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| Queensland Recreational Boating Facilities Demand Forecasting Study 2022  Torres Strait Island Regional Council Assessment |
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Executive Summary

This report, part of the Queensland Recreational Boating Facilities Demand Forecasting Study 2022 (‘the Study’), provides a summary of current and forecast demand on recreational boating facilities in the Torres Strait Island Regional Council (TSIRC) LGA and the capacity of existing facilities to meet this demand. Where capacity is insufficient to meet current or forecast demand, recommendations have been made to improve existing facilities or for the construction of new facilities. This report is intended to support facility deliverers, owners, and managers over the next 20 years in their decision-making on development priorities for recreational boating facilities within the TSIRC LGA.

The Study notes that TSIRC is comprised of multiple areas, each one containing and having its borders immediately surrounding each of the 15 inhabited islands of Torres Strait. For purposes of this report the term ‘TSIRC’ means, unless stated to the contrary, the 15 inhabited islands and their immediately adjacent waters. The Study notes that beyond these island limits, the surrounding waters and uninhabited islands of Torres Strait are part of Torres Shire Council LGA – but that these administrative arrangements have no effect on this Study report.

Key issues and attributes of recreational boating

The key attributes of recreational boating facilities identified in this Study for the TSIRC LGA are summarised in this section, while consultation with stakeholders undertaken as part of the Study identified the following key issues for consideration in the Study:

* Due to the LGA consisting of numerous islands, there is a need for a boating facility on each island with a settlement area.
* All boat launching facilities on the islands are also used by barges, which put higher loads on the facilities, resulting in increased wear and tear. The Study notes that barge/boat ramps are built to approximately 50 tonnes load capacity, while boat ramps are normally built to 8 tonnes load capacity.
* While some vessel use may be for recreation, it is also the primary transport between the TSIRC islands, to islands within Torres Shire and to the mainland, meaning that boating facilities are subject to substantially different usage than exclusive recreational use like those around most of Queensland
* All TSIRC islands are subjected to two fundamentally different seasons and wave climates – the dry season with regular and strong east-south-east winds – and the wet season with variable winds, generally north-westerly, sometimes strong with powerful storms. These weather patterns have a great influence on existing and potential new infrastructure.

Demand summary

The assessment of recreational boating demand is centred on a statistical demand model that considers vessel registration data, population statistics, assumptions around local usage and the movement of vessels into and out of the LGA. It is acknowledged that the demand assessment for communities in the Torres Strait requires additional consideration due to its unique situation. Non-statistical demand is addressed in section 4.4. Key parameters from this assessment for the TSIRC LGA are:

* The population is 4,785 as at the 2021 census and is projected to be 4,992 by 2041.
* As of July 2022, there is a total of 382 trailable vessels with a home registration within the LGA. The number of vessels is likely double to triple this number once vessels that are registered with the Australian Fisheries Management Authority (AFMA) or unregistered are also considered.
* The TSIRC LGA is deemed to be a Very Remote Region with an assumed vessel activation rate for recreational purposes of 14% on a ‘good boating day’. Notably, this does not consider the ‘activation’ of vessels for commuter use, which would be much higher.
* Vessels are primarily used within the LGA and for travel to islands within the primary inhabited Torres Shire islands and the NPARC LGA on the mainland.
* The existing statistical demand for boat launching facilities is 1.4 ‘effective’ boat lanes, which is projected to remain stable over the next twenty years. However, given this is an island LGA, the minimum demand will be one boat ramp per populated island.

Boat launching

Boat launching facilities comprise boat ramps, any queuing facilities (floating walkways, pontoons, beaches and fixed sloping walkways) and the provision of car and trailer unit (CTU) parking. The capacity of a boat launching facility is measured in ‘effective lanes’ for both waterside and landside facilities, with the total capacity of a facility being the minimum of the waterside or landside capacity. Waterside capacity is calculated from the number of boat ramp lanes multiplied by environmental reduction factors (for tide, current or waves) and queuing facility improvement factors to derive the number of ‘effective’ lanes. The landside capacity is calculated from the number of available CTU parking spaces that are available.

TSIRC LGA has sixteen boat launching facilities (15 barge/boat ramps, one at each population centre, plus a part-tide recreational boat ramp at St Pauls), comprising sixteen boat ramp lanes with a total effective boat launching capacity of 6.3 ‘effective’ lanes, which is mostly limited by the lack of parking. However, for the TSIRC LGA, this measure is unimportant, as demand for CTU parking is minimal due to the low number of cars on the islands and because people tend to return vehicles to their residence nearby once launched and/or leave the boat in the water for longer periods of time when compared to other LGAs where vessels are primarily used for recreation.

Deep-draught vessel landings

Vessel landing facilities are provided across the state in the form of pontoons and jetties, to provide locations for larger vessels, or their tenders, to access landside destinations or facilities. Pontoons and jetties may also be provided for other purposes such as supporting boat launching or other recreation and may not be suitable for deep-draught vessels. The trend across Queensland indicates that jetties are rarely used as deep-draught vessel landings, with pontoons preferred by recreational users. As such, the Study has limited the capacity of deep-draught vessel landings to those that are accessible and commonly used by deep-draught vessels, as identified in consultation with stakeholders.

The TSIRC LGA has one pontoon and thirteen jetties. The only facilities that are usable for deep-draught vessels are the ferry pontoon on Hammond Island (Keriri) and the jetties on some of the other TSIRC islands, with some/many jetties tidally restricted and in a poor state at the (2022) time of compilation of this report

Temporary mooring for commuter vessels

The primary form of transport between the islands in TSIRC and for the three populated islands in the Torres Shire LGA is by boat. Typically, this results in boat users travelling between islands, and into Thursday Island (Waibene, Wai-ben) as the central hub for both Torres Shire and TSIRC. There is a preference to leave these vessels in the water, either secured to a pontoon, jetty or mooring buoy, or pull them up on the beach rather than retrieving out of the water. Consequently there is a demand for landing facilities that can cater for temporary mooring of commuter vessels, with 13 jetties and one pontoon dispersed amongst the islands for this purpose.

