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| Queensland Recreational Boating Facilities Demand Forecasting Study 2022  Isaac LGA 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 Isaac 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 Isaac LGA.

Key issues and attributes of recreational boating

The key attributes of recreational boating facilities identified in this Study for the Isaac LGA are summarised in Table 1, while consultation with stakeholders undertaken as part of the Study identified the following key issues:

* large tidal ranges making delivery of all-tide facilities very difficult
* geographically dispersed population necessitates boating facilities at most population centres to service local demand.

1. Key recreational boating attributes for Isaac LGA

| Key attribute | Value |
| --- | --- |
| Deep-draught landing facilities |  |
| Existing demand (number) | 0.3 |
| Existing capacity (number) | 0 |
| Existing shortfall (number) | 0.3 |
| Boat launching facilities |  |
| Number of existing facilities | 6 |
| Current demand for boat launching lanes (effective lanes) | 3 |
| Number of existing ‘effective’ boat launching lanes | 3.28 |
| Current shortfall of ‘effective’ boat launching lanes (number) | -0.27 |
| Demand satisfaction for ‘effective’ boat launching lanes | 109% |
| State average demand satisfaction for ‘effective’ boat launching lanes | 82% |

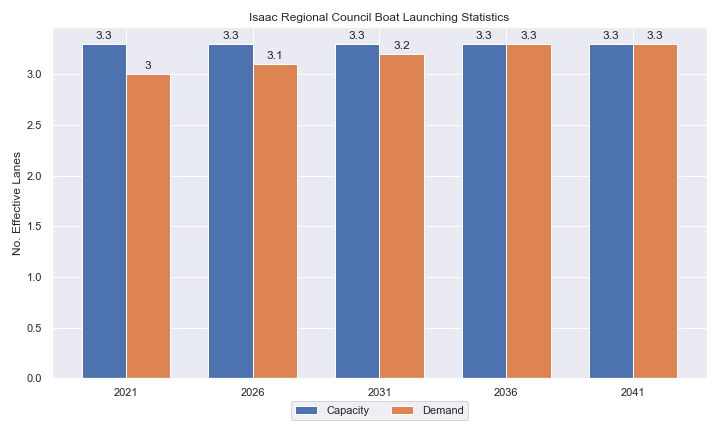
Demand summary

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. Key parameters from this assessment for the Isaac LGA are:

* The population is 21,563 as at the 2021 census and is projected to be 21,446 by 2041
* As of July 2022, there is a total of 1,840 vessels with a home registration within the LGA, with 99% being ‘trailable’ – and therefore requiring boat launching facilities – and 1% being non-trailable
* Isaac is deemed to be a Remote Region with an assumed vessel activation rate of 12% on a ‘good boating day’
* Vessels are primarily used within the LGA, with significant use in Mackay and Whitsunday LGAs.
* Vessels from Mackay flow into the LGA and contribute to local demand.
* The existing demand for boat launching facilities is 3.0 ‘effective’ boat lanes and is projected to be 3.3 ‘effective’ lanes by 2041. As presented in Table 1, the current capacity is 3.3 ‘effective’ lanes.
* The existing demand for deep-draught vessel landings is 0.3 currently and remains unaltered through to 2041. As presented in Table 1, the current capacity is zero deep-draught landings.

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. Isaac LGA has six boat launching facilities, comprising six boat ramp lanes with a total effective boat launching capacity of 3.3 ‘effective’ lanes. Four of these facilities are constrained by waterside capacity with the remainder constrained by landside capacity. The capacity, forecast demand, and shortfall of boat ramp effective lanes in Isaac LGA are shown in Figure 1.



1. Existing capacity, forecast demand and shortfall of ‘effective’ boat ramp lanes for Isaac LGA

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 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.

Isaac LGA has no public deep-draught vessel landings and no recreational boating facilities that can easily accommodate one due to the presence of very wide intertidal flats along this coastline combined with a significant tidal range. The shortfall assessment in Table 2 indicates that there is very little demand for a public landing for deep-draught vessels in Isaac LGA.

1. Deep-draught vessel landing shortfall summary

| Criteria | 2021 | 2026 | 2031 | 2036 | 2041 |
| --- | --- | --- | --- | --- | --- |
| Deep-draught vessel demand | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| Deep-draught vessel capacity | 0 | 0 | 0 | 0 | 0 |
| Shortfall | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |

Priority recommendations

Recommendations for new facilities or upgrades to existing facilities are outlined in Table 3. The range of recommendations seeks to reduce the overall capacity shortfall within Isaac LGA over the 20-year planning life of this project, as well as address specific concerns, including:

* Providing safety improvements to facilities where identified
* Catering for the dispersed population
* Providing access into St Lawrence Creek.

Recommendations

1. Summary of recommended boating infrastructure upgrades for Isaac LGA

| Priority | Criteria | Recommendations |
| --- | --- | --- |
| 1 | * Required to meet existing demand. * Sites that can provide maximum benefit for existing demand pressures at an LGA scale or satisfy specific safety pressures. | * Nil. |
| 2 | * Required to meet demand within the next five to ten years. * Sites that are likely to have low to medium approval complexity. * Sites that can provide satisfaction of specific demand or safety pressures within the LGA. | * St Lawrence Creek: Assess feasibility to construct a 1-lane boat ramp and fixed sloping walkway with 10 formalised all-weather CTU parking spaces. * Carmila Beach: Expand the existing facility to 2-lanes with a central fixed sloping walkway and 10 all-weather CTU parking spaces |
| 3 | * Required to meet demand within the next ten to fifteen years. * Sites that service planned future growth within the LGA. | * Theresa Creek Dam: Construct a second boat ramp lane, assess parking demand. |
| 4 | * Required to meet demand within the next fifteen to twenty years. * Sites that service planned future growth within the LGA. | * Meatworks Creek, Settlement Road: Construct a queuing facility. |

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Definitions

| Term | Definition |
| --- | --- |
| 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. Please refer to Section 4.5 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 land-side recommendations and 18% of waterside recommendations and reflecting 22% of priority 1 the 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 will review previous recommendations and carry forward, modify, or remove 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 is comprised of 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-trailer unit 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.

# Isaac LGA Overview

## Key influences on recreational boating

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

* its designation as a Remote Region, with a moderate local recreational boating fleet
* a small population along with projected minor population decline
* large tidal ranges that limit open water access.

