pitt&sherry

Huonville to Franklin Foreshore Shared Pathway

Feasibility Study

Prepared for
Huon Valley Council

Client representative
Rebecca Bell

Date
30 October 2019

Rev 00

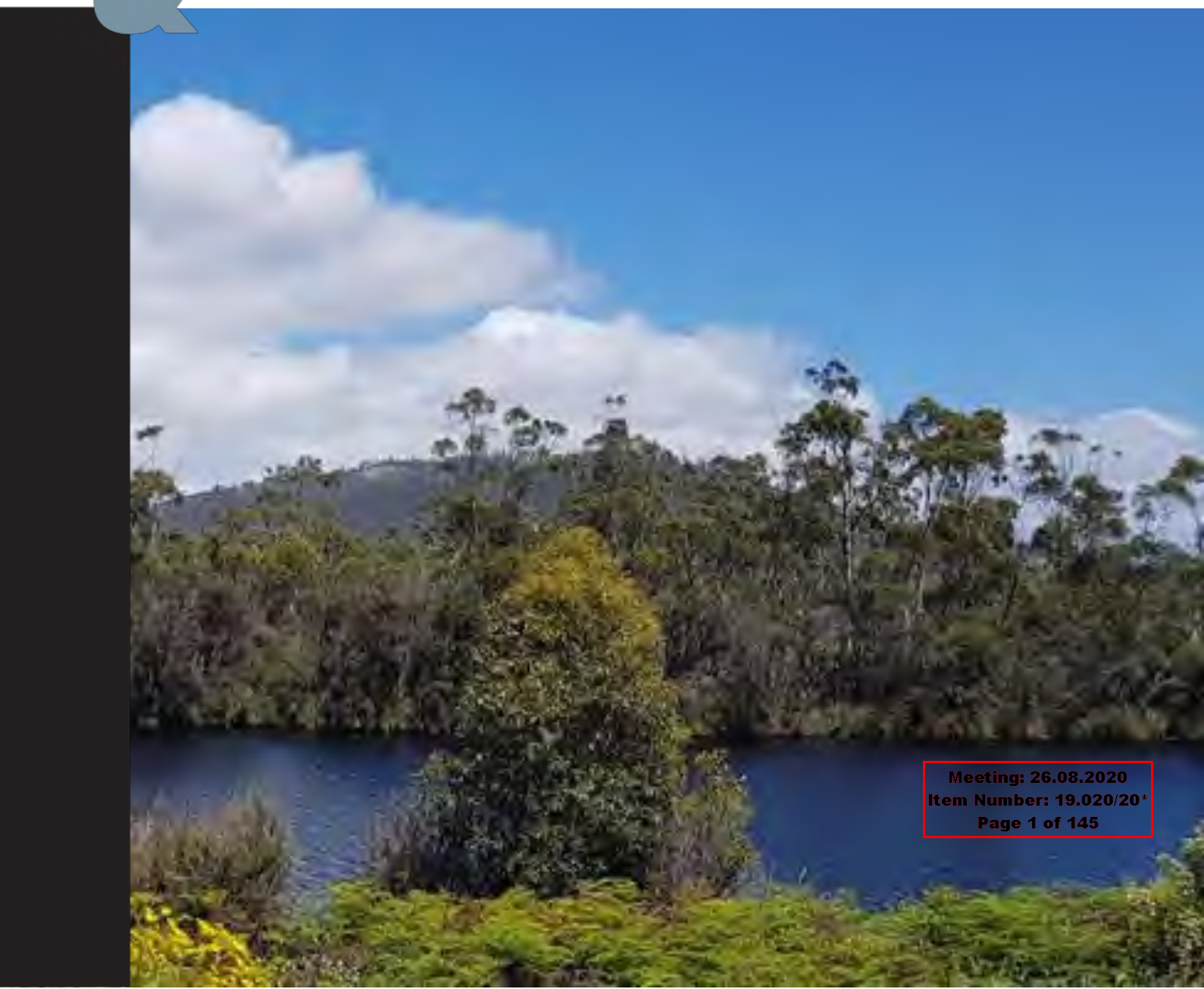

Table of Contents

List of figures

List of tables

List of Plates

Prepared by — L Knight		**28 October 2019**
Reviewed by — D Fotheringham		**28 October 2019**
Authorised by — D Lenel		**30 October 2019**

Revision History

Rev No.	Description	Prepared by	Reviewed by	Authorised by	Date
A	Draft for review	L Knight	I Abernethy	L Knight	1/7/2019
00	Final	L Knight	D Fotheringham	D Lenel	30/10/2019

1. Introduction

Huon Valley Council (Council) proposes the construction of a shared pathway for cyclists and pedestrians between Huonville and Franklin. The pathway will follow the western bank of the Huon River and will commence from a point from the end of Coolstore Rd at Huonville to a point north of Franklin village.

pitt&sherry was commissioned by Council to prepare a Feasibility Study for the proposed pathway which is to include:

- an assessment of potential alignment options
- identification of constraints and opportunities for the pathway
- opportunities for staging of the pathway and the incorporation of features such as accessible viewing platforms, kayak landings, etc
- suitable design and construction elements for each section of the alignment, and
- estimation of construction and maintenance costs.

Agreed key steps in the process were:

Step	Outcome
Initial briefing with Project Management Team Presentation of proposed document template prior to progressing to a draft document.	This step involved the presentation of relevant background information (included in Context section of this report), basic route concepts and staging areas, possible issues and a draft document template.
Engagement with land owners and Council representatives	Wider community engagement program will be conducted by Council once feasibility of the pathway has been established. For the purpose of feasibility assessment, engagement focused on input from relevant Council personnel.
Delivery of a draft Feasibility Study	This report considers feedback received during the workshop with Council. It outlines alignment options, construction and stylistic recommendations and costings, ongoing maintenance costs and opportunities for staging of the proposed pathway to address financial or timing constraints.
Presentation of final Huon River Foreshore Shared Pathway Feasibility Study and a landholder engagement evaluation report for Council approval	The final report will incorporate Council feedback from review of the draft.

2. Background

2.1 Strategic Rationale

The Huon Valley 2020 Community Plan identified Strategic Objectives aimed at fulfilling each of the eight stated Future Directions for the valley. These Future Directions include:

- Build health and well being
- Enhance recreational opportunities.

The Strategic Objectives range of measures were identified to meet these objectives and to allow a measure of success.

Future Direction	Strategic Objective	Measures
Build health and well being	Develop multi-use tracks and trails	• Number of trails • Length of trails and tracks • Usage rates
Enhance recreational opportunities	Improve access along and to the river	• Length of pathways constructed • Usage • Number of marine facilities

The proposed pathway was identified as a priority at the Huon Valley 2020 Future Search Conference conducted in December 2007 and will allow Council to achieve the identified Strategic Objectives.

2.2 The Brief

The brief issued by Council specified that the pathway should be designed within the following parameters:

- Be multi-use accommodating walkers, cyclists and kayakers
- Include provisions for disability access on key sections of the route
- Be entirely contained within the Crown Land Foreshore Reserve along the banks of the Huon River
- Start at the Coolstore Road in Huonville, covering a distance of 7.5 km along the riverbank through to Franklin finishing at the Wooden Boat School, and
- Be constructed of low maintenance materials.

3. Context

This section presents information relevant to the location, design and construction of the pathway. It examines physical constraints, scenic and access opportunities and the legislative and logistical framework that will determine the ultimate pathway form. The extent of the Huon River between the start and end points of the proposed path is shown in Figure 1. The natural and other relevant values present within the reserve are presented in Figure 3 to Figure 7. For ease of presentation of this information the reserve length had been broken into five consecutive maps.