Priority recommendations

The capacity of boat launching facilities of the TSIRC LGA is currently adequate for recreational needs for the 20 year period of this study and no recommendations for new or upgraded boat launching facilities is required. A detailed condition assessment of the boat/ramps that experience heavy-duty use from barges to assess their continued suitability for recreational use is suggested and is understood to be in progress by TSIRC and MSQ.

One TSIRC jetty was inspected during the Study and found to be in very poor condition. While commuter landing facilities are outside the scope of this Study, feedback from TSIRC officers indicated that the 13 jetties are in a generally poor state of repair. Based on this feedback, these landings need to be made safe in the short term and attention given to upgrading them, making them available at all tides, and – considering the use in TSIRC LGA of essential commuter use – making them compliant with Disability Discrimination Act (DDA) provisions where practicable. This is a general requirement across the TSIRC LGA (all 15 population centres), and the Study makes no ‘island by island’ recommendations, being outside the recreational Study scope.

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Definitions

| Term | Definition |
| --- | --- |
| AFMA | Australian Fisheries Management Authority |
| All‑tide (for boat ramps) | Access from a boat ramp to the open sea with an approach depth of 0.5m below LAT or deeper and a depth at boat ramp toe of 0.5m below LAT or deeper. |
| All-tide (for landings) | Access from a gangway‑access pontoon or jetty to the open sea with an approach depth of 1.5m below LAT or deeper and a depth on at least one face of the pontoon of 1.5m below LAT or deeper. |
| BIP | Boating Infrastructure Program – a sub‑program within MSQ's Maritime Assets and Infrastructure Program |
| Boat ramp | A foreshore concrete ramp with a slope designed for vehicular launching and retrieving of recreational boats. |
| Breakwater | A structure constructed over the seabed and/or the foreshore, usually rising to a height above high tide, designed to provide protection to landward areas by limiting penetration of wave action or currents. |
| CTU | Car-trailer unit space – a parking space for a typical car with a boat trailer attached. |
| Demand | Demand is the requirement of the boat‑owning population for facilities to launch/retrieve trailer boats and/or to berth suitable boats at a given year to service their average (non‑peak period) needs. In most locations demand is based on vessel registrations and is expressed in terms of boat ramp lanes or in number of 12m berths at landings. |
| Effective capacity | For a boat ramp, effective capacity (effective lanes) means the number of boat ramp lanes after adjusting for anticipated unavailability due to unacceptable wave action (>0.2m wave height) or water depth, usage constraints such as the lack of adequate parking, and improvements to efficiency or launch/retrieval throughput such as floating walkways or pontoons. |
| FHA | Fish Habitat Area, declared under the Fisheries Act, 1994 |
| FIFO | Fly‑in fly‑out, where skilled workers travel from their city or central location home communities to a remote site to perform their duties often in blocks of time that provide regular, non-weekend, days off. |
| Fixed sloping walkway | A fixed sloping structure installed at the side of a boat ramp to assist launching/retrieval of trailer boats, and dry embarkation/disembarkation from trailer boats. It is sloped to allow use at varying tide heights – sometimes with sections of different slope. |
| Floating walkway | Multiple connected/hinged flotation modules configured to assist launching/retrieval of trailer boats, and dry embarkation/disembarkation from trailer boats at most if not all stages of the tide. Floating walkways are connected to a concrete shore abutment allowing pedestrian and assisted wheelchair access. |
| Gangway access pontoon | A platform/module that always floats, where a boat can be secured alongside on one or more faces. Pontoons are usually separated from a boat ramp and have a hinged articulated gangway for access to the shore via an abutment. |
| GBR | Great Barrier Reef |
| GCWA | Gold Coast Waterways Authority |
| Landing | A landing is a jetty or gangway‑access pontoon that facilitates berthing of vessels and transfer of passengers and stores. They are most often associated with non-trailable vessels |
| Landside | Refers to areas above high-water mark, often used to denote the location of and type of infrastructure. |
| LAT | Lowest Astronomical Tide, used as Chart Datum on navigational charts. |
| LGA | Local Government Area |
| Managing authority | Councils, port authorities, water storage managers as listed in schedule 1 of the Transport Infrastructure (Public Marine Facilities) Regulation 2011 |
| MCU | Material change of use under the planning scheme |
| MNES | Matter of national environmental significance under the Environment Protection and Biodiversity Conservation Act 1999 |
| MSQ | Maritime Safety Queensland |
| NC Act | Nature Conservation Act 1992 |
| Near all‑tide | Access from a boat ramp to the open sea with a minimum approach depth of 0.5m below LAT and minimum depth at the boat ramp of 0.5m below LAT for 80 percent or more of the tidal range (time measured over a year). |
| Parking - Formalised | A sealed, line-marked parking area for car-trailer units, providing adequately sized parking spaces, roadways and turning circles. |
| Parking – Semi-formalised | An all-weather non-sealed parking area, with markers to delineate adequately sized car-trailer unit parking bays and turning circles. Markers can be concrete blocks, pavement markers (e.g., retro-reflective raised markers) or other permanent instalment to show parking bays. |
| Parking – Informal overflow | A naturally surfaced area available for use as overflow parking on the design boating day, signed as such. To have mixed-use purpose (e.g., parkland) when not being utilised as overflow parking. |
| Part‑tide | Boat ramps that do not meet near all-tide or near all-tide requirements. |
| PV | Passenger vehicle (i.e., car – as opposed to car-trailer unit). |
| Port Authority | An organisation that is responsible for the management of one or more ports on the Queensland coast. |
| Population Centre | Official named urban settlements (populated places) that have been sourced from the Queensland Place Names Database. |
| Registration activation rate | The percentage of registered vessels liable to be in use on any given good weather weekend day |
| Shortfall | The number of effective boat ramp lanes or landings required to meet demand for a given timeframe. Negative shortfall signifies an oversupply for the time period nominated. |
| SPL | Strategic Port Land |
| Study | The Recreational Boating Facility Demand Forecasting Study 2022, including this document. |
| TMR | Department of Transport and Main Roads |
| Water Storage Authority | Includes Seqwater, Sunwater |
| Waterside | Refers to areas below high-water mark, often used to denote the location of and type of infrastructure, including dredged channels and breakwaters. |
| WHA | World Heritage Area |
| # | Number |

# Introduction

BMT has been appointed to undertake the Recreational Boating Facilities Demand Forecasting Study 2022 (‘the Study’) by Maritime Safety Queensland (MSQ), a branch of the Queensland Department of Transport and Main Roads (TMR), on behalf of all public recreational boating facility managers and owners across Queensland. The Study supersedes the 2017 study of the same name and is intended to report on recreational boating facility demand, capacity, and shortfall over a 20-year period at a Local Government Area (LGA) scale across Queensland.

