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Boating Industry Association of Victoria

Patterson River North Boat Ramp
FEASIBILITY STUDY – DRAFT REPORT

May 2019

Contents

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Executive Summary

The Boating Industry Association of Victoria (BIAV), together with other stakeholders in Victoria, is seeking to develop a boat ramp on the north bank of the Patterson River, in the vicinity of Wells Road (Melway 97, J3).

This Feasibility Study has investigated the proposed site for the boat ramp, located on the north bank of the river, with direct access to the facility from Wells Road. The facility comprises a two-lane boat ramp, 80 car/trailer parking spaces, a fixed boat holding jetty and access roads into the site. The area needed to develop the site will be established with general fill retained by a retaining wall along the river's edge.

This Study has established, using an analysis of boating demand, that there is more than sufficient demand for additional boat launching facilities along the eastern side of Port Phillip Bay, and in particular the number of boat users, especially boat-based fishers, is placing a significant demand for a new boat ramp on the Patterson River to justify investment in such a facility.

Assessment of the proposed site, for technical, logistical and adverse impact reasons, has identified the preferred site for a boat ramp to be located on the north bank of the river. A car park, with a crushed rock surface, will also be needed, together with a fixed timber jetty for boat queuing during the launching and retrieving operation.

Assessment of the site has included consideration of the potential adverse impacts of the boat ramp on existing overhead and underground services, as well as interaction with pedestrians and cyclists using the shared pathway which runs along the north bank of the river. In the detailed design phase, these potential conflicts will need to be carefully considered to mitigate the adverse impacts of the development.

The estimated cost of the development is $3,310,000, to be refined during detailed design of the facility. It is expected that a 40-week period will be needed to complete construction of the project.

It is recommended that this site be given further consideration to proceed to implementation, including funding and detailed design, leading to project approval and construction.

1 Introduction

Oldfield Consulting Australasia has been engaged by the Boating Industry Association of Victoria (BIAV) to conduct a Feasibility Study for the development of a boat ramp on the north bank of the Patterson River in the vicinity of Wells Road.

The project is located as shown in Figure 1.

Figure 1: Location of the Patterson River North Boat Ramp Site

The Feasibility Study's objective is to assess whether a new boat launching facility can be developed at the northern end of the Patterson River estuary adjacent to Wells Road, and if so, provide a feasible concept plan and facility layout for further consideration at a detailed project design phase.

2 Background

2.1 General

There is a need to provide further recreational boat launching facilities on the Patterson River in the City of Kingston in Melbourne's south-east. The existing facility operated by Parks Victoria at Launching Way is the busiest recreational boating facility in Victoria. It is over-crowded during peak times and additional facilities are needed. The Patterson River boat launching facility has recently been rated in a state-wide survey of boat ramps conducted by RACV as the highest-rating facility in the State, based on a survey of 1300 boat users in Victoria.

The Patterson River Concept Plan (Max Hardy/Tract, 2018) and the Patterson River Engagement Report (DELWP, 2018) have identified a need for additional boating facilities within the lower precinct (i.e. west of Wells Road) of Patterson River.

A feasibility study needs to be prepared, to define the requirements for an additional boat launching facility and its technical feasibility, with the facility to be located on the right (northern) bank of the Patterson River, in the vicinity of the Wells Road bridge.

This Study has investigated the proposed site for a new facility, the space available for a boat ramp and support facilities (car-trailer unit parking, access and egress to the ramp, existing services conflicts, navigable depth of water) and the demand at this site for a new boat ramp facility.

2.2 Other Boat Launching Facilities in East Port Phillip Bay

2.2.1 Patterson River Launching Way (Parks Victoria)

The main boat launching facility at Patterson River comprises four ramps, each with two lanes. Car-trailer unit (CTU) parking includes 375 spaces in the main car park and further spaces in the overflow car park. This facility is considered to be the best boat launching facility in Victoria, providing easy access to Port Phillip Bay and consequently attracts large numbers of recreational boaters.

2.2.2 National Water Sports Centre (NWSC)

This Centre has a two-lane boat ramp which is used exclusively by the users of the Centre for launching rowing tenders and other boats using the Centre's waterway. This ramp is not open to the general boating public. Due to a significant difference in water levels between the NWSC (upper precinct) and the lower precinct of Patterson River, this ramp cannot be used to access Patterson River. It can only cater for users of the NWSC.