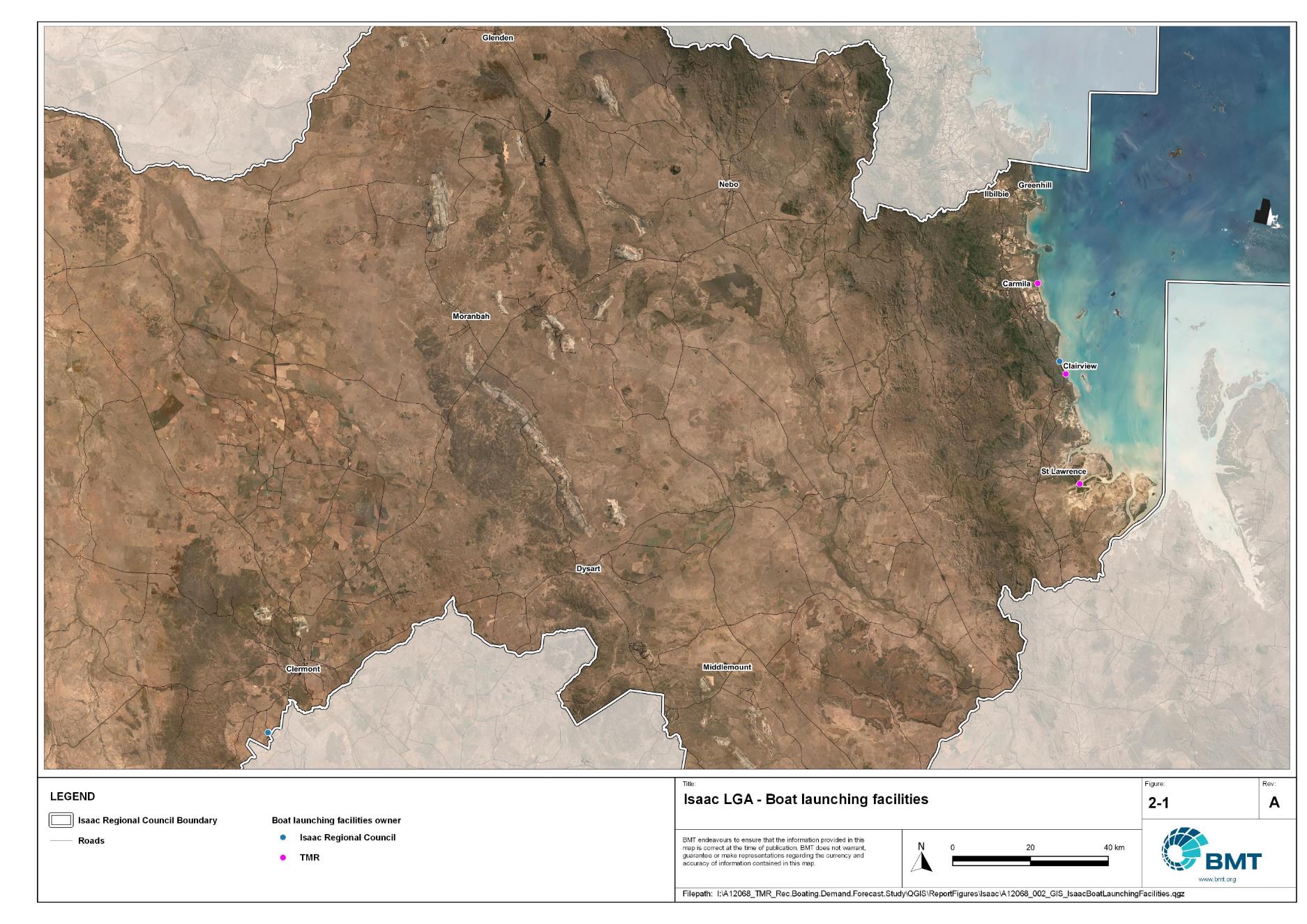
## Existing recreational boating infrastructure

The recreational boating facilities within Isaac LGA are summarised in Table 2.1. These facilities are owned or managed by multiple organisations and include facilities that provide access to open water, estuaries, and fresh water. MSQ’s long term vision is to provide unrestricted access to open water from facilities along the Queensland coast such that all significant population centres are within one hour’s driving range where practical. For clarity, the Study has defined this vision to be the provision of sheltered all-tide, or near all-tide, boat launching facilities within one hour driving range of official population centres (DoR, 2022) lying within 30km of the coastline between the NSW border and Cooktown.

Recreational boating facilities by facility owner in Isaac LGA

| Owner | Open-water boat ramps | | Other boat ramps | | Landings | |
| --- | --- | --- | --- | --- | --- | --- |
| Facilities | Lanes | Facilities | Lanes | Pontoons | Jetties |
| Isaac Regional Council |  |  | 3 | 3 |  |  |
| TMR |  |  | 3 | 3 |  |  |

Each of the boat launching facilities within the LGA are shown in Figure 2.1 .



Public boat launching facilities within the Isaac LGA

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## Existing usage and issues

Consultation with Isaac Regional Council, Sunwater, Maritime Safety Queensland, recreational groups and feedback from the recreational boating facilities survey hosted by TMR indicate the following major issues within Isaac LGA.

* + 1. Large tidal ranges

The Isaac region has a very large tidal range and a wide, flat nearshore area, which makes it very difficult and expensive to construct facilities that provide all-tide access or that have sufficient protection from waves on the open coast. Within the rivers and estuaries, the large tides produce strong tidal currents which can make crossing the tidal deltas at the entrance to rivers from the open ocean challenging.

* + 1. Dispersed population

Isaac LGA is large with a low population density. The population is dispersed within the region such that travel between population centres can require significant travel time. As such, ensuring that each coastal population centre is appropriately served by boat launching facilities is a priority for this region, over-and-above the need to meet boat launching demand at an LGA-wide scale.

# 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 their use is often supported by landside and waterside infrastructure to improve efficiency. In some instances, the usability of a facility can be adversely affected by environmental constraints such as low water 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.

To maximise usage of each facility, the landside and waterside capacity should 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. Recommendations for works or infrastructure promote balancing these two capacity elements by either improving the limiting element for increased facility effectiveness or by increasing the overall 'effective capacity' through changes to both elements.

* + 1. Boat ramp capacity

The overall capacity of each boat launching facility is limited by the effective capacity of either the waterside or landside elements. 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 spaces for parking of car-trailer units (CTU), 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 section3.1.4
* 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), and advises:

* 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.
* Almost 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 are 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 about 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 | 1.7 | 1 Lane/face |
| Pontoon | 1.2 | 2 Lanes/face |
| Queuing beach | 1.1 | 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:

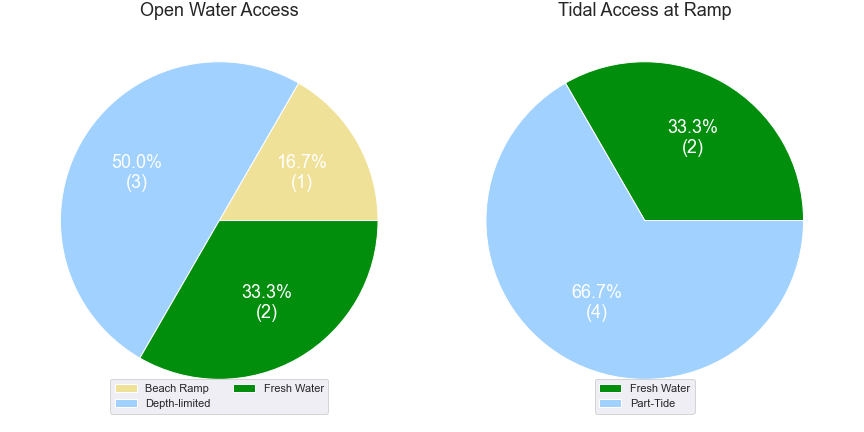
* Open-water access: There are no restrictions between the facility and open water.
* Depth-limited access: There are depth restrictions between the facility and open water that limit navigable access to part of the tidal range. This differs from tidal constraints at the actual facility, which might 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.