The Study has been developed using information from the 2021 Australian Census (ABS, 2021), recreational boat vessel registrations, consultation with facility owners, managers, and stakeholders, the 2022 Queensland Government Get-Involved recreational boating facilities survey (MSQ, 2022), and previous versions of this study (2011, 2017). The Study is intended for use by deliverers, owners, managers, and key stakeholders of public recreational boating facilities across Queensland, namely state government agencies including MSQ and the Gold Coast Waterways Authority (GCWA), local governments, port authorities and water authorities. The Study is non-regulatory in nature and is intended to be used as part of a broader suite of information to identify priority investment in recreational boating infrastructure at a local and state level.

The Study establishes demand primarily on statistics derived from registration and population data. However, non-statistical forms of demand may also be reflected in Study recommendations. Please refer to 4.4 for discussion of non-statistical demand. The Study evaluates existing and forecast demand over a 20-year period and makes recommendations on how this demand might be met over that period. Recommendations may include improvements to both landside and waterside capacity depending on the facility.

Recommendations are assigned a priority ranking, from 1 to 4, indicating if they are required immediately or in the next 5, 10 or 15 years respectively. To end 2022, 14% of recommendations from the 2017 study have been completed, comprising 11% of landside recommendations and 18% of waterside recommendations and reflecting 22% of priority 1 2017 recommendations. A much greater percentage of the earlier 2011 study recommendations have now been implemented. Given the low uptake on existing/outstanding recommendations, this Study reviews previous recommendations and carries forward, modifies, or removes as appropriate. The Study has also been tasked with reviewing specific wave exposed beach launching facilities across the state to determine their contribution to meeting boating facilities demand and make recommendations about their future.

The Study includes a report for every LGA in Queensland and a state-wide summary report. Each LGA report summarises demand pressures from vessel registration data, population statistics, assumptions around local usage and the movement of vessels into and out of the LGA, and existing capacity and recommends opportunities to satisfy shortfall. The state-wide report will support the LGA reports and provide context at a state level for demand pressures, current capacity, equity of access to facilities and state-wide priority for major boating facilities.

The Study is intended to report on publicly accessible recreational boating facilities for registered vessels. This includes boat ramps, floating walkways, pontoons, fixed sloping walkways and supporting car and trailer parking at each facility. The Study does not include recommendations for facilities that are used primarily for commercial purposes, private facilities, non-motorised recreation such as launching canoes and stand-up paddle boards, and fishing platforms.

# TSIRC LGA Overview

## Key influences on recreational/commuter boating

Within the TSIRC LGA, the principal attributes and influences that affect demand on recreational boating infrastructure include:

* its designation as a Very Remote Region, with a highly dispersed local recreational/commuter boating fleet
* demand for boat launching and landing facilities at each of the islands
* limited need for landside parking facilities
* Moderate tidal range
* significant cost and complexity of construction of boating facilities given the remote nature of the region.

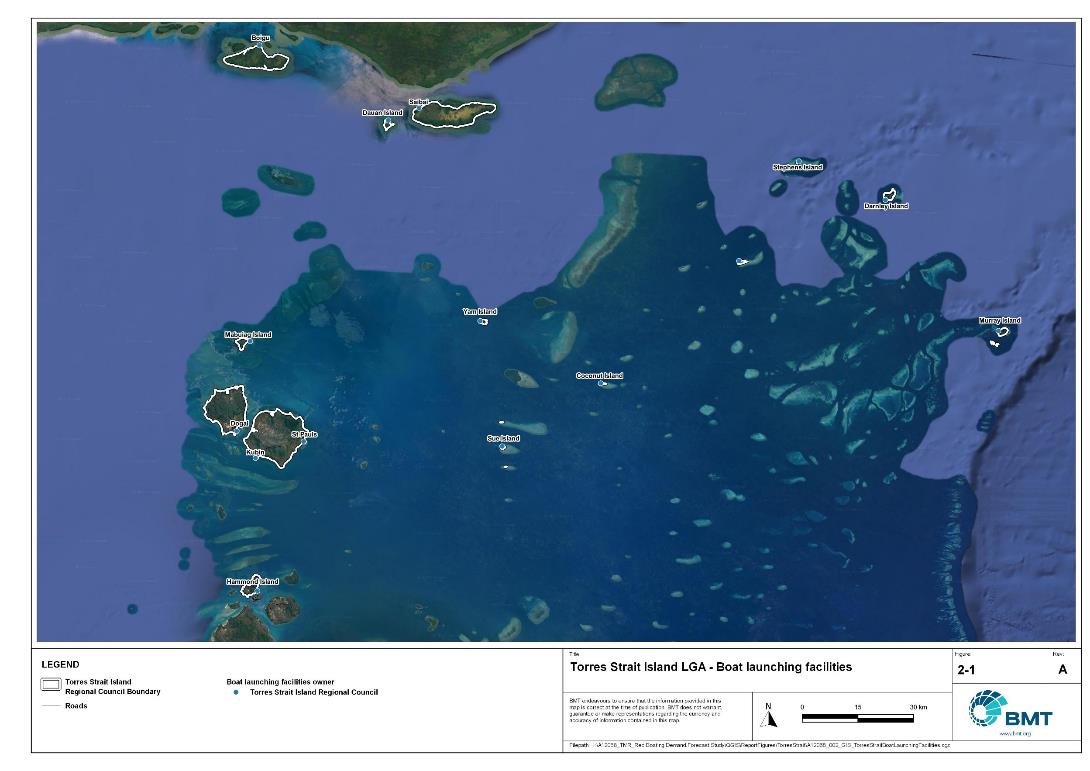
## Existing recreational boating infrastructure

The recreational boating facilities within the TSIRC LGA are summarised in Table 2.1. These facilities are owned exclusively by TSIRC, and all provide access to open water, subject to tidal constraints.