2.2.3 North Road, Brighton

This ramp comprises three lanes with parking for 45 CTUs. The ramp is exposed to westerlies and northerlies. This facility is about 25km north-west of Patterson River North.

2.2.4 Black Rock – Half Moon Bay (Bayside City Council)

This ramp is a single-lane ramp with reasonable access to Half Moon Bay. There are only nine CTU spaces available at this facility. This facility is about 19km north-west of Patterson River North.

2.2.5 Mordialloc (Kingston City Council)

The Mordialloc boat ramp is a two-lane ramp located in Governor Road. There are 45 CTU spaces in a well-arranged car park. This facility has been identified for upgrading in the near future under the Government's Better Boating Victoria program. This facility is about 9km north of Patterson River North.

2.2.6 Kananook Creek (Frankston City Council)

This large facility comprises two 4-lane ramps with access to Port Phillip Bay. However, owing to the limited width of Kananook Creek adjacent to the ramp, launching capacity is limited to an equivalent of about 4 ramp lanes. There are only 40 CTU spaces in the main car park. However, there is an overflow car park with space for about 25 to 30 additional CTUs. This facility is about 11km south of Patterson River North.

2.2.7 Frankston – Olivers Hill (Frankston City Council)

This comprises two single-lane ramps and a central fixed jetty. There are 45 CTU spaces in the car park. There is no space for overflow parking. This facility is about 13km south of Patterson River North.

2.2.8 Boat Ramp Capacities

Using the guidelines in AS 3962 – *Guidelines for design of marinas* (see Chapter 4 below for further detailed discussion), all these nearby boat launching facilities other than Patterson River Launching Way are severely constrained for launching capacity by a lack of CTU parking spaces.

3 Boating Demand Analysis

3.1 Boat Ownership in Victoria

Maritime Safety Victoria, a branch of Transport Safety Victoria, provides an annual report on maritime safety incident statistics. Within this report, statistics are provided for both marine licences and recreational boat registrations for Victoria. The boat registration statistics are provided by vessel type and vessel length.

At 30 June 2017, the recreational boat registrations were as shown in Table 1. Boat registration numbers by boat length are shown in Table 2. Statistics for 2018 are not yet available.

Table 1: Boat ownership statistics for Victoria, June 2017

Vessel Type	Number of vessels	% of Total Number
Open	130,776	67.6
Half cabin	28,804	14.9
Personal watercraft	21,095	10.9
Cabin cruiser	5,898	3.1
Yacht (keel boat)	2,782	1.4
Trailer sailor	2,191	1.1
Hovercraft	868	0.4
Houseboat	718	0.4
Canoe	214	0.1
TOTAL	**193,346**	**100**

Table 2: Boat registrations by boat length, June 2017

Vessel length range	Number of vessels	% of Total Number
0 – 4.8 m	121,801	63.0
4.8 – 8 m	65,697	34.0
8 – 12 m	3,994	2.1
greater than 12 m	1,854	1.0
TOTAL	**193,346**	**100**

The total number of boat registrations was 193,346, while the number of marine licences totalled 407,631.

3.2 Boat Ownership Growth

Statistics for recreational boat registrations and marine licences in Victoria for the years ending 30 June 2016 and 2017 (Marine Safety Victoria) show that boat registrations increased by 1.5% and marine licence numbers increased by 3.1%. The Victorian Department of Transport states that recreational vessel registrations have grown an average of 2.5 per cent per annum over the past eight years.

The recent launch of the Better Boating Victoria plan and the Target One Million plan by the State Government will further stimulate the growth of demand for boat launching facilities in Victoria in the coming years.

The Central Coastal Board's "Recreational Boating Market and Demand Update, 2013" and "Recreational Boating Facilities Framework" (February 2014) report that smaller boats (length less than 4.8 metres) represent 64% of the total number of registered boats in Victoria. Their estimated growth of boat ownership ranges from 1.7% per annum to 2.6% per annum, using a range of growth forecast methods.

