

South Brisbane Sailing Club Inc.

PO Box 3714 South Brisbane QLD 4101



26 March 2021

Cr Adrian Schrinner
Lord Mayor
Brisbane City Council
GPO Box 2287
Brisbane Qld 4001

Dear Cr Schrinner,

I am writing to express the concerns of the Management Committee and the members of the South Brisbane Sailing Club regarding the potential impact of proposed 'Green Bridges'¹ on the safety of sailing, rowing and other watersports on the Milton and St Lucia reaches of the Brisbane River.

We also propose a design solution that would meet community travel needs and maintain the iconic value of sailing and other water sports on this stretch of river for current & future generations.

Figure 1. Family sailing craft on the Milton reach Brisbane River (Nov 2020)



Figure 2. Sailing on the Milton reach of the Brisbane River approx. 1910 (State Library of Queensland).



¹ <https://www.brisbane.qld.gov.au/traffic-and-transport/roads-infrastructure-and-bikeways/green-bridges>

Having considered proposed design options, our conclusion is that ‘Green Bridges’ with two or more piers would present an unacceptable risk to the safety of sailors and the viability of sailing on the Milton and St. Lucia Reaches of the Brisbane River due to safety and reputational impacts including:

- Loss of life or serious injury via vessel-to-vessel impact or vessel-to-pier impact and entrapment
- Significant impact to the sport of sailing as a result of reputational consequences
- Significant economic impact to commercial charter and CityCat ferry services as a result of negative reputational consequences
- Significant tourism and cultural impact risks to the City of Brisbane as a result of negative reputational consequences

A schematic representation of a ‘Green Bridge’ with two piers is given in **Figure 3**. The expected risk of this bridge is estimated as Extreme under guidelines issued by the Australian Maritime Safety Authority (**Figure 4**).

Figure 3. Schematic illustration of “green bridge” with two bridge piers more than 5m from banks

