



Report

Speed Limits Trial Coomera River (South Branch)

2 August 2019

Document control sheet

Enquiries

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Approved

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Signature		Date	9 August 2019
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A message from the CEO

The Gold Coast is a waterways city—our waterways support vital sectors like tourism, recreation and marine industries, and they provide spaces for people to live and play.

That's why the Gold Coast Waterways Authority works to achieve a balance between all the different activities that occur on and around the water, to ensure our waterways are managed sustainably now and into the future.

It's a responsibility we take seriously and it's a responsibility that presents some unique challenges to our statutory authority. Therefore, after careful consideration, I have decided to accept the recommendations of this report to introduce new speed limits for the South Branch of the Coomera River.

It has not been an easy decision to make because we've heard many, many viewpoints about the benefits and disadvantages of changing the speed limit on this stretch of the river.

While the speed limits will not make everyone happy, the decision presents a compromise in trying to balance issues such as speed, wash that can lead to erosion or have an impact upon residents' pontoons, and promoting and ensuring safer waterways access.

I recognise that apart from speed, there are other issues that have been raised during the trial that will need some further work. This is why we have developed an implementation plan that focuses on improving signage for the speed limits, educating waterways users about their responsibilities, and investigating new technologies to improve compliance and monitoring of water traffic to help with future planning and management.

I would like to thank everyone who has taken the time to write to us, to fill out online surveys, or to come and speak with us at community meetings and consultation sessions at local shopping centres and boat ramps. This interaction with our community helps us to make decisions that are transparent and driven locally.

By continuing to work together, we'll ensure safer, sustainable access to our waterways now and into the future.

A handwritten signature in blue ink, appearing to read "Hal Morris".

Hal Morris
Chief Executive Officer
9 August 2019



Table of Contents

Executive summary	7
Glossary	9
Background	11
PART A: Speed limits trial	13
Objective	13
Key findings	14
Recommendations	15
Purpose	16
Scope	16
Reference speed limits and related legislation	16
Early consultation	19
Area	20
Evaluation	20
Characteristics and features of the waterway	22
Potential hazards	23
Existing regulatory system	23
Compliance rates	25
Marine incident data	26
Field observations	27
Types and density of water traffic	28
Public facilities	30
Maritime industry	31
Feedback—Maritime Safety Queensland	32
Feedback—Queensland Police Service	33
Feedback—Queensland Boating and Fisheries Patrol	35

Community feedback	36
Speed limit options	38
Conclusion	40
PART B: Related waterways issues	41
Background	41
South Branch shorelines	41
Marine parks legislation	43
Wash energy	44
Noise	46
Waterfront dwellings	49
Private waterways structures	49
Community feedback	50
Feedback—Department of Environment and Science	52
Feedback—City of Gold Coast	53
Marine zones	54
Appendix 1	55
Appendix 2	56
Appendix 3	58
Appendix 4	60
Appendix 5	64
Appendix 6	65
Appendix 7	66
Appendix 8	67
Appendix 9	68
Appendix 10	69
Appendix 11	70
Appendix 12	71
Appendix 13	72

Appendix 14	73
Appendix 15	74
Appendix 16	75
Appendix 17	76
Appendix 18	78
Appendix 19	83
Appendix 20	84

Executive summary

The Gold Coast Waterways Authority (GCWA) is responsible for managing the use of Gold Coast waterways to balance safety and access for all users. During stakeholder consultation in 2014, and again in 2016, the Gold Coast community made it clear that marine speed limits were important considerations for waterways use. In particular, there was a view that some 6 knots speed limits were unnecessary.

In December 2017, the GCWA Board endorsed a new *Speed Limits and Behaviour Management Strategy 2018-2020* that described a review process and identified five areas for review as part of an initial body of work. One of these areas was the Coomera River (South Branch) from the Broadwater to Sanctuary Cove. This is a particularly important area due to the ongoing development for both marine industry and the residential sector.

GCWA trailed new speed limits on the South Branch for 12 months from July 2018. During the trial, extensive consultation was undertaken with key stakeholders, the community and State Government agencies. GCWA also undertook field observations, examined data for marine incidents and compliance rates, and considered academic research.

The trial set out to assess whether a speed limit of 6 knots for larger vessels, along with a speed limit of 40 knots for smaller vessels and personal watercraft, would achieve an acceptable level of marine safety while, at the same time, minimising regulation, improving travel times and transport efficiency for smaller vessels, and addressing the problem of damaging wash from larger vessels.

The trial and its subsequent evaluation covered new ground and developed evaluation processes that have not been used to this level before. There was also unprecedented monitoring and data gathering from the field by officers from GCWA, complemented by the use of research concerning wave energy by Professor Gregor Macfarlane from the Australian Maritime College.

Recommendations from this trial were developed and documented in August 2019 and referred to GCWA's Chief Executive Officer for consideration and decision-making on new, permanent speed limits. From this, GCWA also developed an implementation package with actions in support of the new speed limits, which will also be commenced in August 2019.

The head of power for GCWA to fix speed limits on Gold Coast waters can be found in the *Transport Operations (Marine Safety) Act 1994*. Any new speed limits must align with the Act's objectives for marine safety, as well as the purposes of the *Gold Coast Waterways Authority Act 2012* for promoting the waterways, improving access and minimal regulation.

The evaluation for the speed limits trial on the South Branch comprised 4 key factors:

1. Safety
2. Waterways
3. Environment
4. Community.

Each factor was weighted equally and GCWA is confident that this has delivered balanced recommendations to the Chief Executive Officer.

To help distinguish between speed limits and broader waterways management issues, this report has been divided into two parts:

1. **Part A**—directed at the speed limits trial for the South Branch of the Coomera River.
2. **Part B**—directed at some important and related issues that came to light during the trial.

The issues discussed in Part B do not fall directly within GCWA’s responsibilities but will require further understanding and response by GCWA together with other agencies and the local government.

Summarised, the recommendations of this report are:

1. Speed limits

That GCWA should fix a new speed limit of 6 knots for vessels 6.5 metres and over, and a new speed limit of 30 knots for personal watercraft and vessels less than 6.5 metres.

That GCWA should also fix a new speed limit of 6 knots for the narrower channel behind the small unnamed island near the entrance to Hope Harbour Marina.

2. Education

That GCWA should partner with Maritime Safety Queensland to develop and implement a recreational boating education campaign to raise community awareness for the new speed limits, as well as operational speed limits for vessels and personal watercraft, and freestyling prohibitions.

3. Enforcement

That GCWA should cooperate with Maritime Safety Queensland, Queensland Police Service and Queensland Boating and Fisheries Patrol for improved compliance outcomes, including enforcement campaigns that target the new speed limits, operational speed limits, freestyling and other higher-risk on-water behaviour.

4. New speed signs

That GCWA should procure and erect a system of new larger speed signs for the new speed limits.

5. New maps

That GCWA should request Maritime Safety Queensland to produce a new map for the new speed limits, as well as a series of new maps for speed limits throughout Gold Coast waters.

6. New technology

That GCWA should partner with Maritime Safety Queensland to investigate new technologies, such as lidar units, for enhanced marine safety through on-water education and enforcement.

Glossary

The following is a glossary of acronyms and terms used in this report:

City means the Council of the City of Gold Coast

Collision Regulations means the *International Regulations for Preventing Collisions at Sea 1972*

CTUs means car-trailer units

DES means Department of Environment and Science

EPA means the *Environmental Protection Act 1994*

GCWA means the Gold Coast Waterways Authority, a statutory authority established by the *Gold Coast Waterways Authority Act 2012*

GCWA Act means the *Gold Coast Waterways Authority Act 2012*

LAT means lowest astronomical tide, the lowest tide that can be predicted to occur under average meteorological conditions and under any combination of astronomical conditions

MSQ means Maritime Safety Queensland, a branch within Department of Transport and Main Roads

PWC means personal watercraft

QBFP means Queensland Boating and Fisheries Patrol, a work unit of Department of Agriculture and Fisheries

QPS means Queensland Police Service

QPWS means Queensland Parks and Wildlife Service, a division within Department of Environment and Science

Strategy means the *Speed Limits and Behaviour Management Strategy 2018-2020*

TIA means the *Transport Infrastructure Act 1994*

TIWMR means the *Transport Infrastructure (Waterways Management) Regulation 2012*

TOMSA means the *Transport Operations (Marine Safety) Act 1994*

TOMSR means the *Transport Operations (Marine Safety) Regulation 2016*

TMR means Department of Transport and Main Roads

Zoning Plan means the *Marine Parks (Moreton Bay) Zoning Plan 2009*.

For Gold Coast waters, the speed limits only apply to “ships”, which is a term defined in TOMSA.

It is also important to understand that different pieces of State and Commonwealth legislation use terms such as “vessel”, “ship”, “personal watercraft” and “watercraft, all of which have defined meanings.

The term “jet ski” is actually the model name for a Kawasaki personal watercraft (PWC).

To ensure no misunderstandings, GCWA would like to clarify that the words “vessel” and “PWC” will be the terms used in this report to capture all types of boats, other vessels and personal watercraft to which speed limits apply. These include, but are not limited to, canoes, dinghies, ferries, house boats, kayaks, jet boats, jet skis, PWC, sail boats, superyachts, tinnies, trawlers, water taxis and any other type of boat or vessel operating on the South Branch, however propelled or moved.

The terms “vessel” and “PWC” do not include “watercraft” for which a speed limit does not apply; for example, boogie boards, kiteboards, paddleboards, sailboards, stand-up paddleboards, surf skis, and surfboards; nor does the term “vessel” include seaplanes.

Where this report uses the term “water traffic”, it means all forms of water traffic, which comprises “vessels” and “PWC”, along with “watercraft” for which a speed limit does not apply.

Background

GCWA was established by the *Gold Coast Waterways Authority Act 2012* (the GCWA Act) with the main purpose of delivering best possible management of Gold Coast waterways at a reasonable cost to the community and government, while keeping government regulation to a minimum.

Other purposes under the GCWA Act include:

- improving and maintaining navigational access
- promoting and managing sustainable use of the waterways for marine industries, tourism and recreation.

As a requirement of the GCWA Act, GCWA developed a *Gold Coast Waterways Management Strategy 2014-2023*, approved by the Minister, which sets out GCWA's objectives and strategic outcomes. For the strategic outcome called "Sustain", one of GCWA's key actions is that of managing the use of Gold Coast waterways to balance safety and access for users.

From this "balancing safety and access for users" action, several detailed actions flow, including:

- 1.5.1 *Engaging with all key user groups and individuals to fully understand their needs and identify options and priorities.*
- 1.5.2 *Reviewing speed limits, wash, noise and behavior management arrangements.*
- 1.5.3 *Implementing new speed limits and other changes from the review.*

A survey by GCWA to help inform development of the *Gold Coast Waterways Management Strategy 2014-2023* found that **68% of respondents** supported a review of speed limits for Gold Coast waterways.

The *Gold Coast Waterways Management Strategy 2014-2023* can be found on GCWA's website here <https://gcwa.qld.gov.au/wp-content/uploads/2017/05/GCWA-Strategy-Document.pdf>.

The *Transport Operations (Marine Safety) Act 1994* (TOMSA) provides the head of power for GCWA to fix speed limits in Gold Coast waters. TOMSA's objectives include providing a system that achieves an appropriate balance between regulation and enabling further development of the effectiveness and efficiency of the maritime industry.

It is important to note that Maritime Safety Queensland (MSQ) has no power to fix speed limits in Gold Coast waters but retains the exclusive power to provide an exemption from a speed limit.

GCWA commenced work to better manage speed limits for Gold Coast waters several years ago, which culminated in production of two documents:

1. *Speed Limits Review Discussion Paper* in 2014
2. *Speed and Behaviour Management Strategy* in 2016.

For both documents, there was broad consultation and stakeholder engagement, with around 2,200 respondents who provided the following feedback for Gold Coast speed limits:

- promote a wash focus—70%
- keep speed limits simple—80%
- focus on user behaviour—76%
- remove unnecessary 6 knot areas—59%.

In December 2017, the GCWA Board endorsed a new *Speed Limits and Behaviour Management Strategy 2018-2020* (the Strategy), which built upon the earlier consultation and stakeholder engagement to provide a good regulatory decision-making framework for speed limits.

The Strategy is underpinned by core principles of best practice regulatory decision-making, as set out in COAG's *Guide for Best Practice Regulation* and the Queensland Government's *Guide to Better Regulation*, in particular:

- establishing an evidence-based case for action to address the problem
- considering a range of feasible options before a regulatory approach, at a reasonable cost to the community and government
- adopting an option that generates greatest benefit to the community
- ensuring that the intent of the regulatory approach and its requirements are clear
- ensuring that any regulation remains relevant and effective over time
- consulting effectively with key stakeholders
- ensuring that any action should be effective and proportionate to the issue being addressed.

The Queensland Government's *Guide to Better Regulation* can be found here <https://s3.treasury.qld.gov.au/files/guide-to-better-regulation.pdf>.

The new Strategy also describes a 7-step problem solving methodology, consistent with the stages of regulatory problem solving as espoused by Professor Malcolm Sparrow in his book *The Regulatory Craft*.¹

In line with the Strategy, GCWA commenced a 12-months trial for speed limits on the South Branch of the Coomera River in July 2018. In that time, GCWA undertook active and passive monitoring of water traffic on the river, and the key findings of the trial are set out later in this report.

In summary, GCWA conducted the speed limits trial for the South Branch having due regard to this background, with special reference to:

- respective powers, limitations, purposes and objectives of the GCWA Act and TOMSA
- GCWA's *Gold Coast Waterways Management Strategy 2014-2023*
- GCWA's *Speed Limits and Behaviour Management Strategy 2018-2020*
- Queensland Government's *Guide to Better Regulation*.

¹ Sparrow M, *The Regulatory Craft*, Brookings Institution Press, Washington DC, USA, May 2000

PART A: Speed limits trial

Objective

The objective of the 12-month speed limits trial was to:

Assess whether a speed limit of 6 knots for larger vessels, along with a speed limit of 40 knots for smaller vessels and PWC, will achieve an acceptable level of marine safety while, at the same time, minimising regulation, improving travel times and transport efficiency for the smaller vessels and PWC, and addressing the problem of damaging wash from the larger vessels.

This objective was developed in response to feedback from the community through consultation, and is consistent with the objectives of TOMSA and the purposes of the GCWA Act, in particular:

- achieving an appropriate balance between regulation and marine safety
- improving access for vessels and PWC
- promoting of the river for use by all users—recreation, tourism and marine industry
- minimising regulation, having consideration to the existing suite of marine safety and waterways management regulations.

Further, the objective of the trial aligns with the key action and the detailed actions of the “Sustain” outcome for the *Gold Coast Waterways Management Strategy 2014-2023*. This includes community consultation that underpins GCWA decision-making, with consideration to noise, wash and behaviour that may affect amenity for waterfront residents.

These issues of wash energy, noise and related broader waterways management issues are discussed in Part B of this report.

Key findings

In response to the objective, the key findings of the speed limits trial for the South Branch of the Coomera River are as follows:

1. Speed limit of 6 knots

A speed limit of 6 knots for all vessels 6.5 metres in length and over (reduced from 8 metres in length during the trial) is appropriate in all the circumstances considered from the trial and documented in this report.

2. Speed limit of 30 knots

A speed limit of 30 knots (reduced from 40 knots during the trial) is appropriate in all the circumstances considered from the trial and documented in this report.

3. Marine safety

The trial speed limits did not adversely affect marine safety on any objective measure, and this finding is supported by the views of the relevant marine enforcement agencies—Maritime Safety Queensland, Queensland Police Service and Queensland Boating and Fisheries Patrol.

4. Community and maritime industry

Access, travel times and efficiencies for smaller vessels transiting the river during the speed limits trial were significantly improved, with field observations and feedback suggesting an overall benefit for recreational boating, the community and the Queensland maritime industry.

5. Damaging wash

A reduction in vessel length from 8 metres to 6.5 metres for the 6 knots speed limit would have a significant effect on reducing the potential for damaging wash from larger vessels.

6. Appropriate balance

Setting the revised speed limits strikes an appropriate balance between the marine safety objective—efficiency and effectiveness of the Queensland maritime industry—and the sustainable use of Gold Coast waterways.

7. Legislative purpose

By setting the revised speed limits, GCWA achieves the purpose of the GCWA Act to deliver best possible management of Gold Coast waterways at a reasonable cost to the community and government, while keeping government regulation to a minimum.

Recommendations

GCWA makes the following recommendations in relation to the speed limits trial for the South Branch of the Coomera River:

1. Speed limits

That GCWA should fix by gazette notice the following speed limits for certain waters of the Coomera River (South Branch):

- a) a new speed limit of 6 knots for vessels 6.5 metres and over
- b) a new speed limit of 30 knots for PWC and vessels less than 6.5 metres.

That GCWA should fix by gazette notice a new speed limit of 6 knots for certain waters of the Coomera River (South Branch) near the entrance to Hope Harbour Marina.

2. Education

That GCWA should partner with MSQ to develop and implement a recreational boating education campaign to raise community awareness for:

- a) implementation of the new speed limits system
- b) operational speed limits for vessels and PWC, as well as freestyling prohibitions.

3. Enforcement

That GCWA should cooperate with MSQ, QPS and QBFP for improved compliance outcomes on the Coomera River (South Branch), including enforcement campaigns that target the new speed limits, operational speed limits, freestyling and other higher-risk on-water behaviour.

4. New speed signs

That GCWA should procure and erect a system of new larger speed signs for the new speed limits.

The designs for the new speed signs can be found in **Appendix 19**.

5. New maps

That GCWA should request MSQ to produce:

- a) a new map for the new speed limits
- b) as a project to enhance marine safety, a series of new maps for speed limits throughout Gold Coast waters.

The new map that describes the new speed limits can be found in **Appendix 20**.

6. New technology

That GCWA should partner with MSQ to investigate new technologies, such as lidar units, for enhanced marine safety through on-water education and enforcement.

Purpose

The purpose of this report is to inform GCWA's Chief Executive Officer for the proper exercise of discretion regarding the best possible management of Gold Coast waterways; in this case, the speed limits for vessels and PWC on the South Branch of the Coomera River.

In arriving at a decision, the Chief Executive Officer must have careful consideration to the objectives of TOMSA and the purposes of the GCWA Act.

Scope

The Chief Executive Officer may only exercise the power to fix speed limits within the framework provided by TOMSA and the GCWA Act.

Consequently, this report must be primarily directed to matters that affect marine safety and the best possible management of Gold Coast waterways, consistent with this legislation.

This report takes into consideration concerns from stakeholders about shoreline damage, noise, wash and private waterways structures, and consequently discusses and makes observations in relation to these concerns in Part B.

Reference speed limits and related legislation

The starting point for any review of speed limits is to only impose speed limits when required for marine safety, and then to balance speed limits against TOMSA's objective for enabling the effectiveness and efficiency of Queensland's maritime industry, together with the GCWA Act's purpose for minimal regulation.

However, it must be remembered that speed limits are not the only legal mechanism regulating the speed of vessels and PWC in Queensland.

Collision Regulations

There is an overarching obligation imposed on all vessels and PWC in Queensland to comply with the *International Regulations for Preventing Collisions at Sea 1972*, commonly called the Collision Regulations. The Collision Regulations are given effect and applied as part of the law of Queensland through TOMSA.

The Collision Regulations describe how masters of vessels are to avoid collisions generally; and in particular, through **rule 6 of the Collision Regulations**, to proceed at a safe speed at all times.

Rule 6 also sets out the factors that must be taken into consideration by masters when determining safe speed for their vessels in the prevailing circumstances and conditions, including:

- state of visibility—reduce speed in fog, rain, mist, smoke or glare
- traffic density, including fishing or any other vessels—slow down on busy waterways, when near moored vessels, larger vessels and work boats, or when operating in narrow channels
- vessel manoeuvrability, with special reference to stopping distance and turning ability in

- the prevailing conditions
- at night, the presence of background lights that restrict visibility, such as shore lights or back scatter of a vessel's own lights
- state of wind, sea, current and proximity of navigation hazards
- vessel draft in relation to the available depth of water
- characteristics, efficiencies and limitations of radar equipment.