Recreational boating facilities by facility owner in TSIRC LGA

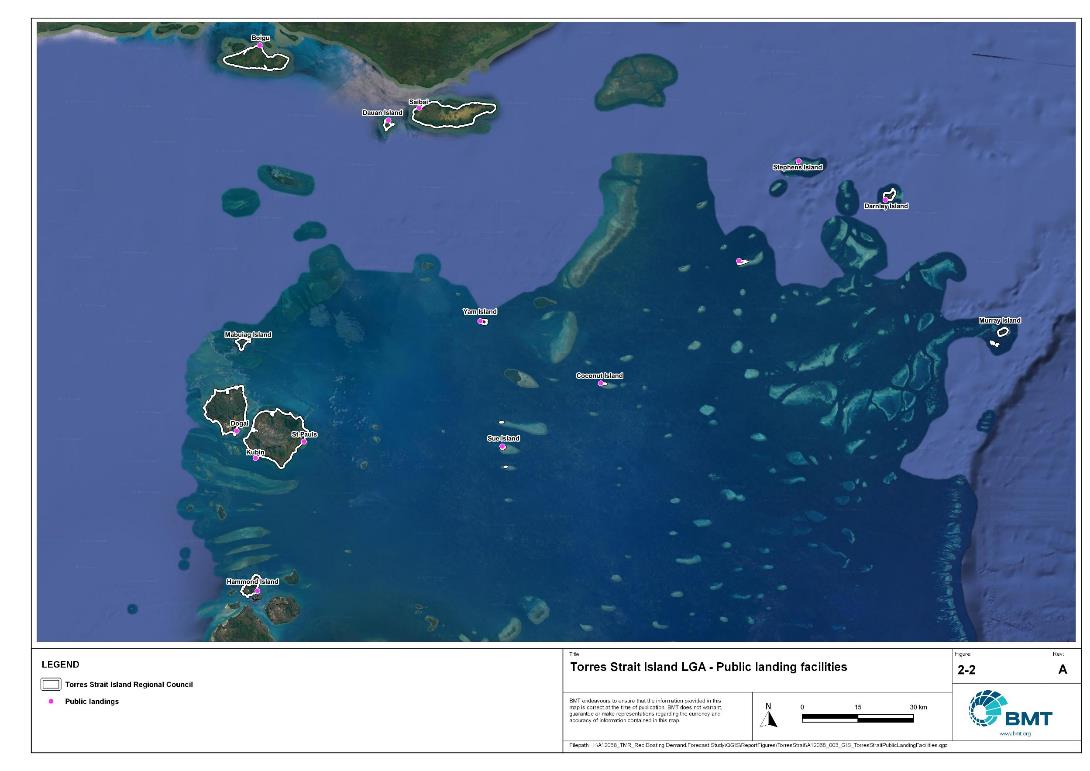
| Owner | Open water boat ramps | | Other boat ramps | | Landings | |
| --- | --- | --- | --- | --- | --- | --- |
| Facilities | Lanes | Facilities | Lanes | Pontoons | Jetties |
| Torres Strait Island Regional Council | 16 | 16 |  |  | 1 | 13 |

Each of the boat launching facilities within the LGA are shown in Figure 2.1, while landing facilities are shown in Figure 2.2. .



Public boat launching facilities within the TSIRC LGA.

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Torres Strait Island LGA – Public landing facilities

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## Existing usage and issues

Consultation with representatives from TSIRC and Maritime Safety Queensland indicates the following major boating themes and issues within the TSIRC LGA.

* + 1. Ramp damage from barges

Barges using the fifteen barge/boat ramps are reportedly getting bigger than what the facilities were initially designed for, resulting in damage and ramp failure in some locations, particularly on the lower portions of the ramps. This limits the usability of these ramps for boat launching and retrieval, particularly at lower tides.

* + 1. Demand for commuter facilities

Each of the islands relies on boating access as the primary means of transportation between the TSIRC islands and to the three populated islands within Torres Shire LGA, as well as to the NPARC LGA on the mainland. Commuter uses may include attending work, social events, and medical needs, which often means travelling in conditions that are not ideal for boating. Each of the islands has a demand for commuter facilities, which may include infrastructure for loading and offloading passengers and supplies as well as providing short-term securing of vessels. This may range from suitable beaches to formal wave-protected pontoons or jetties.

# Capacity Assessment

## Boat ramps

* + 1. Introduction

Boat ramps are facilities that are used for launching and retrieving trailable vessels, typically up to 8m in length (with some exceptions), to and from the water. Boat ramps consist of one or more lanes and are often supported by landside and waterside infrastructure to improve facility efficiency. In some instances, the usability of a facility is adversely affected by environmental constraints such as tide levels, currents, or wave exposure, reducing the overall availability of the facility. Together, consideration of the number of boat ramp lanes, the supporting infrastructure, and environmental constraints results in the facility having a capacity described in terms of ‘effective lanes’ that may or may not be equal to the number of actual boat ramp lanes. The landside and waterside capacity of each facility needs to be balanced. Each facility will have a calculated ‘effective’ capacity for both the landside and waterside elements, with the limiting element dictating the facility's overall effective capacity. Assessment and recommendations promote balancing the two elements by improving the limiting element for increased facility effectiveness or increasing the 'effective capacity' in a balanced way through changes to both elements.

The following information is provided for context on how boat ramp facility capacity is generally determined, acknowledging that many of these aspects have limited applicability to facilities in the TSIRC LGA given the ‘island’ nature of the region and the community’s dependence on these facilities for general transportation.

* + 1. Boat ramp capacity

The waterside capacity is informed by the number of boat ramp lanes and the number and type of queuing facilities, such as pontoons, floating walkways, queuing beaches and fixed sloping walkways. It may also be limited by the available water depth in the adjacent waterbody and exposure to environmental or other physical factors.