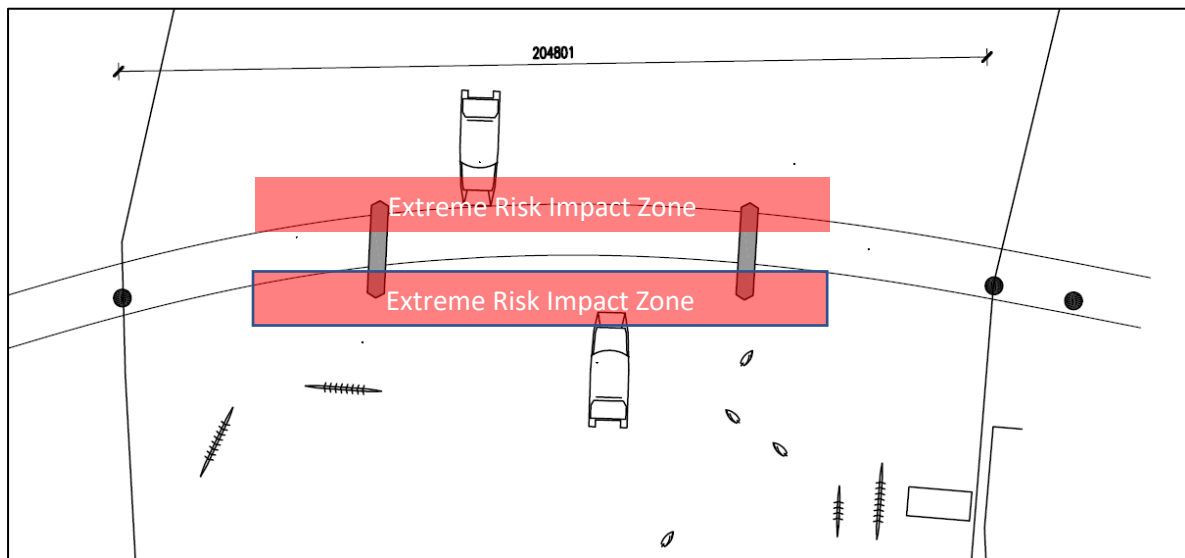
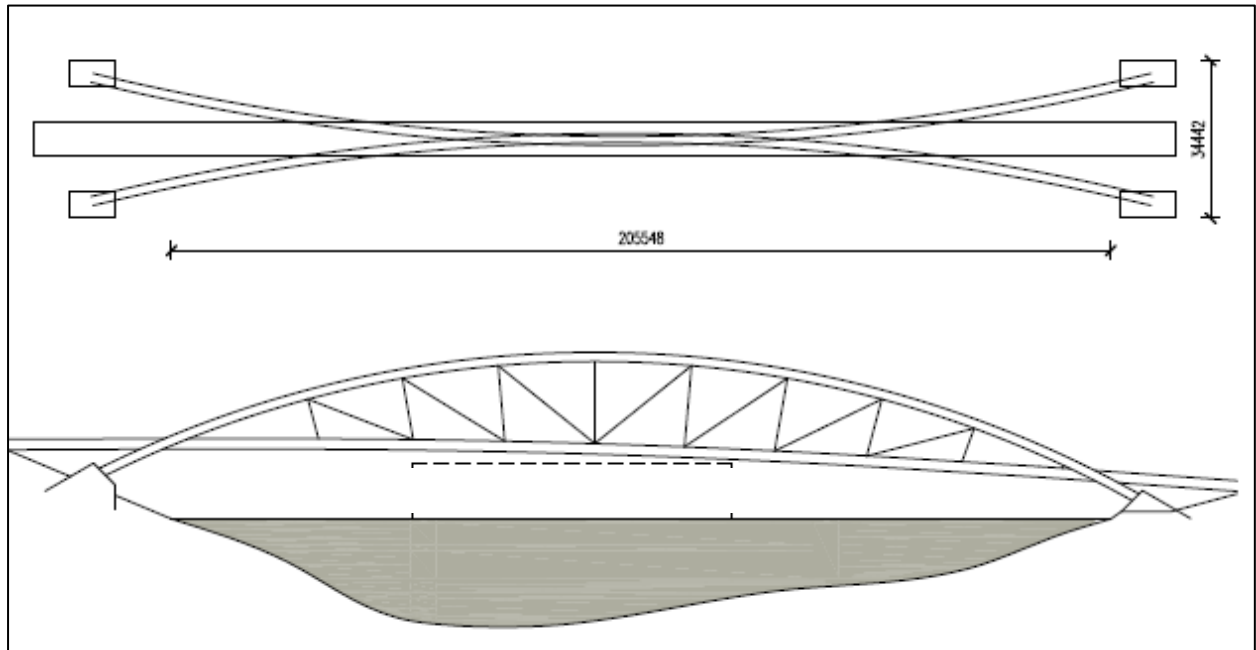


Figure 4. Safety risk to sailors and passive watercraft from a Green Bridge with two or more piers

Likelihood	Consequences				
	Negligible	Minor	Medium	High	Catastrophic
Almost certain	Moderate	Moderate	High	Extreme	Extreme
Likely	Low	Moderate	High	High	Extreme
Possible	Low	Low	Moderate	High	High
Unlikely	Very Low	Low	Moderate	Moderate	High
Rare	Very Low	Very Low	Low	Moderate	Moderate

Our proposed solution to meet community travel aspirations and resolve maritime safety impacts is to design and construct a 'Green Bridge' with a single span, or with piers within 5 meters of the banks, as depicted in **Figure 5**. This design solution would present an acceptable risk to sailors and is likely to enhance spectator interest in the sport of sailing, rowing and other water sports.

Figure 5. Proposed single span "green bridge" design



A practical example of such a design is the famous "Three Countries Bridge" which crosses the Rhine between France and Germany within a metropolitan area of Switzerland (Figure 6). It is the world's longest single-span bridge dedicated to pedestrians and cyclists with a main span of 229.4 meters².