The Collision Regulations apply throughout all Queensland waters, and failing to comply with a rule of the Collision Regulations is an offence, and this includes failing to proceed at a safe speed.² This offence carries a maximum penalty of 500 penalty units (presently \$66,725) or imprisonment for 1 year.

Consequently, before a speed limit may be fixed under TOMSA, the marine safety issue must be such as to justify an increase in “government regulation” over and above the application of rule 6 of the Collision Regulations.

More information about the Collision Regulations can be found on MSQ's website here <https://www.msq.qld.gov.au/Safety/Collision-regulations>

Marine safety legislation

In addition to safe speed under rule 6 of the Collision Regulations, there are two types of speed limits for Queensland waters:

1. **speed limits fixed by gazette notice** under TOMSA³
2. **statutory speed limits** under the *Transport Operations (Marine Safety) Regulation 2016* (TOMSR), commonly referred to as operational speed limits for distance and wash.⁴

GCWA may fix speed limits in Gold Coast waters under TOMSA, while MSQ may fix speed limits elsewhere in Queensland.

The operational “distance-off” speed limits do not apply where a speed limit of 6 knots has already been fixed by gazette notice for a waterway. Any change to an operational speed limit would require an amendment to TOMSR, which would require support from Department of Transport and Main Roads (TMR), the administering agency for all Queensland transport legislation.

Generally, for rivers, the smooth water speed limit of 40 knots would apply for all vessels and PWC where no other speed limit has been fixed by gazette notice. For reference, the following coastal river systems in South East Queensland have marine safety systems that include speed limits of 40 knots:

- Nerang River
- Coomera River (North Branch)
- Coomera River
- Pimpama River
- Logan River
- Brisbane River

² *Transport Operations (Marine Safety Act 1994, section 211*

³ *Transport Operations (Marine Safety Act 1994, sections 206A and 206AA*

⁴ *Transport Operations (Marine Safety) Regulation 2016, sections 81 to 83*

- Pine River
- Caboolture River
- Mooloolah River
- Maroochy River.

The South Branch of the Coomera River forms part of a major river system and also the waterways transport network on the Gold Coast. The speed limit for all vessels and PWC on the South Branch was fixed at 6 knots following the development of Sanctuary Cove in the late-1980s. Despite enquiries, GCWA was unable to ascertain whether there were any policy reasons for fixing this lower speed limit. When compared with other river systems on the Gold Coast, most notably the Nerang River, the 6 knots speed limit for smaller vessels and PWC on the South Branch of the Coomera River was inconsistent.

Given the sentiments of earlier community feedback, it was appropriate that GCWA considered the speed limits for all vessels and PWC on the South Branch, applying the evidence-based approach outlined in the Strategy and consistent with principles of minimal and best practice regulation.

To assist community understanding and compliance, GCWA will always aim for consistent speed limits systems for all Gold Coast waterways:

- 6 knots for canals and smaller creeks
- 30 knots or 40 knots for larger creeks and rivers
- 40 knots for open waterways.

GCWA should also consider a range of factors when deciding speed limits that can be applied generally to Gold Coast waterways. The principles of best practice regulation require that consideration is given to all available evidence, as well as matters of equity where there may be a disproportionate effect upon certain sections of the community. Examples of where the required due consideration may not have been given are the “blanket” 6 knots speed limits for all vessels and PWC on some Gold Coast waterways, which may have been the result of “quick fix” reactions to complex problems, rather than an evidence-based approach.

Where damaging wash is identified as a problem, variable speed limits might also be considered that specifically address wash as a function of vessel speed (for example, 30 knots for PWC and smaller vessels less than 6.5 metres; and 6 knots for vessels 6.5 metres and over). This position is supported by research into wash by Professor Gregor Macfarlane of the Australian Maritime College, and is discussed in Part B of this report.

As recommended in the Strategy, the speed limits trial for the South Branch comprised a variable speed limit: 40 knots for PWC and smaller vessels less than 8 metres; and 6 knots for vessels 8 metres and over. The reasons for these speed limits are discussed later in this report.

There was feedback from some waterfront residents during the trial expressing concern for the higher speed limit of 40 knots (which is 74 km/h) and comparing this with speed limits for streets and roads. The residents mentioned highway speed limits of 100 to 110 km/h, as well as those for built-up areas of 50 km/h and roads through suburbs of 60 km/h. However, as mentioned previously, the Collision Regulations provide rule 6 for safe speed, along with other clear rules for the movements of vessels and PWC; for example, positive obligations

for keeping a proper look-out, giving way, overtaking and passing.

MSQ decided in May 2011 that the maximum speed limit for hire and drive PWC should be fixed by gazette notice at 30 knots (54 km/h).⁵ Hire and drive PWC may be operated by unlicensed masters within a comprehensive safety management system regulated by the Australian Maritime Safety Authority. The state-wide 30 knots speed limit was fixed to restrict speeds for inexperienced masters and facilitate safer navigation, and thereby to enhance marine safety. Evidence gathered by GCWA during the speed limits trial confirmed that a speed limit of 30 knots is appropriate for PWC and smaller vessels to enhance safety for Gold Coast waterways.

The recommendations of this report consider rule 6 of the Collision Regulations, speed limits for other Queensland river systems, as well as feedback from marine enforcement agencies and the community.

Early consultation

Prior to implementation of the speed limits trial, GCWA consulted directly with Queensland Police Service (QPS), Queensland Boating and Fisheries Patrol (QBFP) and MSQ. The shared view of all marine enforcement agencies was that appropriate levels of marine safety on the South Branch could be successfully achieved through:

- a fixed speed limit of 6 knots for larger vessels, to address the problem of damaging wash
- the general smooth water speed limit of 40 knots for smaller vessels and PWC, to improve transport efficiency
- operational speed limits, which are complemented by rules of the Collision Regulations and other prohibitions and restrictions of the existing regulatory system.

MSQ, in particular, expressed its clear position that any trial speed limits should be consistent with other Gold Coast speed limits:

- 8 metres as the length for vessels at 6 knots
- 40 knots as the speed limit for smaller vessels and PWC.

It should be noted that these are the variable speed limits that form part of the marine safety systems for the Pimpama River, the Coomera River, the Coomera River (North Branch), and the Nerang River, so there is already widespread community understanding and compliance with these speed limits.

QPS and QBFP highlighted practical difficulties with enforcement of lower maximum speed limits (for example, speed limits of 20 knots, a speed that can be achieved and exceeded by many different types of vessels), as well as operational limitations of lidar units within the dynamic marine environment. It should also be noted that both QPS and QBFP operate patrol boats over 7 metres in length. They, too, supported the length of 8 metres for larger vessels and the speed limit of 40 knots for smaller vessels and PWC.

With respect to enforcement, GCWA made enquiries with two Australian companies that manufacture new lidar, radar and camera technologies with capabilities for enhanced

⁵ *Queensland Government Gazette*, 27 May 2011

detection of waterways speeding offences and other poor on-water behaviour. GCWA understands this technology has been successfully trialed in New South Wales and Western Australia. In GCWA's view, there is an opportunity to work with MSQ, QPS and QBFP to consider how this kind of technology could be used to assist with enforcement and monitoring of water traffic.

It needs to be understood that speed indicating devices (speedometers and GPS units) are generally not standard equipment for smaller vessels. The masters of smaller vessels may not know with certainty the speed at which their vessels are travelling. Smaller vessels up to 5 metres (not including PWC) account for around 49% of the Gold Coast registered recreational fleet.⁶ In GCWA's view, it is reasonable to contend that many of these smaller vessels would not be able to achieve speeds over 30 knots, a view supported by MSQ, QPS and QBFP, as well as research by Professor Macfarlane.⁷

Considering the advice received from MSQ, QPS and QBFP, GCWA commenced the speed limits trial for the Coomera River (South Branch) in July 2018 for a period of 12-months:

- 6 knots for vessels exceeding 8 metres in length
- 40 knots as the speed limit for smaller boats and jet skis.

The trial period of 12-months was chosen because waterways activities change with seasons, holiday periods and even weather. The full year provided the best possible opportunity for a comprehensive evaluation of the trial.

Area

The area for the speed limits trial comprised the Coomera River (South Branch) and certain waters of the Broadwater near the northern end of the Sovereign Islands, an area approximately 5.5 kilometres in length.

The map that describes the area for the speed limits trial can be found in **Appendix 1**.

Evaluation

GCWA recognises the importance of evidence-based evaluation for regulatory decision-making and has sought to enhance the degree to which its decision-making for the speed limits trial is based on relevant, quantifiable and defensible factors and data.

Consequently, for the speed limits trial, GCWA developed an innovative speed limit evaluation methodology, which to GCWA's knowledge, has not been undertaken for this kind of work in Queensland before. The methodology drew upon earlier academic research and was further refined in consultation with the marine enforcement agencies.

In May 2019, the GCWA Board endorsed four equally weighted **key factors** for evaluation of the speed limits trial:

⁶ *Local Government Area Report*, Department of Transport and Main Roads, May 2019

⁷ Macfarlane G, *Marine Vessel Wave Wake: Focus on Vessel Operations within Sheltered Waterways*, Australian Maritime College, Tasmania, June 2012, page 222

1. Safety
2. Waterways
3. Environment
4. Community.

For each of the key factors, there were several influencing **sub-factors**:

- character and features of the waterway, including width of navigable water and potential hazards
- existing regulatory system
- compliance rates
- marine incident data
- types, densities and interactions of water traffic
- field observations of water traffic at peak times
- public facilities
- maritime industry
- environmental considerations, including shoreline composition and features
- alignment with marine parks legislation
- wash energy as a function of vessel speed
- comments on noise
- dwellings and private structures
- community feedback, both written and through an online survey
- feedback from government agencies
- feedback from local government.

GCWA developed an **evaluation table** to list the key factors and sub-factors, weightings for those factors, scores for each sub-factor, and weighted percentages.

GCWA also considered appropriate speed limits from evaluation, according to the weighted percentage, through an **evaluation guide**.

The new evaluation table and the new evaluation guide can be found in **Appendix 2**.

GCWA also developed a **decision support tool** that used available data to better analyse and evaluate the level of importance, priority or risk for a range of sub-factors, as they related to the operations of vessels and PWC within the area of the trial.

GCWA used the decision support tool to achieve the evidence-based objective by:

- providing a framework for documenting the key factors and influencing sub-factors
- facilitating the evaluation of these sub-factors, according to importance, priority or risk
- enabling consideration for suitability of different speed limits.

The decision support tool quantified each of the sub-factors through a rating score from 1 to 5, based upon data, observations, research or feedback. Lower scores of 1 and 2 indicated higher levels of importance, priority or risk that, in turn, might support lower speed limits or variable speed limits, or highlight a broader waterways management issue.

It is important to note that the rating score was triggered according to the relevant attribute with the highest level of importance, priority or risk. For example, while the review of the South Branch found navigable waters that ranged from around 100 metres to more than 190

metres in width, the evaluation adopted the most conservative approach for this relevant attribute and evaluated the score according to the minimum navigable width of 100 metres.

The decision support tool does not provide results that are absolute in terms of importance, priority or risk. Rather, it is a tool that supports decision-making by increasing the level of objectivity for the decision-making process and decreasing subjectivity.

The decision support tool can be found in **Appendix 3**, while the explanatory notes for the tool can be found in **Appendix 4**.

Characteristics and features of the waterway

The South Branch of the Coomera River is an important part of the waterways transport network for the Gold Coast. It extends for approximately 6 kilometres from its confluence with the Coomera River to its entrance at the Broadwater near the Sovereign Islands. GCWA is currently dredging the South Branch as part of its ongoing dredging program, with the dredged channel width of 40 metres to a depth of at least 3.0 metres below lowest astronomical tide (LAT).

In recent years, GCWA has invested around \$10.3 million in the construction of the recently opened Coomera Dredged Sediment Management Facility, along with dredging campaigns for the South Branch.

The South Branch is also very popular for recreational boating with public boat ramps at Paradise Point, Jabiru Island and Hope Island. Further upriver is the major industrial area of the Gold Coast Marine Industry Precinct and four additional public boat ramps, which are well used by the recreational boating community.

GCWA reviewed aerial imagery of the area of the South Branch to establish the minimum width of navigable water at various locations. GCWA found that widths ranged from around 100 metres at the narrowest point to more than 190 metres at the widest point. This means the South Branch is one of the widest rivers on the Gold Coast.

For comparison, GCWA also reviewed aerial imagery of the Nerang River from near Hoy Street at Broadbeach Waters upriver to near Glenmore Drive at Ashmore, a distance of 5.5 kilometres. The fixed speed limits for this area are the same as those for the speed limits trial: the variable speed limits of 6 knots for vessels 8 metres and over, with 40 knots for PWC and smaller vessels less than 8 metres. GCWA established that widths of navigable water along this area of the Nerang River ranged from around 80 metres to 100 metres, with some narrower sections of around 60 metres.

From the data, it should be generally accepted that the South Branch presents as one of the wider Gold Coast rivers with a dredged channel for safer navigation.

However, GCWA also noted a channel of the South Branch behind a small unnamed island adjacent to the entrance of Hope Harbour Marina, which can be seen on the maps in **Appendices 1** and **20**. The navigable water of this channel narrows from around 50 metres to 40 metres, with a north cardinal beacon about 55 metres north of the island and a starboard lateral beacon marking sand shoals off the island's southern tip. This channel was highlighted

during consultation as one used by PWC travelling at higher speeds.

In response to this feedback, GCWA sought advice from MSQ, QPS and QBFP, from the perspective of marine safety. The shared view of the marine enforcement agencies was that, for the confined channel behind the small unnamed island, a speed limit of 6 knots would be reasonable regulation to enhance marine safety.

The recommendations of this report consider the character and features of the waterway, the character of the channel behind the small unnamed island adjacent to Hope Harbour Marina, as well as feedback from the marine enforcement agencies and the community.

Tables that describe the minimum width of navigable water at various locations on both the South Branch and the Nerang River can be found in **Appendices 6 and 7**.

Potential hazards

The responsibility for safe operations of a vessel or PWC always rests with the vessel's master, and this includes consideration for navigation hazards.

The South Branch is generally free from naturally occurring hazards, such as rock bars and sharp bends, and there are no cross-river bridges. While there are some shallower banks and sand shoals, GCWA also maintains a system of aids to navigation throughout the South Branch and other areas of the Coomera River system. These aids to navigation mark the channel for larger vessels and are shown on MSQ's boating maps and other navigational charts.

For comparison, GCWA considered the North Branch of the Coomera River, approximately 6.2 kilometres in length, with its rock bars, sharp bends, sand shoals and shallower depths. The fixed speed limits for the North Branch are the same as those for the speed limits trial: the variable speed limits of 6 knots for larger vessels 8 metres and over, with 40 knots for PWC and smaller vessels less than 8 metres.

Feedback from the community, MSQ, QPS and QBFP did not highlight any specific, unacceptable potential hazards for vessels and PWC on the South Branch, in the context of waterways character. QPS suggested re-location of one buoy mooring near Paradise Point, but this was to further open the river for faster moving smaller vessels and PWC.

GCWA's assessment of the South Branch of the Coomera River, when compared with other Gold Coast waterways, is that it presents a lower safety risk in terms of potential hazards to navigation.

The recommendations of this report consider the potential for navigation hazards.

Existing regulatory system

In addition to fixed speed limits, there is a suite of existing obligations, rules, requirements, restrictions and prohibitions for the operations of vessels and PWC on the South Branch of the Coomera River, which includes:

Transport Operations (Marine Safety) Act 1994—

- general safety obligation for the safe operations of all vessels and PWC
- safety equipment obligations
- licensing and registration requirements
- all relevant rules of the Collision Regulations (for example, look-out, safe speed, risk of collision, action to avoid collision etc.)

Transport Operations (Marine Safety) Regulation 2016—

- operational “distance-off” speed limits for vessels—6 knots within 30 metres in particular places (for example, boat ramps, jetties, pontoons, and anchored or moored vessels)
- operational “distance-off” speed limits for PWC—6 knots within 60 metres in particular places (for example, boat ramps, jetties, pontoons, anchored or moored vessels, and the shore)
- operational “distance-off” speed limit for PWC—10 knots within 30 metres of another moving vessel
- operational speed limit for damaging wash—marine incident or the shoreline
- freestyling restrictions for PWC

Transport Infrastructure (Waterways Management) Regulation 2012—

- anchoring restrictions and prohibitions
- freestyling prohibition for all watercraft
- water skiing prohibition for all watercraft

Environmental Protection Act 1994—

- noise from PWC and power boat sport.

GCWA’s view is that this existing legislation establishes a comprehensive regulatory system for:

1. **marine safety**, to achieve the objectives of TOMSA
2. **transport purposes** through the effective and efficient management of water traffic, to achieve the objectives of the *Transport Infrastructure Act 1994* (TIA).

From the perspective of marine safety, it should be noted that TOMSR provides some exceptions for the operational “distance-off” speed limits, including:

- for PWC, they may operate at more than 6 knots within 60 metres of the shore, but no more than the speed limit, providing the following apply—
 - the waters are less than 120 metres wide
 - the PWC is operating along or near the centre of the waters, or within a marked channel
 - the PWC moves through the waters in a straight line or in the most appropriate or direct route taking into account the circumstances of the waters.
- for PWC and vessels, from all operational “distance-off” speed limits and the operational speed limit for damaging wash, providing the following apply—
 - it is unsafe for the PWC or vessel to operate at a speed less than its control speed
 - the PWC or vessel is operating at a speed more than the statutory speed, but only to the extent that it is reasonably necessary for safe operations.

TOMSR defines **control speed** as the minimum speed at which a PWC or vessel can be kept on its course in the prevailing circumstances and conditions.

TOMSR also expressly provides that the Collision Regulations continue to apply for PWC, despite the exception for waterways less than 120 metres in width.

GCWA acknowledges and understands the complementary nature of the existing regulatory system. In passing the GCWA Act, the Parliament of Queensland mandated that the regulatory burden on waterways users should not be increased unnecessarily, and through this legislation, GCWA is required to deliver best possible management of Gold Coast waterways at a reasonable cost with minimal regulation.

The recommendations of this report consider the existing regulatory system and apply the principle of minimal regulation.

Compliance rates

TMR keeps records of all marine infringement notices (MINs) issued by shipping inspectors throughout Queensland in a database called TRAILS. The data for MINs was provided to GCWA by MSQ, a branch within TMR.

GCWA was advised by MSQ that location integrity for MIN data must be treated with some caution because the description for offence locations through a precise location recorded on each MIN is a relatively new MSQ initiative. Because of this, MSQ was unable to guarantee that the location data was 100% accurate or complete.

MSQ provided MIN data for the South Branch of the Coomera River from the past 5 years. To address the fact that recording of offence locations is a relatively new initiative, GCWA also requested data from MSQ that included locations described as Paradise Point, Hope Island, Sanctuary Cove and Santa Barbara. This more conservative approach aimed to achieve best possible statistical coverage for the area of the speed limits trial.

A table that summarises the data for MINs from January 2014 to May 2019, according to calendar year, can be found in **Appendix 8**.

The highest numbers of MINs are issued by QPS. Operational police officers from Gold Coast Water Police provided feedback that levels of compliance with speed limits during the trial were similar to those on other Gold Coast waterways, despite their increased patrol presence to specifically target the area. The operational police officers also suggested that compliance rates with the 6 knots speed limit for larger vessels 8 metres and over were also similar to those for these larger vessels when the speed limit was 6 knots before the trial.

During the speed limits trial, only two MINs were issued for operational “distance-off” speeding offences for PWC, while one MIN was issued for damaging wash caused by a larger vessel over 8 metres. The number of marine warnings for 2018 may be explained by the phased approach from education to enforcement by QPS, following commencement of the speed limits trial.