Landside capacity is governed by the availability of nearby car-trailer unit (CTU) parking spaces, the provision of rigging and de-rigging facilities, and provision of single car parking spaces (single cars may otherwise be obliged to park in CTU spaces).

While it is expected that facilities will have their own characteristics influencing efficient use, this Study applies an approach that is consistent across the entire state and consistent with previous editions of the Study. Accordingly, the effective waterside capacity of a boat launching facility is determined as being:

* the ability to support 40 vessels being launched and retrieved per day per lane (see section 3.1.3)
* influenced by exposure to wave, tide, and current conditions (see section 3.1.4)
* supported by queuing facilities that assist in the efficient use of the boat ramp (see section 3.1.4)

Calculation of landside capacity is in line with the TMR guideline (TMR, 2020), which requires less provision of CTU parking per lane than the Australian standard (AS3962 Table 7.1), advising:

* 10 CTUs for a single lane boat ramp accessed by an unsealed road, or 15 CTUs accessed by a sealed road
* 45 CTUs for a two-lane boat ramp
* 70 CTUs for a three-lane boat ramp
* 90 CTUs for a four-lane boat ramp.

A notable difference from the 2017 study is the recognition and inclusion of areas close to existing boating facilities that are unsealed and/or not line marked where parking of cars with trailers occurs and is not discouraged. These areas of informal parking have been identified on aerial imagery and through discussions with managing authorities. Each informal area has been assumed to be available for CTU parking only 50% of the time to account for conflicts with other uses (for example, markets), inefficient parking practices, or poor ground conditions. The rate of parking has been calculated as:

* for linear areas where nose-to-tail parking is expected – 1 CTU per 13m
* for linear areas with enough space to allow side-by-side parking – 1 CTU per 3m, provided there is a minimum distance of 15m from the road or manoeuvring area
* for large areas – 1 CTU per 100m2.
  + 1. Boat ramp capacity basis

The number of vessels per day each boat ramp lane can support is based on the Australian Standard for the Design of Marinas (AS3962-2001) and previous versions of this report (GHD, 2011 and 2017).

Research on boat ramp lane efficiency described in the previous report (GHD, 2017) identified that 40 vessels per lane per day was a reasonable compromise between 50 vessels per lane per day (representing congested conditions) and 30 vessels per lane per day (representing unhampered conditions). For context, the 40 vessels per lane per day rate represents a vessel launch or retrieval every 9 minutes per lane within an average normally used period of 12 hours per day.

During this Study, BMT has sought to validate the assumptions presented above, and those relating to capacity modification, by undertaking a literature review, conducting site visits that included observations of launching and retrieving manoeuvres, and reviewing video recordings of boats launching and retrieving at popular boating facilities. The literature review included a boat ramp efficiency investigation undertaken by BMT on the Mornington Peninsula, Victoria (BMT, 2015) and a review of standards from other Australian states and countries that undertake similar studies. The onsite and video analysis provided the opportunity to observe recreational boat operators using facilities included in the study but did not include observation of total throughput during high demand periods. This assessment was undertaken during site visits across Queensland, and a full day of video recording at Manly Boat Harbour (north ramp) in Brisbane.

The New South Wales and Victoria governments are currently in a planning phase for boating infrastructure and there are presently no publicly accessible documents identifying how those jurisdictions calculate boat ramp lane capacity. The Western Australia government has commissioned studies of the Perth region and the southwest region (Western Australia Department of Transport, 2019 and 2021) that indicate a base rate of 50 vessels per lane per day, with no modifiers applied. Internationally, studies from Florida in the USA (Bell, 2022 and Swett et. al, 2012) assumed that total vessel launch plus retrieval time is between 20 to 40 minutes (18 to 36 vessels per day), although no evidence is provided to support this assumption.

The Mornington Peninsula report (BMT, 2015) collected boat launch and retrieval data for 6 boat ramp facilities on the Mornington Peninsula across 9 days, including the peak Australia Day holiday. Total throughput was assessed for each facility on days where there was constant pressure for launching and retrieving boats with results between 30 and 70 vessels per lane per day for the various facilities. When adjusted for queuing modifications, a baseline rate of between 20 and 50 vessels per lane per day was identified. Of the facilities, the higher rates were achieved where sufficient parking was provided and both waterside and landside queuing facilities existed.

Observations of recreational boat users launching and retrieving their vessels undertaken through the site visits and the analysis of video footage showed that:

* Most observed launches were of ‘multi-person’ boats, which made launching and retrieving boats more efficient.
* aAmost all users were able to launch and/or retrieve their boat within the 9-minute target time, when adjusted for queuing facility efficiency.
* There was a preference to launch adjacent to a floating walkway, where one was available. At facilities where a queuing facility is not immediately adjacent to the lane it is expected that average launch times may slightly increase during busy periods.

While the observations that were made generally aligned with expectations, a more in-depth review of capacity assumptions was outside of the scope of the Study. For future studies there would be value in undertaking a more thorough, data-driven investigation of the assumptions about boat ramp lane capacity, both at its base level and modified by queuing facilities. Overall, the preliminary investigations undertaken as part of the Study suggest that the base rate of 40 vessels per lane per day adopted in previous studies is appropriate.

* + 1. Boat ramp efficiency modifications

The waterside capacity of boat ramp lanes can be reduced by environmental factors that include:

* Water levels: Mainly relating to tidal areas this factor considers the reduction in the amount of time the boat ramp is available to launch and retrieve vessels over the full tidal cycle, thus reducing the overall capacity of the facility. For all-tide access, the boat ramp and connecting channel to the open sea are available during all tidal conditions and therefore available 100% of the time. For near all-tide access the boat ramp and the connecting channel to the open sea are assumed to be available, on average, for 80% of the tidal cycle. For part-tide access the boat ramp and its access channel are available less than 80% of the time. A modification factor of 0.8 is applied for near all-tide facilities and 0.5 for part-tide facilities.
* Wave and current conditions: In areas where vessel launching and retrieval may be intermittently impacted by waves (most commonly on beach ramps, but not exclusively) or strong currents (such as in rivers), a modification factor of 0.5 is applied.