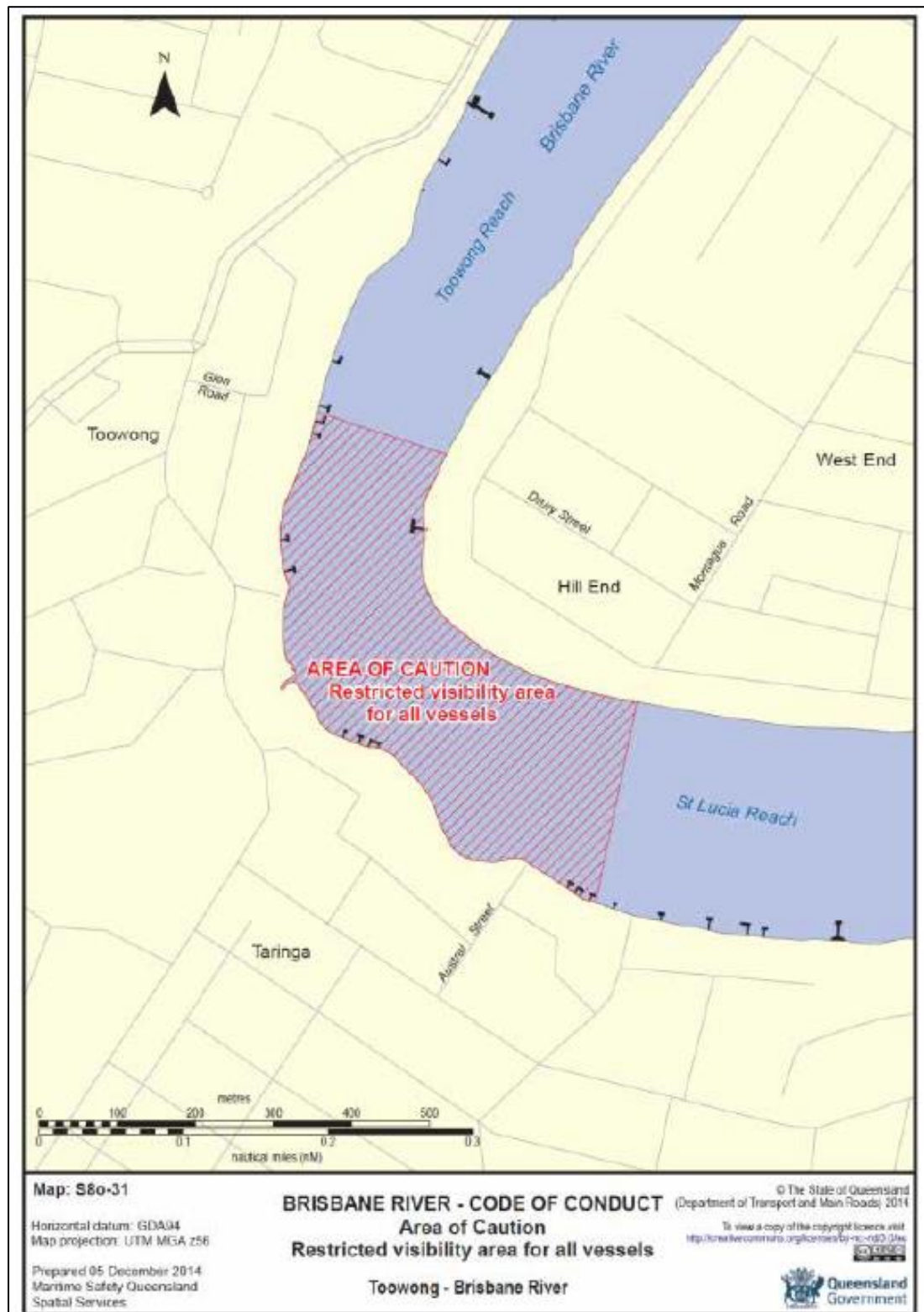
Figure 6. "Three Countries Bridge" single-span bridge dedicated to pedestrians and cyclists



