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

Key issues and attributes of recreational boating

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

* a lack of queuing facilities (floating walkways, pontoons, beaches and fixed sloping walkways) for use at boat launching facilities
* high demand on the Seventeen Seventy facility, particularly from tourists (only 22% of users of this facility are from the Gladstone LGA).

1. Key recreational boating attributes for the Gladstone LGA

| Key attribute | Value |
| --- | --- |
| Deep-draught landing facilities |  |
| Existing capacity (number) | 1 |
| Existing demand (number) | 1.4 |
| Existing shortfall (number) | 0.4 |
| Boat launching facilities |  |
| Number of existing facilities | 21 |
| Current demand for boat launching lanes (effective lanes) | 26.9 |
| Number of existing ‘effective’ boat launching lanes | 24.6 |
| Shortfall of ‘effective’ boat launching lanes (number) | 2.3 |
| Demand satisfaction for ‘effective’ boat launching lanes | 92% |
| State-wide demand satisfaction for ‘effective’ boat launching lanes | 87% |

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 Gladstone LGA are:

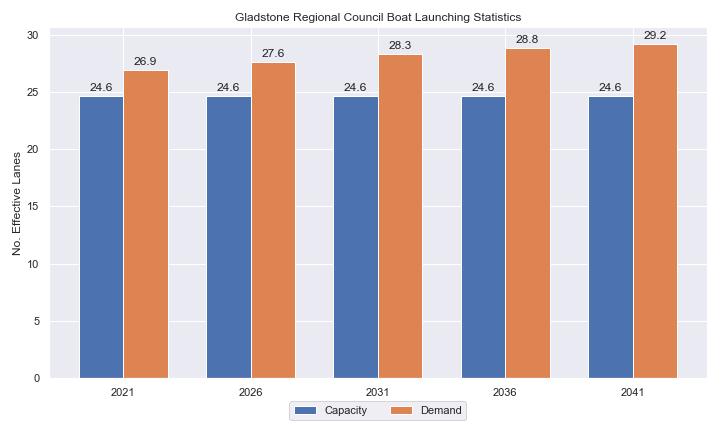
* The population is 63,938 as at the 2021 census and is projected to be 75,237 by 2041.
* As of July 2022, there is a total of 8,074 vessels with a home registration within the LGA, with 97% being ‘trailable’ – and therefore requiring boat launching facilities – and 3% being non-trailable.
* Gladstone LGA is deemed to be a Regional Centre with an assumed vessel activation rate of 10% on a ‘good boating day’.
* Vessels are primarily used within the LGA, with some leakage to Bundaberg and Livingstone LGAs.
* Vessels from Bundaberg, Fraser Coast, Rockhampton and Brisbane LGAs flow into the LGA and contribute to local demand.
* The existing demand for boat launching facilities is 26.9 ‘effective’ boat ramp lanes and is projected to be 29.2 ‘effective’ lanes by 2041. As presented in Table 1, the current capacity is 25.6 ‘effective’ lanes.
* The existing demand for deep-draught vessel landings is one currently and projected to remain at one landing by 2041. As presented in Table 1, the current capacity is one deep-draught landing.

Boat launching

Boat launching facilities comprise boat ramps, any queuing facilities (floating walkways, pontoons, beaches and fixed sloping walkways) and the provision of car-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 and 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.

Gladstone LGA has 21 boat launching facilities, comprising 39 boat ramp lanes with a total effective boat launching capacity of 24.6 ‘effective’ lanes. Nine 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 Gladstone LGA is shown in Figure 1.



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

The Gladstone LGA has one public deep draught vessel landing at Flinders Parade (Auckland Creek), with direct access to the Gladstone CBD. This facility is supported by private facilities at Gladstone Marina, which includes free three-hour berthing. The shortfall assessment in Table 2 indicates that public landing capacity for deep-draught vessels is currently sufficient to support demand in the Gladstone LGA, particularly when considered with the support from Gladstone Marina.

1. Deep-draught vessel landing shortfall summary

| Criteria | 2021 | 2026 | 2031 | 2036 | 2041 |
| --- | --- | --- | --- | --- | --- |
| Deep-draught vessel demand | 1.4 | 1.4 | 1.5 | 1.5 | 1.5 |
| Deep-draught vessel capacity | 1 | 1 | 1 | 1 | 1 |
| Shortfall | 0.4 | 0.4 | 0.5 | 0.5 | 0.5 |

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 the Gladstone LGA over the 20-year planning life of this project, by addressing specific concerns and providing a solution to the current demand pressure on the Seventeen Seventy facility.

Recommendations

1. Summary of recommended boating infrastructure upgrades for Gladstone 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. | * Seventeen Seventy: Upgrade to provide a 4-lane boat ramp with 2 floating walkways and 130 CTU spaces. |
| 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. | * Nil |
| 3 | * Required to meet demand within the next ten to fifteen years. * Sites that service planned future growth within the LGA. | * Nil |
| 4 | * Required to meet demand within the next fifteen to twenty years. * Sites that service planned future growth within the LGA. | * Nil |

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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.

# Gladstone LGA Overview

## Key influences on recreational boating

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

* its designation as a Regional Centre, with a large local recreational boating fleet
* strong projected population growth
* high tourism inputs including larger vessels cruising along the Queensland coast
* good offshore destinations for boating and fishing.

## Existing recreational boating infrastructure

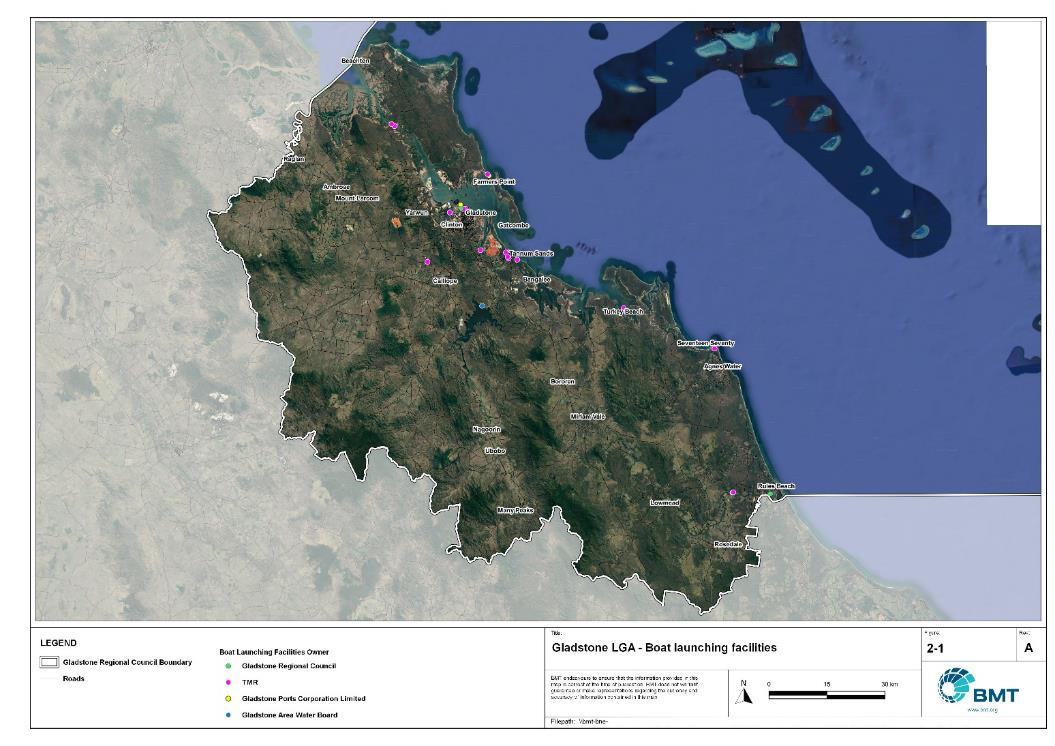
The recreational boating facilities within the Gladstone LGA are summarised in Table 2.1. These facilities are owned or managed by multiple organisations and include facilities that provide access to open water, estuaries, and fresh water. MSQ’s long term vision is to provide unrestricted access to open water from facilities along the Queensland coast such that all significant population centres are within one hour 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 the Gladstone LGA

| Owner | Open water boat ramps | | Other boat ramps | | Landings | |
| --- | --- | --- | --- | --- | --- | --- |
| Facilities | Lanes | Facilities | Lanes | Pontoons | Jetties |
| Gladstone Ports Corporation Limited | 2 | 6 |  |  |  | 3 |
| TMR | 6 | 16 | 10 | 13 |  |  |
| Gladstone Area Water Board |  |  | 1 | 2 |  |  |
| Gladstone Regional Council | 1 | 1 | 1 | 1 | 2 |  |