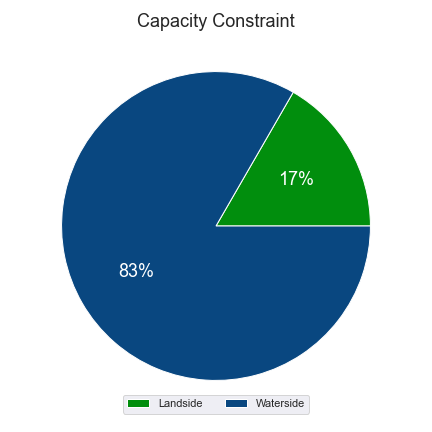
* + 1. Existing boat launching capacity

Within Isaac LGA there are 6 boat launching facilities with a total effective capacity of 3.28 lanes. The effective capacity of boat launching facilities within Isaac LGA is shown in Annex B, with a summary of the access to open water and tidal constraints shown in Figure 3.1 and the overall capacity constraint shown in Figure 3.2. Pertinent features of these facilities include:

* There are 6 total lanes, with an effective capacity of 3.28 effective lanes. This effective capacity is primarily reduced due to the lack of water at lower tides at these facilities.
* There are no facilities in the Isaac LGA that provide unrestricted access to open water, with ramps either depth-limited, beach ramps or located inland.
* Most of the facilities only provide part-tide access, with the two facilities providing ‘all-tide’ access located in freshwater.



(a) Summary of open water access from boat launching facilities (left) and (b) Summary of tidal restrictions at tidal boat launching facilities (right)



Summary of limiting capacity constraint

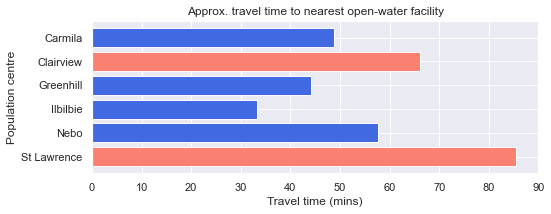
## Access to sheltered near all-tide and all-tide facilities

MSQ has a longer-term vision to provide access to all-tide or near all-tide open water access boat launching facilities along the Queensland coast, such that all significant population centres are within one hour’s driving range as far as practical (TMR, 2020). For this purpose, the Study has defined towns as being within the coastal strip if within 30km of the Queensland coastline. The vision (TMR,2020) is applied to the coastal strip between the NSW border and Cooktown. Consultation throughout the Study has highlighted that this vision is important with users/stakeholders and organisations that own and manage these facilities. As such, the Study has developed a statistical approach to quantify this vision to allow it to be measured and tracked over time. To do this, the Study has calculated the travel time from all Population Centres (DoR, 2022) within the coastal zone to the nearest available sheltered, all-tide or near all-tide facility, regardless of which LGA it is in. This has been accomplished using mapped road networks and assigning speed limits to each type of road, with the following speed limits applied:

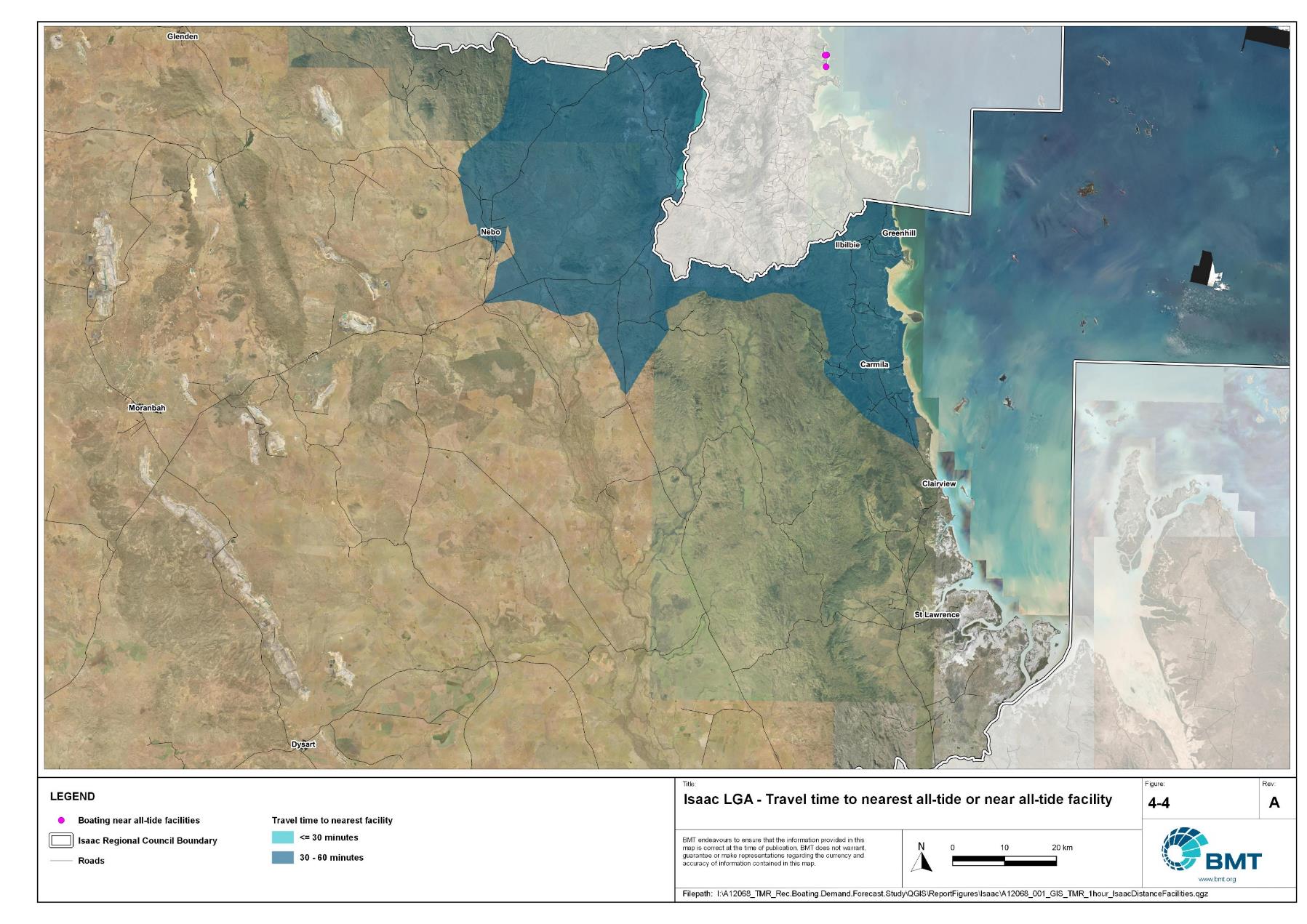
* for restricted roads, 40km/hr
* for local roads, 60km/hr
* for connector roads, 70km/hr
* for distributor roads, 80km/hr
* for highways, 100km/hr.

For Isaac LGA the median travel time from eligible Population Centres to the nearest sheltered all-tide or near all-tide facility is 55 minutes. The distribution of travel times is shown in Figure 3.3 with detailed travel times in Annex C. Figure 3.4 provides a visual representation of the travel time from each of the sheltered near all-tide facilities that serve the LGA. Of interest for Isaac LGA are:

* There are no facilities within Isaac that provide all-tide or near all-tide open water access, instead users are reliant on facilities in Mackay LGA.
* All population centres have a minimum travel time of 30 minutes.
* Clairview and St Lawrence are all outside of the desired 60-minute time frame.



Distribution of travel time from Isaac LGA’s eligible population centres to sheltered near all-tide facilities



Isaac LGA – Travel time to nearest all-tide or near all-tide facility

"I:\A12068\_TMR\_Rec.Boating.Demand.Forecast.Study\QGIS\ReportFigures\Isaac\A12068\_001\_GIS\_TMR\_1hour\_IsaacDistanceFacilities.jpg"

## Deep-draught 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. Within Isaac LGA there are no deep-draught vessel landings.