Since a boat ramp on the Patterson River is expected to attract smaller boats, from the eastern and south-eastern suburbs, which are experiencing population growth of around 2.3% per annum, it is reasonable to apply a boat ownership growth rate of 2.3% per annum for the notional catchment for the Patterson River boat ramp. It is also important to note that the existing Launching Way facility at Patterson River serves the eastern and south-eastern suburbs boating population not just during the summer holiday season, but all year round. This contrasts with other facilities, particularly on the Mornington Peninsula (Mornington, Safety Beach, Dromana, Rye and Sorrento), which are heavily utilised predominantly during the summer months.

3.3 Characteristics of the Victorian Boating Fleet

Boat registration statistics (Maritime Safety Victoria, 2017) provide the mix of boat types (Table 1) and boat sizes (Table 2).

Based on these statistics (AECOM, 2014) the number of boats less that 4.8 m in length is 71% of the total number of open, half cabin and cabin cruiser boats, or 115 844 boats. Of these small boats, 47% or 54 447 boats use Port Phillip Bay, while the rest use Westernport, Bass Strait coastal waters and inland waterways for their boating.

3.4 Boat Lane Demand – East Port Phillip Bay

In Port Phillip Bay, there are 14 boat launching facilities ranging from Newport (The Warmies) in the north to Sorrento in the south. Eight of these facilities are located on the western side of the Bay while the remaining six are located along the bay's east coast and Mornington Peninsula. These 14 sites provide a total of 47 launching lanes, including Launching Way with eight lanes, Altona and Werribee South with six lanes and Half Moon Bay with only one lane.

The capacity of these lanes can be determined by applying a daily peak (maximum) boat launching capacity, over a 13-hour period in the day, of 10 launches per hour per lane, or 130 lane launches per day. This peak launch rate assumes that there is an adequate number of car-trailer unit (CTU) parking spaces and alongside holding berths provided at each facility, based on the guideline in AS 3962 – *Guidelines for design of marinas*, 2001, of 50 CTUs per ramp lane for an urban location, and 3 holding berths per lane. Where the number of CTUs and holding berths is limited and less than recommended, which is typical for nearly all the facilities in Port Phillip Bay, the launch rate needs to be reduced to 60% of the theoretical capacity, or 78 launches per lane per day.

The proposed Patterson River North boat ramp will attract boat owners from the eastern and south-eastern suburbs, who currently typically use Launching Way, Mordialloc, North Road, Kananook Creek and Olivers Hill boat ramps for launching.

The peak capacity of these five facilities is shown in Table 3.

Table 3: Peak Launching Capacity, northern PPB facilities

Boat Launching Facility	Number of ramp lanes	Peak daily launches
Launching Way	8	624
Mordialloc	2	156
North Road	3	234
Kananook Creek	4	312
Olivers Hill	2	156
TOTAL CAPACITY	**19**	**1 482**

The total peak launching capacity in Port Phillip Bay, from the 14 boat launching facilities with their 47 ramp lanes, is 3 666 launches per day. Hence, the five existing ramps at Launching Way, Mordialloc, North Road, Kananook Creek and Olivers Hill and the proposed ramps on the Patterson River North account for 40% of the total capacity within the Bay. The number of small craft (less than 4.8 m in length) accommodated at these five eastern facilities is 40% of 54,447 boats, or 22,000 boats per annum. This equates to an average launch rate of 60 launches per day for every day of the year. While this is less than the peak capacity, it can be assumed that peak demand occurs over the 52 weekends and nine public holidays, a total of 113 days. This translates to 195 launches per day, well exceeding the peak capacity of 78 launches per day per lane.

3.5 Demand for a Patterson River North Ramp

This new boat ramp with two ramp lanes can accommodate up to a peak of 260 boat launches per day. Over an operating year, it is predicted to provide about 2,500 boat launches which equates to an average of 7 launches per day. These peak and average daily boat launch numbers demonstrate a useful contribution to satisfying the overall demand and availability of boat launching facilities along the eastern side of Port Phillip Bay.

In particular, this additional capacity will help to relieve the launch demand during peak times at the Launching Way facility, which is the primary facility used all year round by boaters from Melbourne's eastern and south-eastern suburbs wanting to travel by boat to Port Phillip Bay for fishing and destination-focused recreational boating.