² https://en.wikipedia.org/wiki/Three_Countries_Bridge

In addition, I also draw to your attention the additional risks of a 'Green Bridge' with two or more piers on navigational safety. Of particular concern is the restricted visibility to vessels travelling between the Milton and St. Lucia Reaches. As depicted in Figure 7, the stretch of the Brisbane River between Montague Road and Drury St West End is recognized by Maritime Safety Queensland as an "area of caution".

Figure 7. Area of Caution – West End Peninsula



Any bridge with two or more piers would also place the proposed 'Green Bridge' in conflict with the State Planning Code for Accepted Development for Tidal Works, and State Code 7 regarding Maritime Safety (Figure 8).

Figure 8. State Code 7 regarding Maritime Safety

Protection of navigable waterways:

PO3 Development does not impede the safe movement of vessels in a navigable waterway.

AO3.1 Development ensures navigable waterways are open to vessel traffic at all times.

AND

AO3.2 Development, including structures and any vessel berthed at the structures:

1. does not encroach into, pass over or under a navigation corridor; or
2. is not located in a high-risk maritime development zone.

Note: Navigation corridor and high-risk maritime development zone layers are currently unavailable for Gold Coast waters.

AND

AO3.3 Development does not limit either the depth of a navigable waterway or the size of vessels which can safely navigate the waterway.

Note: Where development proposes to temporarily or permanently limit the depth of a navigable waterway or the size of vessels which can navigate a waterway, it is recommended that a vessel traffic management plan be provided. It is also recommended a marine execution plan be submitted to the regional harbour master 30 days prior to the commencement of works.

AND

AO3.4 Development involving the demolition of structures in a navigable waterway, including piling, ensures the entire structure is removed.

AND

AO3.5 Structures, including all freestanding piles, must be appropriately lit and clearly visible to approaching vessels, and reflective tape must be fitted to all structures to enhance visibility during the hours of darkness.

Note: Where necessary, the regional harbour master may require the installation of aids to navigation on structures.

SBSC Inc also considers the advised 'standard navigational channel width' of 70 meters, as applied to bridges in other reaches of the Brisbane River, is not justifiable and is not applicable to the design of bridges on the Milton, Toowong or St Lucia reaches of the Brisbane River, in view of the high use by rowing craft, canoes, river kayaks, sailing craft, powered recreational and commercial vessels on these reaches .

It is implausible that a standard width of 70 meters would ensure safety outcomes that are consistent with State Code 7 regarding Maritime Safety requiring that "Development does not impede the safe movement of vessels in a navigable waterway."

We would also like to raise concerns that the proposed 'Green Bridge', if designed with two or more piers more than 5 meters from banks, would also conflict with the Queensland Government's State Planning Policy to prevent encroachment of development on sporting and recreational facilities³.

³ <https://cabinet.qld.gov.au/documents/2017/May/SPP/Attachments/Policy.pdf>

As you can see from Figure 9 and Figure 10 the proposed bridge locations would significantly impinge on our Usual Course Area unless the proposed single pier design option is adopted.