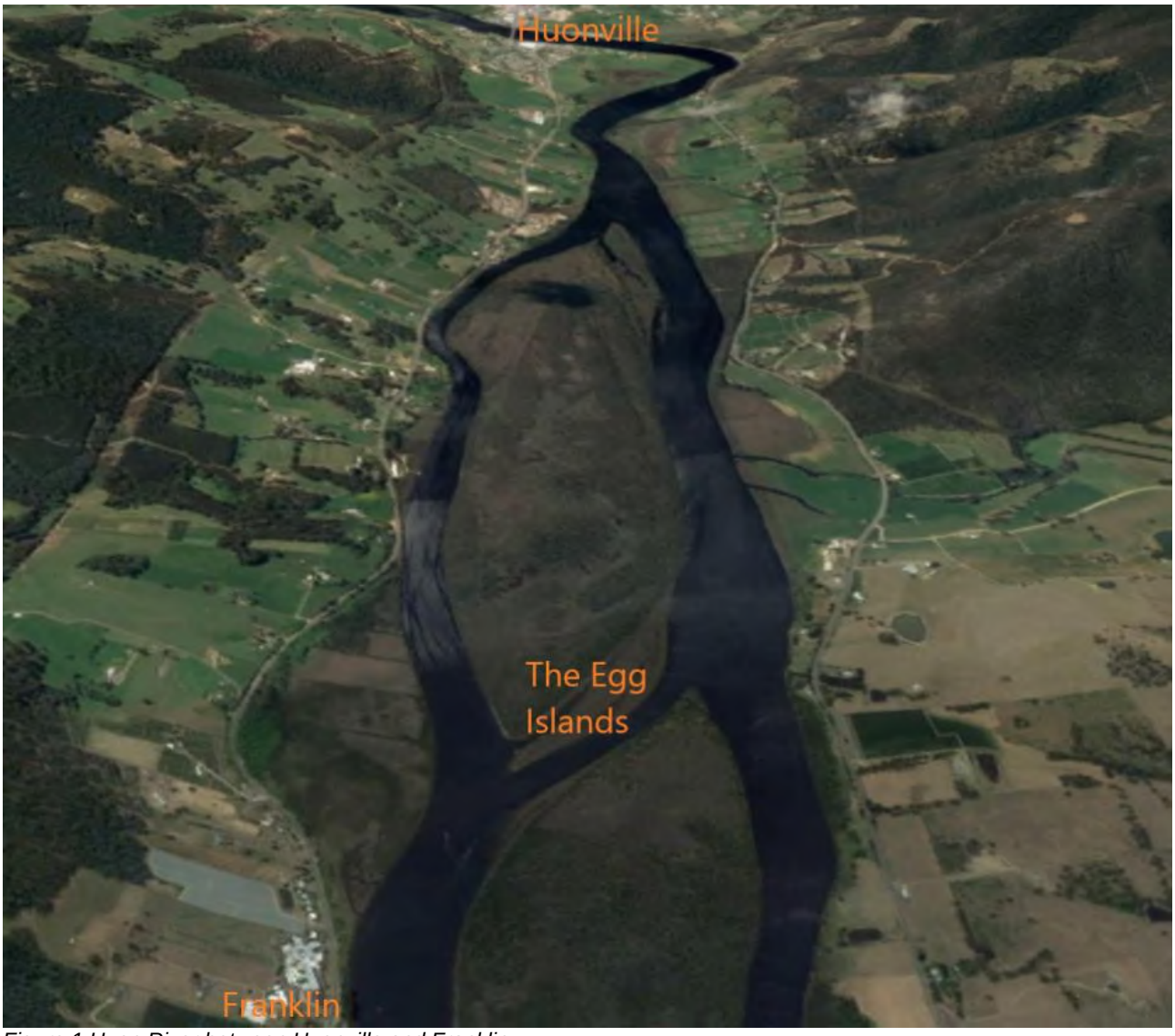

Figure 1 Huon River between Huonville and Franklin

3.1 Scenic and Landscape Values

Land within the reserve offers views across the Huon River to the vegetated hills and farmland to the east. Further downstream, closer to Franklin, the views are dominated by the Egg Islands Conservation Area and the Egg Islands Reserve. The Egg Islands consist of two estuarine islands covering a combined 443 ha. Almost two-thirds of this area is publicly-owned land and managed by the Tasmanian Parks and Wildlife Service (the Conservation Area). The Tasmanian Land Conservancy own and manage just over one-third of the Islands in the Reserve, which is held in freehold title. The northern sections of the islands support the largest remnant of *Eucalyptus ovata* forest and woodland in south-east Tasmania while the southern sections support wetland and rush land vegetation communities. The Islands provide habitat for a range of threatened species.

The rowing course for the rowing club extends from Franklin foreshore to the bottom of the most northern of The Egg Islands and the path will enhance spectator opportunities. The Huon River is popular with kayakers and other recreational users and provision of a formal path presents an opportunity for the inclusion of additional features such as a kayak landing.

The landscape immediately adjoining the proposed path does, in its own right, offer a pleasant combination of farmland outlooks, forest and sedgeland environments. The riverfront reserve is not included within a scenic protection area specific to it, however, it does extend into a Scenic Landscape Corridor associated with the Huon Highway. The intent of this corridor is to protect the views from the highway, and the construction of a ground level walking pathing is consistent with that intention.

Plate 1 Views across the Huon River to farmlands

Plate 2 Views to native vegetation on the eastern bank

3.2 Land Tenure

The scope of the project states that the pathway is to be located wholly within the public reserve running along the bank of the Huon River. The reserve is in Crown ownership but is affected by some development and lease/license arrangements.

3.2.1 Public reserves

The reserve is mostly identified in the Public Land Classification mapping on the LISTmap as a public reserve (previously a river reserve) dedicated under the *Crown Lands Act 2001* (CL Act). It is listed, in part, under the Tasmanian Reserve Estate (on the LISTmap) as an 'Informal Reserve on other public land' with DPIPWE identified as the relevant authority.

The reserve is comprised of multiple parcels with some extending inland to incorporate the Huon Highway as shown in Figure 2. Although the likely alignment is mostly well separated from the highway, there is one section opposite 3128 Huon Highway where there is limited land available for path location. The availability of land is a limiting factor in this location. These constraints are shown on the overall map of the reserve provided in

The Huon River channel falls within the Huon Estuary Marine Conservation Area gazetted under the *Nature Conservation Act 2002 (NC Act)*.

Figure 2 Sections of the public reserve encompassing sections of the Huon Highway

3.2.2 Land use

The reserve is primarily held as vegetated, undeveloped land. There are some sections occupied by the Huon Highway and there are a number of areas where adjoining landowners have paths to jetties or cleared areas adjacent the Huon River.

Plate 3 Example of structures built adjacent and accessed through the reserve

Plate 4 Some residents adjacent the reserve have maintained cleared areas between their land and the river

There are Crown Licenses over those sections of the reserve area identified in Table 1.

Table 1 Current Crown Licenses

PID	Agreement ID	Area	Property
1850429	2229	35601.77 m^2	Reserve adjacent 38 Coolstore Rd (appears to be used for rural purposes)
5704015	46062	7,234 m^2	Reserve adjacent: 3014 Huon Highway 3021 Huon Highway 3025 Huon Highway There is an access track from an old shed site on this area
2887215	51862	3350.029 m^2	Opposite Huon Eldercare
3460379		2043.336 m^2	North of the Wooden Boat Centre

There is a Crown lease over the final section of the reserve which includes the existing pathway. This is located on the section of reserve containing the existing pathway in northern Franklin (PID 3237126; Area 8890.108 m2).

Adjoining land uses are predominantly rural, including dwellings located on rural style lots. These dwellings are frequently located close to the river to maximise views and amenity. As a consequence, they are in close proximity to the reserve and the proposed alignment. The reserve also passes between the waste transfer station and the river.

3.3 Natural Values

The land within the reserve provides a connection between the river and associated riparian communities, and adjoining land developed for rural and other uses.

3.3.1 Native Vegetation Communities

There are seven mapped occurrences of the threatened vegetation community *Eucalyptus Ovata Forest and Woodland* within the reserve. This community (see Plate 5) is listed on Schedule 3 of the NC Act. These are identified on Figure 3 to Figure 7 and may affect site specific locations of the alignment. The main areas are located on the southern extent of 38 Coolstore Rd, behind 2279 and 2825 Huon Highway and behind the waste transfer station. The community is fairly

degraded in most mapped occurrences and is it likely that the path can be aligned to minimise or avoid impacts on the indicator species.

Plate 5 Eucalyptus ovata forest

3.3.2 Threatened Flora and Fauna

There are no threatened flora observations recorded on the Natural Values Atlas within the reserve area.