4 Minimum Requirements for a Boat Ramp

4.1 General

Guidelines for boat launching facilities are set out in Section 7 of AS 3962 – *Guidelines for design of marinas*. Additional guidelines are provided by a number of State Governments (NSW, WA and SA). The following information is drawn predominantly from this Australian Standard, as well as from these State Government guidelines for boat ramp design.

Demand for a boat ramp on the Patterson River (North) has been established. The availability of a site for the boat ramp with sufficient space to accommodate the minimum requirements will be demonstrated in the next Chapter of this Report. It is noted that any boat ramp located on the right (west) bank of the Patterson River will include the basic elements of a boat launching facility, to augment the existing Launching Way facility, particularly during peak demand periods such as public holidays and weekends over summer.

4.2 Boat Ramp

A single lane boat launching ramp needs to have a minimum width of 4 m, preferably 4.5 m. A two-lane ramp should have minimum lane widths of 3.7 m each lane, separated by a longitudinal kerb. For general boating use, the ramp slope should be between 1:9 and 1:7 (vertical to horizontal). The approach to the top of the ramp lanes should extend at least 20 m landward of the head of the ramp for adequate vehicle manoeuvrability.

It should be noted that the existing overhead power lines located parallel to Wells Road, which will need to remain in place, preclude the use of this boat ramp for yachts with masts in place. Signage must be provided to make this exclusion clear and explicit, with associated penalties if appropriate.

4.3 Boat Holding Jetty

A floating pontoon or fixed jetty is essential for temporarily holding boats after they are launched and while queuing to be retrieved. Space for six boats is a minimum requirement for a two-lane ramp lane, seven or eight berths is desirable. On the Patterson River, it would be preferable to align this pontoon or jetty parallel with the river bank to avoid encroaching into the river channel. A jetty long enough for six boats will be at least 35 m in length.

Since the tidal range at Patterson River North is only about 0.8 m, a fixed jetty is the preferred structure type for this holding jetty, rather than a more costly floating pontoon.

4.4 Car/trailer Parking

AS 3962 (Table 7.1) provides guidelines for car-trailer unit (CTU) parking capacity. This states that, in an urban location with boat-holding structures (jetty or pontoon), each launching ramp lane should be provided with 40 to 50 CTU spaces. Each space for a CTU should be at least 2.8 m wide and 12.0 m long, angled at 60° for ease of use. Typically, a single CTU space consumes about 80 sq m, including access lanes. CTU spaces are arranged so that trailers are reversed into each space.

It is also highly desirable to provide a smaller number of single car parking spaces at the site, to accommodate visitors without boats.

4.5 Access Roads

Adequate vehicle manoeuvring space, roadway access and egress to/from the ramp site also needs to be carefully considered and designed. The typical turning circle for a car/trailer combination of 10 m radius, provided in the Standard (Figure 7.1) is available for design purposes.

Roads on the approach and departure sides of the boat ramp and parking should be one-way to avoid conflict and congestion during peak periods. Typical roadway lane width should be not less than 3.5 m with barrier or semi-mountable kerbs on both sides of each roadway.

4.6 Traffic Management

It may be necessary to modify the intersections on adjacent arterial roads, possibly with new traffic control signalling, to adequately manage the increased traffic volume generated by the boat ramp. A signalised intersection on Wells Road is not justified.

4.7 Other Facilities

In order to cater for non-boat-based anglers at the boat ramp site, it may be desirable, if space permits, to construct a fishing platform in the vicinity of the boat ramp.

While some boat ramp facilities are provided with fish-cleaning tables, this is not considered necessary nor desirable because the problem of waste management and potential for pollution of the waterway with fish waste outweighs the convenience of fish cleaning at the boat facility.

4.8 Other Infrastructure

4.8.1 Services

Other than lighting, the need for utility services is limited to stormwater drainage management. The adoption of Water Sensitive Urban Design (WSUD) guidelines for stormwater management leads to simple drainage infrastructure without the need for an intrusive underground drainage pipes and pits system.