While there was no change to the speed limit for larger vessels 8 metres and over, there was feedback from several waterfront residents that the higher speed limit for PWC and smaller vessels tended to encourage higher speeds above 6 knots by larger vessels. QPS regularly responded to these reports, which were documented and often accompanied by many videos

of the alleged speeding larger vessels. The operational police officers who investigated these reports formed the view that there was insufficient evidence to prove many of these alleged offences, because the videos simply did not show speeding vessels or damaging wash. As mentioned previously, for the one offence that could be proved, the investigating police officer issued a MIN.

From the data and feedback, in GCWA's view, it is reasonable to contend that rates for compliance with speed limits and other marine safety and waterways management regulations remained relatively constant during the trial, such that there was no indication of a material change to the level of marine safety flowing from the speed limits trial.

The recommendations of this report consider data and feedback for compliance rates, as well as feedback from the marine enforcement agencies and the community.

Marine incident data

MSQ manages records of reported marine incidents throughout Queensland. Since July 2014, there were 34 reports of marine incidents on waters of the Coomera River system (downriver from the Pacific Motorway Bridge), which included 14 reports on the South Branch.

A table that summarises data for marine incidents reported to MSQ from July 2014 to June 2019, according to calendar year, can be found in **Appendix 8**.

A map that depicts locations of the reported marine incidents since July 2014 to December 2018 can be found in **Appendix 9**.

There were two reported marine incidents during the period of the speed limits trial:

1. damaging wash caused by a larger vessel over 8 metres near Hope Island
2. the collision of a slower-moving smaller vessel with a drifting smaller vessel.

Both incidents were investigated by QPS, with subsequent confirmation by QPS that neither incident was related to the increased speed limit for smaller vessels and PWC.

Further, during the period of the trial, there were no reports for the South Branch in relation to:

- fatal marine incidents
- serious injury marine incidents
- injury marine incidents
- marine incidents caused by speed
- marine incidents caused by wash from smaller vessels and PWC.

The 2018 annual *Marine Incident Report*, prepared by MSQ, was recently tabled in Parliament by the Minister for Transport and Main Roads. The Minister said the report is MSQ's best measure of safety on the waterways and how to best improve performance for the increasing number of boaties. The report noted that the Gold Coast area reported the most marine incidents for 2018, with 83 in 12 months.

It must be highlighted that data provided to GCWA by MSQ did not record any reported marine incidents in the area of the speed limits trial during 2018.

The Minister's media statement for the annual report can be found here <http://statements.qld.gov.au/Statement/2019/7/3/queensland-records-lowest-boating-fatalities-in-four-years>.

MSQ, QPS and QBFP provided feedback on the speed limits trial from the perspective of marine safety, which is documented later in the report.

Many waterfront residents provided feedback that the higher speed limit for PWC and smaller vessels would result in serious marine incidents that would endanger lives, along with higher-energy wash that would cause damage to private property, both pontoons and vessels moored at those pontoons. There was also the concern that the higher speed limit for smaller vessels would encourage speeding offences by masters of larger vessels 8 metres and over.

From the data and feedback, it became apparent that there was no increase in the number of reported marine incidents on the South Branch during the speed limits trial, and that the increased speed limit for PWC and smaller vessels related more appropriately to a lower-level safety risk with no negative impact on the level of marine safety.

Further, the speed limit for larger vessels 8 metres and over remained unchanged. Feedback from QPS suggested that compliance rates with speed limits for larger vessels were similar to those before the trial.

The recommendations of this report consider data and feedback for marine incidents, as well as feedback from the marine enforcement agencies and the community.

Field observations

From November 2018 to May 2019, GCWA conducted **field observations** of the South Branch from Ann Jackson Memorial Park at Paradise Point to accurately identify the type and density of water traffic, to measure compliance rates with speed limits and other marine safety requirements, and to assess higher levels of water traffic interaction.

The location for field observations was selected because it allowed for unobstructed views of around 1.2 kilometres upriver towards Jabiru Island and around 1 kilometre downriver towards the Sovereign Islands, with an area of around **500 metres** in which actual counts of water traffic could be made. The field observations provided a snapshot of water traffic operating on the river within that area.

The location for field observations also allowed for observations towards the private marina for Salacia Waters Apartments, the entrance to Paradise Point Boat Harbour, and private pontoons at Paradise Point.

The field observations found very low levels of water traffic on weekdays and higher levels of water traffic on weekends and public holidays, with compliance rates for speed limits during days with higher levels of water traffic generally exceeding 90%. All field observations were documented in field observation logs, complemented by photos and video.

In order of frequency, problems or issues identified during field observations comprised:

- PWC exceeding the "distance-off" speed limit of 6 knots within 60 metres of pontoons

- PWC exceeding the “distance-off” speed limit of 6 knots within 60 metres of moored vessels
- excessive or damaging wash caused by larger vessels
- freestyling by PWC
- smaller vessels exceeding the “distance-off” speed limit of 6 knots within 30 metres of pontoons.

Separately, there were occasional reports from waterfront residents of water skiing, tubing and wake boarding near Sanctuary Cove and Paradise Point. These activities are prohibited throughout the South Branch under waterways management legislation and, when reported to GCWA, were referred immediately to QPS, QBFP and MSQ.

It must be noted that all problems or issues identified during field observations were compliance problems addressed by the existing regulatory system and were not directly related to the speed limits trial.

GCWA did not receive any reports or concerns about unsafe interactions between water traffic from QPS, QBFP or MSQ.

Some waterfront residents provided feedback about observations of vessels and PWC during the trial, expressing concern for “a couple of thousand movements” with continuous speeding offences and other high-risk on-water behaviour. This was at odds with field observations that counted vessels, PWC and other water traffic, and calculated compliance rates with both the fixed speed limits and the operational speed limits. For example, on Anzac Day 2019, field observations over 8 hours recorded a total of 730 movements for water traffic operating through the area, with a compliance rate of 92% for speed limits.

The data recorded by GCWA from field observations showed water traffic volumes were higher in the South Branch on weekends and public holidays and lower on other days. GCWA concluded that vessels and PWC were generally compliant with speed limits and other regulations, and that the make-up and density of water traffic was reasonable for a river forming part of the transport network.

The recommendations of this report consider data from field observations, community feedback, and feedback from the marine enforcement agencies.

Data from field observations for Anzac Day and the Labour Day long weekend can be found in **Appendices 10** and **11**.

A table that documents data from all field observations from November 2018 to May 2019 can be found in **Appendix 12**.

Types and density of water traffic

Field observations found the South Branch is used for navigation by many different types of water traffic:

- passive craft like kayaks
- smaller dinghies, inflatable boats and speed boats
- larger speed boats

- water ski and wake boarding boats, generally in transit to other areas
- jet skis
- sail boats
- larger vessels, including commercial house boats and ferries
- superyachts navigating to and from the Gold Coast Marine Industry Precinct.

The most recent records provided by TMR show that 32,500 registered recreational vessels (including PWC) are stored at addresses within the Gold Coast local government area, comprising:

- 2,663 vessels over 8 metres
- 2,760 vessels from 6 metres to 8 metres
- 4,367 smaller vessels 5 metres to 6 metres
- 14,891 smaller vessels 5 metres and under
- 7,819 PWC.⁸

Based on these records, more than 83% of the registered recreational fleet from the Gold Coast is represented by PWC and smaller vessels 6 metres in length and under.

Of the vessels ranging from 6 metres to 8 metres, the data does not capture those vessels 6.5 metres and over. Should there be a change in vessel length for a 6 knots speed limit (for example, from 8 metres down to 6.5 metres), such change would affect no more than 9% of the Gold Coast registered recreational fleet.

Field observations found that water traffic densities ranged from very low during weekdays (up to four watercraft within the area of observations at the same time) to moderate during weekends, public holidays and school holidays (from 10 to 14 watercraft within the area of observations at the same time). This moderate level for water traffic density during weekends and holiday periods also took into account the busier times during mid-mornings and mid-afternoons when the densities were observed to be higher.

Field observations found very low numbers of slow-moving passive craft, like kayaks and canoes, as well as a few stand-up paddleboards.

Generally, the highest densities of water traffic observed during field observations were combined totals of up to 13 PWC, smaller vessels and larger vessels within the field observations area of 500 metres at the same time. There was one occasion when 23 PWC transited through the area as a group but this was most likely an organised ride for a PWC club. In this case, all masters were observed operating in compliance with relevant speed limits and other requirements.

For weekdays, field observations were supported by aerial imagery over the entire length of the trial area for the South Branch, which suggested very low levels of water traffic:

- 7 watercraft on Wednesday, 1 August 2018
- 7 watercraft on Tuesday, 6 November 2018
- 11 watercraft on Friday, 31 May 2019.

Field observations during periods of higher water traffic volumes also suggested, generally,

⁸ *Local Government Area Report*, Department of Transport and Main Roads, May 2019

the following make-up of water traffic, expressed as a percentage:

- PWC—29%
- smaller vessels under 8 metres—51%
- larger vessels 8 metres and over—19%
- passive craft—1%.

Field observations over 6 months recorded 12 unsafe interactions from 8,110 water traffic movements. These interactions resulted primarily from operations in contravention of rules of the Collision Regulations. For example, most unsafe interactions were PWC crossing in close-quarters with slower-moving larger vessels, while there was one instance that involved a larger vessel failing to pass another larger vessel on the correct side.

From its field observations, GCWA concluded that densities and interactions of water traffic on the South Branch were generally of a level that allowed for safer navigation, even during times of higher water traffic volumes. It must be noted, however, that this was not the commonly held view of many waterfront residents who provided feedback during the speed limits trial.

It should also be noted that historical aerial imagery shows very low use by water traffic of the South Branch before the start of the speed limits trial, even on weekends.

The recommendations of this report consider TMR data, data from field observations for water traffic densities, as well as feedback from the community.

Public facilities

GCWA invests in public facilities like boat ramps, pontoons and landings to improve waterways access and help service the needs of the recreational boating community.

In December 2017, TMR released the *Recreational Boating Facilities Demand Forecasting Study 2017* (the Study), which examined and assessed the current and future demands for recreational boating facilities throughout Queensland, including a section for the Gold Coast local government area.

There are three all-tide public boat ramps with access to the South Branch:

1. Drake Avenue at Paradise Point (Paradise Point Boat Harbour)
2. Oxley Drive at Paradise Point (Jabiru Island)
3. Boykambil Esplanade at Hope Island (Hope Island).

The Paradise Point Boat Harbour facility contains a 3-lane boat ramp and pontoon, together with parking spaces for 46 car-trailer units (CTUs) and a sandy beach for waiting PWC and smaller vessels. This facility provides ready access to the northern Broadwater and was found during field observations to be very well used, especially on weekends and public holidays.

The Jabiru Island facility contains a 2-lane boat ramp, together with parking spaces for 30 CTUs and a small sandy beach for waiting PWC and smaller vessels. This facility also provides ready access to the northern Broadwater and was found to be well used during field observations.

The Hope Island facility contains a single-lane boat ramp, together with parking spaces for 13 CTUs and a small sandy beach. Like the others, this facility provides ready access to the northern Broadwater and was found to be well used during field observations.

Consultation for the Study identified the Hope Island facility as one that probably requires further consideration for expansion, potentially for 2-lanes with a floating walkway and parking spaces for 35 CTUs.

An observation of the Study is that travel times are a practical limitation that affects decision-making by the boating community about use of particular boat ramps:

“Although navigable access from a boat ramp to open water may be possible, it may not be practical due to the distance travelled by water and/or any speed restrictions that may be in place for the waterway. Most people will seek to launch at the facility that takes the least time to reach their destination. This is particularly the case for offshore destinations where larger volumes of fuel must be paid for and carried to allow for the journey.”

Feedback received from the boating community during consultation for the speed limits trial reinforced this observation of the Study.

Moreover, field observations during weekends and public holidays found that capacity for CTU parking spaces would be regularly exceeded, particularly for the boat ramp at Paradise Point Boat Harbour, with many CTUs having to rely upon on-street parking.

The Study describes the projected sizes of the trailable recreational fleet according to registrations and users. For **users of Gold Coast waters**, the size of the fleet is projected to be more than 44,000 PWC and vessels by 2026, increasing to more than 55,000 by 2036. These figures do not include non-trailable vessels.

The recommendations of this report consider public facilities and their use by the boating community.

The Study can be viewed and downloaded here

<https://publications.qld.gov.au/dataset/recreational-boating-facilities-demand-forecasting-study-2017>.

Maritime industry

The Gold Coast is a waterways city with more than 260 kilometres of navigable waterways with a natural capital value of \$26 billion. The waterways provide significant social, economic and environmental benefits and services for residents and visitors alike. The South Branch of the Coomera River forms a critical part of these waterways, particularly for recreational boating and fishing, marine industries and other commercial operations, and local tourism.

Speed limits for vessels and PWC are fixed by GCWA under TOMSA. The objective of TOMSA is to provide a system that achieves an appropriate balance between regulation of the maritime industry (and this includes the recreational sectors) and enabling that industry's effective and efficient further development.

GCWA acknowledges that the maritime industry is a relevant consideration to its decision-making for speed limits on Gold Coast waterways.

In October 2016, GCWA commissioned NCEconomics to undertake a study on the socio-economic uses and economic values of Gold Coast waterways. The purpose of the study was to determine a baseline for the socio-economic and economic values of the waterways, and through this, to assist GCWA's decision-making, among other things.

The study culminated in production of a *Summary Report* in September 2017, which can be viewed and downloaded here https://gcwa.qld.gov.au/wp-content/uploads/2018/04/ValueStudyGold-Coastwaterways_final2.pdf.

In terms of recreational use and values, the study examined Gold Coast waterways to determine the distribution of waterways activities, distances travelled by visiting recreational users, and how visiting recreational users contribute to the local economy. The study observed that boating accounted for around 30% of waterways activities, which in turn, contributes significantly to the local economy.

For GCWA's online survey, it should be noted that "motor boating" was described as a use of the South Branch of the Coomera River by more than 80% of the survey respondents.

The Queensland Government previously identified the maritime industry as one of its key industry growth sectors, with the boat manufacturing sector representing one of the largest, most sophisticated manufacturing and high value-added sectors in the State.⁹ In fact, Australia's largest manufacturer of aluminium boat and trailer packages is headquartered in the Gold Coast Marine Industry Precinct on the Coomera River.

From field observations and feedback from representatives of maritime industries and the community, GCWA believes the speed limits trial produced a positive effect for recreational boating, maritime industries and tourism. In GCWA's view, the speed limits trial helped to meet TOMSA's objective of enabling the effectiveness and efficiency of the Queensland maritime industry to be further developed.

The recommendations of this report consider the development of the maritime industry, the content of the *Summary Report*, along with field observations and feedback from representatives of maritime industries and the community.

Feedback—Maritime Safety Queensland

MSQ is the state marine safety regulator with responsibilities that include the case management of all reported marine incidents and the fixing of speed limits for Queensland waters beyond those defined as Gold Coast waters under the GCWA Act.

GCWA liaised regularly with MSQ for the duration of the speed limits trial, with MSQ offering its support through provision of marine incident data, data for MINs and other advice.

⁹ *North East Gold Coast strategic land use, economic development and infrastructure study*, Issues and options paper, Department of Infrastructure and Planning, August 2008, page 65

MSQ's position at the commencement of the speed limits trial was primarily that of consistency: 40 knots for PWC and smaller vessels; and 6 knots for larger vessels 8 metres and over.

The Gold Coast office of MSQ provided the following feedback:

"The trial speed limit of 40 knots for smaller vessels has provided improved access to locations in the upper Coomera River and as a result more water traffic is using the river at peak times.

With increased traffic flow in the river and increased speed limit, the risk of collision between vessels may rise accordingly. However, to date, MSQ has not received any increase in marine incident reports.

The trial speed limit of 40 knots allows for greater vessel closure speeds when on reciprocal courses, which would make any collision impact greater than when the speed limit was 6 knots.

Waterfront residents along the trial area have reported that the increased speed limit has caused more vessel wash impacting their pontoons and they have been vocal in their disapproval of the speed limit increase. However, it should be noted that previous vessel wash/wake studies indicate that the faster smaller vessels operate, the less energy in their wash is realised. To date, MSQ has not received indications of broken infrastructure or similar.

It has been reported that some larger vessels, over 8 metres in length, are assuming that the new speed limit applies to them as well. This is not the case, so perhaps GCWA could erect larger speed signs to ensure the over 8 metre vessels don't speed in the area.

The trial speed limits may be compared to the existing speed limits for the Nerang River where the channel widths and depths are similar. Historically, the level of marine incidents on the Nerang River has been low.

From observations to date, from a marine safety perspective, MSQ remains supportive of the speed limits trial.

With respect to options for speed limits (which are discussed later in this report), MSQ supports Option 3—6 knots for vessels 6.5 metres and over, with 30 knots for PWC and smaller vessels.

This option is a combination of marine safety, reducing the effect of vessel wash while maintaining accessibility to the waterway."

Feedback—Queensland Police Service

Gold Coast Water Police is a specialist unit of the QPS. While their primary role is that of search and rescue, the police officers also perform the important role of on-water enforcement for marine safety and certain waterways management legislation.

QPS was very supportive of GCWA throughout the speed limits trial, providing regular feedback, and actively responding to reports and complaints from waterfront residents, primarily those at Sanctuary Cove and Paradise Point.

Feedback from Gold Coast Water Police is reproduced below:

“A lot of the feedback which I have seen from residents refers to marine safety.

During the trial period we have received reports of two marine incidents. The first incident related to a pontoon which was damaged from wash by a large vessel over 8 metres; and the second related to two small vessels under 6 metres when one vessel was drifting with the motor off and the other vessel was doing 10 to 15 knots when its master was not paying attention heading into the afternoon sun. The master’s failure to keep a proper look-out caused the collision and there were no injuries to any person.

The rate of offending detected is no different to any other waterway on the Gold Coast and there is no other waterway that we have patrolled more than the South Branch due to the engagement by local residents. We have certainly had a significant increase in marine complaints in the trial area, but this is due to the residents putting a focus on the detection of offending vessels and subsequent contact with my office.

In my opinion, the trial has not caused any negative impact to marine safety.

Also, to help raise awareness and educate the boating community, it would be good if the speed signs could be larger with hi-visibility borders, and if a series of maps could be produced to show the different speed limits on the Gold Coast, as well as prohibitions for water skiing and freestyling.

With respect to options for the speed limits (which are discussed later in this report), Gold Coast Water Police believe that Option 3—6 knots for vessels 6.5 metres and over, with 30 knots for PWC and smaller vessels less than 6.5 metres—would be the most suitable. However, with this, we also respectfully submit that there would need to be consistency across all Gold Coast waterways if a change like this is to be made, to avoid confusion and misunderstandings.

It is evident during patrols that most vessels do not exceed 30 knots. However, for those that do, the speed limit of 30 knots would significantly reduce their closing speed, which would allow for further reaction time to avoid potential collisions. The reduction in length from 8 metres to 6.5 metres would also reduce wash caused by larger bowriders and wake boarding boats with significant ballast in that 6.5 to 8.0 metres range, which at times can cause excessive or damaging wash.

In ranking order, Gold Coast Water Police, support the following:

- 1. Option 3—most preferred*
- 2. Option 4*
- 3. Option 2*
- 4. Option 1—least preferred.”*

In summary, Gold Coast Water Police held the view that:

- there was no negative impact on marine safety from the speed limits trial
- the trial did not cause any increase in marine incidents
- by removing the 6 knots speed limit for smaller vessels, there was an increased focus on the specified “distance-off” speed limits (for example, 6 knots within 30 or 60 metres of pontoons), and it also brought into play enforcement for two speed zones: one for vessels less than 8 metres; and then another for those 8 metres and over
- travel times and transport efficiency were improved significantly under the trial, with travel times reduced by a large margin for smaller vessels
- there was no increase in damaging wash due to the trial
- vessels over 8 metres were still restricted to 6 knots, the same as before the trial
- the trial did not create any changes to previous behaviour or impacts from the larger vessels.