Numerous sightings of the eastern barred bandicoot (*Perameles gunnii*), a specimen listed as vulnerable under the *Environment and Biodiversity Protection Act 1999* (EPBC Act), have been recorded within and adjacent to the reserve. A Masked owl (*Tyto novaehollandiae castanops*), which is listed as endangered under the *Threatened Species Protection Act 1995* (TSP Act) and vulnerable under the EPBC Act, has also been recorded in Franklin towards the end of the proposed pathway.

Any tree hollows identified as having the potential to provide habitat for the masked owl or evidence of habitation should not be disturbed during construction. This may be a constraint for construction of the final alignment.

3.3.3 Weeds

Numerous weed species listed under the *Weed Management Act 1999* have been recorded along the reserve. These include blackberry and other species also listed as Weeds of National Significance. A weed management plan will be required prior to construction to ensure weeds on land under Council control are managed appropriately and no spread by construction activities.

3.3.4 Aquatic Environment

The pathway alignment runs along the Huon River, which lies within the greater Huon catchment. The section of river adjoining the reserve is within the Huon Estuary Marine Conservation Area. Any disturbance within this conservation area (i.e. a boardwalk extending to the river) may require a Reserve Activity Assessment (RAA).

3.4 Geology

3.4.1 Soils

As identified in the Mineral Resources Tasmania (MRT) Geological Polygons, 1:25,000 mapping, the site is underlain by Undifferentiated Quaternary sediments and sand gravel and mud of alluvial, lacustrine and littoral origin. The geology of the investigation area is generally defined as 'Qh' (sand gravel and mud of alluvial, lacustrine and littoral origin) and 'Q'. (undifferentiated Quaternary sediments). Soils in the northern extent of the reserve (on the first bend from Huonville), are identified as potential dispersive soils (Ordovician limestone). This may have implications for management during construction.

3.4.2 Acid Sulfate Soils

The route generally passes through areas at low risk of disturbance of acid sulfate soils (ASS). One area, in the south of the proposed alignment (adjacent 46099/1) is mapped as being at a high risk of disturbance of ASS (shown red on Figure 6 and Figure 7 below). Construction in areas of potential ASS present a risk associated with the disturbance of sediments which create acidic sediments upon exposure to air. If construction in this area does not involve excavation of sediments, or disturbance and placement above the water table, this poses only a minor risk. This will need to be considered in the context of the pathway alignment and the construction techniques proposed in this area.

3.4.3 Land Capability

All land within the alignment area is identified on the Land Capability mapping on LISTmap as Class 5 land and is not prime agricultural land.

3.5 Hazards

3.5.1 Landslip

There are no proclaimed Landslip areas within the study area. Two sections of Low Risk landslip cover a small section of the study area, however, these are unlikely to be a significant constraint on the alignment and no specific assessment will be required for the planning assessment. The area affecting the reserve is shown on Figure 4.

3.5.2 Coastal Erosion

The western bank of the Huon River is prone to a varying degree of erosion hazard including:

- High risk of storm bite (area)
- Low recession hazard (area)
- Medium recession hazard (area), and
- Areas under investigation for recession

The identified potential risks influence the level of assessment required up-front, the type of construction chosen and the on-going maintenance requirements. Key considerations will be durability of materials and design, and the potential for impacts as a consequence of the works. An assessment will be required with any development application but these are unlikely to be significant impediments to the proposed pathway.

3.5.3 Inundation

The Huon River experiences flooding from in-catchment falls and coastal events. Generally, the lower portions of the reserve are subject to inundation by both types of flood to varying degrees. Again, the durability of materials and design,

and the potential for impacts on surrounding areas as a consequence of the works will require assessment. These are unlikely to be significant impediments to the proposed pathway.

3.6 Heritage Values

There are no known historic heritage places along the alignment of the proposed shared path way, however, there are numerous heritage properties abutting the reserve. An Aboriginal Heritage assessment will be required to be undertaken prior to any finalisation of alignment and works.

Figure 3 Environmental constraints impacting the reserve

Figure 4 Environmental constraints impacting the reserve

Figure 5 Environmental constraints impacting the reserve

Figure 6 Environmental constraints impacting the reserve

Figure 7 Environmental constraints impacting the reserve

3.7 Legislative Requirements

The following sections provide a summary of the relevant pieces of legislation and the effect of each.

3.7.1 Crown Lands Act 2001

The land along the foreshore is reserved under the CL Act and is managed by Council in accordance with the act. As Crown land, the consent of DPIPWE is required for any works within the reserve. The responsibility for the management of public liability associated with the use of the reserve is borne by Council.

3.7.2 Land Use Planning and Approvals Act 1993

Use and development within the reserve is subject to approval under the Huon Valley Interim Planning Scheme 2015 (the Planning Scheme). The reserve falls within the following zones:

- Environmental Management – north of 2925 Huon Highway
- Utilities – where the reserve is closest to the highway
- Rural Resource – the rest of the southern portions of the reserve

The river is zoned Environmental Management and land to the west of the reserve is zoned Utilities (the highway and waste transfer station), Rural Resource and Significant Agriculture. Zoning is shown on Figure 8.

The reserve is also variously impacted by the following Planning Scheme overlays:

- Coastal Inundation
- Coastal Erosion
- Flooding
- Waterways and Coastal Protection
- Scenic Landscape Corridor
- Biodiversity Protection Area
- Potential Acid Sulfate Soils
- Electricity Transmission Infrastructure Protection
- Potential Dispersive Soils

The proposed path falls within the Utilities use class and is a permissible use in all the relevant zones. A Discretionary application will be required which will incorporate a statutory public consultation period.