4.8.2 Lighting

Overhead street lighting is a desirable feature, which provides adequate light for both boat launching/retrieval at night and for security of vehicles parked at night. Standard street light poles, fittings and fixtures can be used, ensuring that overhanging pole arms do not encroach on overhead clearances.

Activity at most boat ramps continues beyond daylight hours so adequate lighting is important for night-time launching and retrievals.

5 Potential Site for a Boat Ramp

5.1 The Site

The site selected for investigation and assessment for its suitability as a site for a new boat ramp is shown located in Figure 2. This site is located on the north (right) bank of the lower, estuarine section of the Patterson River, downstream of the Wells Road/Mornington Peninsula Freeway road bridges.

The site is located approximately 1,700 metres north-east of the Patterson River Launching Way facility and approximately 2,800 metres upstream from the mouth of the river at Port Phillip Bay. The land along the north bank of the river varies in width from 45 metres at the western end to as little as 12 metres at the eastern end. This does not include the levee bank located directly adjacent to the property boundaries along the northern side of the site. This levee bank is about one metre higher than the surrounding land and needs to be retained within any proposed site development for flood management. A gravel public shared bike/pedestrian path is located along the crest of this levee bank.

Figure 2 shows a general aerial view of this site.

Figure 2: Patterson River North – Site for boat ramp

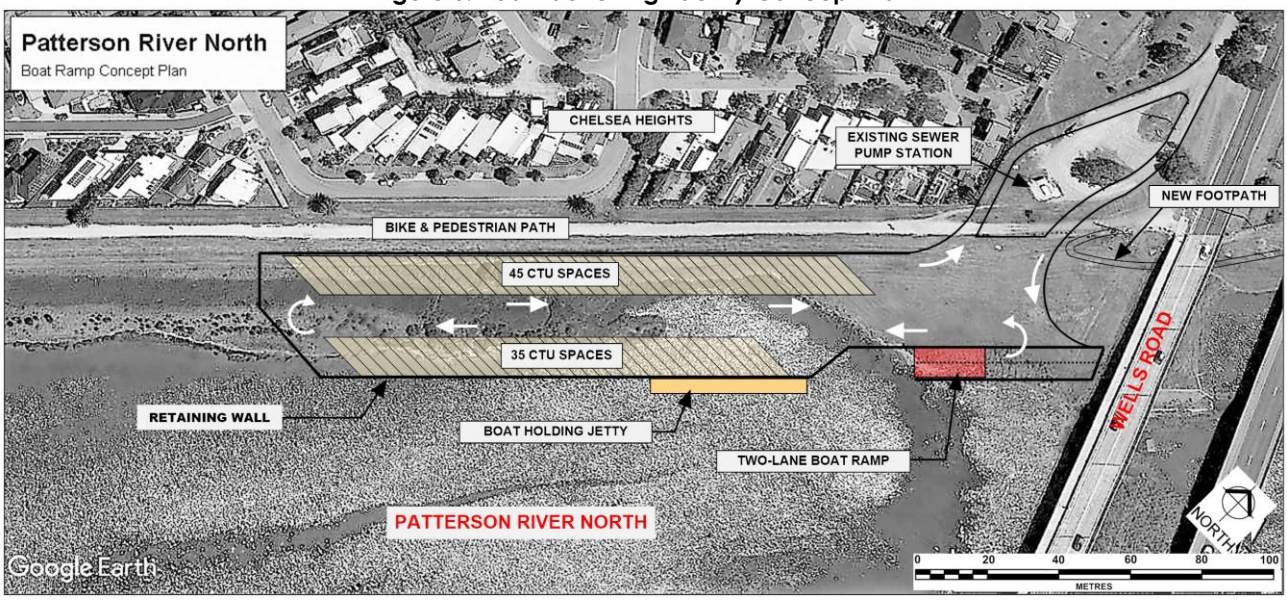
5.1.1 Site Layout

A concept layout for a boat launching facility on this site is shown in Figure 3. This layout shows the suggested location of all the elements for the boat ramp, including CTU parking, access roads, a two-lane boat ramp and the jetty.