# Beach Ramps

As part of the Study, an investigation into the suitability of wave-exposed beach launching ramps was undertaken. These facilities were visited as part of the Study and discussed with managing authorities during consultation, to assess their capability to meet existing demand and their future potential/need. In many cases, the current fleet size and intended use has outgrown the suitability of these ramps, but in some locations, they remain the only facility to service key communities along parts of the Queensland coast. These assessments seek to assist MSQ to determine its future strategy about retention, demolition, maintenance, upgrade, or potential conversion to non-registered boating use (for instance, personal watercraft, vehicular beach access) and consider where communities benefiting from these facilities have suitable alternatives.

## Clairview

The Clairview beach ramp provides access from Colonial Drive, servicing the immediate community of Clairview (population 167) as well as visitors to the area. The facility is a concrete beach ramp (Figure 4.1) that extends down to just beyond HAT. During the inspection of the facility, it was noted that:

* The ramp appeared to be in good condition overall.
* The ramp was very exposed to wave conditions on higher tides that would make launching and retrieving difficult on windy days.
* The ramp has limited opportunity for car and trailer parking nearby, although local community members may be returning their vehicle to their residence after launching.
* The beach ramp had a minor influence on local coastal processes.



Clairview beach ramp

Clairview is a popular holiday destination, and the ramp provides good access to local fishing grounds on good weather days, however issues may arise if the weather changes after vessel launching as small to medium waves at higher tides can make this boat ramp unusable, stranding users on the water. The nearest alternative ramp to Clairview is at Sandfly Creek, 4 kilometres to the north. The facility at Sandfly Creek is sheltered from waves but is heavily tidally restricted and inaccessible from the open water during mid-to-low tides.

Given the level of exposure to waves, tidal constraints, and landside constraints, it is likely that the facility is only available for 30% of the time and therefore provides little in the way of satisfying statistical demand for Isaac LGA, however it is a very important facility for the Clairview community. Within Isaac LGA every boat launching facility faces limitations from either waves, tides or both and as such that capacity and opportunity provided by the Clairview beach ramp is in line with the expectations of the Isaac LGA. It is the recommendation of the Study that the Clairview beach ramp continues to be supported in its current form while other facilities in the region are developed to provide additional opportunities for recreational boat launching.

# 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 Isaac the activation rate is assumed to be 12%, with the key factors influencing the rate including:

* its classification as a Remote Region
* the incidence of blue-collar employment being higher than the state average
* the average age being lower than the state average
* it being located adjacent to the open coast.

## 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. The total number of visiting vessels from each LGA is determined from the number of vessels in the resident active fleet and the relative proportion of resident to visiting vessels. The fleet size is expected to change over time due to changes in population and vessel acquisition trends, with the size and proportion of the fleet across the study period described in Table 5.1.

Active fleet vessel size

| Vessel length | 2021 | 2026 | 2031 | 2036 | 2041 |
| --- | --- | --- | --- | --- | --- |
| 0 to 4.5m | 82 | 84 | 86 | 89 | 89 |
| 4.5m to 8m | 39 | 40 | 41 | 42 | 42 |
| >8m | 6 | 6 | 7 | 7 | 7 |
| Total | 127 | 130 | 134 | 138 | 139 |

## Boat ramp lane demand

The fleet size derived in Table 5.1 represents the statistical demand for the LGA, with vessels under 8m assumed to contribute to boat ramp demand, 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. The total boat ramp lane demand across the study period is shown in Table 5.2.

Boat ramp lane demand

|  | 2021 | 2026 | 2031 | 2036 | 2041 |
| --- | --- | --- | --- | --- | --- |
| Boat ramp lane demand | 3 | 3.1 | 3.2 | 3.3 | 3.3 |

For Isaac LGA the important elements that contribute to the boat ramp lane demand include:

* a moderate sized local fleet, with a high proportion of trailable vessels
* large sized fleets in the LGA to the north (Mackay), which use facilities within Isaac LGA

## 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.

The Study's recommendations may alleviate these non-statistical demand pressures with consideration for capability of all facilities within the LGA. The presence of a non-statistical demand pressure at a facility may not warrant upgrades where other suitable facilities are reasonably available.

## Deep-draught vessel demand

* + 1. Cruising 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 Isaac LGA there are no suitable facilities for deep-draught vessels.

Within the east coast network but outside of the LGA, the nearest public deep-draught vessel facility to the north is at Airlie Beach, approximately 140 nautical miles north of St Lawrence River, and to the south at Gladstone, approximately 170 nautical miles south. This represents the largest stretch of coastline in the east coast network that is not serviced by a public deep-draught vessel landing.

* + 1. Landing demand

Statistical demand for deep-draught vessel landings has been assessed based on the size of the non-trailable fleet within the Isaac LGA. Landing demand is more difficult to assess than boat ramp lane demand as the requirements and duration of the landing influence the demand pressure but are highly variable between users. Nevertheless, the Study has assumed that 5% of the non-trailable fleet will be seeking a landing at any given time. The consultation undertaken during the Study indicates that this assumption may overestimate the number of landings, but that the landings are often utilised for other boating and recreation activities when not in use by deep-draught vessels. In particular, landings that are located near boat launching facilities may be used as queuing facilities and therefore support the efficient launching of smaller recreational vessels. Given this, the 5% assumption has been adopted noting that it may overestimate capacity, but not to an extent that it would be onerous to facility providers. Within Isaac LGA the demand for deep-draught vessel landings is outlined in Table 5.3

Deep-draught vessel landing demand

| Requirement | 2021 | 2026 | 2031 | 2036 | 2041 |
| --- | --- | --- | --- | --- | --- |
| No. of Landings | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |

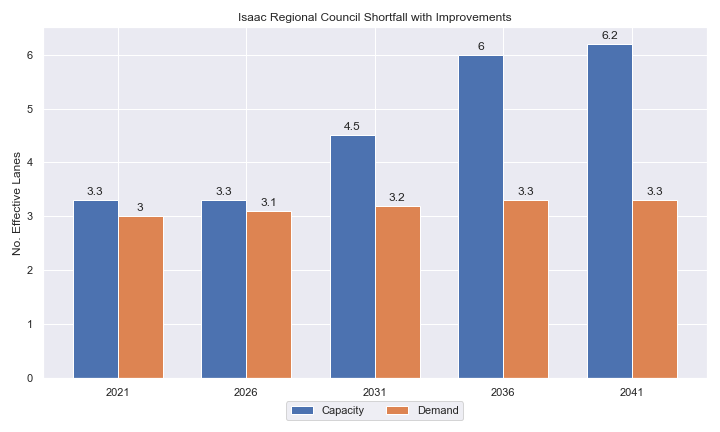
# Shortfall Assessment

## Shortfall assessment – boat ramps

The shortfall of boat ramp lanes within Isaac LGA is shown in Table 6.1 and Figure 6.1 at an LGA scale. This is presented both with and without the inclusion of additional capacity provided by the recommended upgrades.

Shortfall of boat launching facilities

| Assessment | Metric | 2021 | 2026 | 2031 | 2036 | 2041 |
| --- | --- | --- | --- | --- | --- | --- |
| Demand | Demand | 3 | 3.1 | 3.2 | 3.3 | 3.3 |
| Existing | Capacity | 3.3 | 3.3 | 3.3 | 3.3 | 3.3 |
| **Shortfall** | -0.3 | -0.2 | -0.1 | 0 | 0 |
| Improved | Capacity | 3.3 | 3.3 | 4.5 | 6 | 6.2 |
| **Shortfall** | -0.3 | -0.2 | -1.3 | -2.7 | -2.9 |



Shortfall assessment with recommended upgrades adopted.