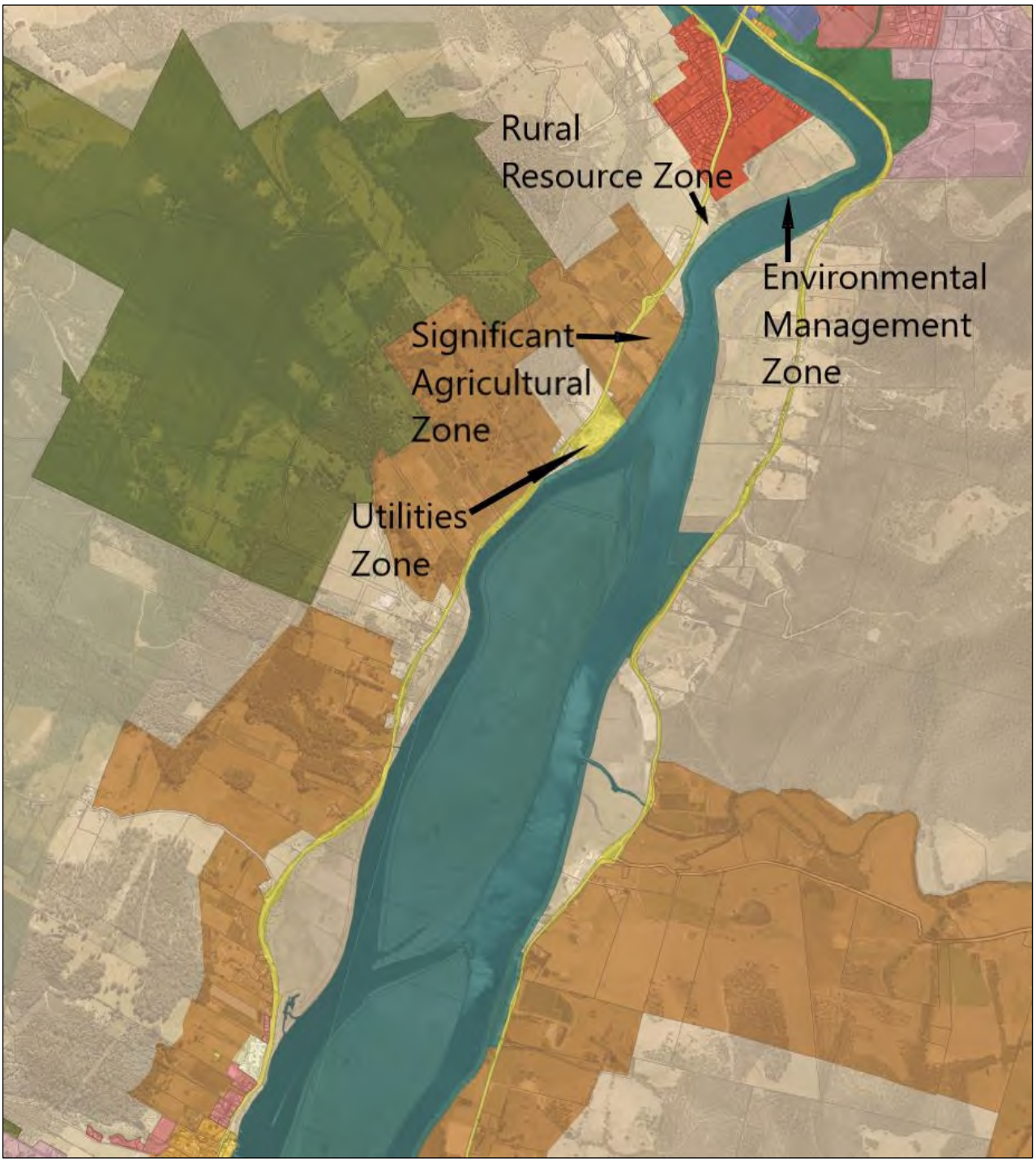

Figure 8 Zoning under the Huon Valley Interim Planning Scheme 2015

3.7.3 *Disability Discrimination Act 1992*

Generally, pathways, footpaths and the like are required to be constructed to allow access for all people. The act does, however, make allowance for situations where the provision of such access would result in an “unjustifiable hardship”. That is where the costs of providing access for all persons with a disability would result in excessive costs or difficulties. Not all areas of the reserve are suitable for access for persons with a disability due to the slope required to access the river bank. There will be, however, sections of the alignment which can be readily accessed from car parking areas or the main foreshore to provide access.

3.7.4 *Threatened Species Protection Act 1995*

This act identifies those species of flora and fauna which are considered to be threatened in Tasmania. There are no current records of threatened plants within the reserve, however, if any are identified during subsequent surveys and cannot be avoided, it may be necessary to apply for a ‘Permit to take’ under this act. This is not an onerous process and would generally happen after the DA process.

3.7.5 *Nature Conservation Act 2002*

Huon Estuary Marine Conservation Area is gazetted under the NC Act and extends from Huonville Bridge to Glaziers Bay and Castle Forbes Bay. This status reflects the significant ecological values present within the estuary, including habitat for threatened species and outstanding water quality. The proposed pathway will allow users to enjoy the natural scenic vistas associated with the reserve and will provide access for kayaking and other recreational uses. Construction next to the river will require implementation of appropriate soil and water management measures to prevent impacts on these values.

3.7.6 *Environment Protection and Biodiversity Conservation Act 1999*

There is a very small number of records for species listed as threatened under this act within the reserve. This act operates independently of development application process, however, it is not considered that any approval under this act will be required for the path. An assessment will be required of the potential for significant impacts on any threatened species. However, given the disturbed nature of the river bank it is not considered that this will be an issue for construction. The species recorded to date are mobile species using a wide range of habitats which are unlikely to be permanently displaced by the construction.

4. Key Factors Influencing Design

4.1 Interaction with adjoining land uses

The presence of a pathway for pedestrians and cyclists may be a concern for some residents. These concerns typically relate to noise, safety and impact on privacy. There are 13 dwellings located between the highway and the river with the closest of these located between 6 m and 15 m from the edge of the reserve (based on aerial imagery).

There are multiple yacht moorings on this stretch of the river which are accessed from the reserve. Some involve paths and / or structures constructed across the reserve. These do not have any approval from Council for activities within the reserve and they are not subject to leases or licenses from the Crown. Construction of a path within the reserve will likely impact on the access to these structures and will increase the number of pedestrians accessing the location of the moorings. Boat owners may have concerns relating to security of the moorings or loss of privacy.

The reserve passes between the waste transfer station and the river. The station is secured by fencing and does not involve the storage of any waste. The presence of the waste transfer station is not considered to pose any impediment to the use of the reserve for a pathway.

4.2 Interaction with Huon Highway

Generally, the reserve lies between the Huon River and freehold land or the Huon Highway. In one section, however, between 2940 and 3012 Huon Highway, the highway is located within the Crown reserve. The owner of the land on the List is shown as DPIPWE and while there is no proposal to impact the highway, the Department of State Growth would still need to be included as a stakeholder when designing the road in these areas.

In addition to this area, there are sections of the highway which are located very close to the river edge. In these areas there is insufficient land for construction of a path, and there is ongoing erosion that is undermining the riverbank.

Plate 6 Proximity of the highway and associated development to the river

5. Key factors Influencing Construction

The type of construction is limited by the nature of the environment where the path is to be located. It is also influenced by external factors which warrant increased levels of construction or protection for longevity.

5.1 Ground Conditions

The land within the reserve has been divided into sections according to the nature of ground conditions as these are likely to be the key factors influencing the construction. These sections are identified on Figure 9 and Figure 10 (these figures are repeated later in this report for ease of referencing). The conditions observed within each section are described in the following sections. These same sections are referenced throughout the balance of this report for consistency and ease of reference.

5.1.1 Section 1 - Length 1,360 m

Coolstore Rd provides access to the proposed path start point. This is a sealed road which runs parallel to the river with a formal car park and small jetty located approximately 275 m from the Huon Highway. There is also additional land available at the end of the seal to provide parking / turning areas. There are a number of dwellings located on the landward side of Coolstore Rd. This section is mostly comprised of solid ground conditions suitable to construct a path or boardwalk. The land on the bend in the river contains some wet areas that may require filling or boardwalk. An alternative is to move the path inland, effectively cutting the corner. There is a Telstra submarine cable near the end of this section. There is also a dwelling located approximately 15 m from the reserve boundary at the end of this section.

Plate 7 Existing entry to Crown reserve at the end of Coolstore Rd (looking toward Huonville)

Figure 9 Path alignment showing individual assessment sections (northern portion)

Figure 10 Path alignment showing individual assessment sections (southern portion)

Plate 8 View toward Huonville from northern extent of reserve

Plate 9 Northern reserve extent

Plate 10 Wet conditions on the river bend make location near the bank difficult

Plate 11 Alternate route to avoid the wet areas on the bend

Plate 12 Conditions on the riverbank – previous fill has been placed in some areas

Plate 13 DOV community with Leptospermum scrub behind

5.1.2 Section 2 - Length 200 m

This section follows the outer bank of the river behind 2779 Huon Highway. Following the river edge through this section would require earthworks to batter back the bank and create level ground for path. An alternate route, slightly inland of this section, would follow the slope of the hill and go over the top of the outcrop in the area shown in Plate 14.

Plate 14 Blackberry and native vegetation growth on the riverbank which is quite steep

Plate 15 Small rocky outcrops can be avoided

5.1.3 Section 3 - Length 190 m

Dolerite outcrops are present in this section and will most likely require rock breaking to continue the route along the river bank. These will provide a solid foundation for construction. Alternately this area could be avoided and tie in to the alternative route recommended for Section 2. There is a dwelling sited approximately 50 m inland from the reserve edge in this section, however, this is largely separated from the reserve by a large dam on site.

Plate 16 Dolerite outcrop

Plate 17 Good conditions for path construction quite close to the riverbank

5.1.4 Section 4 - 230 m

The bank of the river is marshy in places and a setback of 5 m is recommended. There is a dwelling approximately 35 m from the inland edge of the reserve in this section.

Plate 18 Sedge vegetation immediataly adjoining the bank

Plate 19 Riverbank structures

Plate 20 Views afforded by the proposed alignment

5.1.5 Section 5 - 70 m

This short section is very wet, marshy land, however, is not mapped as a wetland. The extent of ground moisture, during the dry survey conditions, suggest there may be a natural spring on site. A boardwalk will be required to traverse this section and to prolong the life of the pathway by avoiding constantly wet conditions.

Plate 21 The spring area which causes wet conditions within the alignment area

Plate 22 Boggy conditions resulting from the spring

Plate 23 Better conditions for construction within this section

5.1.6 Section 6 - 285 m

This section is identified as sedgeland on the TASVEG mapping, however, provides reasonably solid foundation once more than 5 m from the bank.

Plate 24 Suitable location and foundation for the path

Plate 25 Denser sedges nearer the riverbank

5.1.7 Section 7 - 655 m

This section passes behind the waste transfer station and the informal yacht mooring area behind 2925 Huon Highway. There are abandoned car bodies within the reserve which will require removal. This section provides good ground conditions for its full length.