5.1.2 Boat Ramp

A new two-lane boat ramp will need to be constructed, with the preferred location at the eastern end of the site near the Wells Road bridge. A two-lane ramp will be needed to cater for the predicted demand at peak times. The ramp is aligned parallel with the river bank to avoid

Figure 3: Boat Launching Facility Concept Plan



excessive dredging of the river bed for boat navigation around the ramp approaches. The configuration is similar to four of the eight ramp lanes at the Launching Way facility. The ramps will need to be at least 20 to 25 metres long to extend below the low water line in the river.

5.1.3 Retained Fill Area

In the Concept Plan for this site, a substantial retaining wall has been included to retain a volume of fill, needed to establish a broad area for vehicle manoeuvring at the boat ramp and for CTU parking. The retaining wall will be about 250 metres long, up to 40 metres wide and 2 metres high, and will retain a volume of compacted fill of about 12,000 cub.m. The total area will be about 9,500 sq.m.

However, for a less formal arrangement, the parking area could be surfaced with a crushed rock finish, with grades to ensure that surface water drains away without ponding. This would lead to a significant saving in project cost.

Figure 4 shows the existing general topography of the site.

Figure 4: Existing site topography

5.1.4 Holding Jetty

A 35 m long fixed holding jetty abuts the retaining wall for launched boat holding. This will be a timber piled structure with a width of 2.4 m (Figure 5). The deck level needs to be just above the high tide level, about RL +1.0m Australian Height datum (AHD). Stairs leading down to the jetty will provide adequate access from the parking area.

Figure 5: Typical boat holding jetty

5.1.5 Car/trailer Parking

The entire area of the facility will be paved with a bitumen seal with line marking to direct traffic along the correct paths around the facility. Alternatively, a crushed rock surface can be used to reduce the cost of the project. Parking spaces can be delineated with raised markers to control parking of CTUs.

In line with the Australian Standard Guidelines, at least 40 and preferably 50 CTU parking spaces should be provided for each lane of a boat ramp. Hence this facility has included 80 CTU spaces. These spaces are aligned at 45° to the direction of travel in the car park.

5.1.6 Access Roads

The present arrangement for access to the site is from Wells Road north of the river. An existing sewer pump station is located near the site and the levee bank along the north bank of the river creates a significant level difference from the surrounding area. The access roads shown in Figure 3 have been arranged so that the entry road passes to the east of the pump station and the exit road passes to the west of the pump station. This separates the two dominant traffic flow paths for safety and smooth traffic flow. Single lane roadways will be at least 3.7 metres wide and bitumen-sealed.

Figure 6: Gravel access road to be re-aligned and sealed

The roads will need to be carefully aligned to pass safely across the levee bank to maintain safe lines of sight. A similar arrangement already exists at the Launching Way access roadway.

The existing road into the site from Wells Road is presently an unsealed surface (Figure 6). This will be re-aligned and upgraded to a bitumen-sealed surface. Additional stormwater drainage with side entry pits will be added to the existing drainage network.

5.1.7 Constraints

a) Shared footpath

The existing shared footpath running east-west along the crest of the levee bank will need to be retained. Pedestrian crossings and warning signage will be needed where the new facility access roads cross this path. These access roads will have bollards on both sides to contain traffic and ensure that parking is restricted to the formal car park.

The shared pathway is presently being upgraded to include a path extension towards the east beneath the Wells Road bridge, which will attract an increased number of pedestrians and cyclists along this route.

Figure 7: New shared pathway extension at Wells Road

b) Underground services

A number of underground services exist around the entrance to the site. These will need to be investigated in detail as part of the detailed design phase of the project. A preliminary Dial-before-you-Dig enquiry has identified electricity, sewer, water, drainage and communications services which would be costly to relocate, hence the access road design will need to account for these services.

Figure 8: Sewer pumpstation with new perimeter fence

c) Overhead power lines

There are a number of overhead power lines across the proposed access roads. These appear to have adequate height clearance for power boats. However, there may be a risk of contact with these power lines from yacht masts. Measures will be needed to provide adequate safety warnings for yachts, or, alternatively, yacht launching might be banned at this site.

5.2 Dredging of the River Bed

The depth of water at the northern end of the river has not been determined for this Study. It may be necessary to undertake some dredging of the river bed to establish a navigable channel downstream from the boat ramp.

