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| Queensland Recreational Boating Facilities Demand Forecasting Study 2022  Southern Downs 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 Southern Downs 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 Southern Downs LGA.

Key issues and attributes of recreational boating

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

* a lack of capacity at the Leslie Dam facility
* large fluctuations in dam water levels that can impact accessibility to the water.

1. Key recreational boating attributes for Southern Downs LGA

| Key attribute | Value |
| --- | --- |
| Boat launching facilities |  |
| Number of existing facilities | 4 |
| Current demand for boat launching lanes (effective lanes) | 3.7 |
| Number of existing ‘effective’ boat launching lanes | 3.6 |
| Shortfall of ‘effective’ boat launching lanes (number) | 0.1 |
| Demand satisfaction for ‘effective’ boat launching lanes | 97% |
| State-wide demand satisfaction for ‘effective’ boat launching lanes | 82% |

Demand summary

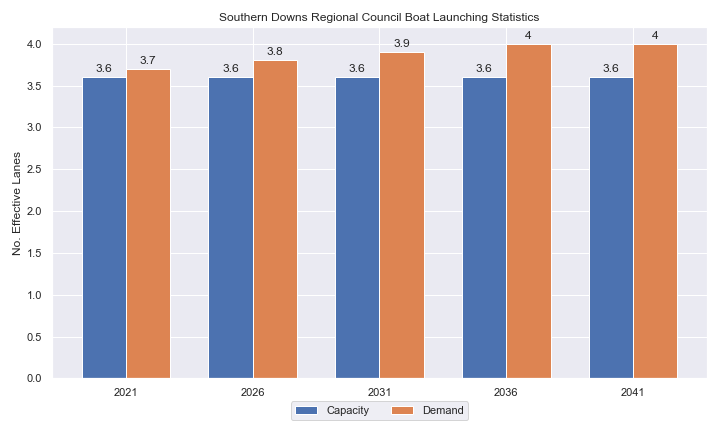
The assessment of recreational boating demand is centred on a statistical demand model that considers vessel registration data, population statistics, assumptions around local usage and the movement of vessels into and out of the LGA. Key parameters from this assessment for the Southern Downs LGA are:

* The population is 35,622 as at the 2021 census and is projected to be 35,610 by 2041.
* As of July 2022, there is a total of 1491 vessels with a home registration within the LGA, with 100% being ‘trailable’ – and therefore requiring boat launching facilities.
* The Southern Downs 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 minor use in the coastal LGAs between the Gold Coast and Fraser Coast.
* Vessels from Toowoomba, Brisbane, Gold Coast, Logan and Tenterfield flow into the LGA and LGA contributing to local demand.
* The existing demand for boat launching facilities is 3.7 ‘effective’ boat ramp lanes and is projected to be 4.0 ‘effective’ lanes by 2041.

Boat launching

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

Southern Downs LGA has four boat launching facilities, comprising seven boat ramp lanes with a total effective boat launching capacity of 3.6 ‘effective’ lanes. The Glenlyon Dam facility is limited by waterside capacity while the remainder are constrained by landside (CTU parking) capacity. The capacity and forecast demand of effective boat ramp lanes in the Southern Downs LGA is shown in Figure 1.



1. Existing capacity and forecast demand of ‘effective’ boat ramp lanes for Southern Downs LGA

Priority recommendations

Recommendations for new facilities or upgrades to existing facilities are outlined in Table 2. The range of recommendations seeks to reduce the overall capacity shortfall within Southern Downs LGA cover the 20-year planning life of this project, as well as address specific safety concerns at Leslie Dam around edge drop-offs of the ramp.

Recommendations

1. Summary of recommended boating infrastructure upgrades for Southern Downs 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. | * Leslie Dam: Duplicate and extend the upper ramp and provide a pontoon for use when the water level is high. Formalise 40 CTU spaces. |
| 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. However, non-statistical forms of demand may also be reflected in Study recommendations. The Study evaluates existing and forecast demand over a 20-year period and makes recommendations on how this demand might be met over that period. Recommendations may include improvements to both landside and waterside capacity depending on the facility.

