Ferry Services

There are short term opportunities to rationalise the existing commercial vehicle ferry operations and long-term parking arrangements. This includes:

- > Consolidation of the existing passenger ferry terminals and bus stops to remove conflicts between vehicle and passenger ferry traffic, buses and pedestrians
- > Rationalisation of vehicle ferry queuing and holding areas
- > Establishing an effective swing basin for the vehicle and passenger ferry services
- > Construction of the ferry passenger parking area adjacent to Emmett Drive.
- > Rationalisation of these areas creates other short term opportunities elsewhere within the Toondah Harbour PDA.

Transport

A number of transport upgrades would be associated with short term development within the PDA. These are as follows:

- > Construction of the link connecting Middle Street to Shore Street East, with an upgrade of Middle Street to a trunk collector standard including on-street cycle lanes and activated frontages for the mixed-use core will be required. Parking for the marina will also be completed
- > Extension of the southern section of Wharf Street to an industrial street standard, with the connection to the vehicle ferry ramps will be completed. Connection to Emmett Drive will also be integrated. Inclusion of a north-south cycle path will be included along Wharf Street
- > An extension to the eastern end of Middle Street will be constructed, ensuring a trunk collector standard is maintained, with appropriate access to parking areas
- > Improvements to the alignment of the current Fison Channel
- > Providing a larger swing basin.

Long Term Opportunities

Marina and Land Reclamation

A new marina will be a transformative addition to Toondah Harbour as part of the long term opportunities within the PDA. The marina includes the development of sites that encompass intense residential development and the creation of new open space on reclaimed land. The marina may also give rise to the need for additional marine services that can also be located on reclaimed land. The marina and areas of reclaimed land have a long lead time due to complex approval and construction processes.

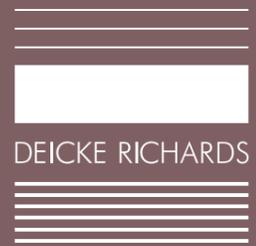
Marina Growth

There is long term opportunity for the marina to grow east to form a larger marina basin, additional residential buildings and extended marine services areas. This development may occur gradually through the ongoing disposal of dredge spoil and balance cut and fill.

- Mixed-use
- High Density Residential
- Community
- Marine Services
- Future Development
- Park / Open Space
- Vegetation
- Plaza
- Beach
- Community Node
- PDA Boundary
- Stage Boundary
- C Catalyst
- ST Short Term Opportunity
- LT Long Term Opportunity



Figure 22. Staging Plan Scale: 1:5,000 @ A3



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