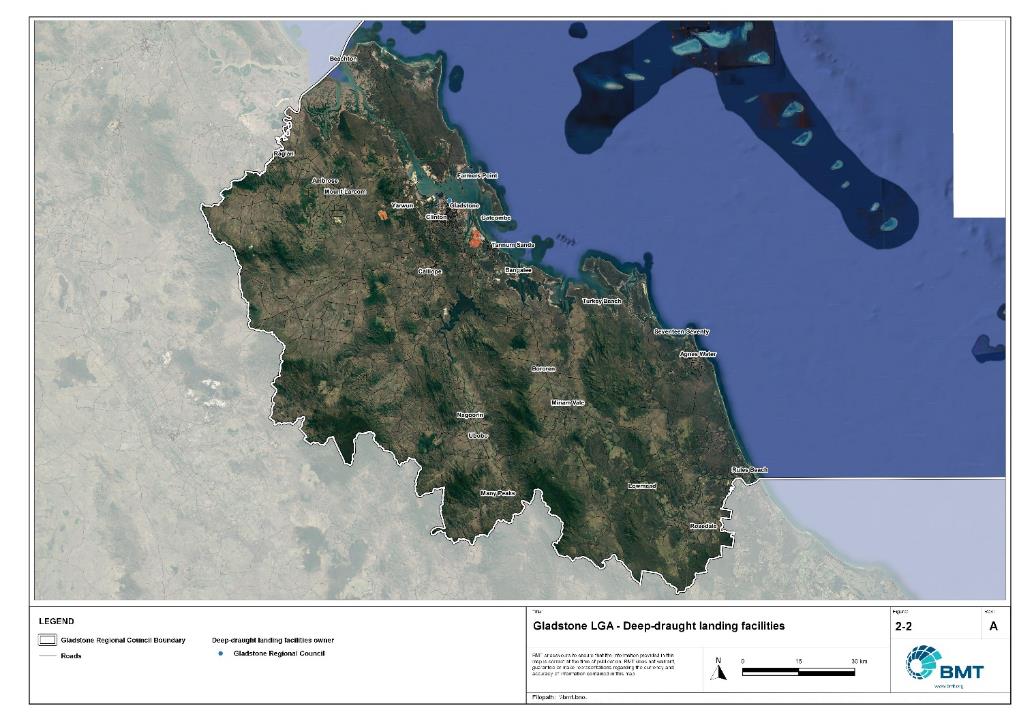
Each of the boat launching facilities within the LGA are shown in Figure 2.1 and deep-draught vessel landings in Figure 2.2.

Access to land from deep-draught vessels is catered for by the provision of landings such as jetties and pontoons that are intended for short term usage, mainly to drop off and embark passengers and supplies. Within Gladstone LGA these vessels are catered for by the pontoon at Flinders Parade, Auckland Creek (O’Connell Wharf).



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Gladstone LGA – Boat launching facilities



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Gladstone LGA – Deep-draught landing facilities

## Existing usage and issues

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

* + 1. Insufficient capacity at Seventeen Seventy

The existing facility at Seventeen Seventy is three lanes with 46 CTU parking spaces. This is a very popular launching point to access offshore waters from this region, including reefs and islands. The township is frequented by large numbers of tourists (from within and outside the Gladstone LGA), as well as locals, and boating is a very popular recreational activity here. At present, this facility is not catering for demand and it should be upgraded.

* + 1. Destinations

There are various destinations for recreational boating within the Gladstone LGA, offshore and through the inland waterways. Recreational fishing is a major contributor to driving demand. There is an equitable number of facilities that provide offshore access, and great opportunities for boating inland as well. This distribution of destinations encourages a distribution of facility use, and as such reduces the pressures on specific facilities.

* + 1. Queuing Facilities

Queuing facilities improve the throughput at facilities, allowing vessels to be tied up off the ramp while a vehicle is parked or retrieved, allowing the next user to user the boat ramp lane. There is a lack of queuing infrastructure at Gladstone LGA facilities, with over half of the facilities in the whole LGA having no form of queuing facility (for example, floating walkway, pontoon or queuing beach). These are preferable from a throughput perspective, as mentioned, but also from an amenity and safety perspective. Disabled or elderly users may benefit from a queuing facility which assists in embarking/disembarking the vessel, while safely avoiding crocodiles or stingers is also a factor for consideration.

# 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:

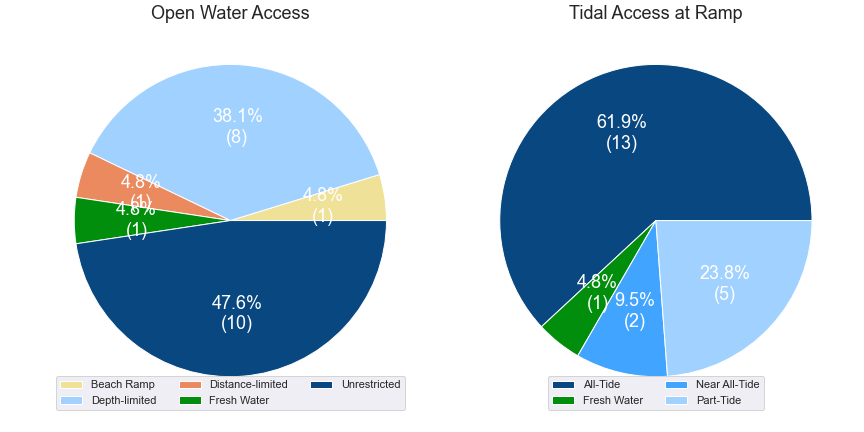
* Open water access: There are no restrictions between the facility and open water.
* Depth-limited access: There are depth restrictions between the facility and open water that limit navigable access to part of the tidal range. This differs from tidal constraints at the actual facility, which might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

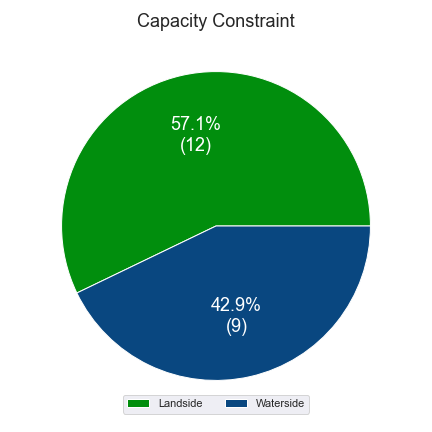
* + 1. Existing boat launching capacity

Within the Gladstone LGA there are 21 boat launching facilities with a total effective capacity of 24.6 lanes. The effective capacity of boat launching facilities within the Gladstone 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 39 total lanes, with an effective capacity of 24.6 effective lanes. This effective capacity is primarily reduced due to insufficient parking being allocated for each lane.
* Boat users in the Gladstone LGA have a range of options for boating, primarily offshore destinations (islands and reefs) and the creek systems, as well as a freshwater destination inland.
* The majority of the facilities in the LGA provide all-tide access.