Feedback—Queensland Boating and Fisheries Patrol

QBFP is a work unit within the Fisheries business area of Department of Agriculture and Fisheries. The primary role is that of fisheries compliance and enforcement, but like Gold Coast Water Police, QBFP also perform an on-water enforcement function for marine safety and waterways management legislation.

Like MSQ and QPS, QBFP was also very supportive of GCWA throughout the speed limits trial.

The Gold Coast office of QBFP provided the following feedback:

“I have canvassed my crew and am happy to report that, from our perspective, the trial has been an overall success.

There may be scope to revisit the length of vessels for the 6 knots speed limit (perhaps a reduction in length to 6.5 metres) where an improvement in wash from 6.5 to 8.0 metre vessels would be captured. However, this is probably not a core marine safety issue in the affected areas.

Another positive from my perspective, is that the trial has certainly freed our agency’s enforcement focus away from somewhat trivial speeding offences to concentrate on more significant areas of maritime safety.

I have received favourable comments from small craft operators (PWC and tinnies) regarding access from the river to the Broadwater. QBFP hasn’t received any direct complaints from any client groups regarding the trial.

This may pave the way to consider other areas for a similar trial, such as upstream of the Turana Street public boat ramp in Coombabah Creek.

With respect to the options put forward by GCWA (which are discussed later in this report), I offer the following:

Option 1—6 knots for all vessels—this option is not conducive to travel efficiency and leads to avoidance of “up-river” boat ramps, which in turn, leads to congestion in other areas. I believe it also leads to frustration and offending by smaller craft operators less than 6 metres and PWC, which then causes undue pressure on enforcement agencies for response where this is not often possible given competing priorities.

QBFP would like to know how the 6 knots speed limit for all vessels came about—where is the science or rationale for this decision?

Option 2—6 knots for vessels 8 metres and over, and 40 knots for PWC and smaller vessels less than 8 metres—as per the present trial, this option has received positive feedback from small craft operators. There is some trepidation that the length of 8 metres is too long regarding wash.

Option 3—6 knots for vessels 6.5 metres and over, with 30 knots for PWC and smaller vessels less than 6.5 metres—this is QBFP’s favoured approach, because this is a measured approach. It should be noted, however, that 30 knots could cause enforcement difficulties when complaints are received (the burden of proof that a vessel is doing 38 knots as opposed to 30 knots). QBFP lidar units are dated and target-definition problematic for PWC and smaller runabouts. I’m unsure whether the newest “V” police lidar units are any better. I’m minded to suggest 6.5 metres and 40 knots, which is consistent with the general smooth water speed limit.

Option 4—6 knots for vessel 5.0 metres and over, with 30 knots for jet skis and smaller boats less than 5.0 metres—I believe the speed limit is too restrictive, as per comments for Option 1.

In order, from most preferred to least preferred, QBFP support the following:

- 1. Option 3—most preferred*
- 2. Option 2*
- 3. Option 4*
- 4. Option 1—least preferred.”*

Community feedback

GCWA undertook significant consultation for the speed limits trial with the local community. There were community meetings, consultation sessions at local boat ramps and shopping centres, meetings with residents’ groups and individuals, production of web-based information and frequently asked questions, a social media campaign that included an online survey, and individual responses to written feedback and comments.

GCWA also received petitions signed by 118 people (which included 54 people with residential addresses at Sanctuary Cove, Hope Island and Paradise Point) concerned about community consultation before the trial, speeding offences and enforcement, damage to private property, environmental damage, noise pollution and danger to human life. These people requested a stop to the trial and the return of the 6 knots speed limit for all vessels.

A scanned copy of a petition can be found in **Appendix 5**.

From the feedback, it became apparent that all concerns about the speed limits trial, from the perspective of marine safety, were appropriately addressed by the existing regulatory system. In fact, GCWA received feedback that if the masters of all vessels and PWC complied with the existing laws, then there would be no problems on the South Branch.

However, the feedback and the petitions also raised several broader waterways management issues, such as shoreline damage and erosion, concerns for marine animals, wash that might damage pontoons, and increased noise affecting amenity and lifestyle. Some of the feedback took the form of comprehensive submissions, accompanied by photos and videos.

GCWA committed to reviewing and giving consideration to feedback and concerns about these broader waterways management issues, which are discussed in Part B of this report.

Speed limit options

GCWA believes it is reasonable to consider four speed limit options for the (South Branch):

Option 1

A new speed limit of 6 knots for all vessels.

This option would appear to have the following advantages and disadvantages:

Advantages	Disadvantages
1. Most simple regulation	1. Blanket approach
2. Responds to wash, in certain conditions	2. Exceeds minimal regulation requirement
3. Strongest support from waterfront residents	3. Unfairly penalises majority of Gold Coast rec fleet
4. Operational speed limits do not apply	4. Inconsistent with speed limits for other rivers
5. Responds to amenity	5. Contrary to best practice regulation
6.	6. Contrary to objectives of TOMSA
7.	7. Contrary to purposes of GCWA Act
8.	8. Least support from enforcement agencies
9.	9. Strongest opposition from boating community
10.	10. Provides no transport efficiency
11.	11. Greatest effect on GC rec vessels—100% fleet
12.	12. Fails to support maritime industry
13.	13. Improper legal mechanism for amenity
14.	14.

Option 2

The variable speed limit of the speed limits trial:

- a) 6 knots for vessels 8.0 metres and over
- b) 40 knots for vessels less than 8.0 metres.

This option would appear to have the following advantages and disadvantages:

Advantages	Disadvantages
1. Aligns with minimal regulation	1. Fails to address concerns for high speed
2. Consistent with speed limits for other rivers	2. Fail to address residents' concerns for safety
3. Consistent with marine parks legislation	3. Fails to adequately address wash concerns
4. Provides greatest trans efficiency <8 m—92%	4. Inconsistent with wash research
5. Strongest support from boating community	5. Enlivens operational speed limits
6. Least effect on Gold Coast rec vessel—8% of fleet	6. Strongest opposition from waterfront residents
7. Support from enforcement agencies	7.
8. Most vessels cannot achieve 40 knots	8.
9. Supports maritime industry	9.
10.	10.
11.	11.
12.	12.
13.	13.
14.	14.

Option 3

A new variable speed limit:

- a) 6 knots for ships 6.5 metres and over
- b) 30 knots for ships less than 6.5 metres.

This option would appear to have the following advantages and disadvantages:

Advantages	Disadvantages
1. Aligns with balanced and minimal regulation	1. Minimal effect on GC rec vessels—17% fleet
2. Support from boating community	2. Least support from waterfront residents
3. Responds to concerns for high speed	3. Enlivens operational speed limits
4. Responds to concerns for safety	4.
5. Responds to concerns for wash	5.
6. Consistent with objectives of TOMSA	6.
7. Consistent with purposes of GCWA Act	7.
8. Consistent with wash research—max length	8.
9. Consistent with max speed for hire & drive PWC	9.
10. Consistent with marine parks legislation	10.
11. Provides trans efficiency vessels <6.5 m—83%	11.
12. Strongest support from enforcement agencies	12.
13. Most vessels under 6.5 m cannot achieve 30 knots	13.
14. Supports maritime industry	14.

Option 4

A new variable speed limit:

- a) 6 knots for ships 5.0 metres and over
- b) 30 knots for ships less than 5.0 metres.

This option would appear to have the following advantages and disadvantages:

Advantages	Disadvantages
1. Aligns with minimal regulation	1. Significant effect on GC rec vessels—30% fleet
2. Responds to concerns for high speed	2. Some support from enforcement agencies
3. Responds to concerns for safety	3. Enlivens operational speed limits
4. Responds to concerns for wash	4.
5. Consistent with wash research	5.
6. Consistent with max speed for hire & drive PWC	6.
7. Consistent with marine parks legislation	7.
8. Provides trans efficiency vessels <5 m—70% fleet	8.
9. Some support from waterfront residents	9.
10. Most vessels under 5 m cannot achieve 30 knots	10.
11. Somewhat supports maritime industry	11.
12.	12.
13.	13.
14.	14.

Conclusion

The evidence from the speed limits trial, which comprised data, observations and research, together with feedback from government agencies and the community, was analysed utilising the new decision support tool, added to the new evaluation table, and considered against the new evaluation guideline.

Having consideration to all available evidence, GCWA recommends Option 3; that is, a new variable speed limits system for the South Branch of the Coomera River:

- a) 6 knots for vessels 6.5 metres and over
- b) 30 knots for PWC and vessels less than 6.5 metres.

In GCWA's view, the feedback and other evidence collected during the speed limits trial most appropriately supports Option 3 as the option that best satisfies the objectives of TOMSA and the purposes of the GCWA Act to achieve an appropriate balance between:

- marine safety
- management of damaging wash
- utility for the waterway
- legitimate access to the waterway for the community
- minimal regulation.

PART B: Related waterways issues

Background

Investigations by GCWA show that population growth, increasing numbers of registered recreational vessels, growth of the Gold Coast Marine Industry Precinct and improved access to the waterways have contributed to increased waterways use.

During the speed limits trial, it became apparent that several related issues were linked to the increased use of the South Branch by vessels and PWC. While the management of these issues falls outside the legal and policy areas of direct responsibility for GCWA, they still need to be understood and are relevant for waterways management within the area of the speed limits trial.

Consequently, Part B of this report aims to describe the different jurisdictional and administrative arrangements available for management of these issues beyond the fixing of speed limits.

The issues highlighted from increased use of the South Branch by PWC and smaller vessels can be captured and described under the following headings:

- sensitivities of South Branch shorelines
- marine parks legislation within Gold Coast waterways
- wash energy
- noise
- waterfront dwellings
- private waterways structures
- community concerns.

These issues will each be discussed, in turn.

Part B also mentions marine zones, a legislative mechanism that may be worthy of further exploration by the City of Gold Coast (the City).

South Branch shorelines

Research by Professor Gregor Macfarlane of the Australian Maritime College suggests that shorelines of sheltered waterways types may be characterised according to the level of sensitivity:

1. **highly sensitive**—very sheltered waterways, such as rivers with limited width and steep cohesive banks that are highly susceptible to erosion by wash
2. **moderately sensitive**—semi-sheltered waterways, such as the lower reaches of rivers with artificial armour engineered to withstand wave action
3. **coastal**—more exposed waterways.¹⁰

The northern shoreline for the South Branch is formed by Coomera Island, which lies within a

¹⁰ Macfarlane G, *Marine Vessel Wave Wake: Focus on Vessel Operations within Sheltered Waterways*, Australian Maritime College, Tasmania, June 2012, page 46

habitat protection zone of the Moreton Bay Marine Park. This shoreline is generally comprised of shallow sloping muddy beach-like banks and adjacent muddy tidal flats with mangroves. The shallow sloping nature of the banks allows for dissipation of waves over larger areas, except on higher tides when waves may flow through into mangroves.

From Professor Macfarlane's research, GCWA believes it is reasonable to characterise the Coomera Island shoreline more towards a highly sensitive shoreline than one that is moderately sensitive. GCWA formed this view because of the river's naturally occurring lower-energy environment and the presence of some shoreline areas with lower cohesive banks that may be susceptible to erosion from higher-energy wash caused by vessels 6.5 metres and over.

GCWA received feedback from several waterfront residents who were concerned about shoreline erosion and fallen trees on Coomera Island, which they said was caused by wash from increased use of the river by PWC and smaller vessels. Department of Environment and Science (DES) subsequently provided comments to GCWA about the shoreline of Coomera Island, which can be found later in this report.

GCWA would also be pleased to take further advice from DES about the shoreline of Coomera Island and how it might be affected by natural processes and vessel generated wash.

GCWA received submissions from waterfront residents concerned about the levels of wash generated when PWC and smaller vessels accelerated or decelerated near the entrances to canals or the upriver boundary of the speed zone. In particular, it was raised that wash from PWC and vessels entering and exiting a canal system at Paradise Point was contributing to sand erosion along part of the western canal edge, from about 30 metres into the canal. The speed limit for all canals in Queensland is 6 knots, unless otherwise fixed by gazette notice.

In contrast to Coomera Island, the southern bank of the South Branch is predominantly a heavily developed, artificial shoreline that comprises smaller rocks commonly called "rip rap" bank armour, with some small areas of muddy-sand beach-like foreshores.

The purpose of bank armour is the protection of waterfront edges from the forces of tidal currents and wave action that can erode and undermine river banks, and thereby cause expensive waterfront damage. Bank armour is generally considered important for good maintenance of waterfront properties, protecting valuable waterfront land from erosion and flood impact.

The area of the speed limits trial also included the northern end of the Sovereign Islands, which has a shoreline composed entirely of concrete revetment walls. Like the "rip rap" bank armour, concrete revetment walls are engineered for the protection of waterfront edges from tidal currents, wave action and flood impact.

From Professor Macfarlane's research, GCWA concluded it is reasonable to characterise the shorelines of both the southern bank of the South Branch and the northern end of the Sovereign Islands as moderately sensitive shorelines. GCWA reached this conclusion because both shorelines are predominantly engineered artificial bank armour or concrete revetment walls.

An understanding of shoreline characterisations helps to inform decision-making for maximum vessel length, when considered from the perspective of energy of the maximum wave as a function of vessel speed. In GCWA's view, for highly to moderately sensitive shorelines, it would be both reasonable and responsive to consider lower speed limits for larger vessels because the energy of their wash may be a contributing factor to shoreline damage.

The recommendation of this report for new speed limits considers both the northern and southern shorelines of the South Branch, as well as research by Professor Macfarlane, feedback from DES, and community feedback.

A table that describes the composition of the southern shoreline at various locations of the South Branch can be found in **Appendix 6**.

For comparison, a table that describes the shoreline composition of the Nerang River at various locations can be found in **Appendix 7**.

Marine parks legislation

The management of the Moreton Bay Marine Park by DES, through Queensland Parks and Wildlife Service (QPWS), is supported by several pieces of Queensland legislation, including:

- *Marine Parks Act 2004*
- *Marine Parks Regulation 2017*
- *Marine Parks (Moreton Bay) Zoning Plan 2008* (the Zoning Plan).

Among other things, the Zoning Plan provides for “go slow” areas with objects that include:

- protection of turtles and dugong
- protection of turtle and dugong habitats
- protection of natural integrity and values of relatively undisturbed areas.

GCWA received some feedback during the trial raising concerns about environmental damage and erosion to Coomera Island, as well as the risk of vessel strikes with marine animals like turtles and dugong. DES subsequently provided comments to GCWA that addressed each of these concerns, which can be found later in this report.

With respect to vessel strikes, it should be noted there are three “go slow” areas under the Zoning Plan over channels marked with aids to navigation in southern Moreton Bay. For these specific areas, **vessels over 8 metres** must not operate at speeds of more than **10 knots**. These particular “go slow” areas were put in place due to historical strikes by larger vessels on turtles and dugong. The trial speed limit of 6 knots for vessels 8 metres and over offers at least the same level of protection for turtles and dugong as that provided by these specific “go slow” areas under the Zoning Plan.

GCWA formed the view that the trial speed limits were suitably aligned with both the habitat protection zone and the larger vessel “go slow” areas within the Moreton Bay Marine Park, as provided by marine parks legislation.

The recommendation of this report for new speed limits considers marine parks legislation, feedback from DES, and community feedback.

A map of the Moreton Bay Marine Park's designated "go slow" areas can be found here <https://parks.des.qld.gov.au/parks/moreton-bay/zoning/pdf/map5-goslowareas.pdf>.

Certain waters of the South Branch are outside the boundary of the Moreton Bay Marine Park; for example, those waters near the Sovereign Islands and Paradise Point.

A table that describes whether a location for the speed limits trial is within the boundary of the Moreton Bay Marine Park (MP) can be found in **Appendix 6**.

Wash energy

The term "wash" is commonly used to refer to the waves and turbulence generated by a vessel as it moves through the water. The energy of a vessel's wash and the effects this might have on the shoreline, structures and other vessels will depend upon how the vessel is operated, its hull design and waterline length, the number of passengers, and the weight of its load. From this, it is reasonable to contend that variables for calculating wash energy are probably infinite, which is the reason why consideration of more indicative data should be the preferred approach when examining wash as a function of vessel speed.

It is generally accepted that a vessel operating at slower speeds "half-on-the-plane" will generate higher-energy wash as the vessel moves through the water, and this applies similarly to PWC and vessels, smaller and larger. Slower speeds will generally cause a vessel's stern to 'dig-in' and its bow to rise, sometimes referred to as "bog-planing". This type of vessel attitude often makes it difficult for the vessel's master to maintain a proper look-out ahead, as required by the Collision Regulations. It should be noted that, in addition to causing higher-energy wash, a vessel operating "half-on-the-plane" will also suffer from poor fuel economy.

PWC and many other smaller and larger vessels are constructed with planing hulls. Planing hulls are designed to produce dynamic lift and have less hull in the water when travelling at higher speeds. This contrasts with displacement hulls that are designed to push through the water, and semi-displacement hulls that create large holes in the water and generate larger bow and stern waves. It is generally accepted that PWC and vessels travelling "on-the-plane" generate wash of lower energy.

In August 2016, Professor Macfarlane was engaged by GCWA, as part of the original *Speed and Behaviour Management Strategy* from 2016, to provide specialist advice for speed limits and wash with scientific justification for speed limits. Professor Macfarlane's advice was founded in research into wash data acquired from full-scale trials on a variety of relevant vessels, along with predictions from an empirical tool developed over the past 20 years specifically for that purpose.

The report to GCWA by Professor Macfarlane provides the following:

"It is generally accepted that wave energy is a better quantity for determining acceptable wash than wave height, as it is a function of both wave height and period. The energy of the maximum wave is plotted as a function of vessel speed in Figure 2.

A separate vessel wash study investigated nominal wave energy limits designed to minimise bank erosion of typical rivers in south-east Queensland and proposed a limit of approximately 180 J/m for moderately sensitive shorelines. This limit is shown in Figure 2, which suggests all generic vessels (just) meet this criterion at a speed of 6 knots. For comparison, the recommended wave energy limit for more sensitive shorelines (60 J/m) is also shown in Figure 2—in such cases there is an argument that vessel speed should be limited to just 5 knots.

There is strong justification from the results presented in Figure 2 that larger vessels (in excess of 6.5 metres) should continue to observe the 6-knot speed limit to avoid generating unacceptably energetic waves (at any speed in excess of 6 knots). These results also clearly demonstrate the need for smaller craft to minimise operation at ‘intermediate’ speeds (6 to 15 knots)—if they don’t, their waves can easily exceed the nominal acceptable limit of 180 J/m. This confirms the proposal that operators of small craft be encouraged to “get up on-the-plane” (speeds around 20 to 25 knots) to minimise wave generation.

It is reiterated that the data presented here is deliberately general in nature—it is extremely impractical to consider every variable that influences the characteristics of vessel-generated waves, thus the primary aim is to provide indicative data from which rational waterway management decisions can be made. It may be worth noting that the Author has recently commenced an (independent) research program that aims to further investigate vessel wash in the slow speed range of 4 to 10 knots, where wave characteristics are known to change dramatically. This study may also consider various river bank types and the effect of lateral distance between the banks and the vessels’ sailing line.”¹¹

“Figure 2” mentioned by Professor Macfarlane can be found in **Appendix 15**.

It should be noted that Professor Macfarlane’s “Figure 2” makes comparisons of generic vessel types with values for water depth and lateral distances of 6 metres and 23 metres respectively. Professor Macfarlane also suggests that similar general trends for wave energy would result from different values of water depth and lateral distance.

In another published report, Professor Macfarlane also observes that the maximum wave, defined as the highest wave in the wave train, will not generally be depth-affected if the water depth is greater than half the vessel’s waterline length.¹² Generally, a speed boat of 6.4 metres would have a waterline length of around 5.4 metres. In GCWA’s view, it is reasonable to contend that the navigable waters of the South Branch are around 2.5 to 3.0 metres in depth at LAT, with a dredged channel of around 3.0 metres below LAT.