Plate 26 Relatively open level ground for path construction

Plate 27 Fences and structures within and adjacent the reserve

5.1.8 Section 8 - 270 m

This section is narrow at its northern end and accommodates the powerlines to the dwellings and transfer station adjacent Section 7. The area was very overgrown in places and visibility and access to assess the ground conditions was poor. The stays for the power poles also intrude in to the reserve area. There is a concrete slab from an old shed or dwelling located at the southern end of this section.

Plate 28 Powerlines and previous retaining works within the narrow portion of this section

5.1.9 Section 9 - 340 m

This section follows the outer bend of the river and has been subject to previous erosion. Sheet piling has been installed in the past and further bank stabilisation and back filling will be required. The path will need to be constructed on concrete piles through this section or boardwalk construction used to avoid anchoring any works to the bank.

Plate 29 Piling used to reinforce the river bank adjacent the road

Plate 30 Fallen trees and erosion adjacent the road

Plate 31 The path will need to be located off shore in this location

5.1.10 Section 10 - 200 m

This section provides mostly good conditions for construction. However, the bank may need erosion protection in some areas.

Plate 32 Level ground close to the river offering unimpeded views

Plate 33 Good conditions for construction are present in this section

5.1.11 Section 11 - 770

This section passes through level ground, however, a significant portion is through wetland vegetation which offers no suitable foundation for a concrete or gravel path. A board walk will be required across wetter areas and a bridge across Clarks Rivulet. An alternative route could be provided along the road however views would be obscured by development and the path would leave the reserve. There is a strip of acquired road adjacent the highway which suggests future road widening, which would likely make this route unviable.

Plate 34 Areas within the reserve are dominated by wetland

Plate 35 A bridge is required over Clarks Rivulet

5.1.12 Section 12 - 200 m

Due to the proximity of the Huon Highway to the edge of the river, the path will need to be constructed in the river throughout this section.

Plate 36 Proximity to the road limits the area available for construction

Plate 37 Close proximity to the river in an area used for parking by customers of the cidery opposite

5.1.13 Section 13 - 330 m

This section offers good conditions for path construction along its length. There are existing informal paths present in this section which may offer a suitable alignment.

Plate 38 Existing path through this section

Plate 39 Firm conditions adjacent the riverbank behind fringing vegetation

5.1.14 Section 14 – 1,260 m

This section follows the outward sweep of the river and is dominated by dense marshy wetlands. A boardwalk will be required to prevent damage to the wetlands and as there is no feasible alternative method of construction. Bridges will be required over the narrow inlets draining from the wetland. An alternative route could be provided along the road, however, views would be obscured by road-side vegetation and the distance from the river and the wetlands would make this section less appealing to pedestrians. There is also a substantial fall from the road which may make construction of a path difficult. This section ties in to the end of the existing path.

Plate 40 Substrates are muddy and support sedge communities. There are some abandoned structures present

Plate 41 This section is dominated by sedgeland

Plate 42 Channels through the sedgeland will require bridges to cross

Plate 43 The alternative route along the highway poses its own problems for construction

5.1.15 Section 15 - 330 m

This final section involves the existing path. Sections of gravel path would be upgraded and suitable clearance under trees for cyclists would be required.

Plate 44 Entrance to the existing path

Plate 45 The current path is constructed of treated pine

Plate 46 Incorporation of existing native vegetation enhances the appearance of the path

5.2 Riverine influences

Some sections of the alignment are located on the outer bank of the river and are naturally subjected to erosion and undercutting of the river bank. Future stability and erosion will need to be considered when siting poles and structures.

The Huon River is also affected by flooding. The finished height of structures, durability of materials and longevity of surfaces are all factors for consideration when determining the final design.

5.3 Teredo worm

Teredo worm is a bivalve mollusc, adapted to boring through submerged wood, which damages and destroys submerged structures. While extended periods in fresh water can kill them, Teredo can tolerate low saline levels (salinity down to 5 parts per thousand), and flourishes at levels greater than 9 parts per thousand. The waters of the Huon River offer conditions favourable for this species which has caused significant damage to structures within the river over relatively short time frames.

Options for the prevention and treatment of attack by this species are not proven to be entirely effective or not practical for fixed structures. These include:

- Use of naturally resistant timbers such as turpentine (*Syncarpia glomulifera*), an Australian hardwood produced on the mainland
- Wrapping with geotextile membranes
- Inundation in freshwater (applicable to boats)
- Heating and/or drying of the wood and injection of targeted pesticide – not practical for immersed structures, and
- Use of treated timbers (pressure treated; previously copper chrome arsenate solutions were used).

Turpentine is a slow growing species grown interstate and is approximately four times the cost of standard timbers. There is also some suggestion that this should also be treated which would add to the cost. Geotextile wrapping is also expensive and freshwater inundation and pesticide injection are not practical for submerged structures, which leaves treated timbers as the only feasible option.

6. Stakeholders

Key stakeholders who may be impacted by, or have a role in the assessment of, the path are outlined in Table 2. Council will be undertaking the stakeholder engagement process.

Table 2 Relevant stakeholders

Stakeholder	Reason for engagement
Crown Land Services (DPIPWE and Parks and Wildlife)	The Crown is the owner of the reserve and the river bed and consent is required to undertake works
Adjoining land owners	Residents living near the reserve may have concerns relating to loss of privacy, security and disturbance by path users
Department of State Growth	The reserve passes in close proximity to the Huon Highway and at one location the highway is located within the reserve. Riverbank erosion observed adjacent the highway will likely require construction of the path in the river in these areas due to the lack of land for path location and the instability of the ground. Any construction would need to take into account and riverbank protection works required to protect the highway from future erosion.
TasNetworks and TasWater	Electricity and water infrastructure along the highway needs to be identified and advice obtained regarding appropriate clearances for construction
MAST	Any structures within the river should be referred to the authority that regulates maritime safety and navigation
Recreational users of the river	Opportunities for kayak landings and viewing stations for the rowing course should be discussed to ensure they are fit for purpose

7. Recommended Alignment

Fourteen distinct sections were assessed for path construction, not including the section of existing path north of Franklin. These are identified on Figure 11 and Figure 12 and have a combined length of 6.75 km (including bridges).

Generally, the proposed alignment follows the reserve with the exception of those areas where it is necessary to locate the path within the river. There are additional areas where the presence of natural and man-made features constrain path location. Key constraints are listed in Table 3.

Table 3 Key constraints affecting alignment

Section	Constraint
Section 1 – on first bend	There is an area of boggy ground conditions which will require construction of a boardwalk area. Alternately, a diversion could be constructed on higher ground but this may extend outside the reserve. If an alternative route can be located within the reserve this is a less expensive option than a board walk and should be the first priority for this section.
Section 8	This section of the reserve is narrow and constrained by utilities. Consultation with infrastructure providers will be required to determine an appropriate route this section.
Section 9	Riverbank erosion has reduced the area of reserve available for construction and the path will need to be constructed in the river. Works will also need to be cognisant of any future works required on the riverbank to protect the highway infrastructure.
Section 12	This section of reserve is too narrow and constrained by electricity lines. The path will need to be built on concrete piles, partly or fully in the river.
Section 14	The reserve in this area follows the outer edge of a large sedgeland area. This will require boardwalk construction with bridges across the inlets that separate the wetland from the main river bank. An alternative to this route would involve a path along the road edge, as the vegetation type is consistent across the land between the reserve and the highway. This is not greatly desirable given the narrow shoulders available and the drop from the road level to the wetland below.

Figure 11 Path alignment showing individual assessment sections (northern portion)

Figure 12 Path alignment showing individual assessment sections (southern portion)

8. Recommended Construction

8.1 Path construction

Recommended construction for each section of the proposed path is outlined in Table 4. Concrete has been chosen as the preferred path surface due to the reduced maintenance costs and durability. A report prepared by the Australian Bicycle Council in conjunction with Australian Road Research Board to identify the whole-of-life costs of the pavement for bicycle paths and shared paths concluded that concrete and bitumen surfaces provide the more preferable riding surfaces[1]. These surfaces are generally more resistant to cracking and erosion and provide a smoother surface, however, cracks and sharp drop offs should be avoided. Concrete is less likely to break down creating debris and loose stones than bitumen.