(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

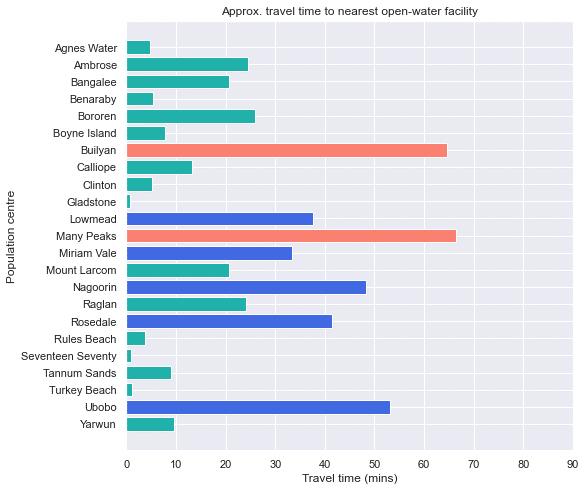
## Access to sheltered near all-tide and all-tide facilities

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:

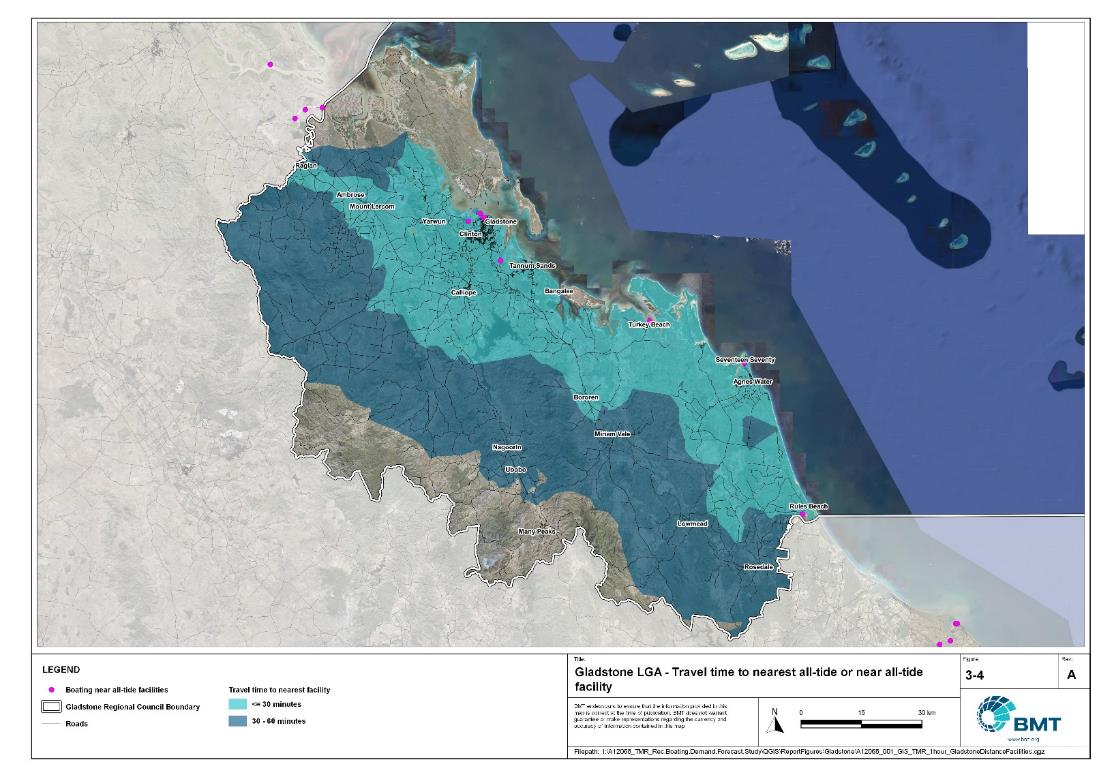
* for restricted roads, 40km/hr
* for local roads, 60km/hr
* for connector roads, 70km/hr
* for distributor roads, 80km/hr
* for highways, 100km/hr.

For the Gladstone LGA the median travel time from eligible Population Centres to the nearest sheltered all-tide or near all-tide facility is 21 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 the Gladstone LGA are:

* 91% of the eligible population centres are within the desired 1-hour travel time.
* The majority of eligible population centres are within 30 minutes of a sheltered near all-tide or all-tide facility.



Distribution of travel time from the Gladstone LGA eligible population centres to sheltered near all-tide facilities



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

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## 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 the Gladstone LGA there is one deep-draught vessel landing providing access:

* Flinders Parade, Auckland Creek (pontoon adjacent O’Connell Wharf) is located next to East Shores parkland and is a short walk from the CBD, with public transport options available as well. No pump-out facilities are provided.

The public pontoon at Seventeen Seventy is not included as a deep-draught vessel landing due to depth limitations both at the pontoon and at the bar. Although it is possible for deep-draught vessels to navigate this bar, it is dynamic and at times can be treacherous.

Gladstone LGA has additional deep-draught vessel landings provided by private facilities, some of which provide free short stay facilities for vessels, such as Gladstone Marina, which can provide free mooring for up to 3 hours if arranged prior to arrival.

In summary, Table 3.2 shows the total capacity of deep-draught landing facilities within Gladstone LGA.

Deep-draught landing facilities within the Gladstone LGA

| Facility type | Total capacity |
| --- | --- |
| Public sheltered mainland landings | 1 |
| Private sheltered landings | 1 facility – Gladstone Marina regularly has various berths available |
| **Total** | **2** |

# 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 Gladstone LGA the activation rate is assumed to be 10%, with the key factors influencing the rate including:

* its classification as a Regional Centre
* 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.

## Digital user survey

To gain an understanding of usage trends at existing formal recreational boating facilities across Queensland, the Study has considered the results of a digital user survey using human movement data, sourced through a third party. The data was acquired from a location data store with more than 13 trillion mobile location observations globally from 2019 to present, which were sourced from 250,000 different mobile phone applications that users ‘opted-in’ to use the location services under the application’s terms and conditions. All data received was deidentified and compliant with relevant data privacy regulations.

The analysis uses mobile devices (such as telephones) location data as a proxy for boat user traffic, however, this relationship has several limitations including, but not limited to:

* Mobile device users detected in the area of interest may not be boat users (for example, pedestrians not using vessels may walk through the detection area).
* The relationship between mobile device users and vessels may not be 1:1 (that is, there may be multiple mobile devices providing data for each vessel).
* Users of vessels may not have a mobile device, may not be using a mobile device or may not have provided permission to use their location data.

With these, and potentially other, limitations in mind, the Study compared this data against vessel launching counts provided by various facility managers and found that approximately 15-30% of vessels are captured using this digital survey method. This percentage can change from facility to facility and from day to day. Consequently, the Study has not relied on raw counts of users from this data, but instead considered the relative trends within the data, with the assumption that no groups (for example, users from a particular LGA or using a particular facility) within the data would be more or less likely to be captured by the technique.

The Study has used this data to identify the relative volume of users, the ‘home’ local government area of users and the popularity of destinations that users travel to once vessels have been launched.

* + 1. Inter-LGA demand

The human movement data has been interrogated to determine the LGA of origin for users of the Gladstone LGA’s public boating facilities to ascertain the proportion of users from each LGA that are using specific facilities. Statistics from all public boating facilities within the LGA are then grouped together to determine the total proportion of resident or visiting users across the LGA. Table 4.1 shows the active fleet proportion from the top 10 LGAs contributing to demand on facilities within the Gladstone LGA. All other sources have been grouped together.

LGA of origin for active fleet in the Gladstone LGA

| LGA of origin | Active fleet proportion |
| --- | --- |
| Gladstone | 70.20% |
| Brisbane | 3.60% |
| Bundaberg | 2.70% |
| Sunshine Coast | 2.60% |
| Moreton Bay | 2.60% |
| Rockhampton | 1.90% |
| Gold Coast | 1.70% |
| Fraser Coast | 1.20% |
| Logan | 1.20% |
| Livingstone | 1.00% |
| Other LGAs | 11.50% |

* + 1. Intra-LGA demand distribution

Recreational boat users will tend to use facilities that best suit their needs, the destinations they want to access, the capability of their vessel and the weather conditions. Consequently, distribution within an LGA is unlikely to be evenly spread across all facilities, with some facilities attracting users disproportionately due to amenity, access, or destinations. The attractiveness of large well-designed facilities is likely to draw visiting boat users in preference to smaller or less desirable facilities across the LGA. The human movement statistics have been assessed to qualitatively estimate the proportion of users using each facility, both in total and with respect to both resident and visiting boat users (Table 4.2).