Based upon Professor Macfarlane’s research, in GCWA’s view, it is reasonable to contend that PWC and smaller vessels could reasonably have higher speed limits on the South Branch, while larger vessels should have speed limits of 6 knots.

¹¹ Macfarlane G, *Vessel Wave Wake Study*, Australian Maritime College, Tasmania, August 2016, pages 4 and 5

¹² Macfarlane G, and Cox G, *The Development of Vessel Wave Wake Criteria for the Noosa and Brisbane Rivers in Southeast Queensland*, Proceedings of the 5th International Conference on Coastal Environment—Environmental Problems in Coastal Regions, Alicante, Spain, April 2004, pages 55-72

Professor Macfarlane also suggests, generally, that wave energy is better than wave height when determining what might be an acceptable level for wash. However, it should also be noted that wave height is the environmental consideration typically described in plans for the engineering parameters of marinas and private pontoons.

The report to GCWA by Professor Macfarlane also provides the following:

“The height of the maximum wave for the various generic vessels listed in Table 1 are plotted as a function of vessel speed in Figure 1. As can be seen, the form of the curve is generally similar for all vessels in that wave height initially increases as speed increases above 4 knots, reaches a peak and then gradually decreases. The speed at which the peak occurs is influenced by the length of each vessel—which is related to the length Froude number (i.e. the peak occurs at a higher speed for longer vessels). As can also be seen, peak wave height generally increases with an increase in vessel size.”¹³

From Professor Macfarlane’s research, it should be noted that PWC and smaller vessels up to 6.4 metres produce maximum wave heights less than 300 millimetres at 6 knots and wave heights less than 200 millimetres at 20 knots and above, where the nominal lateral distance is 23 metres. Professor Macfarlane clarifies that the height of the maximum wave will generally be greater at shorter lateral distances and lower for longer distances.

“Figure 1” mentioned by Professor Macfarlane can be found in **Appendix 16**.

In terms of wash as a function of vessel speed, to reduce the potential for wash that might cause shoreline damage, the research by Professor Macfarlane suggests the following for moderately sensitive shorelines:

- PWC and smaller vessels up to 6.4 metres—speeds around 20 to 25 knots
- larger vessels 6.5 metres and over—6 knots.

The recommendation of this report for new speed limits considers Professor Macfarlane’s research.

Professor Macfarlane’s report can be found here <https://gcwa.qld.gov.au/about/our-publications/>.

Noise

The regulation of loud, unpleasant or disruptive noise from vessels and PWC will always present a difficult challenge. Like residential dwellings near airports, railways lines and major highways, the noise from vessels and PWC on waterways that are part of a transport network in an ever-growing waterways city will consistently be the subject of strong views on both sides of the conversation.

As it currently stands, noise from PWC and other forms of power boat sport is regulated by the City under powers provided by the *Environmental Protection Act 1994* (the EPA), which is administered by DES.

¹³ Macfarlane G, *Vessel Wave Wake Study*, Australian Maritime College, Tasmania, August 2016, page 4

In simple terms, audible noise from PWC alone, or PWC and vessels towing water skiers, toboggans or tubes, may be an offence where the noise can be heard from the same dwelling for more than 2 continuous minutes at certain times:

- on a business day or a Saturday, before 7 am or after 7 pm
- on any other day, before 8 am or after 6:30 pm.

Under the EPA, it should be noted that some definitions apply:

- **audible noise**—noise that can be clearly heard by an individual who is an occupier of an affected building
- **power boat sport**—a sport in which a person is towed by a line attached to a power boat (for example, water skiing, tobogganing or tubing); or operating a jet ski or other power-driven personal watercraft, other than for fishing.¹⁴

The maximum penalties for offences against noise standards range upwards from 600 penalty units (presently more than \$80,000), depending on the nature of the contravention. It is understood that authorised officers under the EPA from the City may issue on-the-spot fines for noise-related offences.

The EPA also provides that a local government may prescribe noise standards through a local law. For the Gold Coast, however, it is the default noise standard that applies for PWC and power boat sport (i.e. the audible noise provision described above), because there is currently no local law in force that prescribes a relevant noise standard.

GCWA sought advice from the City about noise from PWC and other vessels on the South Branch. The City provided insight and explained the relevant provisions of the EPA, as well as the practical difficulties for enforcement of audible noise from power boat sport because it is almost impossible to prove each element of the offence beyond reasonable doubt. GCWA was informed by the City that it had not received any reports of noise from power boat sport on the South Branch of the Coomera River.

It should be noted that TOMSR also provides for the establishment of marine zones in response to community concerns for matters such as noise and amenity. Marine zones are discussed later in this report.

Freestyling, wave jumping and water skiing are expressly prohibited on the South Branch of the Coomera River under the *Transport Infrastructure (Waterways Management) Regulation 2012* (TIWMR). The objectives of transport infrastructure legislation include establishing a regime for the effective and efficient use of waterways for transport purposes. These objectives should not be confused with the safety-related objectives of TOMSA, under which prohibitions for water skiing are made where that activity endangers marine safety.

It is commonly accepted that modern 4-stroke outboard engines fitted to many vessels offer lower levels for noise emissions, and that modern PWC are manufactured with systems for improved sound reduction or suppression. However, this may be contrasted with older 2-stroke outboard engines and older PWC, which are also common.

Generally, the problem with noise generated by PWC is that some masters fail to observe the

¹⁴ *Environmental Protection Act 1994*, sections 440L and 440Z

freestyling and wave jumping prohibitions, or they operate their PWC in a manner where the craft leave and then re-enter the water. It should be noted that the exhaust of a PWC travelling through the water will be muffled, but as soon as the PWC becomes airborne, even momentarily, then there is no such muffling effect. It is also common for masters to vary the speed of their PWC, which causes fluctuating noise that may be more irritating than constant noise.

From field observations, GCWA found that noise from PWC and vessels on the South Branch was apparent from around 9 am to 3 pm on weekends and public holidays, the times and days of higher water traffic density. However, as noise monitoring is beyond GCWA's area of expertise, GCWA was unable to form a view about noise from PWC or other vessels. GCWA also accepts that its field observations were conducted generally from 8 am to 4 pm and, therefore, were outside the times for the noise-related offence provisions of the EPA.

Throughout its field observations, GCWA noted a very small number of smaller racing inflatable boats commonly called "thundercats", travelling at higher speeds through the field observation area, sometimes freestyling, and often causing higher-pitched engine noise. These boats are designed for racing sport and are generally powered by 2-stroke outboard engines up to 50 hp. It was these faster travelling "thundercats" that were observed and recorded for some of the speeding and unsafe interaction issues during field observations, and which were subject of referral to the marine enforcement agencies.

GCWA received written feedback from 131 people who were concerned about noise from PWC and vessels. These people attributed the increase in use of the river by PWC and smaller vessels as a direct result of the higher trial speed limit, and that this then caused a significant, negative impact upon waterfront amenity and consequently lifestyle. Through their feedback, the people requested a return to the 6 knots speed limit for all PWC and vessels to restore the amenity of the area.

GCWA reviewed aerial imagery to compare the number of waterfront residential dwellings along the area of the speed limits trial on the South Branch with a 5.5 kilometres reach of the Nerang River with the same variable speed limits system. GCWA found 114 waterfront residential dwellings along the South Branch and 292 waterfront residential dwellings along the Nerang River.

GCWA accepts that the speed limits trial has promoted and improved access to the South Branch by PWC and smaller vessels, which could increase levels of noise. However, GCWA is also mindful that the regulation of noise from PWC and power boat sport is a matter of separate regulation, either under the EPA or through a local law. Consequently, GCWA would be pleased to engage in discussions with the City about the community feedback on noise and whether separate regulation could be further explored to better address community concerns.

The EPA envisages local laws that could prescribe noise standards. Should the City seek to pursue this as a matter of separate regulation, then there are several factors that could be considered in relation to noise from PWC and vessels:

- character of the noise (for example, tones, impulses and fluctuations)
- quality of the noise
- noise levels

- effect of noise on other activities
- whether noise exceeds background noise levels
- time of the noise event
- use of waterfront land
- number of people affected.

A table that describes the number of dwellings at various locations along the South Branch can be found in **Appendix 6**.

A table that describes the number of dwellings at various locations along the Nerang River can be found in **Appendix 7**.

Aerial imagery of the Coomera River (South Branch) and the Nerang River can be found in **Appendices 13 and 14**.

Waterfront dwellings

There are 114 residential dwellings from the Sovereign Islands through to Sanctuary Cove, either waterfront properties, or near waterfront properties, within the 5.5 kilometres of the speed limits trial. These dwellings also include the residential apartment blocks at Paradise Point and Hope Island.

During the trial, there was strong feedback from waterfront residents concerned that speeding PWC and vessels, both smaller and larger, as well as wash from these craft, might cause damage to the shoreline and private pontoons. GCWA acknowledged the seriousness of this feedback and, in response, conducted field observations of the South Branch and actively sought comments from QPS, QBFP, MSQ and DES, which are documented in this report.

GCWA also reviewed aerial imagery to compare the density of waterfront properties along the South Branch with the density of waterfront properties along the Nerang River, with the same variable speed limits system. GCWA found higher densities of residential dwellings along the Nerang River, where minimum widths of navigable water are from around 60 to 80 metres.

There were waterfront residents who provided feedback about noise from PWC and vessels and the disruption this caused to the amenity of the area and their lifestyle. This feedback is documented previously in this report.

The recommendations of this report consider data about waterfront dwellings, feedback from government agencies and the community.

A table that describes the number of dwellings at various locations along the area of the speed limits trail can be found in **Appendix 6**.

For comparison, a table that describes the number of dwellings at various locations along the Nerang River can be found in **Appendix 7**.

Private waterways structures

GCWA reviewed aerial imagery to compile an inventory of private waterways structures for the area of the speed limits trial, establishing the number and locations of 76 pontoons and

one marina, as well as the width of the South Branch at these locations.

GCWA also reviewed a sample of plans for waterways structures from Paradise Point, Hope Island and Sanctuary Cove, to better understand their engineering. These samples were examined because of concerns by some waterfront residents that wash from PWC and smaller vessels travelling at faster speeds might cause damage to their private pontoons.

From the sample of plans, GCWA found that pontoon engineering parameters for environmental considerations generally ranged from:

- wind—from 36 m/s (129 km/h) to 60 m/s (216 km/h)
- waves—from 0.50 m to 0.76 m (there are some designed for 0.30 m)
- tidal current—from 1.0 m/s (3.6 knots) to 2.0 m/s (7.2 knots).

There was feedback from residents at the Salacia Waters Apartments who were concerned that increased wash from PWC and smaller vessels travelling at higher speeds would cause significant damage to the Salacia Waters Marina. GCWA found that the plans for this marina describe higher-level design parameters, including wave height of 0.76 metres and Q100 flood currents.

GCWA compared the number of private waterways structures on the South Branch with the number of private waterways structures on the Nerang River, with the same variable speed limits system. GCWA found two marinas and more than 200 private pontoons on the Nerang River in an area the same length as the speed limits trial on the South Branch.

It should be noted that for the Nerang River, as well as other areas of the Coomera River system where the speed limit is 6 knots for larger vessels and 40 knots for smaller vessels and PWC, the design parameters for private waterways structures are generally similar, including wave heights of 0.5 or 0.6 metres.

The recommendations of this report consider data about private waterways structures and their engineering, along with community feedback.

A table that describes the number of marinas and pontoons at various locations along the area of the speed limits trial can be found in **Appendix 6**.

A table that describes the number of marinas and pontoons at various locations along the Nerang River can be found in **Appendix 7**.

A table that describes samples of environmental engineering parameters for private marine structures on the Coomera River (South Branch), the Coomera River and the Nerang River can be found in **Appendix 17**.

Community feedback

GCWA undertook significant community consultation for the speed limits trial, including:

- meetings with key stakeholders
- meetings, conversations and direct correspondence with individual community members
- meetings with the local MP
- meetings with other government agencies

- conversations with local government
- community meetings and consultation sessions
- an online survey
- production of FAQs, web-based information and posts through social media.

As mentioned in Part A, GCWA also received petitions signed by 118 people (including 54 local waterfront residents) expressing their concerns for speeding vessels, property damage, environmental damage, noise and danger to life, and requesting a stop to the trial and a return to the 6 knots speed limit for all vessels.

The scanned copy of a petition can be found in **Appendix 5**.

Generally, feedback about the trial from the boating community was positive, while feedback from waterfront residents at Sanctuary Cove, Hope Island and Paradise Point was critical.

The waterfront residents' main concerns may be summarised as:

- noise from increased levels of PWC and vessels
- higher-energy wash from all vessels and PWC, with potential to cause property and shoreline damage (specifically to pontoons)
- speeding PWC and smaller vessels too close to pontoons
- freestyling and other unsafe PWC operations that would result in serious or even fatal marine incidents.

Except for noise, it should be noted that all of these concerns relate to contraventions of existing laws regarding speed, operations and activities, rather than the speed limits trial as such. This means that most of these concerns, which are legitimate, can be addressed through the existing regulatory system.

Some residents also expressed concerns about the speed of larger vessels, which they said were encouraged to exceed the speed limit of 6 knots because of the higher speed limit for PWC and smaller vessels.

GCWA was questioned about its "baseline" for the speed limits trial. To be clear, GCWA's motivation for the trial was an obvious "speed limit inconsistency" that did not appear to be based on evidence. The most striking example was the inconsistency with the Nerang River, which has the same variable speed limits as those for the South Branch during the trial.

At the close of consultation on 30 June 2019, the following statistics were available:

- 535 people provided feedback
- 341 people supported the trial
- 194 people opposed the trial (this included 118 people who signed petitions)
- 23 residents from Sanctuary Cove, Hope Island and Paradise Point supported the trial
- 105 residents from Sanctuary Cove, Hope Island and Paradise Point opposed the trial
- 113 people were concerned about speeding, including the maximum speed of 40 knots
- 166 people were concerned about wash that might damage pontoons
- 152 people were concerned about wash that might cause shoreline damage
- 131 people were concerned about noise from PWC and vessels
- 64% of those who provided feedback supported the trial
- 36% of those who provided feedback opposed the higher speed limit of the trial.

GCWA also launched an online survey called *Have Your Say in May* that ran from 7 May 2019 until the end of the trial on 30 June 2019.

The analysis of the survey results found the following:

- 986 people responded to the survey
- 70% supported the trial
- 27% opposed the trial
- 3% were unsure
- highest response rates were from people who used the river for motor boating (80%), followed by recreational fishing (45%) and waterfront residents (33%).

Written feedback from consultation was considered and captured to GCWA's record keeping system.

The recommendations of this report consider the feedback from the community.

Data from the online survey can be found at **Appendix 18**.

Feedback—Department of Environment and Science

DES manages Queensland's marine parks as multi-use marine protected areas. QPWS, a division within DES, is responsible for the day-to-day management of the Moreton Bay Marine Park.

GCWA approached QPWS for comments about the speed limits trial and the marine park, specifically in response to "go slow" areas and concerns about vessel strikes on marine animals, as well as concerns about erosion or other environmental damage to Coomera Island.

QPWS provided the following comments:

"QPWS has not received any reports or complaints about vessel strikes of marine animals in the South Branch during the speed limits trial, nor have they had cause to undertake any studies or monitoring of possible effects upon marine animals from the trial.

For the South Branch, Coomera Island generally has a shallow sloping shoreline that allows wave dissipation over larger areas, except at high tide when waves may impact upon mangrove areas. We are not aware of any reports of complaints about erosion or environmental damage to the shoreline of Coomera Island, nor have we commissioned any studies into shoreline erosion in the area.

Coomera Island is in a low-wave energy environment. There's no doubt that water traffic increases wave energy but small vessels traveling at higher speeds are not likely to be worse than the same vessels traveling at 6 knots when they generate larger but slower, higher-energy waves.

An examination of aerial imagery over the past 15 years does not reveal any significant shoreline changes to Coomera Island. Where there has been erosion, this would not have any significant impact upon the natural values of the marine park. For vessel operations specifically, while vessel wake may assist natural processes, current flows and dredging operations would be the main contributors to shoreline erosion.

DES would not designate a new “go slow” area over a main navigation channel because of shoreline erosion without strong, compelling evidence of major impacts to the natural integrity and values of the marine park, and broad consultation with all key stakeholders and waterway users.”

The recommendation of this report for speed limits considers the feedback from DES.

Feedback—City of Gold Coast

The City is responsible for the planning and delivery of services and projects to make the Gold Coast a functional, thriving, sustainable and attractive place to live and carry out business.

Some of the City’s responsibilities extend to the waterways, including:

- investigation of noise complaints
- management of public marine facilities, such as boat ramps and pontoons
- maintenance of canals, including dredging to achieve design profiles
- management of the City’s bridges over the waterways
- performing the role of assessment manager for development applications (for example, tidal works)
- management of bathing reserves.

Noise from increased numbers of PWC and smaller vessels due to the trial was raised as a concern by 131 people, including residents from Sanctuary Cove, Hope Island and Paradise Point. In response to these concerns, GCWA sought advice from the City, which is discussed in the section entitled “Noise”.

More information about the City’s role for the regulation of noise is outlined in a fact sheet entitled *Noise Pollution: Power boat sports on waterways*, which can be found on the City’s website here <http://www.goldcoast.qld.gov.au/documents/bf/noise-operating-powerboats.PDF>.

Marine zones

As mentioned in the section entitled “Noise”, GCWA received feedback from 131 people expressing concerns for amenity and lifestyle due to increased levels of PWC and vessels on the South Branch, as a direct result of the speed limits trial. While these types of concerns would not normally be considered strictly relevant to fixed speed limits under TOMSA, they were concerns that GCWA documented and considered as part of the work for the trial.

GCWA understands that any conversation about amenity or lifestyle requires careful consideration to relevant legislation. The proper understanding of TOMSA is that speed limits should be fixed primarily for reasons of enhancing marine safety, but with consideration to other legislation (for example, the Zoning Plan for the Moreton Bay Marine Park). Speed limits under TOMSA should not be fixed as a “blanket tool” that doubles as a means of resolving non-safety related concerns like noise that affects amenity and lifestyle. The fixing of a speed limit for these kinds of concerns would most likely be an improper exercise of power under TOMSA, which could be criticised through an investigation by the Ombudsman.

One approach that might be worthy of further exploration is that of a marine zone, as provided by TOMSR. In simple terms, marine zones are a legal mechanism that can be used by a proposing entity (usually a local government for an area) to better manage waterways at a local level to balance the needs of the boating community and other waterways users with the lifestyle of local waterfront residents and their concerns for noise and other amenity-related issues.