Figure 9. SBSC Usual Course Area (St Lucia Reach)



We would also like to reinforce other suggestions and concerns that SBSC would like to see addressed in future planning for the proposed 'Green Bridges':

- **Pier design:** Any submerged pier thickening or buttress would introduce additional navigation hazards for sailing boats, significant entrapment risks and would generate considerable conflict between powered vessels and sailing craft. Piers also reduce visibility for all watercraft. It is essential to maintain visibility both upstream and downstream for all commercial and recreational users.
- **Toowong to West End location.** Proposed location A is highly preferred as it would have least impact on the launching, use and retrieval of boats from SBSC. Option C is expected to have unacceptable impacts on SBSC during the construction phase and beyond, particularly on our ability to launch and retrieve sailing boats with 4 – 6 metre masts from our current boat ramp.
- **St Lucia to West End location.** All options would have a comparable impact on sailing conducted by SBSC.
- **Parking.** Parking for sailors and other users of the SBSC clubhouse hall facility is likely to be impacted by an increased demand for parking space during bridge construction and subsequently. Those adversely affected would include parents of children in learn to sail classes, owners of boats and other users of the SBSC Community Hall, noting that SBSC usually hires the hall to 15-20 community groups each week. With current parking space already at a premium, it is strongly recommended that consideration be given by BCC to the need for dedicated parking or time-management of parking space for users of the club.
- **Flood risk.** The SBSC Community Hall and Clubhouse has been heavily impacted by both the 1974 and 2011 floods. While we have recovered from these floods and remain financially viable and buoyant, SBSC is unable to afford flood insurance, which has risen substantially in recent years. All bridge piers and infrastructure would need to be located in a way which does not increase flood risk to the SBSC Community Hall.

Figure 10. Usual Course Area (Milton Reach)



- **Cultural and build heritage values.** The SBSC Clubhouse and Community Hall has significant heritage values as recognised by council heritage architects, local historians, past and current members of SBSC and the wider community. The bridge would need to be located and designed in a way that does not diminish the visual amenity and character of SBSC and its environs.

SBSC also wishes to advise that while the option of a single pier (two-span) 'Green Bridge' has also been given consideration, SBSC has not yet been able to determine with certainty which pier location would have least safety impacts. Options for a single pier (two span) bridge would include: (a) a single central pier, (b) a single pier approx. 1/3 of the width of the river from the northern bank or (c) a single pier approx. 1/3 of the width of the river from the southern bank.

SBSC has referred this question to an Expert Panel on Maritime Safety formed in collaboration with Rowing Queensland and Yachting Queensland. SBSC will provide more detailed recommendations on a single pier (two span) Green Bridge once the Expert Panel has provided a final report.

While we recognise that the Brisbane City Council has engaged some of Queensland's best engineers in the development of the Green Bridges program, given the special conditions presented by the vessel use and geographical conditions of these reaches of the Brisbane River, I would like to draw your attention to principles regarding bridge design in the publication *Knott, M., Pruca, Z. "Vessel Collision Design of Bridges." Bridge Engineering Handbook. Ed. Wai-Fah Chen and Lian Duan Boca Raton: CRC Press, 2000* which are relevant to safety concerns raised by SBSC Inc.