Popularity of boat launching facilities.

| Facility | Overall fleet | Resident fleet | Visiting fleet |
| --- | --- | --- | --- |
| Boyne Island, David Bray Park | 20.50% | 25.10% | 9.60% |
| Toolooa, Gladstone - Benaraby Road | 19.10% | 23.20% | 9.50% |
| Seventeen Seventy, Captain Cook Drive (1770) | 13.40% | 4.30% | 34.90% |
| Gladstone Marina, Alf O'Rourke Drive | 8.90% | 10.40% | 5.40% |
| Tannum Sands, Wild Cattle Creek Road | 7.30% | 7.50% | 6.70% |
| Awoonga Dam | 5.50% | 4.60% | 7.60% |
| Boyne Island, Alexander Street | 5.10% | 6.70% | 1.50% |
| Calliope River, south bank, beside old Bruce Highway | 4.70% | 3.60% | 7.20% |
| Turkey Beach, Hancock Street | 3.70% | 2.40% | 6.60% |
| Hanson Road, Powerhouse, NRG, Calliope River | 3.60% | 4.00% | 2.70% |
| Tannum Sands, Tiller Street (Ibis Park) | 2.20% | 2.80% | 0.90% |
| Curtis Island | 1.90% | 1.80% | 2.10% |
| Gladstone, Morgan Street | 1.50% | 1.80% | 0.90% |
| Gladstone, Goondoon Street | 1.00% | 1.20% | 0.80% |
| Baffle Creek, Coast Road | 0.70% | 0.20% | 2.00% |
| Rosedale, Ferry Road (Baffle Creek) | 0.40% | 0.10% | 1.00% |
| Ramsay Crossing | 0.20% | 0.10% | 0.30% |
| The Narrows | 0.20% | 0.10% | 0.20% |
| Curtis Island, South End Terrace | 0.20% | 0.20% | 0.20% |

The results indicate that there are a few facilities that were preferred to launch from, as well as a divide between ramps commonly used by residents and visitors. The David Bray Park facility on Boyne Island registers a very high proportion of the resident fleet, servicing the Tannum Sands locality and providing offshore access. There aresimilar results from the Toolooa facility (access to creek systems very popular for fishing), which registered a significantly higher proportion of the resident fleet than the visiting fleet.

The numbers for the visiting fleet are concentrated at the Seventeen Seventy facility, with a large portion of the visiting fleet frequenting this facility. This emphasises the high tourism value that this ramp has to the Gladstone LGA, despite the known capacity and open-water access constraint issues.

The Gladstone Marina facility (Alf O’Rourke Drive) also ranks quite highly in terms of popular facilities, which provides direct offshore access from a location close to the population centre of Gladstone.

The distribution of capacity within the LGA needs to consider these trends to avoid consistent capacity shortfalls at some facilities or indicating demand for unnecessary extra capacity at other facilities. Results from the above statistics and feedback obtained through the TMR online survey indicate that within the Gladstone LGA the following factors tend to influence the preferred facilities for recreational boat users:

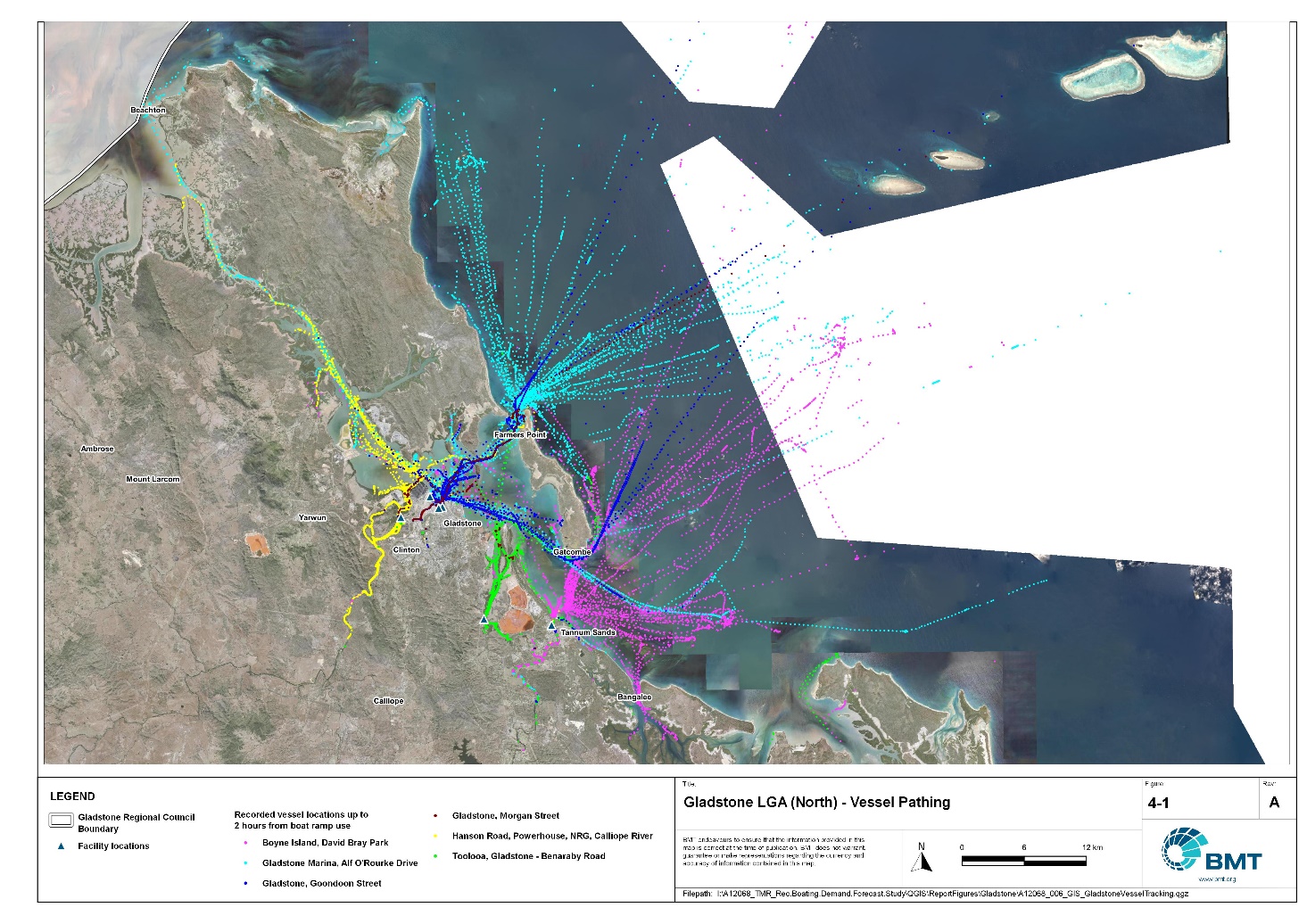
* dry entry/exit capabilities of launching facilities provided through floating walkways and pontoons
* preferred locations for desired activity (for example, fishing)
* parking capacity
* condition of the ramps (feedback indicates some ramps have maintenance issues, such as being slippery and unsafe due to mud covering).
  + 1. Destinations

For facilities that provide sheltered, near all-tide or all-tide open water access, additional analysis of the human movement statistics has been undertaken to identify destinations for users of these facilities. Location data from users utilising the facilities was extracted for a period of two hours after they used the facility, and trimmed for waterside destinations. For the Gladstone LGA this additional analysis was applied to the following facilities, with destinations mapped in Figure 4.1 and Figure 4.2. :

* Boyne Island, David Bray Park
* Gladstone Marina, Alf O’Rourke Drive
* Gladstone, Goondoon Street
* Gladstone, Morgan Street
* Hansom Road, Powerhouse, NRG, Calliope River
* Toolooa, Gladstone– Benaraby Road
* Seventeen Seventy, Captain Cook Drive
* Turkey Beach, Hancock Street.