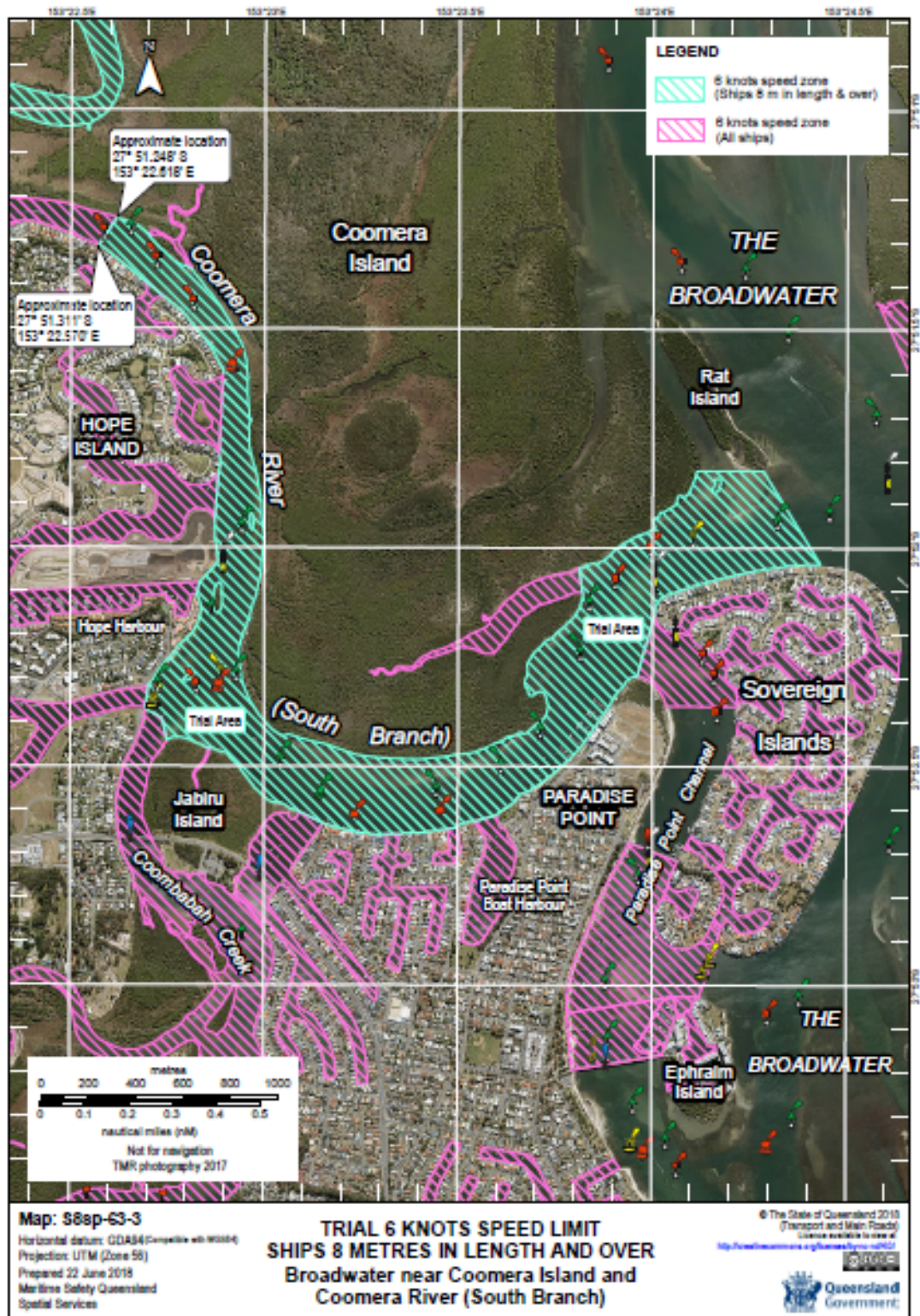
Marine zones may provide for operational requirements to regulate PWC, certain types of vessels or activities on a waterway, including requirements that may restrict or prohibit. An example of an operational requirement through a marine zone could be the restriction of PWC operations on an area of a waterway from 7 pm to 7 am, to address community concerns about noise. For the Gold Coast, there is already a marine zone for Tallebudgera Creek with a requirement that PWC must not be operated on that waterway.

To establish a marine zone, a proposing entity must follow the process for marine zones set out in TOMSR, which includes extensive community consultation and the production of a proposal that appropriately documents the area for the marine zone, the requirements for PWC or vessel operations, and the reasons that justify the marine zone. Once the proposing entity has decided that it wishes to progress a marine zone, then that entity will need to approach MSQ with its formal marine zone proposal.

Guidelines for the development of a marine zone proposal can be found on MSQ’s website at <https://www.msq.qld.gov.au/Waterways/Marine-zones>. These guidelines provide a convenient reference for local governments, should they wish to explore a marine zone to manage noise or other amenity-related issues at the local level, consistent with the requirements of TOMSR.

Appendix 1

Map for speed limits trial



Appendix 2

Evaluation Table

Factors and Sub-factors	Weighting %	Maximum Score	Evaluated Score	Score	Weighting	Weighted %
SAFETY – 25%						
Waterway character	15	20	17	0.85	0.15	12.75
Width of navigable water		5	4			
Width of dredged channel		5	3			
Depth of waterway		5	5			
Potential hazards		5	5			
Existing regulatory system	2	5	5	1.00	0.02	2.00
Compliance rates (MINs)	3	5	3	0.60	0.03	1.80
Marine incident data	5	5	5	1.00	0.05	5.00
WATERWAYS – 25%						
Waterway type	3	5	4	0.80	0.03	2.40
Field observations	5	5	5	1.00	0.05	5.00
Water traffic density	5	5	3	0.60	0.05	3.00
Water traffic interaction	5	5	3	0.60	0.05	3.00
Public facilities	2	5	4	0.80	0.02	1.60
Maritime industry	5	5	4	0.80	0.05	4.00
ENVIRONMENT – 25%						
Southern shoreline	5	5	5	1.00	0.05	5.00
Northern shoreline	5	5	3	0.60	0.05	3.00
Marine Park alignment	5	5	4	0.80	0.05	4.00
Wash energy	5	5	2	0.40	0.05	2.00
Noise comment	5	5	4	0.80	0.05	4.00
COMMUNITY – 25%						
Waterfront dwellings	5	5	3	0.60	0.05	3.00
Private waterways structures	5	5	3	0.60	0.05	3.00
Community feedback	5	5	3	0.60	0.05	3.00
Community survey	5	5	3	0.60	0.05	3.00
Feedback from govt agencies	5	25	19	0.76	0.05	3.80
MSQ		5	4			
QPS		5	4			
QBFP		5	4			
DES		5	4			
CoGC		5	3			
EVALUATION	100	135	100		1.00	73.55

Evaluation Guide

Gold Coast waters—generally	
> 90%	40 knots for all vessels
76 – 90%	40 knots for vessels less than 8.0 metres / 6 knots for vessels 8.0 metres and over
60 – 75%	30 knots for vessels less than 6.5 metres / 6 knots for vessels 6.5 metres and over
< 60%	6 knots for all vessels

Moreton Bay Marine Park—designated “go slow” areas	
Turtles and dugong	6 knots for all vessels
Vessels over 8 metres	6 knots for vessels 8.0 metres and over
Natural values	6 knots for all vessels

Appendix 3

Decision Support Tool

The attributes and scores highlighted in the shaded cells are those that were used to inform the evaluation of this speed limits trial.

SAFETY

Navigable water*		Dredged channel		Depth		Potential hazards	
> 100 m	5	> 60 m	5	> 2.5 m LAT	5	Shallow depth	5
81 m – 100 m	4	41 m – 60 m	4	2.0 – 2.5 m	4	Sand shoals	4
61 m to 80 m	3	21 m – 40 m	3	1.5 – 2.0 m	3	Bridges	3
41 m to 60 m	2	20 m or less	2	1.0 – 1.5 m	2	Sharp bends	2
40 m or less	1	None	1	< 1.0 m LAT	1	Rock bars	1

Existing regulatory sys		Compliance rates		Marine incident data	
Water skiing	5	Significant decrease	5	0	5
Freestyling	4	Decrease	4	1 – 3	4
Anchoring	3	No change	3	4 – 6	3
Speed limits	2	Increase	2	7 – 9	2
Collision Regs	1	Significant increase	1	10 +	1

WATERWAYS

Waterway type		Field observations (%)		Water traffic (%)		Water traffic density	
Larger water body	5	91 – 100%	5	Larger vessels	28	0 – 4	5
River	4	81 – 90%	4	Smaller vessels	51	5 – 9	4
Creek	3	71 – 80%	3	PWC	20	10 – 14	3
Boat harbour	2	61 – 70%	2	Passive craft	1	15 – 19	2
Canal	1	60% or less	1	Swimmers	0	20 +	1

Water traffic interaction		Public facilities		Maritime industry	
Very low	5	> 3 boat ramps	5	Strong support	5
Low	4	3 boat ramps	4	Moderate support	4
Medium	3	2 boat ramps	3	Neutral	3
High	2	1 boat ramps	2	Minimal support	2
Very high	1	0 boat ramps	1	Low support	1

ENVIRONMENT

Southern shoreline		Northern shoreline		Marine park alignment		Wash energy	
Artificial	5	Artificial	5	General	5	6.5 m or less	5
Rocky shore	4	Rocky shore	4	Habitat	4	6.6 – 7.0 m	4
Tidal banks	3	Tidal banks	3	Conservation	3	7.1 – 7.5 m	3
Steep banks	2	Steep banks	2	National Park	2	7.6 – 8.0 m	2
High eco value	1	High eco value	1	Go Slow Area	1	> 8.0 m	1

Noise comment	
20% or less	5
21 – 40%	4
41 – 60%	3
61 – 80%	2
81 – 100%	1

COMMUNITY

Waterfront dwellings		Private structures		Community feedback		Community survey	
20 or less	5	40 or less	5	81 – 100%	5	81 – 100%	5
21 – 40	4	41 – 60	4	71 – 80%	4	71 – 80%	4
41 – 60	3	61 – 80	3	61 – 70%	3	61 – 70%	3
61 – 80	2	81 – 100	2	51 – 60%	2	51 – 60%	2
> 80	1	> 100	1	50% or less	1	50% or less	1

Boating feedback		Resident feedback	
81 – 100%	5	81 – 100%	5
71 – 80%	4	71 – 80%	4
61 – 70%	3	61 – 70%	3
51 – 60%	2	51 – 60%	2
50% or less	1	50% or less	1

GOVERNMENT AGENCIES and LOCAL GOVERNMENT

MSQ		QPS		QBFP		DES	
Strong support	5	Strong support	5	Strong support	5	Strong support	5
Support	4	Support	4	Support	4	Support	4
Neutral	3	Neutral	3	Neutral	3	Neutral	3
Little support	2	Little support	2	Little support	2	Little support	2
No support	1	No support	1	No support	1	No support	1

CoGC	
Strong support	5
Support	4
Neutral	3
Little support	2
No support	1

* For “Width of navigable water”, the rating score was triggered for the river. The channel behind the small unnamed island near the entrance to Hope Harbour Marina was considered separately.

Appendix 4

Explanatory notes

SAFETY

Width of navigable water

This sub-factor ranges from “40 m or less” (1 = higher safety risk) to “> 100 m” (5 = lower safety risk). The basis for the scores is that confined waterways less than 40 metres in width have much less space for safer navigation at higher speeds, while open waterways more than 100 metres in width provide substantial space for safer navigation at higher speeds.

Width of dredged channel

This sub-factor ranges from “None” (1 = higher safety risk) to “> 60 m” (5 = lower safety risk). The basis for the scores is that natural waterways with no dredging may have shallower depths that require slower speeds for safer navigation, while dredged waterways generally provide for known channel widths and depths that allow navigation with safety at higher speeds.

Depth of waterway

This sub-factor ranges from “< 1.0 m” (1 = higher safety risk) to “> 2.5 m” (5 = lower safety risk). The basis for the scores is that larger vessels of greater draft require deeper waterways. The greater depths reduce the risk of grounding and other marine incidents, with smaller vessels and PWC generally drawing very little water, while vessels over 20 metres drawing greater depths, depending on design and cargo.

Potential hazards

This sub-factor ranges from “Rock bars” (1 = higher safety risk) to “Shallow depth” (5 = lower safety risk). The basis for the scores is that waterways with hazards like rock bars, sharp bends and bridges present a significantly higher risk to vessels and PWC than a waterway with sand shoals, particularly one with an established system of aids to navigation (AtoN), represented on nautical charts or maps.

Existing regulatory system

This sub-factor ranges from “Collision Regulations” (1 = lower level regulatory system) to “Water skiing” (5 = higher level regulatory system). The basis for the scores is that waterways with higher level regulatory systems that restrict or prohibit specific activities for transport efficiency reasons (for example, anchoring or water skiing under transport infrastructure legislation), in contrast to restrictions or prohibitions under marine safety legislation, may allow for higher speed limits because there is lower risk of adverse safety interactions.

Marine incident data

This sub-factor ranges from “10 +” (1 = higher safety risk) to “0” (5 = lower safety risk). The basis for the scores is that higher marine incident numbers may suggest inappropriate regulatory systems (for example, speed limits that are too high), which in turn, could mean adverse safety outcomes. This sub-factor is supported by marine incident data from 2014 to 2019 on the Coomera River (South Branch), with contributing factors that include excessive speed.

Compliance rates

This sub-factor ranges from “Significant increase” (1 = higher safety risk) to “Significant decrease” (5 = lower safety risk). The basis for the scores is that higher numbers of marine infringement notices (MINs) may suggest an increasing trend in poor on-water behaviour, which in turn, could mean adverse safety

outcomes. This sub-factor is supported by MIN data for prescribed offences from 2014 to 2019, complemented by feedback from marine enforcement agencies.

WATERWAYS

Waterway type

This sub-factor ranges from “Canal” (1 = higher waterway risks) to “Larger water body” (5 = lower waterway risks). The basis for the scores is that canal systems are generally narrower, confined waters with speed limits of 6 knots for all vessels and PWC, while larger water bodies (like main channels, bays and lakes) are generally more open waters with higher speed limits up to 40 knots for all vessels and PWC (for example, certain areas of Moreton Bay).

Field observations

This sub-factor measures compliance rates with speed limits and ranges from “60% or less” (1 = lower compliance) to “91 – 100%” (5 = higher compliance). The basis for the scores is found in evidence-based problem-solving where field observations of water traffic during weekends and public holidays (**peak times**) accurately identified and measured speeding offences and other compliance problems related to the operations of vessels and PWC within an area approximately **500 metres** in length at Paradise Point.

This sub-factor was also used to inform the sub-factors of water traffic make-up (%), water traffic density and water traffic interaction.

Water traffic make-up (%)

This sub-factor is derived from actual counts of water traffic and expresses, as a percentage, the breakdown of different types of water traffic; namely, “passive craft”, “PWC”, “smaller vessels” and “larger vessels”. The counts were made during field observations of water traffic on the Coomera River (South Branch) at peak times within the area for field observations at Paradise Point.

Like the sub-factor of field observations, this sub-factor was used to inform the sub-factors of water traffic density and water traffic interaction.

Water traffic density

This sub-factor is derived from actual counts of PWC, smaller vessels, larger vessels and passive craft (collectively, the craft) and ranges from “20 +” craft (1 = higher waterway risk) to “0 – 4” craft (5 = lower waterway risk). The basis for the scores is that higher water traffic densities could lead to adverse waterway or safety outcomes, such as collisions between the craft or frustration by their masters. The counts were made during field observations of water traffic at peak times within the area for field observations at Paradise Point.

Water traffic interaction

This sub-factor ranges from “Very high” (1 = higher waterway risk) to “Very low” (5 = lower waterway risk). The basis for the scores is that higher densities of water traffic within the area of field observations may lead to greater water traffic congestion and hazardous water traffic interactions, which in turn, could lead to adverse waterway or marine safety outcomes.

This sub-factor was informed by the sub-factors of water traffic make-up (%) and water traffic density.

Public facilities

This sub-factor ranges from “0” (1 = no public need) to “> 3” (5 = higher public need). The basis for the scores is that the number and location of public facilities promotes use of, and improves access to, the river by trailable PWC and vessels, which in turn, supports service needs of the boating community.

The construction and maintenance of public facilities is consistent with objectives of transport infrastructure legislation and purposes of Gold Coast waterways legislation.

Maritime industry

This sub-factor ranges from “low support” for further development of the maritime industry (1 = low support) to “strong support” for further development of the maritime industry (5 = strong support). The basis for the scores is that recreational boating is an important, growing sector of the maritime industry, and that decisions to support this sector help to enable the effectiveness and efficiency of the maritime industry, which directly aligns with the objective of marine safety legislation.

ENVIRONMENT

Southern and Northern shores

These sub-factors range from “High eco value” (1 = higher environmental risk) to “Artificial” (5 = lower environmental risk). The basis for the scores for both shores is the same: that relatively undisturbed areas with higher ecological and natural values are offered higher levels of protection under marine parks legislation from certain activities, such as faster moving PWC and vessels.

These sub-factors are complementary to the zoning plan for Moreton Bay Marine Park.

Alignment with marine park zoning plan

This sub-factor ranges from “Go slow area” (1 = higher natural value) to “General” (5 = general park value). The basis for the scores is that some activities within Moreton Bay Marine Park may require different management approaches, such as slower speeds in certain areas for PWC and vessels.

This sub-factor respects the marine park’s Zoning Plan, which identifies general use, conservation park, habitat protection and marine national park zones, as well as ‘go slow’ areas for PWC and vessels.

Wash energy

This sub-factor ranges from vessels “> 8.0 m” (1 = higher damage risk) to smaller vessels “< 6.5 m” (5 = lower damage risk). The basis for the scores is that wash energy as a function of vessel speed, and consequently higher-energy wash capable of causing damage to structures or the shoreline, can be related to vessel waterline length, as shown by research undertaken by Australian Maritime College.

Noise

This sub-factor is derived from documented comments received by GCWA during the 12-months of the speed limits trial, and ranges from “81 – 100%” (1 = higher levels of community concern) to “0 – 20%” (5 = lower levels of community concern). The basis for the scores is that the number of documented comments highlighting concerns about noise from PWC and vessels, expressed as a percentage, reflects the level of community concern.

All documented comments received by GCWA for the speed limits trial were captured in a feedback spreadsheet, to ensure accurate recording for this sub-factor.

COMMUNITY

Waterfront dwellings

This sub-factor ranges from “> 70” dwellings (1 = higher impact) to “20 or less” dwellings (5 = lower impact). The basis for the scores is that of potential community impact, closely related to noise and wash energy. It is derived from counts of waterfront dwellings, and dwellings near the waterfront, to ascertain the highest density of dwellings within 1 km along the banks of the Coomera River (South Branch).

Private structures

This sub-factor ranges from “> 100” structures (1 = higher impact) to “40 or less” structure (5 = lower impact). Like waterfront dwellings, the basis for the scores is that of potential community impact, primarily related to wash energy and its potential to affect structures. It is derived from counts of private pontoons and marinas constructed within the Coomera River (South Branch), approximately 5.5 km.

Community feedback

This sub-factor ranges from “50% or less” (1 = lower community support) to “81 – 100%” (greater community support). The basis for the scores is that of community opinion and sentiment for the speed limits trial, expressed as a percentage, and is derived directly from documented comments and feedback received by GCWA from individuals or corporate entities during consultation.

All documented comments and feedback received by GCWA for the speed limits trial were captured in a feedback spreadsheet, to ensure accurate recording for this sub-factor.

Community survey

This sub-factor ranges from “50% or less” (1 = lower community support) to “81 – 100%” (greater community support). The basis for the scores is that of community opinion and sentiment for the speed limits trial, expressed as a percentage, and is derived directly from results of the online survey that was conducted from May to June 2019, as part of the *Have Your Say in May* communication campaign.

Feedback from government agencies and local government

This sub-factor ranges from “No support” (1 = lowest support) to “Strong support” (5 = greatest support). The basis for the scores is that of views expressed about the speed limits trial by government agencies and local government, and is derived from documented comments received by GCWA from:

- Maritime Safety Queensland
- Queensland Police Service
- Queensland Boating and Fisheries Patrol
- Department of Environment and Science

For this sub-factor, City of Gold Coast provided comments in a phone conversation.

Appendix 5

Scanned copy of a petition

16 January 2019

Petition – Mr Hal Morris, CEO Gold Coast Waterways Authority, PO Box 107, Southport QLD 4215.

CC – Mr David Crisafulli – State MP Broadwater, Councillor Cameron Caldwell – Division 10

We, the residents and concerned citizens with properties located on the Coomera River and within the areas of Sanctuary Cove and Hope Island wish to object to the current speed trial being conducted on the Coomera River.

Speeds have increased to 40 knots for boats under 8 metres, with larger vessels also beginning to appear in the speed bracket.

There has been **NO Community Consultation** with stakeholders prior to making this change.