Conversely, effective boat ramp capacity can be improved through the use of well-designed queuing facilities. Queuing facilities aim to improve amenity and efficient use of the boat ramp by accelerating one or more of the following phases of boat launching, with the opposite steps required for retrieval:

1. manoeuvring for launching, including for CTU entering the queuing area for the boat ramp and reversing into position for launch
2. launching and securing the launched vessel
3. moving the launch vehicle from the boat ramp to the parking area
4. removing the vessel from the waterside queuing facility.

A range of waterside queuing facilities is in use in Queensland boating infrastructure, which modify different phases of the total launching process. These include:

* Floating walkways and fixed sloping walkways: Positioned to abut a boat ramp lane, these structures aim to:
  + improve amenity – such as to assist embarking/disembarking passengers, provide a refuge from in-water contact with crocodiles and so on.
  + make securing the vessel and removing the vehicle from the boat ramp more rapid, while freeing the boat ramp for subsequent users.
* Pontoons: Also used by deep-draught vessels, these structures improve the ability to secure the vessel and clear the boat ramp, but there is usually some time lost returning to recover the launch vehicle compared with the above options as they are generally positioned slightly further away from the ramp.
* Queuing beaches: These also provide a place to secure the vessel close to the boat ramp, although they are generally not as fast to use as pontoons.

As observed throughout the Study site visits, each of these queuing facility types can support a limited number of boat ramp lanes depending on the available space on the queuing facility. The 2017 edition of this study applied a blanket uplift for all boat ramp lanes where a queuing facility was provided. However, the number of lanes each type of queuing facility can realistically support varies. Accordingly, this Study has provided limitations to the number of boat ramp lanes that can benefit from each queuing facility, based on the number of “working faces” (or area for a queuing beach) provided, where the “working face” is a face that allows temporary securing of vessels during launching or retrieval. The adopted improvement factors and supported lanes are summarised in Table 3.1.

Queuing facility efficiency modifiers

| Queuing facility | Modification factor | Supported lanes |
| --- | --- | --- |
| Floating walkway (lanes adjacent to walkway) | 1.7 | 1 Lane/face |
| Floating walkway (lanes not adjacent to walkway) | 1.3 | 1 Lane/face |
| Fixed sloping walkway | 1.2 | 1 Lane/face |
| Pontoon | 1.2 | 2 Lanes/face |
| Queuing beach | 1.15 | Site-based |

In other states in Australia, reversing queuing bays are more commonly used than in Queensland. These are CTU waiting bays at the head of the boat ramp that are aligned with each boat ramp lane to allow the user to reverse directly down the boat ramp once it is clear. CTU waiting bays reduce the time of the first phase of boat launching by allowing waiting CTU’s to be ready to reverse as soon as the lane becomes clear. The BMT (2015) study on the Mornington Peninsula included facilities with and without these bays. Boat ramps that included reversing queuing bays achieved 50% greater throughput. Facilities that have implemented this approach in Queensland include North Street Southport, Urangan Boat Harbour, Townsville Recreational Boating Park, and the (under construction late 2022) boat ramp at Yorkeys Knob.

* + 1. Accessibility from boat launching facilities

Recreational boat users will typically select the boat launching facility most appropriate or convenient to the activity they are seeking to undertake, the anticipated weather/wave conditions, and their destination. Each of facility within an LGA will provide a varying degree of access to different destinations and for different activities. During the Study, consultation with stakeholders highlighted the following general types of destinations and activities:

* open water/offshore: typically accessed for visiting offshore islands or remote beaches, snorkelling or diving locations, deep sea fishing and general recreation
* creeks and estuaries: typically accessed for fishing, crabbing, wildlife observation, skiing and general recreation
* freshwater: typically accessed for skiing, fishing, wildlife observation and general recreation.

These destinations are typically serviced by different types of recreational vessels. Inshore locations including creeks, estuaries and other freshwater locations are typically patronised by vessels less than 4.5m, except for ski boats, which can be much larger than this. Offshore locations typically require larger boats for access as these vessels are more capable of managing a wide range of wave conditions and can carry sufficient fuel to access distant destinations. Smaller vessels may be able to access close destinations on good weather days, and larger vessels may choose to access inshore destinations, particularly on poor weather days.

Consequently, the following aspects are used to classify how well a facility provides open water access:

* Open-water access: There are no restrictions between the facility and open water.
* Depth-limited access: There are depth restrictions between the facility and open water that limit navigable access to part of the tidal range. This differs from tidal constraints at the actual facility, which might be usable at all tides, but offshore access is limited by a downstream bar or delta.
* Distance-limited access: The distance from the facility to the open water is unrealistic for typical boat users. This distance is assumed to be about 4.5km between the facility and open water to rate as 'distance limited', with travel times increased further where portions of the access channel are regulated by speed limits.
* Infrastructure-limited access: There are man-made obstacles between the facility and open water, such as above-ground pipeline crossings, low bridges or weirs that impede navigable access to open water.
* Beach ramps: These provide open-water access but are typically constrained by environmental conditions such as wave exposure and tide levels. The capacity of these facilities has been individually assessed based on consultation and other data sources and is described in more detail in section 4.
* Freshwater: There is no access to open water.

Certain facilities, particularly those in freshwater, may be constrained by periods of drought, or debris deposition after rainfall events that limit access to destinations, and therefore whether a facility will provide useful boat launching capacity. While it is noted that drought and rainfall may affect the overall capacity of boat launching within an LGA and given that the timing of such events is not readily predictable, their impact on capacity has not been evaluated.

* + 1. Existing boat launching capacity

Within the TSIRC LGA there are sixteen boat launching facilities with the effective capacity of boat launching facilities shown in Annex B. Pertinent features of these facilities include:

* There is a statistical effective capacity of 6.3 lanes, but of more relevance, there is at least one boat launching facility per island.
* The facility on Mer (Murray) Island and Saibai are only usable at high tide.
* All other facilities provide near all-tide or all-tide boat launching capacity.