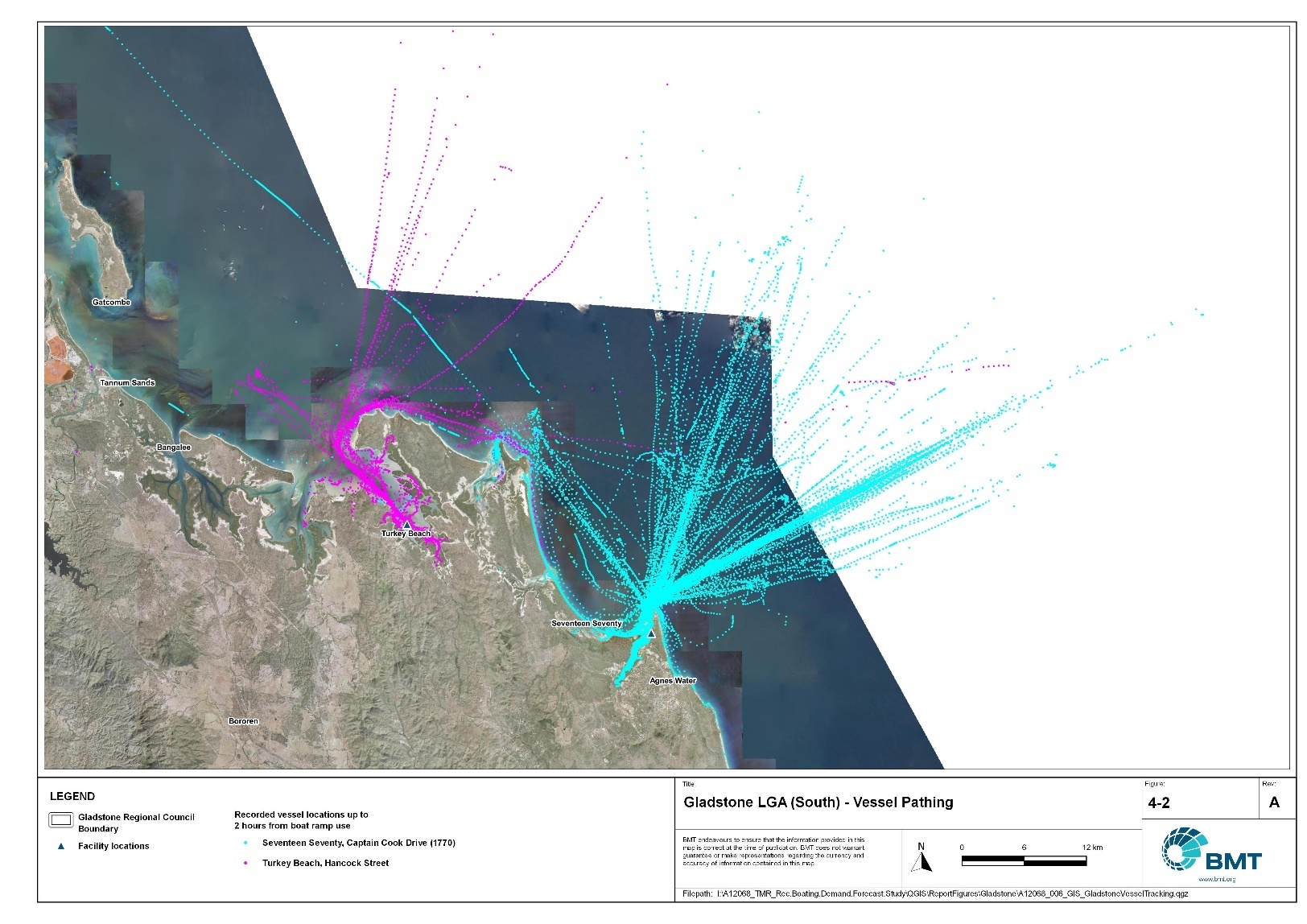
From this additional analysis, the following notable observations were made:

* Users accessing open water destinations gave preference to the Gladstone Marina, Boyne Island and Seventeen Seventy facilities (as well as Goondoon Street, to a lesser extent). Contributing factors here are likely that these are the closest facilities to various pen water destinations, as well as the capacity on the waterside and landside of these facilities.
* Users of the facility on the Calliope River were more likely to remain in the river or the Narrows, between Curtis Island and the mainland.
* The Seventeen Seventy facility provides access to a widely dispersed range of destinations, with open water ventures tracked in a wide range of directions, mostly heading towards the Capricorn-Bunker Group of islands, known for its reefs and islands.
* Those launching from Turkey Beach are likely to remain in the waters around Eurimbula, with only occasional use of this facility for ventures to open water.
* Inside the surrounding islands (between islands and mainland), there are dispersed tracking paths to various areas and inlets, indicating that users tend to spread out within these areas for fishing in quieter spots.



Gladstone LGA (North) – Vessel Pathing

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Gladstone LGA (South) – Vessel pathing

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## 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 outlined in Table 4.1.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 4.3.

Active fleet vessel size

| Vessel length | 2021 | 2026 | 2031 | 2036 | 2041 |
| --- | --- | --- | --- | --- | --- |
| 0 to 4.5m | 721 | 739 | 760 | 774 | 785 |
| 4.5m to 8m | 355 | 364 | 374 | 380 | 385 |
| >8m | 28 | 29 | 29 | 29 | 29 |
| Total | 1104 | 1132 | 1162 | 1183 | 1199 |

## Boat ramp lane demand

The fleet size derived in Table 4.3 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 03.1.2 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 4.4.

Boat ramp lane demand

|  | 2021 | 2026 | 2031 | 2036 | 2041 |
| --- | --- | --- | --- | --- | --- |
| Boat ramp lane demand | 26.9 | 27.6 | 28.3 | 28.8 | 29.2 |

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

* a substantially sized local fleet, with a high proportion of trailable vessels
* attractive open water and coastal destinations for visitors from south-east Queensland, as well as popular landside holiday locations with excellent boating opportunities (Seventeen Seventy).

## 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 Gladstone LGA suitable facilities for deep-draught vessels include the public pontoon on Flinders Parade, and the private facilities at the Gladstone Marina.

Within the east coast network but outside the LGA, the nearest deep-draught vessel landings in either direction from the facility at Flinders Pde, Gladstone are 101 nautical miles to the south (Bundaberg public pontoon) and 58 nautical miles to the north (Rosslyn Bay). At present, the public pontoon at Seventeen Seventy is limited by the sand shoals that exist around it and at the creek entrance and has not been included in these calculations.

The public pontoon at Flinders Pde, Gladstone provides excellent access to the CBD for supplies and provisions, as well as public transport options, but no fuel or sewage pump out facilities are available for public use. For vessels seeking to stay in the region, protected mooring or berthing is seasonally available at private facilities in the Gladstone Marina.