## Shortfall assessment – deep-draught landings

The shortfall of public deep-draught landings for Isaac LGA is provided in Table 6.2. There are currently no existing facilities to cater for the demand, however, the existing demand is for less than 1 deep-draught vessel landing for all time periods.

Shortfall of deep-draught vessel landings

| Assessment | Metric | 2021 | 2026 | 2031 | 2036 | 2041 |
| --- | --- | --- | --- | --- | --- | --- |
| Deep-draught vessel landings | Demand | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| Capacity | 0 | 0 | 0 | 0 | 0 |
| **Shortfall** | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |

# Stakeholder Feedback



The Study has undertaken extensive consultation throughout its execution to achieve a comprehensive understanding of issues relating to the use of recreational boating facilities across the state. This consultation was conducted with managing authorities that own and/or and manage recreational boating facilities, as well as with facility stakeholders including recreational groups, volunteer marine rescue and coastguard organisations, and the general public. Stakeholder engagement was supplemented with site visits to facilities where key issues had been identified.

## Managing authority feedback

For Isaac LGA, the Study team met with Isaac Regional Council and Maritime Safety Queensland to discuss recreational boating facilities within the region. This consultation process identified a range of potential opportunities to improve the amenity, safety and access of recreational boat launching facilities. The Study has considered the practical implementation of each of these opportunities with respect to the required infrastructure, difficulty of implementation and magnitude of benefit, as summarised in Table 7.1.

Stakeholder identified opportunities

| Location | Stakeholder opportunity | Review comments |
| --- | --- | --- |
| Meatworks Creek, Settlement Road | Provide queuing facility to assist with launching and siltation issues. | Agreed. |
| St Lawrence Creek | Informal site to the west of the train bridge currently exists. Could be formalised. Big tides and currents here. | Agreed. Would provide boat launching closer to St Lawrence and access to St Lawrence Creek and open waters when the tide allows. |
| Greenhill | Informal site could be formalised on the north side of the settlement area to create an all-tide access with a causeway. | Not agreed. While this is an opportunity for an open water facility, it would be prohibitively expensive as a causeway of up to 800m or significant dredging would be required to achieve all-tide access status. This would require significant engineering to withstand cyclonic wave conditions. Development here would also need to overcome significant environmental constraints.  It is recommended that a formalised beach access ramp is provided instead. This would facilitate access to the beach for launching at appropriate tides, at a significantly lower cost. This would reduce ongoing erosion exacerbated by the use of the existing informal track, improve access amenity and satisfy a portion of demand for those boat users able to launch from the beach (without providing formal capacity). |

## Stakeholder feedback

Broader stakeholder feedback has been conducted within the Study by undertaking virtual or face-to-face meetings with recreational boating groups and marine rescue organisations, as well as through the Recreational Boating Facility Survey (MSQ, 2022) undertaken by Maritime Safety Queensland, which included survey responses of nearly 3,000 users and open submissions. For Isaac LGA a total of 27 submissions was received, with 83% of respondents using trailable power boats and 96% of respondents using recreational boating facilities at least once a month. For Isaac LGA the following themes were extracted from the survey and associated comments:

* 69% of respondents typically travel less than 1hr to their preferred boat ramp (which may not be their closest facility)
* 78% of respondents indicated that floating walkways are their preferred type of queuing facility
* 81% of respondents indicated that they would be unwilling to walk further than 200m from designated CTU parking to a boat ramp
* The most common requests for new boat ramps were at:
  + Carmila Creek
  + St Lawrence Creek
  + Meatworks Creek, Settlement Road.
* The following themes were identified with respect to existing facilities:
  + desire for upgrades to boat ramps with floating walkways (Meatworks Creek) or pontoons (Carmila Beach, St Lawrence), repair and maintenance (Carmila Beach)
  + more parking areas
  + provision of recreational fishing facilities.
* Where the closest available boat launching facility was not preferred, respondents indicated that the following key aspects influenced their choice:
  + desire for pontoons/floating walkways
  + tidal access limitations
  + preferred fishing areas.
* Respondents were given an opportunity to provide additional feedback. Carmila Beach boat ramp was frequently identified as needing a pontoon. This boat ramp was also reported to be unsafe during launching and retrieval of boats, and during strong currents, large tides and due to the presence of a large rock at the toe of the ramp. Upgrading Carmila Beach boat ramp to be more friendly for mobility-impaired users (such as those in wheelchairs, elderly people) and children was an identified desire.

# Development Recommendations

## Previous recommendations

The 2017 GHD assessment recommended opportunities for increasing capacity of recreational boating facilities across the state. However, the implementation of these recommendations has been low, with only 10% of the total state-wide 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.

Within Isaac LGA none of the recommendations have been implemented since the delivery of the 2017 GHD study. The low rate of implementation of these recommendations is likely the result of budgetary constraints applied due to the COVID-19 pandemic. As such, some of the recommendations proposed in the 2017 GHD study remain viable. This current Study has reviewed the unimplemented 2017 recommendations (Table 8.1) for Isaac LGA in conjunction with stakeholders during the consultation process to identify previous recommendations that are:

* Still viable: The recommendation in its original form remains suitable for solving demand pressures.
* Still viable with modifications: The recommendation could remain viable with modifications identified throughout the consultation process.
* No longer viable: The recommendations are no longer suitable to be carried through as recommendations in this study.

Recommendations from the 2017 study that are considered viable or viable with modifications are carried forward into the recommendations of this Study with a suitable update to their priority status if required.

Assessment of unimplemented 2017 recommendations

| Location | 2017 Recommendation | 2022 Review | Review comment |
| --- | --- | --- | --- |
| Priority 1 | | | |
| Theresa Creek Dam west | Expand the ramp to 2-lanes and expand unformed carpark to achieve an area sufficient for 45 CTUs, converting the parking area to an all-weather surface. | Viable with modifications. | Eastern boat ramp has been identified as the main ramp by Council and should be expanded to a 2-lane ramp. An assessment of parking demand is recommended, and options should align with the Theresa Creek Dam Master Plan. |
| Meatworks Creek, Settlement Road | Expand the facility to 2-lanes and provide an all-weather parking area for 10 CTUs. | Viable with modifications | The waterside facilities should instead be supplemented with a queuing structure to improve safety and efficiency of queuing, while the landside semi-formal parking is providing sufficient capacity at present. |
| Carmila Beach Road, Carmila | Expand the ramp to 2-lanes and provide an all-weather surfaced area for 10 to 15 CTUs. | Viable with modifications | Include a fixed sloping walkway to improve amenity, and efficiency of launching/retrieving. |
| Priority 2 | | | |
| Lake Elphinstone | Expand facility to 2-lanes and increase parking are to an all-weather surface to support 45 CTUs. | No longer viable | No indication of demand for this facility. |
| Priority 3 | | | |
| Nil. |  |  |  |
| Priority 4 | | | |
| Isaac River | Feasibility study for a facility on the Isaac River | No longer viable | Not likely to be suitable/feasible as the river regularly runs dry and most property along the river is privately owned. |
| Mackenzie River | Feasibility study for a facility on the Mackenzie River | No longer viable. | Informal launching is catering for demand along the Mackenzie River at present. |

## Priority recommendations

The selection and ranking of development priorities provides for progressive implementation of solutions to meet capacity shortfalls and/or resolve existing safety and usage issues at existing facilities over time. Recommendations have been split into four categories for implementation within the 20-year planning period of this study, with the following projected timelines:

* Priority 1: For immediate planning and design
* Priority 2: Planning and design intended to provide capacity within 5-10 years
* Priority 3: Planning and design intended to provide capacity within 10-15 years
* Priority 4: Planning and design intended to provide capacity within 15-20 years.