## Deep-draaugt vessel landings

Deep-draught vessel landings are intended to provide short-term landing capacity for vessels that are too large to use public boat launching and retrieval facilities. These facilities are provided for the benefit of both local vessels and to service the fleet of vessels that travel along the Queensland coast. Deep-draught vessel landings may be designed to accept one or more large vessels at a time and/or provide capacity for tenders from larger vessels that may be anchored or moored nearby, for the purpose of loading and offloading passengers and supplies and making short local visits to onshore destinations.

For the Study, deep-draught vessel landings need to be primarily accessible by recreational boats for short, temporary stays. In some cases, commercial vessels may utilise these facilities subject to the relevant permissions, however, this may reduce the capacity of the facility to cater for recreational vessels. Deep-draught vessel landings should be located such that the facility provides reasonable access to landside passenger pick up and drop off, provisioning, recreational destinations, or population centres.

* + 1. Pontoons

Within the TSIRC LGA there is one deep-draught pontoon that provides access to:

* Hammond Island (Keriri) ferry pontoon – available for passenger drop-off/pick-up.
  + 1. Jetties
* There are 13 TSIRC LGA jetties.
* Several of the 13 jetties are accessible at all tides for both deep-draught and commuter vessels, while some are reported as tidally restricted, some extremely so.

# Demand Assessment

The Study has developed a model to calculate statistical demand for boat launching facilities and deep draught vessel landings at an LGA scale. Vessels that are less than 8m in length are considered trailable and drive demand for boat launching facilities such as boat ramps, while those over 8m are assumed to remain on water and drive demand for deep draught landings.

Statistical demand is recognised at three different levels for public marine facilities within the TMR guidelines (TMR, 2020), which are:

* off-peak demand – typical weekday usage
* average demand – demand on ‘good boating days’, taken to be demand for a facility on weekends (and, for certain regional locations, other busy periods)
* peak demand – demand for a facility at peak holiday periods or for special events.

The demand model created for this Study is intended to provide information on demand pressures on ‘good boating days’ for all facilities as per the intentions of the guidelines. The model achieves this through a ‘registration activation rate’ that estimates the proportion of registered vessels in an LGA that is assumed to be active on a ‘good boating day’, as well as the exchange of vessels between LGAs, and general tourism pressures.

## Activation rate

The fleet size for each LGA is determined statistically from vessel registration numbers and the application of a vessel activation rate, while for future time horizons vessel registration and population growth estimates are also utilised. The methodology for determining the registration activation rate has been adopted from the previous study (GHD, 2017), with activation rates taken to be between 8% and 14% for a typical weekend. The variability of the activation rate is intended to capture the regional differences in vessel types, and is driven by the availability of access to open water, accessibility of other recreational opportunities, and likelihood of users’ available time for recreation, considering factors including:

* remoteness classification for the LGA
* incidence of blue-collar employment
* average age of residents
* whether the LGA is coastal.

Further information about the derivation of this rate can be found in Annex A. For the TSIRC LGA the activation rate is assumed to be 14%, with the key factors influencing the rate including:

* its classification as a Very Remote Region
* the LGA being composed of a number of island communities dependent on boating for transportation

## Active fleet size

The total ‘active’ fleet on a good boating day is derived from the activation rate of the total fleet of registered vessels within the LGA and the net inflow of visiting vessels. Given that TSIRC is an island LGA, vessels cannot be transported into the LGA by land and launched at TSIRC facilities, and consequently the number of visiting vessels is assumed to be zero. The projected ‘active fleet’ for TSIRC, based on MSQ registrations alone, is 57 trailable vessels and 2 deep-draught vessels. This number is expected to significantly underestimate the total number of vessels as it does not consider vessels registered through AFMA or vessels that are unregistered. Consultation with TSIRC during the Study indicated that the number of vessels was likely to be in the order of 1 vessel for every 5 people. Population statistics obtained from TSIRC (TSIRC, 2023) have allowed the Study to use this ratio to calculate the total and active fleet for each community.

Total fleet and active fleet by community

| Community | Population | Assumed total fleet | Assumed active fleet |
| --- | --- | --- | --- |
| Badu | 1000 | 200 | 28.0 |
| Boigu | 300 | 60 | 8.4 |
| Dauan | 250 | 50 | 7.0 |
| Erub | 400 | 80 | 11.2 |
| Kirriri | 250 | 50 | 7.0 |
| Iama | 350 | 70 | 9.8 |
| Kubin (Moa) | 150 | 30 | 4.2 |
| Mabuiag | 250 | 50 | 7.0 |
| Masig | 250 | 50 | 7.0 |
| Mer | 450 | 90 | 12.6 |
| Poruma | 210 | 42 | 5.9 |
| Siabai | 500 | 100 | 14.0 |
| St Pauls (Moa) | 300 | 60 | 8.4 |
| Ugar | 80 | 16 | 2.2 |
| Warraber | 250 | 50 | 7.0 |

## Boat ramp lane demand

The active fleet size derived in Table 4.1 represents the statistical demand for the LGA, measured in boat ramp lanes. As outlined in section 3.1.2 the adopted capacity of each effective lane is 40 vessels per day, with each vessel assumed to both launch and retrieve, for a total of 80 vessel movements per day. Based on the assumed active fleet in Table 4.1, there is demand for boat launching at each community, but the statistical demand is less than one lane for all communities, indicating that provided there is a suitable boat launching facility for each community, boat launching demand should be satisfied.

## Non-statistical demand

As well as the statistical demand outlined in the section above, facilities may face demand pressures that are related to their functional use, which reduces the capability of the facility to service the recreational boat fleet in the desired manner. Issues with specific facilities have been identified within the consultation process of the Study with appointed managers and other stakeholders. While care has been taken to identify these non-statistical demand issues throughout the Study, it is beyond the scope of the Study to individually review the functionality, safety, and amenity of each facility across Queensland. Non-statistical demand pressures may warrant upgrades to facilities even where statistical demand is satisfied by existing capacity. These pressures have been classified into the following categories:

* Amenity: Amenity describes the functional usability of the facility including the desire to provide dry entry and exit facilities, facilities that provide easy access and/or access for persons with restricted mobility.
* Safety: Safety demand may include protection from currents and waves or contact with marine creatures such as sharks, jellyfish, and crocodiles.
* In-water congestion: Where existing queuing facilities are not able to efficiently meet the needs of the facility. Such deficiency may warrant additional queuing facility capacity to optimise boat launching and retrieval.