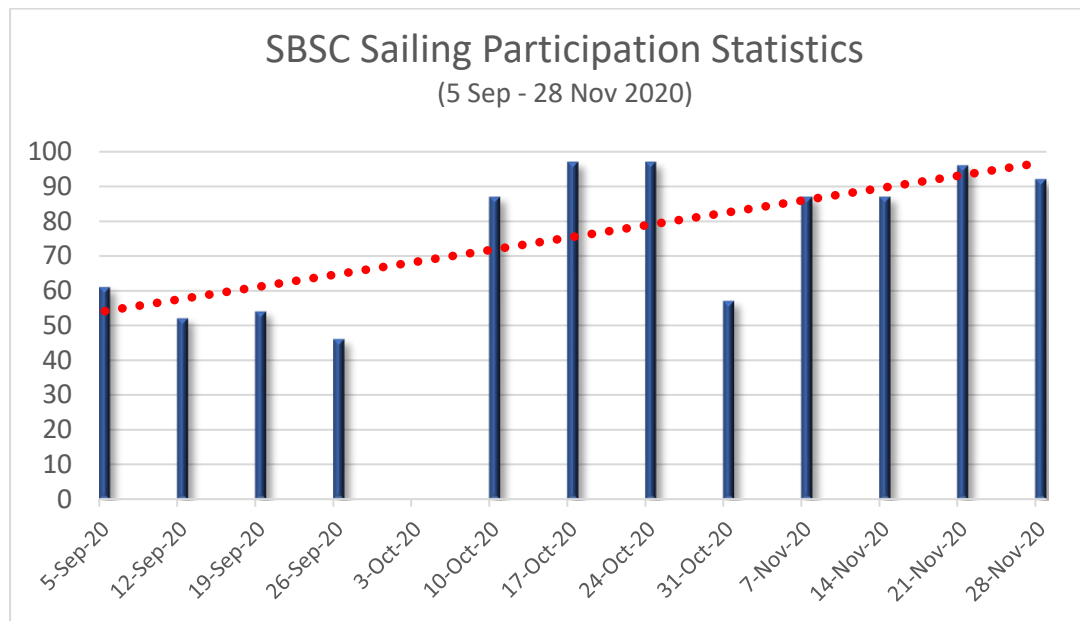
- Bridges should be located away from turns in the channel. The distance to the bridge should be such that vessels can line up before passing the bridge, usually at least eight times the length of the vessel. An even larger distance is preferable when high currents and winds are likely to occur at the site.
- Bridges should be designed to cross the navigation channel at right angles and should be symmetrical with respect to the channel.
- An adequate distance should exist between bridge locations and areas with congested navigation, port facilities, vessel berthing manoeuvres, or other navigation problems.
- Locations where the waterway is shallow or narrow so that bridge piers could be located out of vessel reach are preferable.
- The selection of the type and configuration of a bridge crossing should consider the characteristics of the waterway and the vessel traffic, so that the bridge would not be an unnecessary hazard to navigation. The layout of the bridge should maximize the horizontal and vertical clearances for navigation, and the bridge piers should be placed away from the reach of vessels.
- Finding the optimum bridge configuration and layout for different bridge types and degrees of protection is an iterative process which weighs the costs involved in risk reduction, including political and social aspects.
- The characteristics of the waterway in the vicinity of the bridge site such as the width and depth of the navigation channel, the current speed and direction, the channel alignment and cross section, the water elevation, and the hydraulic conditions, all have a great influence on the risk of vessel collision and must be taken into account.
- The presence of bends and intersections with other waterways near the bridge increases the probability of vessels losing control and become aberrant. The navigation of downstream barge tows through bends is especially difficult.
- The vessel transit paths in the waterway in relation to the navigation channel and the bridge piers can affect the risk of aberrant vessels hitting the substructure.

- Water currents at the location of the bridge can have a significant effect on navigation and on the probability of vessel aberrancy. The design water currents commonly used represent annual average values rather than the occasional extreme values that occur only a few times per year, and during which vessel traffic restrictions may also apply.
- General knowledge on the operation of vessels and their characteristics is essential for safe bridge design.
- The vessel data required for bridge design include types of vessels and size distributions, transit frequencies, typical vessel speeds, and loading conditions. In order to determine the vessel size distribution at the bridge site, detailed information on both present and projected future vessel traffic is needed.
- Due to economic and structural constraints, bridge design for vessel collision is not based on the worst-case scenario, and a certain amount of risk is considered acceptable.
- The risk acceptance criteria consider both the probability of occurrence of a vessel collision and the consequences of the collision. The probability of occurrence of a vessel collision is affected by factors related to the waterway, vessel traffic, and bridge characteristics. The consequences of a collision depend on the magnitude of the collision loads and the bridge strength, ductility, and redundancy characteristics. In addition to the potential for loss of life, the consequences of a collision can include damage to the bridge, disruption of motorist and marine traffic, damage to the vessel and cargo, regional economic losses, and environmental pollution.
- Acceptable risk levels have been established by various codes and for individual bridge projects. The acceptable annual frequencies of bridge collapse values used generally range from 0.001 to 0.0001. These values were usually determined in conjunction with the risk analysis procedure recommended and should be used accordingly.
- Incorporation of the risk of vessel collision and cost of protection in the total bridge cost has almost always resulted in longer span bridges being more economical than traditional shorter span structures, since the design goal for developing the bridge pier and span layout is the least cost of the total structure (including the protection costs). Typical costs for incorporating vessel collision and protection issues in the planning stages of a new bridge have ranged from 5% to 50% of the basic structure cost without protection.
- Experience has also shown that it is less expensive to include the cost of protection in the planning stages of a proposed bridge, than to add it after the basic span configuration has been established without considering vessel collision concerns. Typical costs for adding protection, or for retrofitting an existing bridge for vessel collision, have ranged from 25% to over 100% of the existing bridge costs.