Table 4 Recommended construction method for each path section

Section	Description	Length (m)
1	Concrete path	1,360
2	Concrete path with section of retaining wall to accommodate a steep embankment (assumed 2m high maximum)	200
3	Concrete path	190
4	Concrete path	230
5	Boardwalk over spring fed wet area	70
6	Concrete path	285
7	Concrete path	655
8	Boardwalk in river due to proximity to highway	270
9	Boardwalk in river or steel sheet piling and back fill with concrete path	340
10	Concrete path	200
11	Boardwalk with bridge of Clarks Rivulet	770
12	Path on piles in the river due to proximity to highway	200
13	Concrete path	330
14	Boardwalk	1,260
15	Boardwalk – to tie in to the existing path	330

A minimum suggested path width is 2 m which is a desirable width for a shared path and offers a good compromise in terms of practicality and construction costs. It accommodates an operating width of 1 m for bicycle and rider which is the minimum desirable width (Figure 13). This width is suitable for paths with relatively low and consistent levels of use and where there are constraints limiting construction of a wider path. It may be necessary to widen the path by up to 1 m if a

[1] Australian Government: Department of Infrastructure, Transport, Regional Development and Local Government, 2006, User guide to bicycle and shared path selection – Using whole-of-life costing, by ARRB Group, WC5226-III, Sydney, Australia

barrier is required (likely next to the retaining wall for a short distance). All final design should be in accordance with Austroads requirements. A slightly wider width of 2.5 m would allow the path to be accessed by small maintenance vehicles and may assist with construction sequencing.

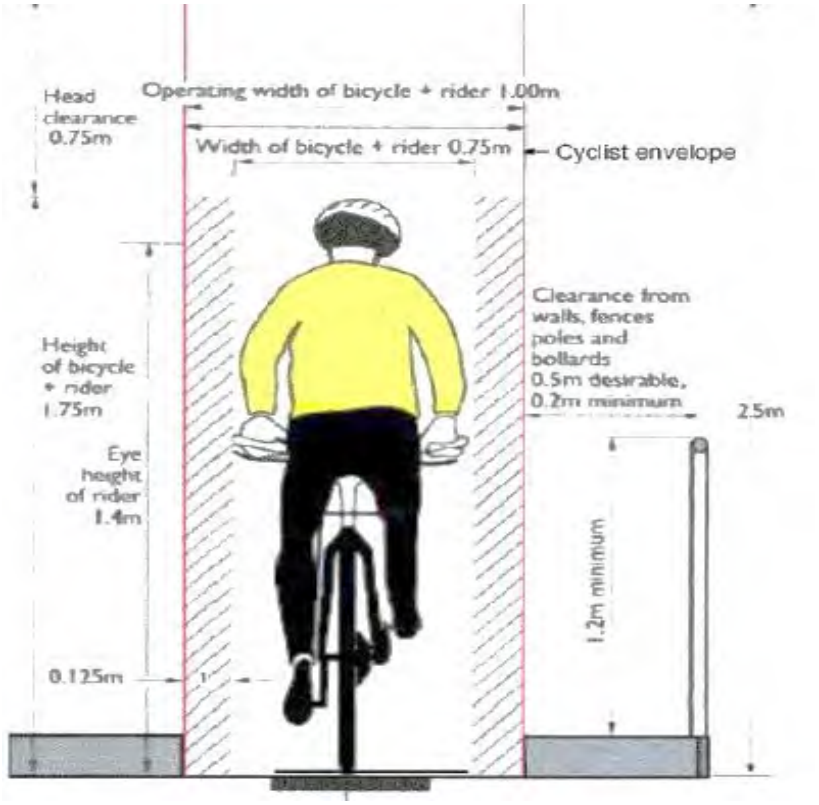

Figure 13 Operating width of cyclist (Source: Roads and Traffic Authority 2005)

The costs associated with gravel paths are not significantly lower and the maintenance and replacement costs are much higher. Gravel or bitumen paths are prone to cracking and weed or grass penetration which exacerbates breakdown of the surface.

Adoption of an alignment along the highway through sections 13 - 15 would reduce the combined length in that section from 1.96 km to 1.66 km.

8.2 Options for staging

8.2.1 Option 1

Staging options are shown on Figure 14 and Figure 15. Staging of the path allows the cost and works to be spread over a period of time. Logical stages include those at either end where existing support infrastructure such as parking is already provided. At the northern end, the construction of the first 1.36 km section would result in a total walking distance of 2.1 km from the Huonville town centre and a round trip of over 4 km. Concrete path is recommended in the section which would provide a long-term asset with low maintenance costs.

Views from this section incorporate Huonville, the river, views to the east and down river. There are only three landowners adjacent this section, including TasWater, which reduces the potential for adverse impacts on landowners. There is also a short section of road reserve next to 2769 Huon Highway which could be used to create a loop back to Huonville. The latter would require an assessment of the highway to determine its suitability for additional pedestrian traffic.

8.2.2 Option 2

In terms of providing a pathway that provides opportunities for users to experience wetlands, birdlife, regatta viewing and views of the river, the southern section extending around the sedgeland is most desirable. This has a length of 1.3 km (with potentially a 330 m tie in with the existing path). This would create a path length of 1.9 km from the Franklin foreshore reserve or a return trip of just under 4 km.

These are the two longest sections of the path totalling 2.66 km (approximately 41% of the total), with the balance in-between equalling 3.74 km. Both sections have logical connections to the highway which provide access for construction and maintenance vehicles.

8.3 Opportunities for additional features

8.3.1 Viewing decks

The rowing course runs parallel to the southern sections of the proposed alignment. The construction of the path on the outer edge of the sedgeland presents an opportunity to incorporate casual viewing decks for regattas as well as general recreational use as shown on Figure 15. These could be extended from the boardwalk similar to the example shown in Plate 47.

Plate 47 Typical location for viewing or seating platforms

8.3.2 Kayak landing

The Huon River is popular with kayakers and the possibility of providing a launch point was considered. There is an area of yacht moorings on the river side 2925 Huon Highway which is accessed via a road within public land (shown on Figure 14). There is also sufficient area for maneuvering and parking of vehicles in this area. The land has an area with suitable slopes for a ramp or a jetty similar to the one shown in Plate 48.

Plate 48 Potential location for kayak landing and suggested simple launching deck and ramp

A landing could also be provided at the northern end of the path in the location shown on Figure 14. A third kayak lading and picnic spot, remote from any existing dwellings, is suggested in Section 10 as shown on Figure 15.

8.3.3 Northern viewing platform

An alternative path slightly inland of sections 2 and 3 could be constructed to avoid the steep cutting proposed. A viewing platform could be installed in this area to provide a lookout across the valley. The length of this path would be only slightly longer than that proposed.

8.3.4 Maintenance and user access

Access to the Huon Highway is available at a number of locations and requires little additional infrastructure. These are identified on Figure 14 and Figure 15 below and include:

- commencement and end points of the path
- adjacent 2769 Huon Highway (road reserve – end of Section 1 and Stage 1 option)
- between 2851 and 2855 Huon Highway (between Sections 4 and 5)
- where the road reserve passes in front of 2925 Huon Highway (proposed kayak landing and car park area – Section 7)
- north of 3014 Huon Highway (Section 10), and
- adjacent the northern tip of 3166 Huon Highway (start of Section 13 – end of southern staging option).

These points allow access for construction vehicles and ongoing maintenance (inspections, rubbish removal, etc).

8.3.5 Car parking

The provision of a central car parking area near the proposed kayak landing site in Section 7 would formalise the current use in that area. There is already an informal parking area that would likely only require clearing and grading with compacted gravel. The carpark would require 3 m wide x 5.4 m long parks with an aisle width behind 6.5 m to allow for vehicles to turn and leave. To accommodate 6 carparks requires an area of approximately 18 x 12 m = 216 m^2. There is approximately a 45 m x 12 m available area. Based on the minimal work required to formalise the carpark costs would be in the order of \$50/m^2 = \$10,800.

This area is identified as a suitable maintenance access point so would be a good location for dog walking bins, litter bins, etc.