For the communities in TSIRC, the amenity or usability of boat launching, or commuter use facilities (see below), needs to be carefully considered as they are core transport infrastructure as well as being used recreationally. Users of these facilities will therefore have to use the facilities to attend appointments, social gatherings, hospitals, work, and other reasons and often don’t have the flexibility to await ideal launching conditions. Consequently, each facility should be constructed to maximise the opportunities for safe launching, including maximising the tidal range for safe use, consideration for wave protection, or consideration for seasonal alternatives.

## Landings demand

* + 1. Cruising and tourist vessels

Vessels cruising along the east coast of Queensland have a requirement for a network of deep-draught vessel landings that are appropriately spaced to be within a day’s sailing on good weather days. These facilities are required to support the reprovisioning of vessels as they travel along the coast and provide access to desirable land-based destinations. Private marina facilities may be used by cruising vessels where there is an expectation for a prolonged stay that requires protected mooring or berthing. Within the TSIRC LGA suitable facilities for deep-draught vessels are only at the pontoon on Hammond. The Study was advised during consultation that some TSIRC islands are proposing attracting tourists and visitors (such as cruising ships and vessels). To the extent this is confirmed, further investigation is needed to assess the need for pontoon landings suitable for cruising and other deep-draught vessels. Further assessment is outside the scope of the Study.

* + 1. Landings demand

Within TSIRC there are no registered recreational vessels larger than 8m and therefore no statistical pressure for deep-draught vessel landings. However, there is pressure on landing facilities to perform as temporary mooring facilities for commuter use vessels. The existing thirteen jetties, with varying degrees of tidal access, are reportedly in great demand for commuter use landing but in very poor condition. While outside the scope of this Study, the usability of these structures for each community has been identified as a key concern for boating facilities within TSIRC, both for their usability recreationally, but also to perform functionally for core transportation needs. A further assessment of the suitability of existing structures and need for additional structures for use by commuter vessels is recommended.

# Development Recommendations

## Previous recommendations

The 2017 GHD assessment recommended opportunities for increasing the capacity of recreational boating facilities across the State. However, the implementation of these recommendations has been poor, with only 10% of the total recommendations delivered in part or full in the 5 years since the delivery of the report. Of the priority 1 recommendations (for immediate delivery) and priority 2 recommendations (for implementation within 5 years) only 18% and 6% respectively have been delivered. State-wide only 5% of landside recommendations were delivered, while 16% of waterside recommendations were delivered.

For the TSIRC LGA no recommendations were provided in the 2017 GHD study.

## Priority Recommendations

The TSIRC LGA is sufficiently catered for with respect to demand for recreational boating facilities. However, given the shared use of these facilities with commercial operators and in particular barges, as well as the demand for commuter facilities, the Study makes the following general recommendations:

* The condition and capacity of the ramps should be thoroughly investigated and upgraded and/or repaired where they are found to be damaged by barge use. It is understood that this process is currently being undertaken by TSIRC.
* Boat launching facilities, as far as practicable, should seek to achieve near all-tide availability, that is, they should be able to be used for at least 80% of the tidal cycle.
* Commuter-use facilities are essential for the islands, and a more detailed assessment, with respect to wave and wind climate, water depths and local demand should be made for each island to determine the features and configuration of the most appropriate commuter landing facility. The range of options, in ascending order of level of difficulty to implement, includes landing beaches, jetties and pontoons. Pontoons and other floating infrastructure are not recommended at any of the islands without suitable wave protection, such as breakwaters. Given the remoteness of the islands, the maintenance requirements and intended design life of specialised structures (including pontoons) will need to be carefully considered.

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###### Demand Study

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###### Boat launching facility capacity

Capacity of existing boat launching facilities

| Facility ID | Facility name | No. lanes | Tidal access  (at ramp) | Waterside capacity | Effective capacity |
| --- | --- | --- | --- | --- | --- |
| TS15 | Badu barge/boat ramp | 1 | Near All-Tide | 0.8 | 0.8 |
| TS10 | Boigu barge/boat ramp | 1 | Near All-Tide | 0.8 | 0.8 |
| TS05 | Dauan barge/boat ramp | 1 | Near All-Tide | 0.8 | 0.8 |
| TS35 | Erub (Darnley) barge/boat ramp | 1 | Near All-Tide | 0.8 | 0.8 |
| TO50 | Hammond Island barge/boat ramp | 1 | All-Tide | 1.0 | 1.0 |
| TS55 | Iama (Yam) barge/boat ramp | 1 | All-Tide | 1.0 | 1.0 |
| TS20 | Kubin (Moa Island) barge/boat ramp | 1 | Near All-Tide | 0.8 | 0.8 |
| TS30 | Mabuiag barge/boat ramp | 1 | All-Tide | 1.0 | 1.0 |
| TS45 | Masig (Yorke) barge/boat ramp | 1 | Near All-Tide | 0.8 | 0.8 |
| TS42 | Mer (Murray) barge/boat ramp | 1 | Part-Tide | 0.3 | 0.3 |
| TS60 | Poruma (Coconut) barge/boat ramp | 1 | Near All-Tide | 0.8 | 0.8 |
| TS01 | Saibai barge/boat ramp | 1 | Part-Tide | 0.5 | 0.5 |
| TS25 | St Pauls (Moa) barge/boat ramp | 1 | All-Tide | 1.0 | 1.0 |
| TS27 | St Pauls (Moa) boat ramp | 1 | All-Tide | 1.0 | 1.0 |
| TS50 | Ugar (Stephen) barge/boat ramp | 1 | Near All-Tide | 0.8 | 0.8 |
| TS65 | Warraber (Sue) barge/boat ramp | 1 | All-Tide | 1.0 | 1.0 |

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