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

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

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

# Southern Downs LGA Overview

## Key influences on recreational boating

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

* its designation as a Regional Centre, with a small local recreational boating fleet
* stagnant projected population growth
* several large water bodies that are attractive for recreational boating.

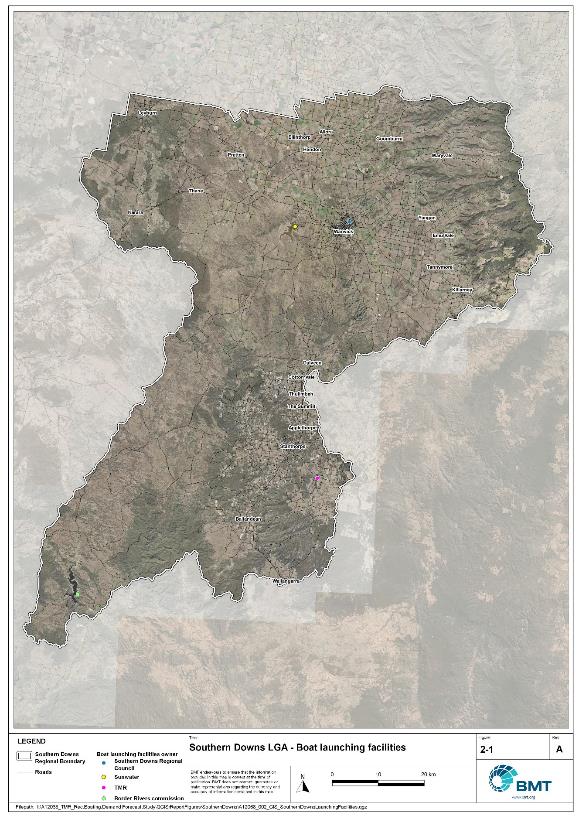
## Existing recreational boating infrastructure

The recreational boating facilities within the Southern Downs LGA are summarised in Table 2.1. These facilities are owned or managed by multiple organisations and provide access to various freshwater water bodies throughout the LGA.

Recreational boating facilities by facility owner in Southern Downs LGA

| Owner | Open water boat ramps | | Other boat ramps | | Landings | |
| --- | --- | --- | --- | --- | --- | --- |
| Facilities | Lanes | Facilities | Lanes | Pontoons | Jetties |
| Border Rivers Commission |  |  | 1 | 1 |  |  |
| Southern Downs Regional Council |  |  | 1 | 1 | 1 | 1 |
| Sunwater |  |  | 1 | 1 |  |  |
| TMR |  |  | 1 | 1 |  |  |

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



Public boat launching facilities within the Southern Downs LGA.

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# Capacity Assessment

## Boat ramps

* + 1. Introduction

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

* + 1. Boat ramp capacity

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

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

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

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

Calculation of landside capacity is in line with the TMR guideline (TMR, 2020), which requires less provision of CTU parking per lane than the Australian standard (AS3962 Table 7.1), which 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 is 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 is assumed to be available, on average, for 80% of the tidal cycle. For part-tide access the boat ramp and its access channel is available less than 80% of the time. A modification factor of 0.8 is applied for near all-tide facilities and 0.5 for part-tide facilities.
* Wave and current conditions: In areas where vessel launching and retrieval may be intermittently impacted by waves (most commonly on beach ramps, but not exclusively) or strong currents (such as in rivers), a modification factor of 0.5 is applied.

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

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

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

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

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

Queuing facility efficiency modifiers

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

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

* + 1. Accessibility from boat launching facilities

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

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

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

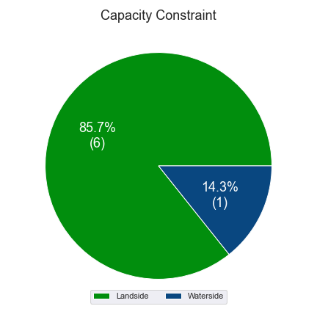
Consequently, the following aspects are used to classify how well a facility provides open water access:

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

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

* + 1. Existing boat launching capacity

Within the Southern Downs LGA there are four boat launching facilities with a total effective capacity of 3.6 lanes. The effective capacity of boat launching facilities within the Southern Downs LGA is shown in Annex B, with the overall capacity constraint shown in Figure 3.1.