The recommendations have been structured to include consideration of the reasonable timelines for implementation. This may include consideration for budgetary processes, planning, environmental approvals, consultation periods and construction. The priority selection of recommendations has been conducted in accordance with TMR’s Marine Infrastructure and Facilities Plan (TMR, 2020) guidelines, namely:

1. *priority to be given to the provision of sheltered all-tide or near all-tide launching facilities giving access to the open sea on an all-tide or near all-tide basis.*
2. *part-tide facilities (for launching or access) may be provided where there is demand and dredged access is not feasible. For instance, beach access or open beach ramps may be provided where there is sufficient demand and no suitable nearby sheltered waterway*
3. *the most economically viable options will take precedence, including the expansion of existing facilities, and the changing of existing foreshore land uses. In many cases, limiting or avoiding dredging and/or breakwater costs will be a crucial factor*
4. *a goal of providing access to sheltered all-tide or near all-tide boat launching facilities within one hour’s drive for significant communities*

Consequently, higher order recommendations need to address, where possible, the provision of facilities that provide maximum benefit in the widest range of conditions and will be limited to those solutions that are already significantly advanced or ‘shovel ready’ or that require limited further design, planning and approvals. Lower order recommendations will consist of solutions where there is reduced adherence to the TMR guidelines and/or there are constraints that may result in long lead times to resolve. A summary of the recommendations is provided in Table 8.2 with full detail of each recommendation in the tables that follow.

Summary of recommendations for Isaac LGA

| Priority | Description | Landside or waterside | Increased capacity  (effective lanes) |
| --- | --- | --- | --- |
| 1 | Nil. |  |  |
| 2 | St Lawrence Creek: Assess feasibility to construct 1-lane boat ramp with fixed sloping walkway and 10 formalised all-weather CTU spaces. | Both | 0.75 |
| 2 | Carmila Beach: Expand facility to 2-lanes with central fixed sloping walkway and 10 all-weather CTU spaces. | Both | 0.5 |
| 3 | Theresa Creek Dam: Construct a second boat ramp lane, construct 35 semi-formalised CTU parking spaces if required (in line with Master Plan). | Both | 1.5 |
| 4 | Meatworks Creek, Settlement Road: Install a queuing facility. | Waterside | 0.25 |

## 

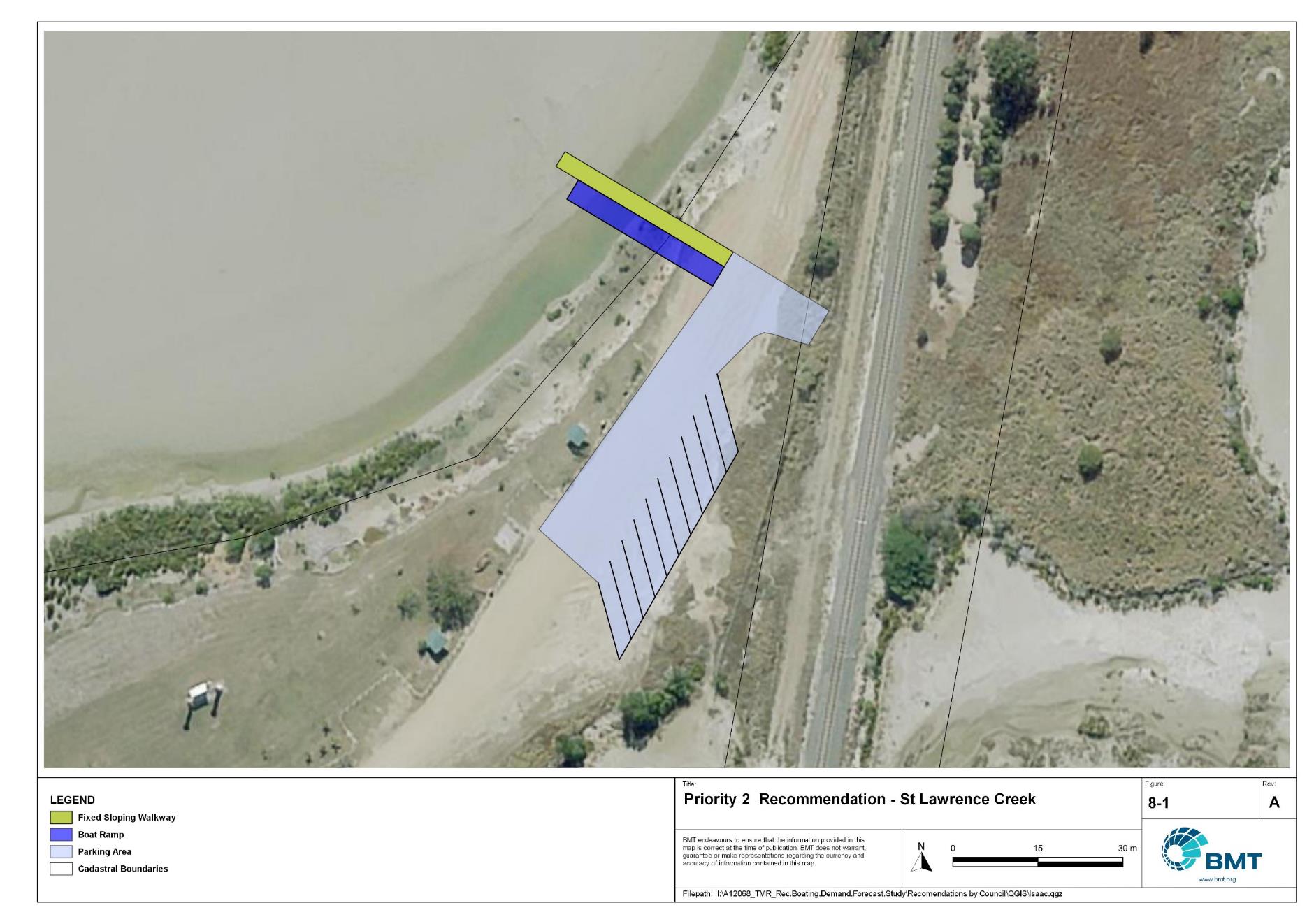
## Priority 1 recommendations

Nil.