We strongly urge that you immediately **revert back** to the original speed limits for the following reasons:

1. **Failure of vessels to comply with existing marine laws** and failure to adhere to basic courtesy rules such as vessels are to proceed at 6 knots within 30 metres of boats anchored or moored to the shore or ground, as well as approaching within 100 metres of a jetty, wharf, pontoon or boat ramp – **NO poling**.
2. **Damage to private property** – several large boats have broken loose from their pontoons. In addition, equipment (tenders and jet skis) has been shaken loose and subsequently damaged. Several residents have been forced to relocate their vessels to safer anchorage to avoid damage from the wakes of large vessels travelling at an increased speed.
3. **Damage to the environment** – there is clear evidence of environmental damage to the nature reserve opposite the trial speed zone area (Coomera Island National Park), with fallen trees and erosion of the levee banks.
4. **Noise pollution** – the Gold Coast is a destination that residents choose to invest within due to the climate and peaceful environment. The increase in noise pollution from speeding jet skis, tinnies and cruisers is forcing residents and investors to relocate indoors. Consequently, this is preventing them from experiencing the outdoors lifestyle they purposefully purchased. Evidence of this is supplied under a separate submission to GCWA.
5. **Endangering lives** – many residents have been forced to stop their children and grandchildren from participating in recreational activities on pontoons, such as fishing, due to the increased danger of severe wake wash. These children could potentially be exposed to danger from speeding and possible collision of jet skis, tinnies and cruisers due to the excessive speeds.

We, the undersigned, request an immediate halt to the trial and further request that the previous speed limits and marine laws be re-introduced.

23

GCWA RECEIVED	
7 JUN 2019	
<input type="checkbox"/> Email	<input checked="" type="checkbox"/> Fax
<input type="checkbox"/> Mail	<input checked="" type="checkbox"/> Cit
File No: 230/155/18	
Rec: J/94580	
Action Officer's:	
PK	

Appendix 6

Dwellings, structures, shoreline composition and width of navigable water—Coomera River (South Branch)

Location	Dwellings	Marinas	Pontoons	Southern shoreline	Width	MP
Sovereign Islands near Knightsbridge Parade	27	0	19	Concrete revetment wall	> 180 m	No
Paradise Point near Salacia Waters Marina	2*	1	0	Bank armour	> 110 m	No
Paradise Point from Killowill Avenue to Doris Gibbs Park	12	0	3	Bank armour with small section of sandy beach	> 190 m	No
Paradise Point from Lindsay Parade to Hume Parade	24	0	17	Bank armour	> 170 m	No
Jabiru Island	0	0	0	Predominantly muddy bank with some bank armour	> 190 m	Yes
Hope Island near Boykambil Esplanade	12**	0	0	Predominantly bank armour with some muddy-sandy beach	> 160 m	Yes
Small un-named island near Hope Harbour	0	0	0	Muddy tidal flat	> 110 m	Yes
Hope Island near Keyside Drive (new development)	0	0	0	Bank armour	> 130 m	No
Sanctuary Cove near The Circuit	17***	0	18	Bank armour	> 100 m	No
Sanctuary Cove near Riverside Drive	9	0	9	Bank armour	> 110 m	No
Sanctuary Cover near Marine Drive East	11	0	10	Bank armour	> 120 m	No
Total dwellings, marinas and pontoons	114	1	76			

* There are two residential apartment blocks at Paradise Point associated with the Salacia Waters Marina.

** There are five residential apartment blocks and seven residential dwellings at Hope Island near Boykambil Esplanade. All of these are technically not “waterfront properties” because there’s a land reserve between the dwellings and the river. There are no development approvals granted by City of Gold Coast for marine structures like pontoons.

*** There is one very small area with two nearby pontoons where the South Branch narrows to approximately 100 metres. This area is around 20 metres in length near 8104 The Circuit at Sanctuary Cove. GCWA has established a red port lateral buoy at this location 20 metres from the bank armour shoreline.

Appendix 7

Dwellings, structures, shoreline composition and width of navigable water—Nerang River

Location	Dwellings	Marinas	Pontoons	Shorelines	Width	Vacant
Hoy Street to Witt Avenue	43	0	33	Bank armour and concrete revetment wall	> 80 m	5
Witt Avenue to Carrara Road	88	0	77	Bank armour and concrete revetment wall	> 70 m	4
Carrara Road to Ross Street	91	0	81	Bank armour and concrete revetment wall	> 60 m	3
Ross Street to Glenmore Drive	70	2*	23	Bank armour	> 60 m	11
Total dwellings, marinas and pontoons	292	2	214			

* Under construction

Appendix 8

Data for marine infringement notices—Coomera River (South Branch)

Offence	2014	2015	2016	2017	2018	2019
Speeding – fixed speed limit	85	45	25	19	24	2
Ship > 6 knots within 30 m in particular places	3	0	1	1	0	0
PWC > 6 knots within 60 m in particular places	0	3	1	1	2	0
PWC > 10 knots within 30 m of moving ship	0	0	0	0	0	0
Damaging wash	0	0	0	0	1	0
Marine Warnings – offence not recorded in TRAILS	144	193	254	190	240	25
Total	232	241	281	211	267	27

Data for marine incidents—Coomera River (South Branch)

Year	2014	2015	2016	2017	2018	2019
Marine Incidents	0	2	7	3	0*	2**

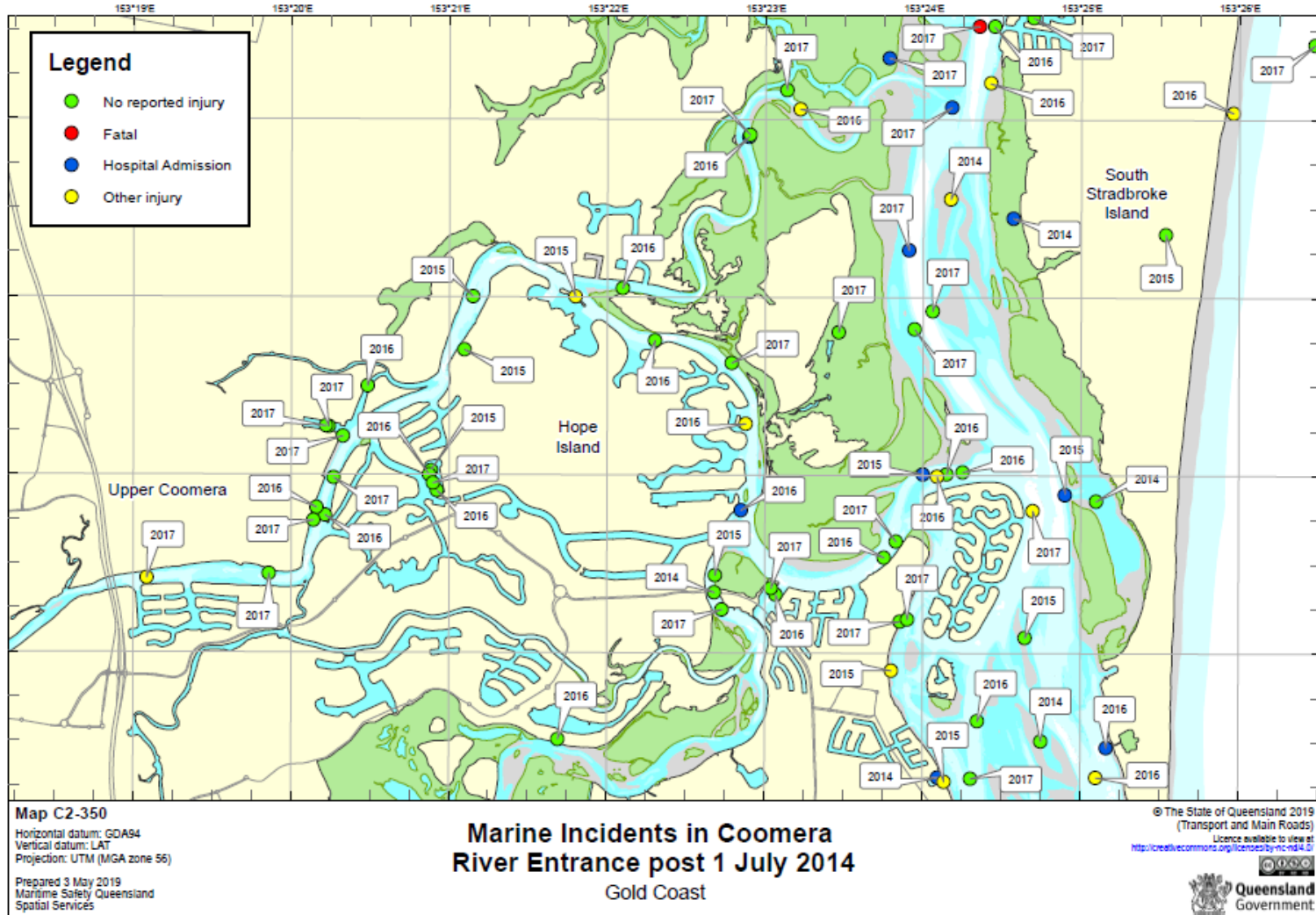
* Data provided to GCWA by MSQ did not record any reported marine incidents in the area of the speed limits trial in 2018.

** GCWA was advised of two reported marine incidents in 2019—a collision between two smaller boats at slower speed, and damaging wash caused by the operations of a larger vessel—neither incident was related to the speed limits trial.

The data in these tables was the most current available, as at the date of this report.

Appendix 9

Map for reported marine incidents



Appendix 10

Data from field observations—Anzac Day 2019

Speed					Excessive wash and other compliance problems						
Water traffic	Count	Speeding	Non-compliance%	Compliance rate %	Excessive wash	Damaging wash	Freestyle	Unsafe interaction	Water skiing	Speeding and other problems	Overall Compliance rate %
PWC	225	22	10%	90%	-	-	-	-	-	22	90%
Smaller boats < 8 m	374	20	5%	95%	3	4	-	-	-	27	93%
Larger vessels 8 m and over	122	18	15%	85%	3	7	-	-	-	28	77%
Passive craft	9										
Total	730	60	8%	92%	6	11	-	-	-	77	89%

Water traffic (%)	
PWC	31%
Smaller boats <8 m	51%
Larger vessels 8 m and over	17%
Passive craft	1%

Appendix 11

Data from field observations—Labour Day long weekend 2019

Speed					Excessive wash and other compliance problems						
Water traffic	Count	Speeding	Non-compliance%	Compliance rate %	Excessive wash	Damaging wash	Freestyle	Unsafe interaction	Water skiing	Speeding and other problems	Overall Compliance rate %
PWC	437	25	6%	94%	-	-	6	3	1	35	92%
Smaller boats < 8 m	928	41	4%	96%	4	8	3	3	-	59	94%
Larger vessels 8 m and over	342	14	4%	96%	3	8	-	-	-	25	92%
Passive craft	9										
Total	1,716	80	5%	95%	7	16	9	6	1	119	93%

Water traffic (%)	
PWC	26%
Smaller boats < 8 m	54%
Large vessels 8 m and over	19%
Passive craft	1%

Appendix 12

Table of data from all field observations—November 2018 to May 2019

Speed					Excessive wash and other compliance problems						
Water traffic	Count	Speeding	Non-compliance%	Compliance rate %	Excessive wash	Damaging wash	Freestyle	Unsafe interaction	Water skiing	Speeding and other problems	Overall Compliance rate %
PWC	2277	303	13%	87%	-	-	32	7	2	344	85%
Smaller boats < 8 m	4120	308	7%	93%	20	10	11	4	3	356	91%
Larger vessels 8 m and over	1634	168	10%	90%	40	21	-	1	-	230	86%
Passive craft	79										
Total	8,110	779	10%	90%	60	31	42	12	5	930	89%

Water traffic (%)	
PWC	28%
Smaller boats < 8 m	51%
Larger vessels 8 m and over	20%
Passive craft	1%

Appendix 13

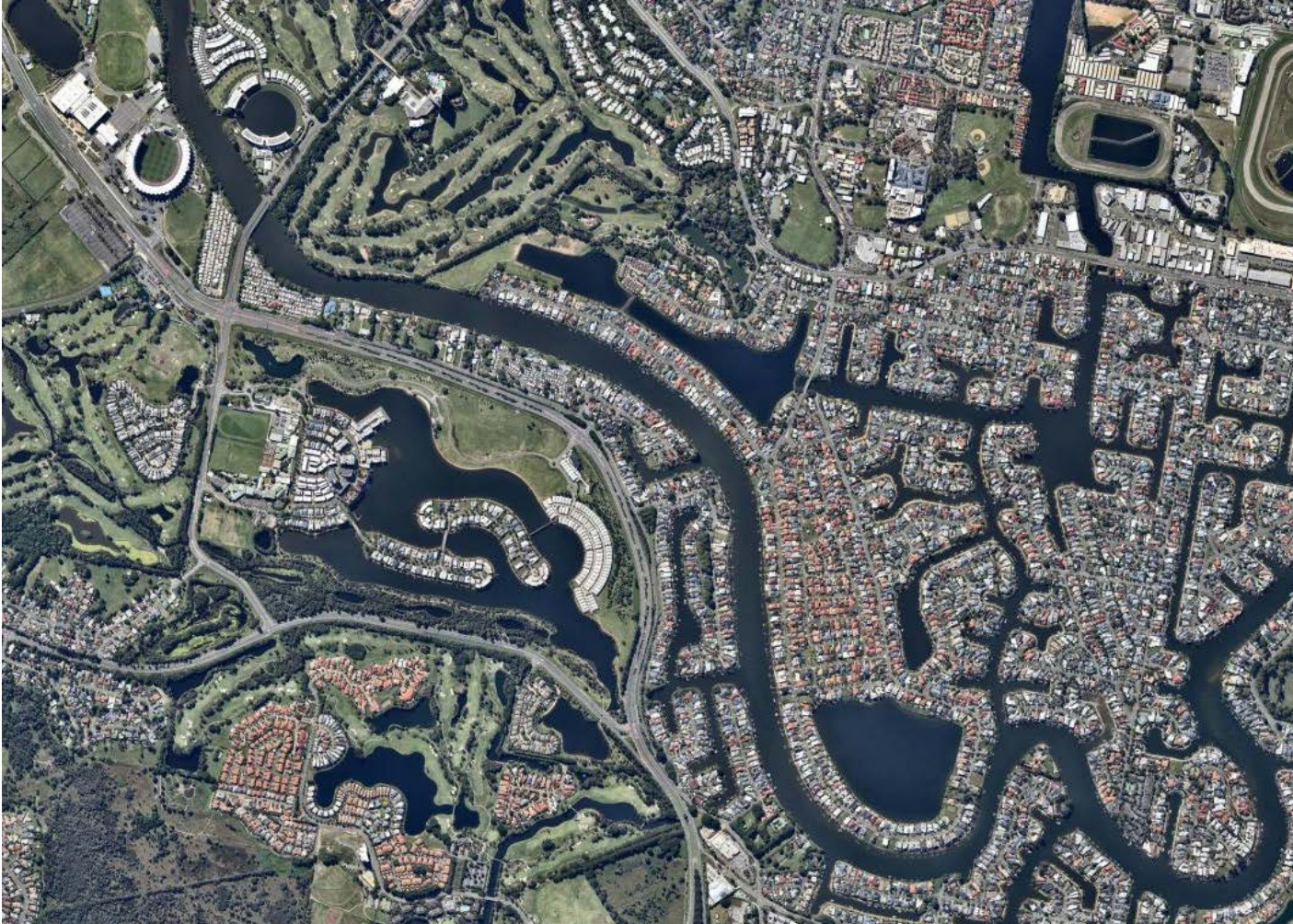
Aerial imagery of the Coomera River (South Branch)