Summary of limiting capacity constraint

# 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 are 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 Southern Downs 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 is higher than the state average
* the average age is higher than the state average.

## 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 Southern Downs LGA’s public boating facilities to indicate 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 Southern Downs LGA; all other sources have been grouped together.

LGA of origin for active fleet in Southern Downs LGA

| LGA of origin | Active fleet proportion |
| --- | --- |
| Southern Downs | 52.9% |
| Toowoomba | 14.0% |
| Brisbane | 5.8% |
| Gold Coast | 4.1% |
| Logan | 2.9% |
| Tenterfield (NSW) | 2.3% |
| Redland | 2.2% |
| Ipswich | 1.9% |
| Moreton Bay | 1.6% |
| Lockyer Valley | 1.2% |
| Other LGAs | 11.1% |

* + 1. Intra-LGA demand distribution

Recreational boating 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 in Southern Downs LGA

| Facility | Overall fleet | Resident fleet | Visiting fleet |
| --- | --- | --- | --- |
| Leslie Dam | 58.0% | 59.5% | 56.2% |
| Storm King Dam | 28.2% | 32.9% | 23.0% |
| Glenlyon Dam | 13.8% | 7.6% | 20.7% |

The results indicate that there is a strong preference for the Leslie Dam facility amongst resident and visiting fleets, with the Storm King Dam more preferred by locals than visitors and the Glenlyon Dam facility more preferred by visitors than locals. Data for the Victoria Street facility in Warwick was not collected.

## 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 | 110 | 113 | 115 | 118 | 119 |
| 4.5m to 8m | 39 | 40 | 41 | 42 | 42 |
| >8m | 0 | 0 | 0 | 0 | 0 |
| Total | 149 | 153 | 156 | 159 | 161 |

## 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 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 4.4.

Boat ramp lane demand

|  | 2021 | 2026 | 2031 | 2036 | 2041 |
| --- | --- | --- | --- | --- | --- |
| Boat ramp lane demand | 3.7 | 3.8 | 3.9 | 4 | 4 |

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

* a small sized total fleet of trailable vessels
* forecast stagnant population over the Study period
* facilities that are attractive to larger LGAs such as Toowoomba and Brisbane.

## 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.

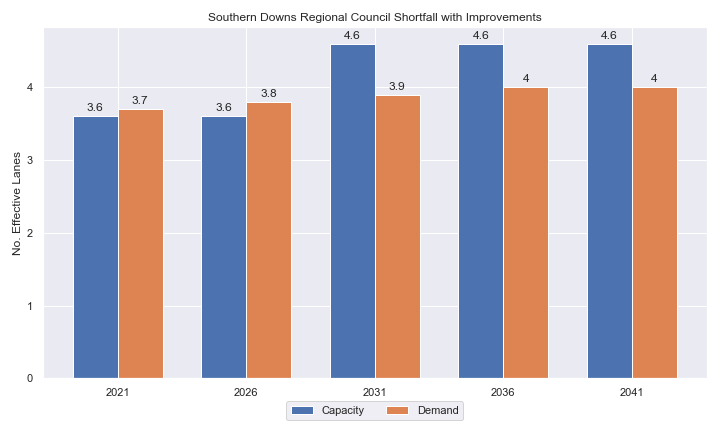
# Shortfall Assessment

## Shortfall assessment – boat ramps

The shortfall of boat ramp lanes within the Southern Downs LGA is provided in Table 5.1 and in Figure 5.1 at an LGA scale. This is provided both with and without the inclusion of additional capacity provided by the recommended upgrades described in section 7.