8.3.6 Toilet

A toilet could be located off Coolstore Rd, east of the existing car park, opposite No 22. There is a gravity sewer main in the road which extends to a pump station in front of No 26. Prefabricated toilet units are available with a twin, DDA compliant toilet block costing in the order of \$50,000. Connection to the mains would cost approximately \$126/m or approximately \$3,780 for the 30 m connection required.

Figure 14 Location of staging options and additional features – Map 1

Figure 15 Location of staging options and additional features – Map 2

8.4 Design elements

8.4.1 Pathway

Concrete path is recommended for 3.45 km, or just over half, of the 6.75 km total length (Plate 49 and Figure 16). Costings are provided for 2 m and 2.5 m widths.

Plate 49 Typical concrete path - Tasman Bridge to Rose Bay Highschool

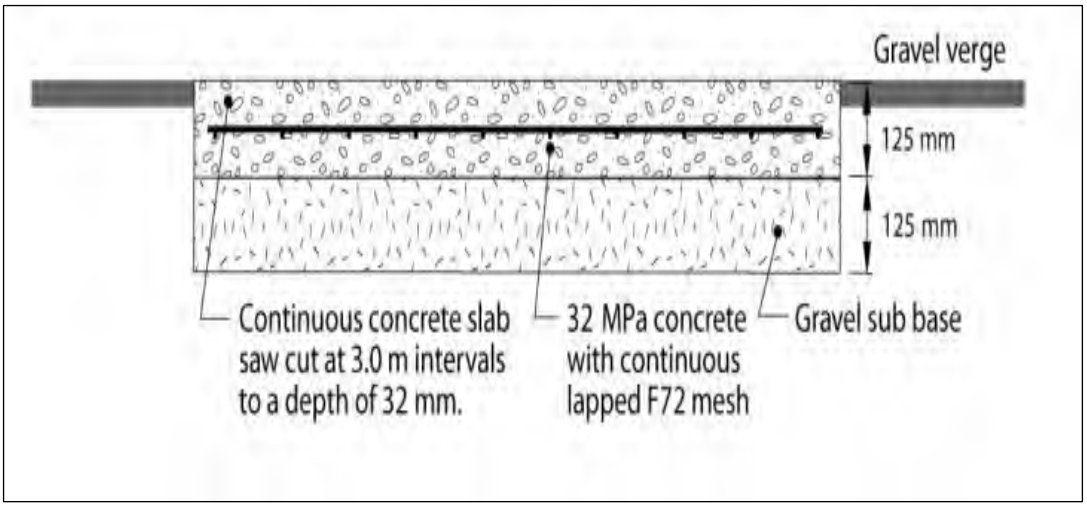

Figure 16 A typical section of a concrete path with gravel sub-base

8.4.2 Boardwalk

Boardwalks are proposed over large sections of the alignment where ground conditions are not suitable for concrete path construction, where vegetation communities or bank erosion require avoidance or where there is insufficient land available between the road and the river. These would be constructed of treated pine superstructure with either treated pine (Plate 50) or fibre glass reinforced plastic (FRP) as shown in Plate 51. FRP is well suited to wet or corrosive environments and provides inherent grip, eliminating the need to install wire mesh for slip protection. Costs for superstructure is the same for both with the reduced cost for installation of FRP deck panels (as opposed to individual planks) reducing the overall costs.

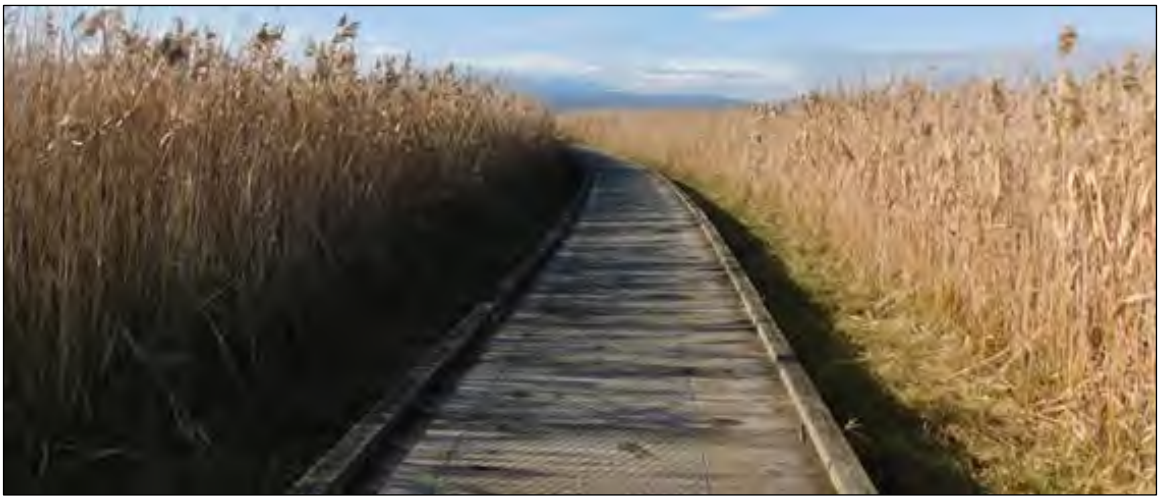

Plate 50 Example board walk with side rail and slip prevention wire (from Tamar Wetlands)

Plate 51 Example jetty with FPR surface and pine superstructure (Source: Grating Tasmania)

8.4.3 Bridges

Short sections of bridge are proposed across inlets and Clarks Rivulet. These will be similar in construction to boardwalks and may include side barriers. Depending on water depths and location it may be possible to simply extend boardwalks in lieu of bridges. An example is shown in Plate 52.

Plate 52 Example bridge

8.4.4 Signage

The installation of signage at either end is recommended to identify key features of the path such as length, access requirements and timeframes for completing. Details of facilities (seating, kayak landing, etc) and their location along the path could also be included. Signage along the path to highlight natural values (as per the existing signage below) can also widen the user experience.

Plate 53 Existing signage Bicycle stand

8.4.5 Amenities and cyclist facilities

Optional bicycle stands could be provided at the commencement of the path head and at locations along the route.

Plate 54 Simple bicycle facilities

The siting of picnic tables, litter bins and dog walking bags and bins will help prevent litter accumulation along the path and allow enjoyment of the river environment by those with limited mobility.

9. Cost Estimates

9.1 Construction

The use of gravel and a cellular recycled plastic/gravel system (such as SurePave), throughout the on-ground sections, were costed as alternatives to concrete to assess the price differential. Gravel was selected as the fill material for the cellular system to minimise establishment time and effort (watering, etc) and to enhance path definition. Comparisons of treated pine and a combination of treated pine and FBR decking was also prepared for boardwalk sections. The prices are based on the per square metre costs provided in Table 5. The cost differential for the two boardwalk materials relates to the cost of the superstructure (mainly the decking) only – additional costs for construction in the river relate to access difficulties and additional foundation requirements and these are common to all options.

Table 5 Cost of various construction materials

Materials	**Cost / m^2**
Gravel path	60
SurePave (recycled plastic cells filled with gravel)	90
Bitumen	90
Concrete	120
Boardwalk over ground – treated pine	2,000
Boardwalk over ground – treated pine and FRP deck	1,300
Boardwalk over river – treated pine	4,000
Boardwalk over river – treated pine and FRP deck	3,300

The estimated costs of construction are summarised in Table 6 and detailed in Appendix A. Costs for 2 m and 2.5 m wide paths constructed of gravel, stabilised gravel (in cellular grids), bitumen and concrete path are provided. Options for decking made of treated pine and FRP are also provided.