Despite the lack of information for the river depth, it is estimated that about 1,500 cub.m may need to be removed and disposed of. While this is not a large quantity, the policies and procedures of the State Government governing approval of dredging projects will attract a significant cost. Contamination testing of the river bed sediments, consideration of appropriate disposal of the dredged spoil and dredging methods, all come into consideration for the approval process.

6 Cost Estimate

A preliminary cost estimate has been prepared for the development concept for the site, based on the scope of works needed as shown in the Concept Plan in Figure 3. This includes a two-lane boat ramp and adequate parking.

Allowances in the estimate have been included to cover Contract Preliminaries (site establishment, plant mobilisation and demobilisation, insurances and other fixed charges), Engineering and Project Management, and Contingency of 15%.

Cost estimates for the site is summarised in Table 4.

Table 4: Preliminary Cost Estimate

Project Component	Amounts, $
Contract Preliminaries	285,400
Site preparation & setting out	50,000
Bulk earthworks	630,700
Retaining wall	325,000
Access roads	109,200
Area pavements (crushed rock only)	855,000
Boat Ramp – 2-lane	257,400
Timber jetty	151,200
Sub-Total	**2,663,900**
Contingency, 15%	400,000
Engineering & Project Management, 8%	245,000
TOTAL (excl GST)	**3,308,900**
GST	330,900
TOTAL (incl GST)	**3,639,800**
Dredging (additional scope)	180,000
Car park bitumen sealing (additional scope)	370,000

If a single-lane boat ramp was constructed in lieu of a two-lane ramp, the cost is expected to reduce to about $2,200,000. However, future upgrade of the site to incorporate a second ramp lane and additional CPU parking is estimated to cost nearly as much again.

7 Feasibility Analysis of the Site

7.1 Preliminary cost estimate

The preliminary cost estimate of the boat ramp development indicates a cost of around **$3,310,000 (excl GST)**. This includes a two-lane boat ramp, adequate car/trailer unit parking, access roads from Wells Road and a timber holding jetty.

7.2 Constraints of this Site

In summary, this site is primarily constrained by existing underground and overhead services which cannot easily be relocated. Careful attention to these services during detailed design should mitigate the need to relocate services. In addition, careful management of the pedestrian and cycling traffic using the shared path along the levee bank will be needed where the new site access roads cross this path.

7.3 Level of Feasibility

Overall, the site at Patterson River North lends itself to development into a feasible and workable boat launching facility. There is significant cost attached to the need to construct a long retaining wall to retain the fill needed to raise the area above the river flood level. This will create a large area, needed to cater for car/trailer unit parking, in line with the requirement and demand for parking per boat ramp lane using the Australian Standard Guidelines.

The demand analysis demonstrates that a two-lane ramp is needed. However, this could be developed over a number of years, where a single lane is constructed initially, with a smaller number of CTU spaces, and a second ramp lane and additional CTU parking could be added to the ramp at a later date as demand increases.

7.4 Dredging for Navigation

The depth of water at the northern end of the river has not been determined for this Study. However, it is possible that some dredging of the river bed may be needed to provide adequate navigable depth leading downstream from the boat ramp to Port Phillip Bay. Parks Victoria or Melbourne Water may have a clearer understanding of water depths at the site.

While the quantity of dredging is likely to be relatively small, the cost to proceed with dredging will need to include contamination and geotechnical testing of the river bed material, approval to dispose of the dredged material and other environmental issues in line with State Government policy and procedures for dredging.

8 Conclusions and Recommendations

A potential site along the north (right) bank of the Patterson River, adjacent to the Wells Road bridge has been considered as a viable site for a new boat ramp and associated facilities.

The facility will include all necessary elements of a boat launching facility, including a two-lane boat ramp, a fixed timber jetty, an unsealed car/trailer park of at least 80 car/trailer units or more, space permitting, and entry/exit access roads to Wells Road.

Estimated costs for a boat ramp facility have been prepared for the site, of **$3,310,000 (excl GST)**.

The concept for the facility is shown in Figure 3, which presents a technically feasible development at this site.

It is recommended that the Patterson River North boat launching facility site be adopted as the preferred site for development of a boat launching facility on the Patterson River.

9 References

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