Shortfall of boat launching facilities

| Assessment | Metric | 2021 | 2026 | 2031 | 2036 | 2041 |
| --- | --- | --- | --- | --- | --- | --- |
| Demand | Demand | 3.7 | 3.8 | 3.9 | 4 | 4 |
| Unimproved | Capacity | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| **Shortfall** | 0.1 | 0.2 | 0.3 | 0.4 | 0.4 |
| Including upgrades | Capacity | 3.6 | 3.6 | 4.6 | 4.6 | 4.6 |
| **Shortfall** | 0.1 | 0.2 | -0.7 | -0.6 | -0.6 |



Shortfall assessment with recommended upgrades adopted.

# 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 also supplemented with site visits to facilities where key issues had been identified.

## Managing authority feedback

For the Southern Downs LGA, the Study team met with Sunwater and Maritime Safety Queensland to discuss recreational boating facilities within the region. Invitation to meet with Southern Downs Regional Council were declined. This consultation process identified a potential opportunity to alleviate demand pressure. The Study has considered the practical implementation of each of this opportunity 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 |
| --- | --- | --- |
| Leslie Dam | Facility is not currently meeting demand, needs a duplicated lane and pontoon. | Agreed. The duplication and extension of the top (high water) lane along with formal parking will improve this facility, while a pontoon can be installed for higher water levels, noting that at lower water levels the beach is available for boats. |

## 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 that included survey responses of nearly 3,000 users and open submissions. For the Southern Downs LGA a total of 6 submissions were received, with 100% of respondents using trailable power boats and 100% of respondents using recreational boating facilities at least once a month. For the Southern Downs LGA the following statistics or themes were extracted from the survey and associated comments:

* 83% of respondents typically travel less than 1hr to their preferred boat ramp (which may not be their closest facility).
* 0% of respondents indicated that floating walkways are their preferred type of queuing facility.
* 100% 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:
  + Leslie Dam
  + Cecil Plains, Yarramalong, Talgai Weir Reserve, which are all in Toowoomba LGA.
* The following themes were identified with respect to existing facilities:
  + Upgrading boat ramps with pontoon (Leslie Dam) and maintenance (Warwick)
  + Toilets, rubbish bins, freshwater taps, and so on.
* Where the closest available boat launching facility was not preferred, respondents indicated that the following key aspects influenced their choice:
  + better fishing
  + easier to use.

# Development Recommendations

## Previous recommendations

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

Within the Southern Downs LGA 50% of the recommendations have been implemented since the delivery of the 2017 GHD study. This current Study has reviewed the unimplemented 2017 recommendations (Table 7.1) for Southern Downs 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 may be carried forward into the recommendations of this Study with a suitable update to their priority status if required.

Assessment of unimplemented 2017 recommendations

| Location | Description | Assessment | Review comment |
| --- | --- | --- | --- |
| Priority 1 | | | |
| Nil |  |  |  |
| Priority 2 | | | |
| Nil |  |  |  |
| Priority 3 | | | |
| Connolly Dam | Construct single lane ramp.  Construct all-weather surface (unsealed) parking for 10 CTUs | No longer viable | Not required to meet the demand pressures within the LGA |
| Priority 4 | | | |
| Nil |  |  |  |

## 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 and will be limited to those solutions that are already significantly advanced or ‘shovel ready’ or that require very 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 7.2 with full detail of each recommendation in the tables that follow.

Summary of recommendations for Southern Downs LGA

| Priority | Description | Landside or waterside | Increased capacity  (effective lanes) |
| --- | --- | --- | --- |
| 2 | Leslie Dam: Duplicate and extend the upper ramp and provide a pontoon for use when the water level is high. Formalise 40 CTU spaces. |  | 1.0 lane |