* + 1. Landing demand

Statistical demand for deep-draught vessel landings has been assessed based on the size of the non-trailable fleet within the Gladstone 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 the Gladstone LGA the demand for deep-draught vessel landings is outlined in Table 4.5

Deep-draught vessel landing demand

| Requirement | 2021 | 2026 | 2031 | 2036 | 2041 |
| --- | --- | --- | --- | --- | --- |
| No. of Landings | 1.4 | 1.4 | 1.4 | 1.5 | 1.5 |

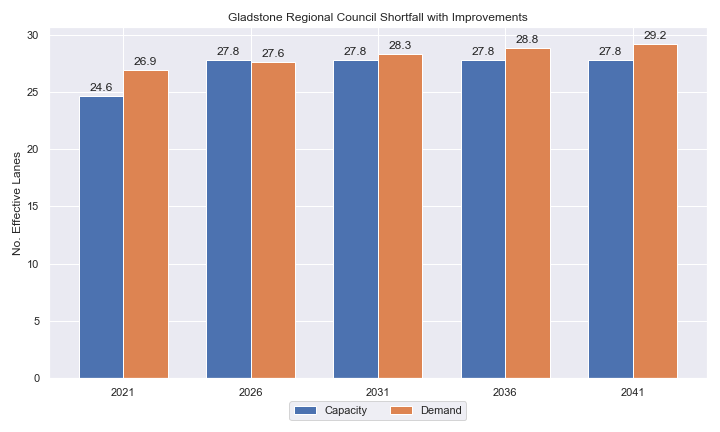
# Shortfall Assessment

## Shortfall assessment – boat ramps

The shortfall of boat ramp lanes within the Gladstone LGA is shown in Table 5.1 and Figure 5.1 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 | 2021 | 2026 | 2031 | 2036 | 2041 |
| Existing | Capacity | 26.9 | 27.6 | 28.3 | 28.8 | 29.2 |
| **Shortfall** | 24.6 | 24.6 | 24.6 | 24.6 | 24.6 |
| Improved | Capacity | 2.3 | 3 | 3.7 | 4.2 | 4.6 |
| **Shortfall** | 24.6 | 27.8 | 27.8 | 27.8 | 27.8 |



Shortfall assessment with recommended upgrades adopted.

* + 1. Open water access shortfall in boat ramp lanes

Statistical capacity has been calculated across the Gladstone LGA in its entirety, however, some facilities are evidently more popular than others due to their ability to access open water destinations, and/or their usability. In general, larger vessels are more suited to access open water destinations while smaller vessels are more likely to remain in sheltered environments. This was identified in the 2017 study and confirmed during discussions with stakeholders. The human movement data indicates that visiting boats from other LGAs are drawn to facilities that provide access to open water destinations. To ensure that the capacity of effective boat ramp lanes in the LGA is appropriately distributed to cater for these usage trends, it is worth assessing facilities providing this desirable access as a subset of the total capacity for the LGA. A ‘scenario’ approach to assessing this capacity (Table 5.2) has been developed, with Scenario 1 derived from empirical estimates of vessel distribution and Scenario 2 derived from the human movement statistics, and the result averaged between the two scenarios. This provides the opportunity to rationalise the figure that drives the demand and acknowledge when one scenario is not representative of the population or consistent with stakeholder feedback. The scenarios that were assessed are:

Scenario 1: 80% of larger vessels and 20% of smaller vessels from the local fleet and 80% of the visiting fleet are using the facilities with unrestricted open water access.

Scenario 2: Distributing the fleet between facilities as per the human movement statistics.

Shortfall assessment for open water, all-tide or near all-tide facilities for Gladstone LGA

| Assessment | Metric | 2021 | 2026 | 2031 | 2036 | 2041 |
| --- | --- | --- | --- | --- | --- | --- |
| Overall | Capacity | 16 | 16 | 16 | 16 | 16 |
| Scenario 1 | Demand | 15.7 | 16.1 | 16.6 | 16.9 | 17.2 |
| Shortfall | -0.3 | 0.1 | 0.6 | 0.9 | 1.2 |
| Scenario 2 | Demand | 13.9 | 14.3 | 14.7 | 15 | 15.2 |
| Shortfall | -2.1 | -1.7 | -1.3 | -1 | -0.8 |
| **Average** | Demand | 14.8 | 15.2 | 15.65 | 15.95 | 16.2 |
| **Shortfall** | -1.2 | -0.8 | -0.35 | -0.05 | 0.2 |

Comparing the LGA-scale shortfall with the subset of facilities providing protected all-tide or near all-tide access to open water indicate that the demand is well distributed within the LGA, and that facility users that are seeking this type of facility are well catered for in the Gladstone LGA at present.

## Shortfall assessment – deep-draught landings

The shortfall of public deep-draught landings for the Gladstone LGA is provided in Table 5.3.The existing capacity is statistically adequate to meet demand, particularly with the inclusion of facilities at the Gladstone Marina.

Shortfall of deep-draught vessel landings

| Assessment | Metric | 2021 | 2026 | 2031 | 2036 | 2041 |
| --- | --- | --- | --- | --- | --- | --- |
| Deep-draught vessel landings | Demand | 1.4 | 1.4 | 1.4 | 1.5 | 1.5 |
| Capacity | 1 | 1 | 1 | 1 | 1 |
| **Shortfall** | 0.4 | 0.4 | 0.4 | 0.5 | 0.5 |

# 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 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 the Gladstone LGA, the Study team met with Gladstone Regional Council, Gladstone Port Corporation, and Maritime Safety Queensland to discuss recreational boating facilities within the region. This consultation process identified a range of potential opportunities to alleviate demand pressures. 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 6.1.

Stakeholder identified opportunities

| Location | Stakeholder opportunity | Review comments |
| --- | --- | --- |
| Seventeen Seventy | Concept to upgrade the facility with 110 CTU spaces and upgrades to the boat ramp. | Concept is excellent and one of the few solutions to the site, which has mulitpleheavy constraints. |
| Boyne Island, David Bray Park | Reconfigure the floating walkway to be in the centre of the ramp. | Agreed. This would be worth doing at a convenient time in the asset life of the floating walkway. |
| Kalkie, McGills Road | Add in additional queuing facility or mooring rings. | Floating infrastructure is unsuitable for this site, but provision of tie-up points is supported. |
| Toolooa | Provision of additional parking to the south. | Additional parking would provide increased capacity at this facility. |

## 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 the Gladstone LGA a total of 128 submissions was received, with 81% of respondents using trailable power boats and 97% of respondents using recreational boating facilities at least once a month. For the Gladstone LGA the following statistics or themes were extracted from the survey and associated comments:

* 100% of respondents typically travel less than 1-hour to their preferred boat ramp (which may not be their closest facility).
* 63% of respondents indicated that floating walkways are their preferred type of queuing facility.
* 87% 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:
  + SES Grounds (to service Seventeen Seventy Marina, Captain Cook Drive, and Round Hill Creek areas)
  + South End on Curtis Island
  + Calliope River (near Byellee Road)
  + Boyne Island (more lanes for the existing boat ramp or a new multi-lane boat ramp, preferably at Tarcoola Drive).
* The following themes were identified with respect to existing facilities:
  + high demand for pontoons or floating walkways (for example, Tarcoola Drive at Boyne Island, Seaview Terrace at South End Curtis Island, Goondoon Street, Gladstone CBD, Lake Awoonga, Tiller Street, Seventeen Seventy Marina, Port Alma)
  + dangerous boat ramps (for example, South End Curtis Island, Seventeen Seventy) that need serious improvements
  + shortage of parking spaces, preferably secured with CCTV at popular boat ramps (for example, Seventeen Seventy Marina, Captain Cook Drive, and Boyne Island)
  + desirable addition of fish cleaning facilities, filleting tables, and wash down areas (for example, Seventeen Seventy Marina boat ramp)
  + need for more toilets, rubbish bins, and night-time lighting.
* Where the closest available boat launching facility was not preferred, respondents indicated that the following key aspects influenced their choice:
  + looking for boat ramps with pontoons/floating walkways
  + looking for (secure and adequate) parking areas
  + looking for all-tide or near all-tide boat ramps.
* Respondents were provided an opportunity to provide additional feedback, with the following themes identified:
  + There was acknowledgement that the number of existing boat ramps were adequate, but in need of upgrading and maintenance in terms of repairing, cleaning, and installing pontoons. There was recognition of population growth and the need for more car parks, multiple lanes and perhaps larger boat ramps.
  + Safety concerns were reported at existing boat ramps, including the need for pontoons to separate users from crocodiles, unsafe low-tide and slippery boat ramps, and conflicts with other beach users, particularly boat ramps in the middle of the beach putting swimmers at risk (for example, Seaview Terrace, South End Terrace, Tarcoola Drive).
  + A high demand for upgrading and maintaining Seventeen Seventy Marina boat ramp was identified regarding secure parking shortage, and need for pontoon and fish cleaning facilities. Safety concerns towards pedestrians, cyclists, tourists, and sightseers walking around the facility was also reported.