May I also draw to your attention the following characteristics of sailing

- **Viability and growing participation in sailing.** Since 2019, the SBSC Management Committee has embarked on a program to grow participation in sailing, in response to the BCC policies and increasing demand for recreational use of the river. As you can see from Figure 10, SBSC has been able to rebound from the impacts of COVID.
- **Youth and family participation:** In 2019 SBSC embarked on an expanded Learn to Sail program targeting local youth and families. We are now at a peak level of service for our Junior and Adult Learn to Sail programs where approximately 45 people attend classes each week. We have also recently commenced an After School Learn to Sail program and have conducted a successful School Holiday program targeting families from West End and nearby suburbs. We have attracted 40-60 youth to these classes now on Saturdays, Sundays and week-days.

Figure 10. SBSC Sailing Participation Statistics



- Continuity of sailing.** Since at least 1903, sailing on the Milton and St. Lucia reaches of the Brisbane River has been a regular Saturday afternoon social event, with only World Wars and flooding events interrupting the clubs' activities. Since the 2011 flood and more recent times, the SBSC Management Committee and volunteers have been successful in promoting and attracting sailing enthusiasts to river sailing. In doing so, we have seen a resurgence of Saturday afternoon racing with a regular fleet of 25-30 boats, including our novice and youth sailing teams. These races create a great deal of enthusiasm among competitors of all ages and create a great scene for spectators from both the Toowong and West End sides of the river.
- Riverfire Regatta:** The 2011 Brisbane flood event had a large impact on SBSC operations; 2017, the SBSC Management Committee, Sailing Committee and members were pleased to re-introduce our signature sailing event, the Brisbane Riverfire Sailing Regatta <https://www.youtube.com/watch?v=qgDhjrr50k4> which is held annually to coincide with the end of the Brisbane Festival.

On behalf of the SBSC Management Committee and members I submit these concerns to you so that any further progression of the Green Bridge design can take these matters into account to also include a single span option that would allow continued safe sailing, rowing and other watersport activity.

I have also taken the liberty of providing copies of this letter to the Minister for Sport, Hon. Stirling Hinchliffe, the Minister for State Development, Infrastructure, Local Government and Planning Hon Dean Wells, Hon Amy MacMahon Member for South Brisbane and Councillor for The Gabba Ward Jonathan Sri, so that these elected members are also aware of the adverse impacts that a two-pier 'Green Bridge' would have on sailing practiced by members of the South Brisbane Sailing Club, rowing and other watersports, and the benefits and feasibility of a single span bridge.

We would not like to see the Brisbane City Council credited with the construction of Green Bridges that would result in the demise of sailing, rowing and other watersports on the Milton and St Lucia reaches of the Brisbane River.

I and other members of our Management Committee would be happy to meet with you or your representatives to further explain our concerns and proposal.

Kind regards

A handwritten signature in black ink that reads "Robert Preston". The signature is written in a cursive style with a large, looped 'R' and a long, sweeping underline.

Robert Preston
President
South Brisbane Sailing Club Inc.
E president@sbsc.org.au