## Priority 2 recommendations

St Lawrence Creek – Priority 2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| General description | | | | |
| Location | On the southern bank of St Lawrence Creek, southwest (upstream) of the railway bridge. | | | |
| Existing Facility? | Current informal facility and canoe launching point. | | | |
| Coordinates | -22.34196220, 149.52435666 | | | |
| Existing tidal status | N/A – Part-tide once complete | | | |
| Existing wave exposure | N/A – None once complete | | | |
| Existing current exposure | N/A – exposed once complete | | | |
| Proposed works | Conduct feasibility assessment into establishing a facility here, considering current velocities and mobility of channels. If feasible, construct a one-lane boat ramp with a fixed sloping walkway and 10 formalised CTU spaces. | | | |
| Increased effective capacity | 0.75 effective lanes | | | |
| Capacity improvement position | Waterside | Landside | | Both |
| Rationale | To provide access to the St Lawrence Creek system and offshore. St Lawrence is a population hub in the coastal Isaac region, and there is demand (council informed) for a facility in the St Lawrence Creek. | | | |
| Anticipated Costs (+/- 50%) | Waterside infrastructure | | $620,000 | |
| Landside infrastructure | | $130,000 | |
| Planning, environmental and approvals constraints | | | | |
| Assessment | Requirement | Comments | | |
| Fish Habitat Zone | x | N/A | | |
| Native Title | ü | New tenure required for proposed works therefore, interaction with Native Title required. | | |
| MCU requirement | ü | The proposed works will likely trigger a Development Permit for a Material Change of Use. | | |
| Clearing remnant vegetation | ü | The works are within areas containing RVM category B – remnant vegetation. A Development Permit may be required for the clearing of remnant vegetation. | | |
| GBRWHA | ü | Works are within the GBRWHA which may require a Controlled Activity Approval if there is likely to be a significant impact. | | |
| Marine Park | ü | Works are within the Great Barrier Reef Coast Marine Park (Broadsound) in a General Use Zone which will likely require a Marine Park Permit.  Works can be undertaken within a General Use Zone to the extent they provide opportunities of reasonable use and conservation. | | |
| Tidal works assessment | ü | Marine-based works will likely be tidal works and require a Development Permit. | | |
| Other as required | x | N/A | | |
| Sea Level Rise | ü | The proposed works are within the boundaries of the erosion prone area. | | |
| Storm Tide Hazard | ü | The proposed works are within the boundaries of a high hazard area. | | |
| Anticipated Complexity | Low | Medium | | High |
| Maritime engineering review | | | | |
| Assessment | Site considerations | Comments | | |
| Engineering Matters | Current Forces | Site may be subject to moderate to high currents and further assessment of the impact on this recommendation is required. | | |
| Water Levels | This site is subject to inundation from flood waters and more detailed consideration will be required to ensure the recommended option is suitable. | | |
| Anticipated Complexity | Low | Medium | | High |



Priority 2 recommendation – St Lawrence Creek

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Carmila Beach – Priority 2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| General description | | | | |
| Location | South bank of the mouth of Carmila Creek, along the Esplanade at Carmila Beach. | | | |
| Existing Facility? | Yes | | | |
| Coordinates | -21.91033688, 149.46264439 | | | |
| Existing tidal status | Part-tide | | | |
| Existing wave exposure | None | | | |
| Existing current exposure | None | | | |
| Proposed works | Expand to 2-lane facility with a central fixed sloping walkway, formalising 10 CTU spaces in an all-weather parking area and maintaining informal overflow area.  Remove large rock at the toe of the ramp during construction. | | | |
| Increased effective capacity | 0.5 effective lanes | | | |
| Capacity improvement position | Waterside | Landside | | Both |
| Rationale | The Carmila Beach facility is a popular boat ramp for the community, and this ramp allows access to open water during approximately half of the tidal range. Expanding to a 2-lane facility with a central queuing structure will allow for improved amenity and more efficient launching and retrieving during the higher tides when this process is time critical.  Floating infrastructure is not recommended at this facility due to the impact of current forces, and there may be benefit in community consultation/education to explain this reasoning.  Removing the rock will increase the safety and available tidal range of use at this location. | | | |
| Anticipated Costs (+/- 50%) | Waterside infrastructure | | $1,400,000 | |
| Landside infrastructure | | $95,000 | |
| Planning, environmental and approvals constraints | | | | |
| Assessment | Requirement | Comments | | |
| Fish Habitat Zone | ü | Works are within the West Hill Fish Habitat Area (FHA-039) - Management Area B. A Development Permit and Resource Allocation Authority will be required for works within a declared FHA. | | |
| Native Title | x | N/A | | |
| MCU requirement | x | N/A | | |
| Clearing remnant vegetation | ü | The parking lot works are within areas containing RVM category B – remnant vegetation. A Development Permit may be required for the clearing of remnant vegetation. | | |
| GBRWHA | ü | Works are within the GBRWHA which may require a Controlled Activity Approval if there is likely to be a significant impact. | | |
| Marine Park | ü | Works are within the Great Barrier Reef Coast Marine Park (Broadsound) in a General Use Zone which will likely require a Marine Park Permit.  Works can be undertaken within a General Use Zone to the extent they provide opportunities of reasonable use and conservation. | | |
| Tidal works assessment | ü | Marine-based works will likely be tidal works and require a Development Permit. | | |
| Other as required | x | N/A | | |
| Sea Level Rise | ü | The proposed works are partially within the boundaries of the erosion prone area with the exception of the parking lot works. | | |
| Storm Tide Hazard | ü | The proposed works are within the boundaries of a high and medium hazard area. | | |
| Anticipated Complexity | Low | Medium | | High |
| Maritime engineering review | | | | |
| Assessment | Site considerations | Comments | | |
| Engineering Matters | Current Forces | Site may be subject to moderate to high currents and further assessment of the impact on this recommendation is required. | | |
| Water Levels | This site is subject to inundation from flood waters and more detailed consideration will be required to ensure the recommended option is suitable. | | |
| Anticipated Complexity | Low | Medium | | High |



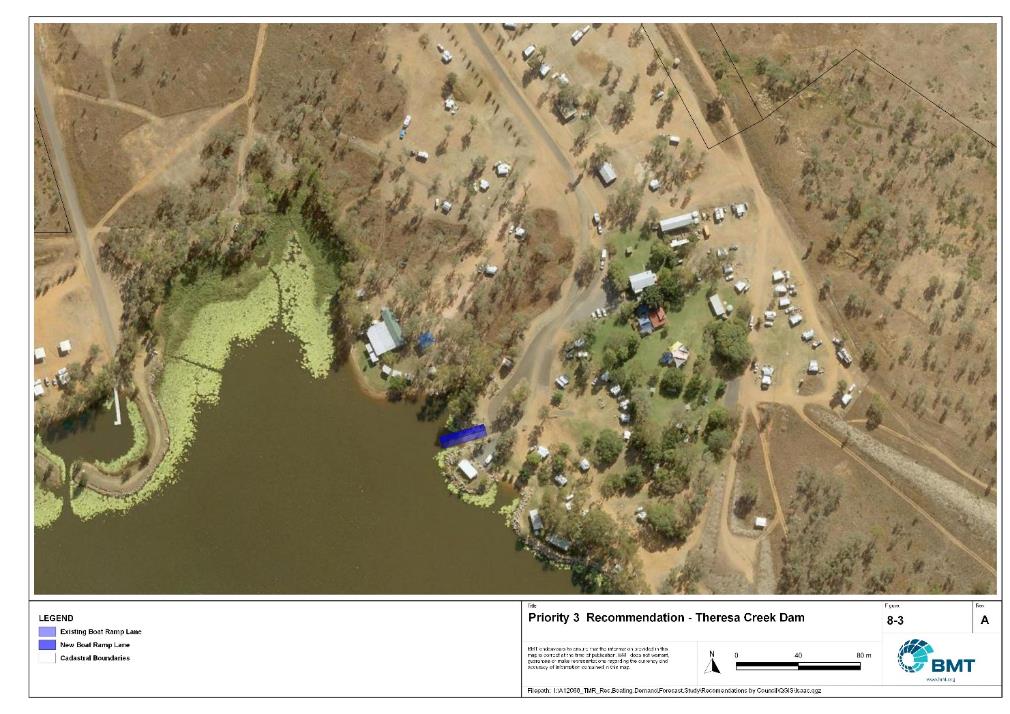
Priority 2 Recommendation - Carmila Beach

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## Priority 3 Recommendations