There was a considerable demand to provide a better small recreational facility at Curtis Island since the current commercial ramp is intended for ferries and large boats, putting small boats in danger during launching/retrieving. The current recreational ramp is tide-restricted, and not easy to use for commuting (jobs on the mainland, residence on Curtis Island). Incidents with the barge were reported, such as interference with launching and retrieval and serious concerns regarding the potential for future accidents. The Curtis Island commercial ramp was repeatedly reported to be difficult to use and dangerous due to its design and ramp position. A need for a pontoon or floating walkway was also reported.

# 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 land-side recommendations were delivered, while 16% of water-side recommendations were delivered.

Within the Gladstone 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, many of the recommendations proposed in the 2017 GHD study remain viable. This current Study has reviewed the unimplemented 2017 recommendations (Table 7.1) for the Gladstone 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 |  |  |  |
| Seventeen Seventy, Captain Cook Drive | Acquire land to achieve 90 CTU spaces. Expand ramp to four lanes with a floating walkway. | Viable with modifications | Further capacity is required to cater for demand. |
| Priority 2 | | | |
| Toolooa, Gladstone-Benaraby Road | Expand parking area to the north and south of existing area to achieve 45 CTU spaces. | No longer viable | Capacity is sufficient without this upgrade. May be considered further in future demand studies. |
| Priority 3 | | | |
| Tannum Sands, Tiller Street (Ibis Park) | Expand parking to the east towards Bevington Street. | No longer viable | Capacity is sufficient without this upgrade. May be considered further in future demand studies. |
| Priority 4 | | | |
| Calliope River, Beecher | Construct a 2-lane ramp with a floating walkway. Construct parking for 45 CTU spaces. | No longer viable | Capacity is sufficient without this upgrade. May be considered further in future demand studies. |
| Broadacres Drive, Tannum Sands | Construct a 2-lane ramp with a floating walkway. Construct parking for 45 CTU spaces. | No longer viable | Capacity is sufficient without this upgrade. May be considered further in future demand studies. |

## 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. Furthermore, 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. 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 are provided in Table 7.2 with full detail of each recommendation in the tables that follow.

Summary of recommendations for Gladstone LGA

| Priority | Description | Landside or Waterside | Increased capacity  (Effective lanes) |
| --- | --- | --- | --- |
| 1 | Seventeen Seventy, Captain Cook Drive: Realign the road and upgrade facility to include 4-lanes with 2 floating walkways and provide 130 CTU spaces. | Both | 3.2 lanes |

## Priority 1 recommendations

Seventeen Seventy, Captain Cook Drive - (Priority 1)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| General description | | | | |
| Location | Captain Cook Drive, Seventeen Seventy | | | |
| Existing Facility? | Yes | | | |
| Coordinates | -24.171312334082337, 151.88302231640913 | | | |
| Existing tidal status | Near all-tide | | | |
| Existing wave exposure | Nil | | | |
| Existing current exposure | Nil | | | |
| Proposed works | Realign road and upgrade facility to include 4-lanes with 2 floating walkways and a greater capacity parking area with 130 CTU parking spaces. | | | |
| Increased effective capacity | 3.2 effective lanes | | | |
| Capacity improvement position | Waterside | Landside | | Both |
| Rationale | This facility is a high-demand tourist facility with excellent access into the southern Great Barrier Reef. At present the capacity of the facility is limited and lacks any queuing facilities to assist with launching and retrieving vessels. The proposed solution realigns the road that currently separates the parking facility from the boat ramp and expands the facility to cater for the demand pressure that is coming both from Gladstone LGA and from visitors from across Queensland. | | | |
| Anticipated Costs (+/- 50%) | Waterside infrastructure | | $2,350,000 | |
| Landside infrastructure | | $1,400,000 | |
| Planning, environmental and approvals constraints | | | | |
| Assessment | Requirement | Comments | | |
| Fish Habitat Zone | X | N/A | | |
| Native Title | ü | New tenure required for works so interaction with Native Title required | | |
| MCU requirement | ü | Parking lot works will likely trigger a Development Permit for a Material Change of Use | | |
| Clearing remnant vegetation | ü | The carpark works are within an area containing RVM category B – remnant vegetation. A Development Permit may be required for the clearing of remnant vegetation. | | |
| GBRWHA | ü | The marine-based works are within the GBRWHA and therefore, may trigger a Controlled Activity Approval is there is likely to be a significant impact. | | |
| Marine Park | ü | Marine-based works are within the Great Barrier Reef Coast Marine Park (Round Hill Creek) in a General Use Zone. Therefore, a Marine Park Permit may be required. | | |
| Tidal works assessment | ü | Marine-based works will likely be tidal works and therefore will require a Development Permit. | | |
| Other as required | ü | Marine Plants – the boat ramp works may impact marine plants and therefore may require a Development Permit for marine plant disturbance.  State Controlled Road - New parking lot works will interact with a State Controlled Road and will likely require a Development Permit. | | |
| Sea Level Rise | ü | Marine-based works are within the boundaries of the erosion prone area subject to sea level rise. | | |
| Storm Tide Hazard | ü | The marine-based works is within a high storm tide hazard area. Some areas of the carpark and road upgrade are within a medium to high hazard area. | | |
| Anticipated Complexity | Low | Medium | | High |

Map

Description automatically generated with low confidence

Priority 1 Recommendation – Seventeen Seventy, Captain Cook Drive

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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 | Queuing facility | Formal CTUs | Informal CTUs | Waterside capacity | Landside capacity | Effective capacity | Constraint |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Open Water Access** | | | | | | | | | | | |
| GL11 | Toolooa, Gladstone - Benaraby Road | 2 | All-Tide | All-Tide | Floating Walkway | 10 |  | 3 | 0.75 | 0.75 |
| GL27 | Curtis Island | 1 | All-Tide | All-Tide | Pontoon | 0 |  | 1.2 | 0 | 0 |
| GL31 | Hanson Road, Powerhouse, NRG, Calliope River | 4 | All-Tide | All-Tide | Floating Walkway | 75 |  | 5.4 | 3.25 | 3.25 |
| GL81 | Gladstone, Goondoon Street | 3 | All-Tide | All-Tide | Pontoon | 17 |  | 3.4 | 1.25 | 1.25 |
| GL86 | Gladstone, Morgan Street | 2 | All-Tide | All-Tide | None | 20 |  | 2 | 1.25 | 1.25 |
| GL89 | Gladstone Marina, Alf O'Rourke Drive | 5 | All-Tide | All-Tide | Floating Walkway | 110 |  | 7.4 | 5 | 5 |
| MV21 | Seventeen Seventy, Captain Cook Drive (1770) | 3 | Near All-Tide | Near All-Tide | Beach | 46 |  | 2.64 | 2.25 | 2.25 |
| MV31 | Turkey Beach, Hancock Street | 2 | All-Tide | All-Tide | Floating Walkway | 25 |  | 3 | 1.5 | 1.5 |
|  | Albion Park, Gladstone | 1 | All-Tide |  | None |  | 10 | 1 | 0.75 | 0.75 |
| **Subtotal** |  | **23** |  |  |  | **303** | **10** | **29** | **16** | **16** |
| **Depth-limited** | | | | | | | | | | | |
| CP11 | Tannum Sands, Wild Cattle Creek Road | 1 | Part-Tide | Part-Tide | None | 8 |  | 0.5 | 1 | 0.5 |
| CP12 | Tannum Sands, Tiller Street (Ibis Park) | 1 | Near All-Tide | Near All-Tide | None | 10 |  | 0.8 | 0.75 | 0.75 |
| CP21 | Boyne Island, David Bray Park | 4 | Near All-Tide | Near All-Tide | Floating Walkway | 20 |  | 4.8 | 1.25 | 1.25 |
| CP26 | Boyne Island, Alexander Street | 1 | Near All-Tide | Near All-Tide | None | 20 |  | 0.8 | 1.25 | 0.8 |
| CP51 | The Narrows | 1 | Part-Tide | Part-Tide | None | 10 |  | 0.5 | 1 | 0.5 |
| CP52 | Ramsay Crossing | 1 | Near All-Tide | Part-Tide | None | 10 |  | 0.8 | 1 | 0.8 |
| MV11 | Rosedale, Ferry Road (Baffle Creek) | 1 | Part-Tide | Part-Tide | None | 10 |  | 0.5 | 1 | 0.5 |
| MV15 | Baffle Creek, Coast Road | 1 | Part-Tide | Near All-Tide | None | 10 |  | 0.5 | 1 | 0.5 |
|  | Baffle Creek, Flat Rock Road | 1 | Part-Tide |  | None | 8 |  | 1 | 0.75 | 0.75 |
| **Subtotal** |  | **12** |  |  |  | **106** | **0** | **10.2** | **9** | **6.35** |
| **Fresh water** | | | | | | | | | | |
| CP16 | Awoonga Dam | 2 | Fresh Water | Fresh Water | None | 30 |  | 2 | 1.5 | 1.5 |
| CP41 | Calliope River, south bank, beside old Bruce Highway | 1 | Fresh Water | Part-Tide | None | 8 |  | 0.5 | 0.75 | 0.5 |
| **Subtotal** |  | **3** |  |  |  | **38** | **0** | **2.5** | **2.25** | **2** |
| **Beach ramps** | | | | | | | | | | |
| GL21 | Curtis Island, South End Terrace | 1 | Part-Tide | Part-Tide | Beach | 10 |  | 0.28 | 1 | 0.28 |
| **Subtotal** |  | **1** |  |  |  | **10** | **0** | **0.28** | **1** | **0.28** |
| **Total effective capacity** | | | | | | | | | **24.63** |  | |