Image, nearmap, elevation 200 metres, 31 May 2019

Appendix 14

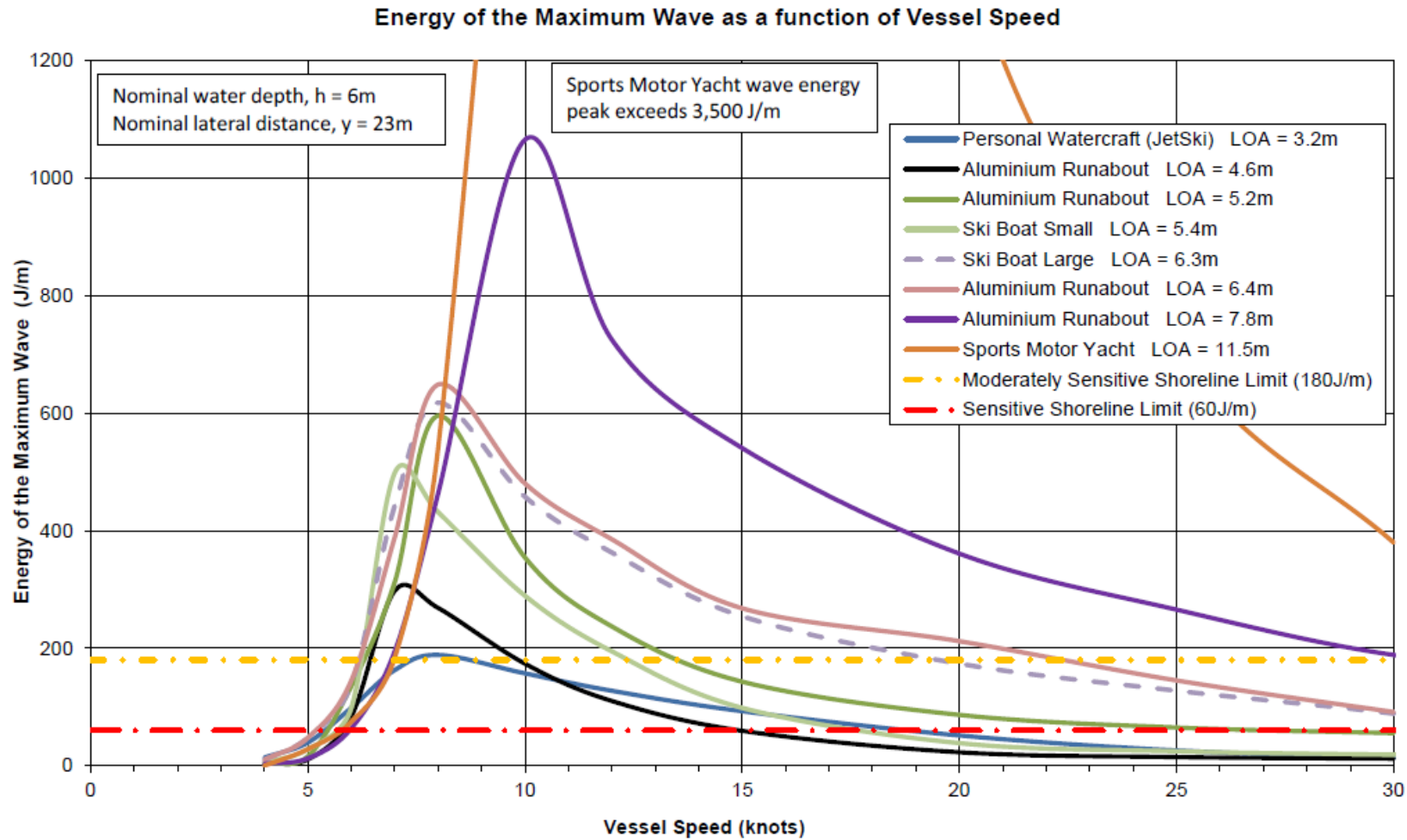
Aerial imagery of the Nerang River



Image, nearmap, elevation 200 metres, 7 May 2019

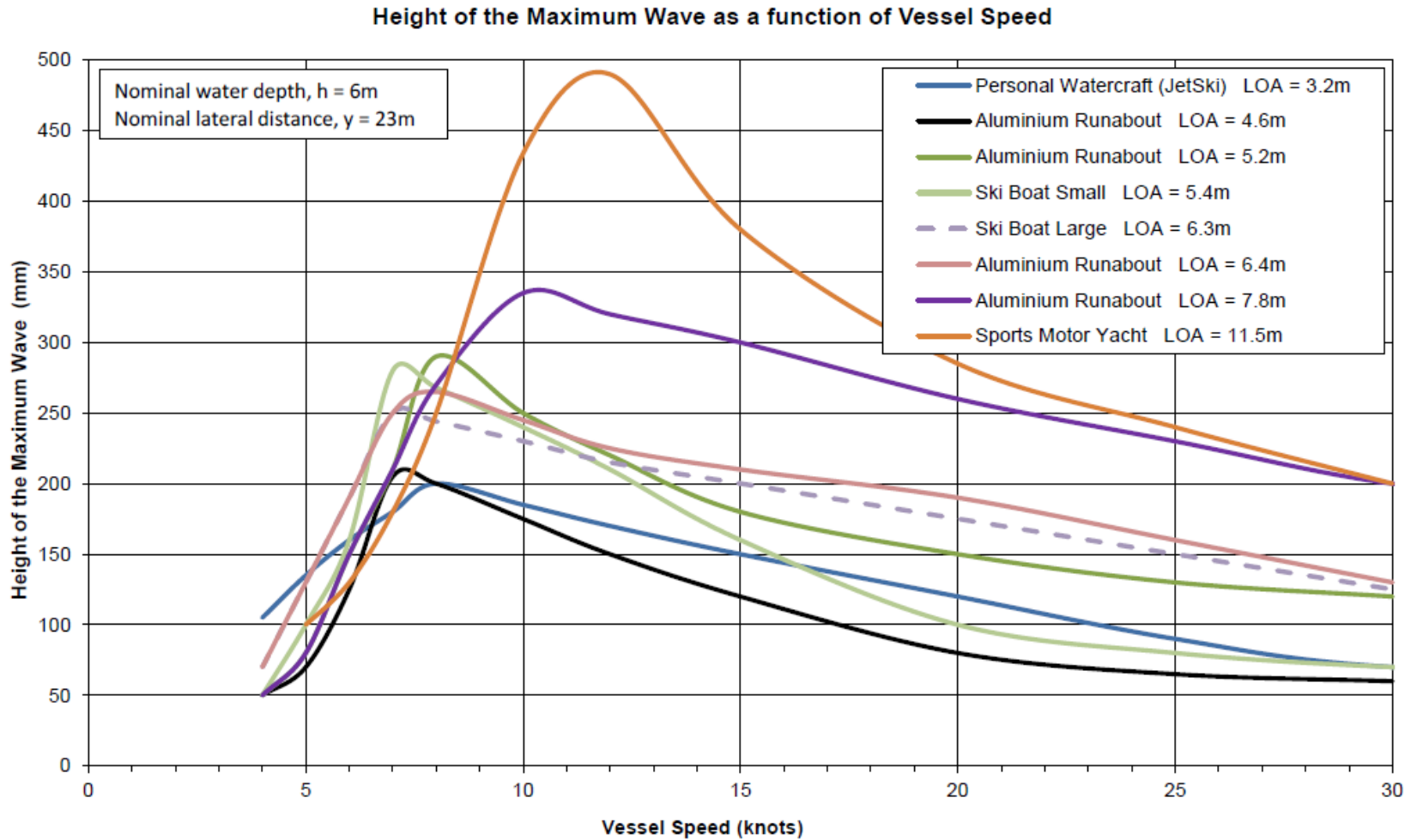
Appendix 15

“Figure 2” mentioned by Professor Gregor Macfarlane



Appendix 16

“Figure 1” mentioned by Professor Gregor Macfarlane



Appendix 17

Engineering parameters for environmental considerations

Coomera River (South Branch) near Paradise Point – within area of speed limits trial

Location	Wind velocity	Wave height	Flood level	Stream velocity
Killowill Avenue, Paradise Point	60 m/s	0.76 m	Q100	Q100 – 2.4 m/s
Hume Parade, Paradise Point	36 m/s	0.60 m	Q50 – 3.0 m max	Q50 – <0.76 m/s (2% exceedance probability)
Hume Parade, Paradise Point	36 m/s	0.30 m	Q100 – RL +2.05 m AHD	1.58 m/s max
Beardsley Court, Paradise Point	41 m/s	0.50 m	Q100	1.00 m/s
Hume Parade, Paradise Point	41 m/s	0.50 m	N/A	2.00 m/s
Hume Parade, Paradise Point	39 m/s	0.60 m	N/A	Q50 – 2.04 m/s (2% exceedance probability)

Coomera River (South Branch) near Hope Island and Sanctuary Cove – within area of speed limits trial

Location	Wind velocity	Wave height	Flood level	Stream velocity
Anchorage Terrace, Hope Island	39 m/s	0.60 m	N/A	2.00 m/s
Riverside Drive, Sanctuary Cove	41 m/s	0.50 m	Q100 - RL +2.05 AHD	<1.80 m /s max (2% exceedance probability)
Riverside Drive, Sanctuary Cove	41 m/s	0.50 m	Q100 – RL +2.05 AHD	<1.80 m /s max (2% exceedance probability)

Engineering parameters for environmental considerations (continued...)

Coomera River near Santa Barbara – same speed limit as speed limits trial

Location	Wind velocity	Wave height	Flood level	Stream velocity
Chindrina Street, Santa Barbara	36 m/s	0.30 m	Q100 – RL +2.37 m	Q100 <1.0 m/s max (2% exceedance probability)
Chindrina Street, Santa Barbara	39 m/s	0.60 m	Q50	Q50 <1.78 m/s max (2% exceedance probability)
Chindrina Street, Santa Barbara	31 m/s	0.60 m	Q50	Q50 <1.78 m/s max (2% exceedance probability)

Nerang River – same speed limit as speed limits trial

Location	Wind velocity	Wave height	Flood level	Stream velocity
Witt Avenue, Carrara	36 m/s	0.60 m	Q50 – 3.0 m max	Q100 – <1.76 m/s max (2% stream velocity)
Cabana Boulevard, Benowa Waters	49 m/s	0.60 m	N/A	3.00 m/s
Cabana Boulevard, Benowa Waters	49 m/s	0.60 m	N/A	3.00 m/s
Cabana Boulevard, Benowa Waters	36 m/s	0.60 m	Q50 – 3.0 m max	Q50 – 1.85 m/s (2% exceedance probability)
Cabana Boulevard, Benowa Waters	49 m/s	0.60 m	N/A	3.00 m/s
Cabana Boulevard, Benowa Waters	32 m/s	0.50 m	N/A	1.00 m /s

Appendix 18

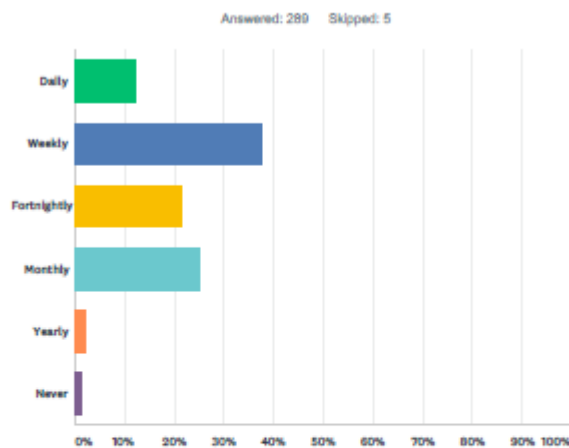
Online survey

The *Have Your Say in May* online survey comprised 14 questions:

1. How often do you use the Coomera River (South Arm)?
2. What days do you use the Coomera River?
3. What activities do you use the Coomera River for?
4. When the speed limit was 6 knots for all vessels, how often did you use it?
5. With the trial speed limit of 40 knots for boats under 8 metres, how often do you use it?
6. What phrase best represents how you feel about the speed trial?
7. The speed trial has achieved its aim to maintain safety, improve travel times for smaller boats and address damaging wash caused by larger vessels.
8. What do you value or find beneficial about the speed limits trial?
9. What concerns do you have about the speed limits trial?
10. Cameras should be used to record poor behaviour and support action by warnings or fines.
11. What type of boat or vessel do you own?
12. What is your post code?
13. What gender do you identify with?
14. What is your age?

The analysis of data from questions 1 to 7 is reproduced below:

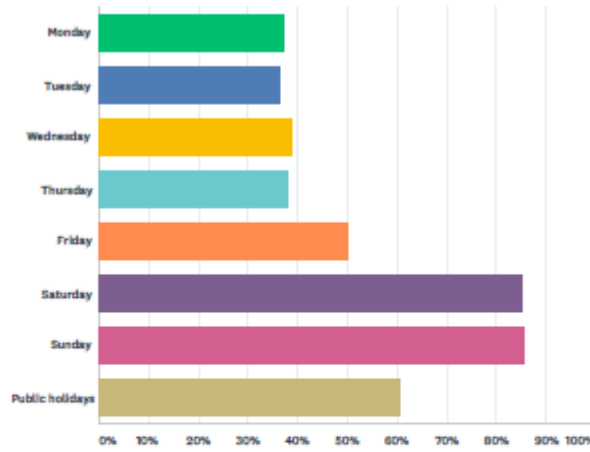
Q1 How often do you use the Coomera River (South Arm)?



ANSWER CHOICES	RESPONSES
Daily	12.11% 35
Weekly	37.72% 109
Fortnightly	21.45% 62
Monthly	25.26% 73
Yearly	2.08% 6
Never	1.38% 4
TOTAL	289

Q2 What days do you use the Coomera River?

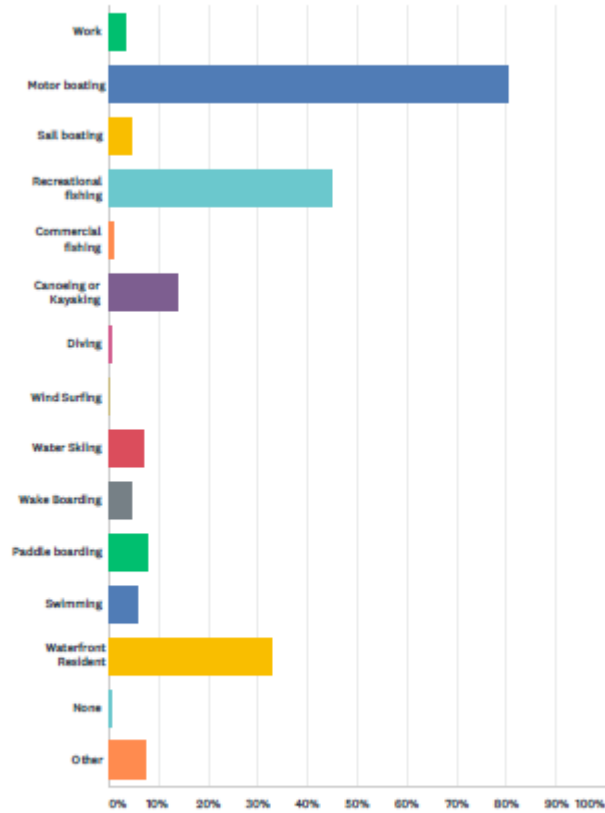
Answered: 287 Skipped: 7



ANSWER CHOICES	RESPONSES	
Monday	37.28%	107
Tuesday	36.59%	105
Wednesday	38.68%	111
Thursday	37.98%	109
Friday	50.17%	144
Saturday	85.37%	245
Sunday	85.71%	246
Public holidays	60.63%	174
Total Respondents: 287		

Q3 What activities do you use the Coomera River for?

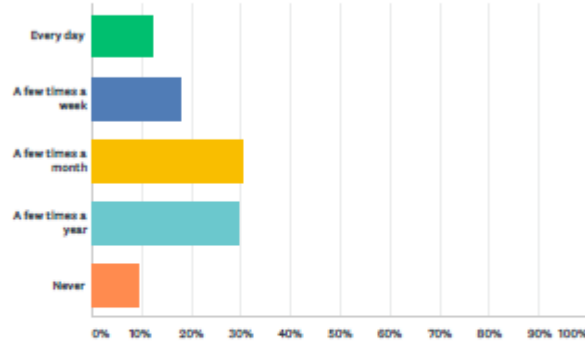
Answered: 292 Skipped: 2



ANSWER CHOICES	RESPONSES	
Work	3.42%	10
Motor boating	80.48%	235
Sail boating	4.79%	14
Recreational fishing	44.86%	131
Commercial fishing	1.03%	3
Canoeing or Kayaking	14.04%	41
Diving	0.68%	2
Wind Surfing	0.34%	1
Water Skiing	6.85%	20
Wake Boarding	4.79%	14
Paddle boarding	7.88%	23
Swimming	6.16%	18
Waterfront Resident	32.88%	96
None	0.68%	2
Other	7.53%	22
Total Respondents: 292		

Q4 When the Coomera River (South Arm) was 6 knots for all vessels, how often did you use it?

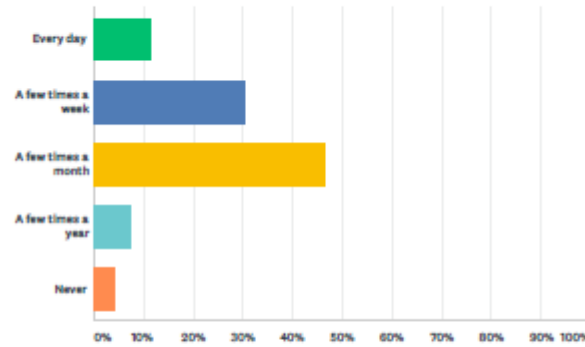
Answered: 290 Skipped: 4



ANSWER CHOICES	RESPONSES	
Every day	12.41%	36
A few times a week	17.93%	52
A few times a month	30.34%	88
A few times a year	29.66%	86
Never	9.66%	28
TOTAL		290

Q5 With the trial speed limit of 40 knots for boats under 8 metres in the Coomera River (South Arm), how often do you use it?

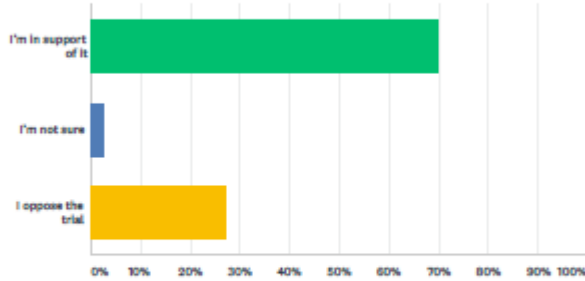
Answered: 290 Skipped: 4



ANSWER CHOICES	RESPONSES	
Every day	11.72%	34
A few times a week	30.34%	88
A few times a month	46.55%	135
A few times a year	7.24%	21
Never	4.14%	12
TOTAL		290

Q6 What phrase best represents how you feel about the Coomera River (South Arm) speed trial?

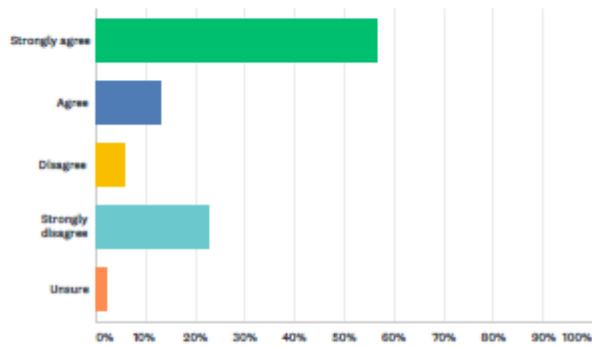
Answered: 293 Skipped: 1



ANSWER CHOICES	RESPONSES	
I'm in support of it	69.97%	205
I'm not sure	2.73%	8
I oppose the trial	27.30%	80
TOTAL		293

Q7 The Coomera River (South Arm) speed trial has achieved its aim to maintain safety, improve travel times for smaller boats and address damaging wash caused by larger vessels.

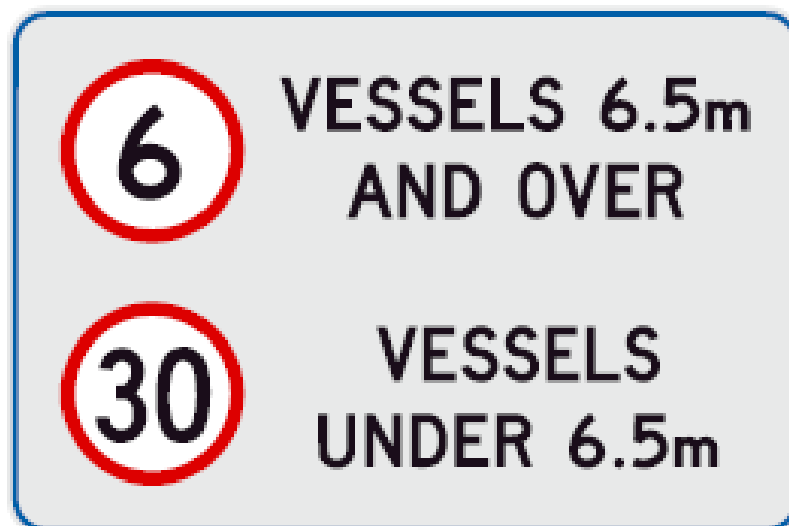
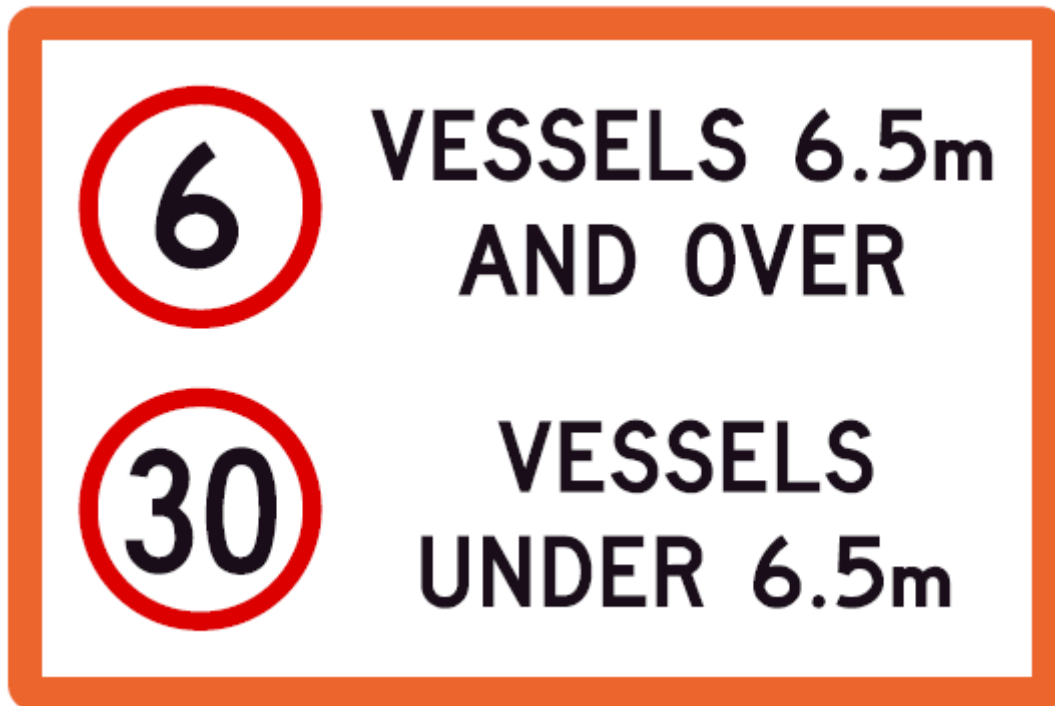
Answered: 294 Skipped: 0



ANSWER CHOICES	RESPONSES	
Strongly agree	56.46%	166
Agree	12.03%	38
Disagree	5.78%	17
Strongly disagree	22.79%	67
Unsure	2.04%	6
TOTAL		294

Appendix 19

Designs for new speed signs



Appendix 20

Map for new speed limits