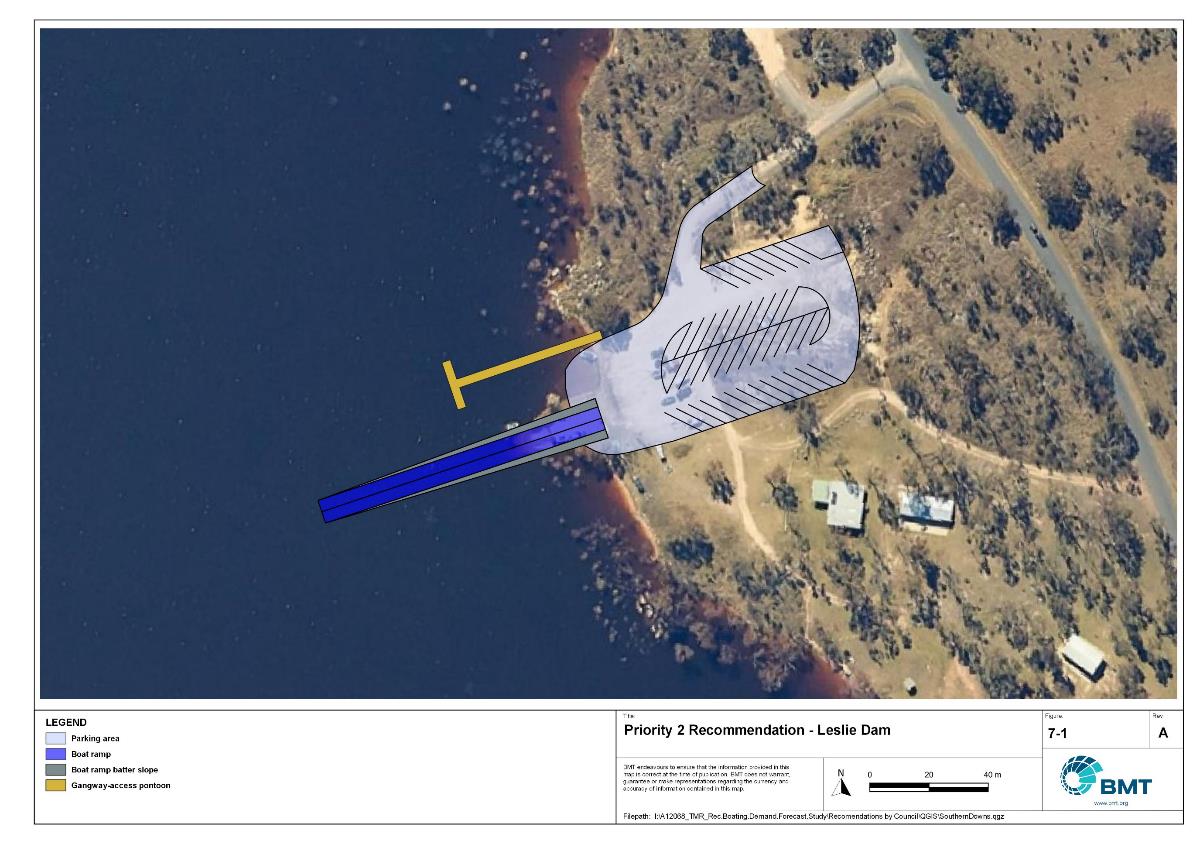
## Priority 1 recommendations

Nil

## Priority 2 recommendations

Leslie Dam- (Priority 2)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| General description | | | | |
| Location | Murray Cod Road, Leslie Dam | | | |
| Existing Facility? | Yes | | | |
| Coordinates | -28.22417500, 151.92124100 | | | |
| Existing tidal status | Fresh water - Various ramps down to low water level. | | | |
| Existing wave exposure | None | | | |
| Existing current exposure | None | | | |
| Proposed works | Duplicate and extend the upper ramp and provide a pontoon for use when the water level is high. Construct gentle batter slopes on the side of the ramp to ensure there is no abrupt drop-off.  Formalise 40 CTU parking spaces. | | | |
| Increased effective capacity | 1.0 effective lane | | | |
| Capacity improvement position | Waterside | Landside | | Both |
| Rationale | The demand study has found that this facility is the most popular in the LGA. The proximity to population centre Warwick, and the relative capacity of other facilities around the LGA indicate this facility should be upgraded prior to upgrades of others. | | | |
| Anticipated Costs (+/- 50%) | Waterside infrastructure | | $1,425,000 | |
| Landside infrastructure | | $790,000 | |
| Planning, environmental and approvals constraints | | | | |
| Assessment | Requirement | Comments | | |
| Fish Habitat Zone | X | N/A | | |
| Native Title  (Bundjalung People) | ü | New tenure may be required and therefore interaction with Native Title. | | |
| MCU requirement | ü | Carpark works may trigger a Development Permit for a Material Change of Use. | | |
| Clearing remnant vegetation | ü | Proposed works may be within a declared RVM category C – high-value regrowth vegetation area. A Development Permit may be required for the clearing of remnant vegetation. | | |
| GBRWHA | X | N/A | | |
| Marine Park | X | N/A | | |
| Tidal works assessment | X | N/A | | |
| Other as required | ü | Proposed works may trigger a Development Permit for operational works. | | |
| Sea Level Rise | X | N/A | | |
| Storm Tide Hazard | X | N/A | | |
| Anticipated Complexity | Low | Medium | | High |