###### 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) |
| --- | --- |
| Agnes Water | 4.7 |
| Ambrose | 24.5 |
| Bangalee | 20.6 |
| Benaraby | 5.4 |
| Bororen | 25.9 |
| Boyne Island | 7.8 |
| Builyan | 64.7 |
| Calliope | 13.2 |
| Clinton | 5.2 |
| Gladstone | 0.7 |
| Lowmead | 37.6 |
| Many Peaks | 66.5 |
| Miriam Vale | 33.4 |
| Mount Larcom | 20.7 |
| Nagoorin | 48.3 |
| Raglan | 24.1 |
| Rosedale | 41.5 |
| Rules Beach | 3.7 |
| Seventeen Seventy | 1.0 |
| Tannum Sands | 9.0 |
| Turkey Beach | 1.1 |
| Ubobo | 53.2 |
| Yarwun | 9.6 |

###### Facility Use

Boat launching facility usage statistics

| Facility ID | Facility name | Total reports | Gladstone | Brisbane | Bundaberg | Sunshine Coast | Moreton Bay | Rockhampton | Gold Coast | Fraser Coast | Logan | Livingstone | Other LGAs |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Total |  | 36837 | 25864 | 1321 | 1000 | 945 | 942 | 688 | 613 | 428 | 427 | 376 | 4233 |
| Total % |  | 100.0% | 70.2% | 3.6% | 2.7% | 2.6% | 2.6% | 1.9% | 1.7% | 1.2% | 1.2% | 1.0% | 11.5% |
| CP21 | Boyne Island, David Bray Park | 7548 | 86.0% | 1.7% | 0.8% | 0.8% | 1.6% | 0.5% | 0.7% | 0.5% | 0.5% | 0.6% | 6.1% |
| GL11 | Toolooa, Gladstone - Benaraby Road | 7027 | 85.2% | 2.1% | 1.5% | 1.0% | 1.4% | 0.9% | 0.8% | 0.8% | 0.5% | 0.4% | 5.4% |
| MV21 | Seventeen Seventy, Captain Cook Drive (1770) | 4940 | 22.4% | 12.6% | 7.3% | 7.9% | 8.0% | 2.1% | 5.5% | 2.8% | 3.6% | 1.5% | 26.3% |
| GL89 | Gladstone Marina, Alf O'Rourke Drive | 3278 | 82.0% | 1.3% | 1.0% | 3.1% | 0.8% | 1.4% | 1.3% | 0.5% | 1.1% | 0.6% | 7.0% |
| CP11 | Tannum Sands, Wild Cattle Creek Road | 2679 | 72.5% | 3.1% | 1.6% | 1.9% | 2.8% | 1.6% | 1.3% | 1.3% | 0.9% | 1.5% | 11.5% |
| CP16 | Awoonga Dam | 2020 | 58.9% | 1.9% | 2.9% | 4.1% | 2.5% | 4.2% | 3.5% | 1.1% | 1.8% | 4.3% | 15.0% |
| CP26 | Boyne Island, Alexander Street | 1897 | 91.6% | 0.3% | 0.6% | 0.8% | 0.7% | 0.3% | 0.1% | 0.6% | 0.3% | 1.5% | 3.2% |
| CP41 | Calliope River, south bank, beside old Bruce Highway | 1719 | 53.8% | 2.6% | 3.0% | 2.2% | 3.4% | 4.2% | 1.5% | 3.0% | 1.6% | 1.7% | 23.1% |
| MV31 | Turkey Beach, Hancock Street | 1357 | 46.6% | 6.5% | 10.2% | 4.1% | 1.8% | 1.8% | 1.6% | 1.3% | 0.4% | 0.7% | 25.0% |
| GL31 | Hanson Road, Powerhouse, NRG, Calliope River | 1336 | 77.6% | 2.0% | 0.3% | 1.6% | 0.9% | 4.9% | 0.7% | 0.4% | 1.3% | 0.7% | 9.4% |
| CP12 | Tannum Sands, Tiller Street (Ibis Park) | 814 | 88.5% | 0.7% | 0.5% | 0.6% | 1.4% | 0.2% | 0.7% | 0.5% | 0.4% | 0.1% | 6.4% |
| GL27 | Curtis Island | 686 | 66.5% | 4.8% | 2.2% | 1.2% | 1.0% | 12.0% | 0.1% | N/A | 0.7% | 0.3% | 11.2% |
| GL86 | Gladstone, Morgan Street | 565 | 81.9% | 3.2% | 1.4% | 0.4% | 1.6% | 0.9% | 0.9% | 1.1% | 0.2% | 0.2% | 8.3% |
| GL81 | Gladstone, Goondoon Street | 385 | 77.7% | 3.6% | 1.0% | 1.3% | 1.0% | 1.3% | 1.0% | 0.3% | 0.3% | 0.5% | 11.9% |
| MV15 | Baffle Creek, Coast Road | 270 | 19.3% | 6.7% | 15.6% | 10.4% | 7.0% | 2.2% | 1.9% | 4.4% | 2.6% | 0.7% | 29.3% |
| MV11 | Rosedale, Ferry Road (Baffle Creek) | 130 | 17.7% | 0.8% | 44.6% | 2.3% | 13.1% | 3.1% | 0.8% | 9.2% | N/A | N/A | 8.5% |
| CP52 | Ramsay Crossing | 68 | 52.9% | 1.5% | N/A | N/A | 1.5% | 22.1% | N/A | N/A | 5.9% | 1.5% | 14.7% |
| CP51 | The Narrows | 62 | 56.5% | 1.6% | N/A | 8.1% | N/A | 24.2% | N/A | N/A | N/A | 1.6% | 8.1% |
| GL21 | Curtis Island, South End Terrace | 56 | 69.6% | 10.7% | 1.8% | N/A | 3.6% | 7.1% | N/A | N/A | N/A | N/A | 7.1% |

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