Theresa Creek Dam - (Priority 3)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| General Description | | | | |
| Location | Percy Albert Drive, on Theresa Creek Dam, south of Clermont. | | | |
| Existing Facility? | Yes | | | |
| Coordinates | -22.97199594, 147.55297122 | | | |
| Existing tidal status | All-tide | | | |
| Existing wave exposure | None | | | |
| Existing current exposure | None | | | |
| Proposed works | Construct a second boat ramp lane adjacent to the first. Semi-formalise a parking area for 35 CTUs if required, in line with the Master Plan. | | | |
| Increased effective capacity | 1.5 effective lanes | | | |
| Capacity improvement position | Waterside | Landside | | Both |
| Rationale | Theresa Creek Dam is a very popular tourism location in the Isaac region, with visitor numbers increasing substantially in recent years. Community consultation completed by Isaac Regional Council yielded over 500 responses and indicated that the ramp here was under pressure and should be upgraded.  Increasing the ramp to two lanes will allow for more efficient throughput and reduced conflict. Adequate car parking should be available for the users of this facility. If these users are typically patrons of the campground/caravan park, with allocated parking areas (of adequate size to fit a CTU), then a standalone car park may not be required. Otherwise, if CTUs aren’t allocated to ‘overnighting’ patrons or there is demand for parking from external public users (non-patrons), a car park with 35 CTU parking spaces should be constructed, in line with the Master Plan, to cater to the waterside capacity. | | | |
| Anticipated Costs (+/- 50%) | Waterside infrastructure | | $250,000 | |
| Landside infrastructure | | - | |
| Planning, Environmental and Approvals Constraints | | | | |
| Assessment | Requirement | Comments | | |
| Fish Habitat Zone | x | N/A | | |
| Native Title | x | N/A | | |
| MCU requirement | x | N/A | | |
| Clearing remnant vegetation | x | N/A | | |
| GBRWHA | x | N/A | | |
| Marine Park | x | N/A | | |
| Tidal works assessment | ü | N/A | | |
| Other as required | x | Construction of an additional boat ramp lane will likely trigger requirement of a Development Permit for operational works. | | |
| Sea Level Rise | x | N/A | | |
| Storm Tide Hazard | x | N/A | | |
| Anticipated Complexity | Low | Medium | | High |



Priority 3 recommendation – Theresa Creek Dam

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## Priority 4 recommendations

Meatworks Creek, Settlement Road – Priority 4

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| General description | | | | |
| Location | At the end of Settlement Road, on the north bank of Meatworks Creek, a tributary of Waverley Creek. | | | |
| Existing Facility? | Yes | | | |
| Coordinates | -22.37425200, 149.57561300 | | | |
| Existing tidal status | Part-tide | | | |
| Existing wave exposure | None | | | |
| Existing current exposure | None | | | |
| Proposed works | Construct a queuing facility at the boat ramp. Assess the suitability of a floating walkway, a fixed sloping walkway or a gangway access pontoon. | | | |
| Increased effective capacity | 0.25 effective lanes | | | |
| Capacity improvement position | Waterside | Landside | | Both |
| Rationale | To improve queuing efficiency and safety in a potential crocodile habitat. The single lane ramp and informal parking area is serving this facility sufficiently, though the lack of queuing infrastructure has seen recreational boat users pulling up into the mud bank beside the ramp, damaging vegetation and posing a safety risk to users walking through the mud.  A gangway-access pontoon has been installed at this facility in the past, but deteriorated and became unusable, owing to flood flows. Investigation into the cause of this deterioration should inform the consideration of a new queuing structure, noting that the mud banks at this facility frequently become exposed. | | | |
| Anticipated Costs (+/- 50%) | Waterside infrastructure | | TBD | |
| Landside infrastructure | | TBD | |
| Planning, environmental and approvals constraints | | | | |
| Assessment | Requirement | Comments | | |
| Fish Habitat Zone | ü | Works are within the Broad Sound Fish Habitat Area (FHA-047) - Management Area A. A Development Permit and Resource Allocation Authority will be required for works within a declared FHA. Works for public boating infrastructure are permissible in FHA Management A but only where a range of policy requirements are met, including clear demand and the absence of any viable alternatives. | | |
| Native Title | x | N/A | | |
| MCU requirement | x | N/A | | |
| Clearing remnant vegetation | ü | The works are within areas containing RVM category B – remnant vegetation. A Development Permit may be required for the clearing of remnant vegetation. | | |
| GBRWHA | ü | Works are within the GBRWHA which may require a Controlled Activity Approval if there is likely to be a significant impact. | | |
| Marine Park | ü | Works are within the Great Barrier Reef Coast Marine Park (Waverley Creek) in a General Use Zone which will likely require a Marine Park Permit.  Works can be undertaken within a General Use Zone to the extent they provide opportunities of reasonable use and conservation. | | |
| Tidal works assessment | ü | Marine-based works will likely be tidal works and require a Development Permit. | | |
| Other as required | x | N/A | | |
| Sea Level Rise | ü | The proposed works are within the boundaries of the erosion prone area. | | |
| Storm Tide Hazard | ü | The proposed works are within the boundaries of a high hazard area for storm tide. | | |
| Anticipated Complexity | Low | Medium | | High |



Priority 4 Recommendation – Meatworks Creek

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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 | Tidal Access to Open Water | Queuing Facility | Formal CTUs | Informal CTUs | Waterside capacity | Landside capacity | Effective Capacity | Constraint |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Depth-limited** | | | | | | | | | | | | | |
| BD21 | Carmila, Carmila Beach Road | | 1 | Part-Tide | Part-Tide | None | 0 | 4 | 0.5 | 0.5 | 0.5 | Waterside |
| BD17 | Sand Fly Creek, Clairview north | | 1 | Part-Tide | Part-Tide | None | 0 | 5 | 0.5 | 0.5 | 0.5 | Waterside |
| BD11 | Meatworks Creek, Settlement Road | | 1 | Part-Tide | Part-Tide | None | 0 | 11 | 0.5 | 1.25 | 0.5 | Waterside |
| **Subtotal** |  | | **3** |  |  |  | **0** | **20** | **1.5** | **2.25** | **1.5** |  |
| **Fresh water** | | | | | | | | | | | | |
| DA52 | Lake Theresa, Theresa Creek Dam | | 1 | Fresh Water | Fresh Water | None | 0 | 5 | 1 | 0.5 | 0.5 | Landside |
| DA53 | Lake Theresa, Theresa Creek Dam west | | 1 | Fresh Water | Fresh Water | Floating Walkway | 0 | 10 | 1 | 1 | 1 | Waterside |
| **Subtotal** |  | | **2** |  |  |  | **0** | **15** | **2** | **1.5** | **1.5** |  |
| **Beach ramps** | | | | | | | | | | | | |
| BD16 | Clairview, Colonial Drive | | 1 | Part-Tide | Part-Tide | Beach | 0 | 4 | 0.275 | 0.5 | 0.28 | Waterside |
| **Subtotal** |  | | **1** |  |  |  | **0** | **4** | **0.275** | **0.5** | **0.28** |  |
|  | | Total effective capacity | | | | | | | | | **3.28** |  | |

###### Travel time statistics

Travel time from population centres to nearest sheltered all-tide or near all-tide open water accessible facilities

| Population centre | Travel time (mins) |
| --- | --- |
| Carmila | 48.8 |
| Clairview | 66.1 |
| Greenhill | 44.1 |
| Ilbilbie | 33.3 |
| Nebo | 57.7 |
| St Lawrence | 85.5 |

|  |  |  |
| --- | --- | --- |
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