Priority 2 Recommendation – Leslie Dam

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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 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Fresh water access** | | | | | | | | | | | | | |
| ST11 | Storm King Dam | 1 | Fresh Water | Fresh Water | Pontoon | 0 | 10 | 1.2 | 1 | | 1 | Landside |
| ST15 | Glenlyon Dam | 1 | Fresh Water | Fresh Water | Beach | 0 | 20 | 1.1 | 1.25 | | 1.1 | Waterside |
| WK10 | Leslie Dam (highest/upper ramp) | 1 | Fresh Water | Fresh Water | None | 0 | 10 | 1 | 0.75 | | 0.75 | Landside |
| WK11 | Leslie Dam (second highest ramp) | 1 | Fresh Water | Fresh Water | None | 0 | 0 | 1 | 0 | | 0 | Landside |
| WK12 | Leslie Dam (third highest\_WK13 is lowest) | 1 | Fresh Water | Fresh Water | None | 0 | 0 | 1 | 0 | | 0 | Landside |
| WK13 | Leslie Dam (lowest water level of four ramps) | 1 | Fresh Water | Fresh Water | None | 0 | 0 | 1 | 0 | | 0 | Landside |
| WK16 | Warwick, Victoria Street | 1 | Fresh Water | Fresh Water | Pontoon | 0 | 10 | 1.2 | 0.75 | | 0.75 | Landside |
| **Subtotal** |  | **7** |  |  |  | **0** | **50** | **7.5** | **3.75** | | **3.6** |  |
| **Total effective capacity** | | | | | | | | | | **3.6** | | |

###### Facility Use

Boat launching facility usage statistics

| Facility ID | Facility name | Total Reports | Southern Downs | Toowoomba | Brisbane | Gold Coast | Logan | Tenterfield | Redland | Ipswich | Moreton Bay | Lockyer Valley | Other LGAs |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Total |  | 3604 | 1906 | 505 | 210 | 146 | 106 | 82 | 79 | 68 | 56 | 45 | 401 |
| Total % |  | 100.00% | 52.90% | 14.00% | 5.80% | 4.10% | 2.90% | 2.30% | 2.20% | 1.90% | 1.60% | 1.20% | 11.10% |
| WK10 | Leslie Dam (highest/upper ramp) | 2090 | 54.30% | 20.60% | 4.30% | 3.40% | 2.20% | 0.40% | 1.80% | 2.40% | 1.30% | 1.50% | 7.80% |
| ST11 | Storm King Dam | 1018 | 61.60% | 4.00% | 9.10% | 3.00% | 2.80% | 2.90% | 2.90% | 0.80% | 2.60% | 0.40% | 9.80% |
| ST15 | Glenlyon Dam | 496 | 29.00% | 6.90% | 5.60% | 8.70% | 6.70% | 8.90% | 2.40% | 1.80% | 0.60% | 1.80% | 27.60% |

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