Table 6 Estimated construction costs

Path Material	Boardwalk and Bridge Deck Material			
	Treated pine	**Treated pine (total)**	**FRP**	**FRP (Total)**
2 m gravel	$13,796,200	$18,210,984	$10,752,750	$14,193,630
2.5 m gravel	$17,220,250	$22,730,730	$13,405,250	$17,694,930
2 m stabilised gravel	$13,991,200	$18,468,384	$10,939,200	$14,439,744
2.5 m stabilised gravel	$17,464,000	$23,052,480	$13,649,000	$18,016,680
2 m bitumen	$13,991,200	$18,468,384	$10,939,200	$14,439,744
2.5 m bitumen	$17,464,000	$23,052,480	$13,649,000	$18,016,680
2 m concrete	$14,186,200	$18,725,784	$ 11,134,200	$14,697,144
2.5 m concrete	$17,707,750	$23,374,230	$13,892,750	$18,338,430

Note: No allowance has been made for vegetation clearance

9.2 Comparison of options

There is a significant difference in the initial costs associated with the use of FRP as opposed to treated pine on the decking of boardwalks and bridges. The long-term maintenance and durability of this material is also better than pine and it is slip resistant, eliminating the need for wire and the associated maintenance. Concrete is the most expensive option, with recycled plastic cells with gravel infill costing the same as bitumen. Gravel is the cheapest option, however, the initial cost saving (approx. $500,000 on a 2.5 m wide option) is offset by the increased costs of maintenance associated with gravel paths which wash out, crack and break up under normal conditions. The use of bitumen yields even less cost saving up front (approximately $210,000 for 2.5 m wide options) and is also prone to cracking which presents a safety issue for cyclists. A stabilised gravel path would potentially involve less disturbance for construction and would be more accommodating of uneven ground surfaces (tree roots etc.). It will however require maintenance and ultimately the plastic will break down.

The construction of an alternate route (concrete path on ground) over the top of the hill through Sections 2 and 3 would eliminate the need for the retaining wall and rock breaking, reducing the cost by approximately $120,000, but would increase the length of those sections slightly.

A significant cost saving could be made by replacing the Section 14 boardwalk with a path along the Huon Highway. This would require a detailed analysis of safety and topographical constraints but could reduce costs of that section significantly from almost $3,500,000 to closer to $1,000,000 (based on 2.5 m width FRP and includes cost estimate for barrier along full length). The path length would increase from 1,300 m to 1,665 m and the tie in with the existing path would need to be redesigned. The length would increase to 7,470 m and overall costs would be reduced.

9.3 Maintenance

The path will be maintained by Council. No lighting is proposed along the path and the following elements will require maintenance:

- Pavement
- Ramps
- Rails
- Signs & Marking.

Factors which influence maintenance costs include:

- Vegetation and debris
- Root infiltration/Pavement lifting
- Cracking
- Drainage
- Erosion.

Cracks in any surface allow water to infiltrate impacting the base material and potentially leading to erosion and subsequent failures. The use of root barriers, appropriate concrete thickness, joint location, proper drainage and adequate curing times are all important factors in constructing a durable path. Ongoing management of overhead vegetation (trimming back to reduce dripping and debris fall), weed management and maintenance of drainage are all essential to maintaining longevity. The inclusion of granular surfaces adjacent the path also assist with drainage and weed control.

Cracks in concrete paths and movement between slabs which results in height differentials can usually be resolved by grinding to remove sharp or sudden edges. Joint sealant may also require replacement and in unusual circumstances, a slab may require replacement. Regular inspections are required (say once a fortnight depending on conditions).

A life span of 40 years is generally assumed for concrete paths[2] which is twice that assumed for gravel.

[2] Australian Bicycle Council User Guide to Bicycle and Shared Path Selection – Using Whole of Life Costing (2006)

10. Conclusion

A shared path for cyclists and pedestrians between Huonville and Franklin will provide a range of recreational opportunities for residents and visitors. The existing Crown reserve extending along the Huon River can be used to provide a path suitable for cycling and pedestrians including those with children, prams and varying levels of ability. A path with a total length of 6.75 km could be constructed from the existing car parking facilities at Coolstore Rd south of Huonville, extending through to the existing path that starts near the wooden boat centre at Franklin.

Options for the provision of two shorter sections have also been considered to allow staging and the reduction of upfront costs. Both staging options present different experiences with one offering views through pasture areas looking across to forested hills and farmland, the other offering waterside views of wetlands and the river and associated activities.

The provision of facilities along the route has also been considered with an area identified for future kayak landing and car parking which take advantage of existing constructed access to the river bank.

A concrete path is recommended for those land-based sections of the alignment which offer superior durability, longer lifespan and lower maintenance costs. In areas of lower lying land, unsuitable substrate and where the highway is too close to the river to allow construction, timber boardwalks with FPR decking will be constructed. Maximising the views along the river will also result in the greatest extent of boardwalk construction and much higher construction costs. Aligning the final section of the path along the Huon Highway will greatly reduce costs and while not offering direct river views, will provide views across wetlands and the Egg Islands.

Cost Estimate Comparisons

Appendix A

pitt&sherry

FRP Option

Section	Description	Material	Unit	Qty	Bitumen/ m2	Concrete/ m2	Gravel/ m2	Sure pave + gravel	2m Concrete Path	2.5m Concrete Path	2m Bitumen Path	2.5m Bitumen Path	2m Stabilised Gravel Path	2.5m Stabilised Gravel Path	2m Gravel	2.5m Gravel
1	Generally cleared alignment – no veg removal required	Concrete path	M	1360	90	120	60	90	326400	408000	244800	306000	244800	306000	163200	204000
2	Steep embankment	Concrete path	M	200	90	120	60	90	48000	60000	36000	45000	36000	45000	24000	30000
		Retaining wall and barrier	M	200	400	400	400	400	80000	80000	80000	80000	80000	80000	80000	80000
3	Dolerite outcrops present, most likely require rock breaking to continue route along river bank alternate to go over top of hill	Concrete path	M	190	90	120	60	90	45600	57000	34200	42750	34200	42750	22800	28500
		Rock breaking	M	190	90	90	90	90	34200	42750	34200	42750	34200	42750	42750	42750
4	Generally good ground conditions	Concrete path	M	230	90	120	60	90	55200	69000	41400	51750	41400	51750	27600	34500
5	March land, Quite wet	Boardwalk	M	70	1300	1300	1300	1300	182000	227500	182000	227500	182000	227500	182000	227500
6	Reasonably ground conditions 5m back from bank	Concrete path	M	285	90	120	60	90	68400	85500	51300	64125	51300	64125	34200	42750
7	Good ground conditions	Concrete path	M	655	90	120	60	90	157200	196500	117900	147375	117900	147375	78600	98250
8	If built out onto river	Boardwalk in river	M	270	3300	3300	3300	3300	1782000	2227500	1782000	2227500	1782000	2227500	1782000	2227500
9	Previous sheet piling and erosion on bank	Sheet piling or boardwalk in river	M	340	3300	3300	3300	3300	2244000	2805000	2244000	2805000	2244000	2805000	2244000	2805000
10	Good conditions some erosion protection required	Concrete path	M	200	130	130	130	130	52000	65000	52000	65000	52000	65000	52000	65000
11	Water logged Marshland	Boardwalk over land	M	770	500	500	500	500	770000	962500	770000	962500	770000	962500	770000	962500
		Bridge over Clarks River	Item	1	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000
12	Path required to be constructed in river	Path built on pile	M	200	3300	3300	3300	3300	1320000	1650000	1320000	1650000	1320000	1650000	1320000	1650000
13	Good ground conditions	Concrete path	M	330	90	120	60	90	79200	99000	59400	74250	59400	74250	39600	49500
14	Poor ground conditions, thick waterlogged marshland, would most likely require boardwalk and bridge over inlet to prevent negative impact to wetlands	Boardwalk	M	1260	1300	1300	1300	1300	3276000	4095000	3276000	4095000	3276000	4095000	3276000	4095000
		Bridges	M	40	3300	3300	3300	3300	264000	330000	264000	330000	264000	330000	264000	330000
15	Tie into existing boardwalk	Boardwalk	M	330	500	500	500	500	330000	412500	330000	412500	330000	412500	330000	412500
								Subtotal	**$11,134,200.00**	**$13,892,750.00**	**$10,939,200.00**	**$13,649,000.00**	**$10,939,200.00**	**$13,649,000.00**	**$10,752,750.00**	**$13,405,250.00**
Contingency (20%) plus design, approvals and project mgmt. (12%)									$3,562,944.00	$4,445,680.00	$3,500,544.00	$4,367,680.00	$3,500,544.00	$4,367,680.00	$3,440,880.00	$4,289,680.00
								Total including contingency	**$14,697,144.00**	**$18,338,430.00**	**$14,439,744.00**	**$18,016,680.00**	**$14,439,744.00**	**$18,016,680.00**	**$14,193,630.00**	**$17,694,930.00**

Indicative cost environment and heritage based on similar length pathway	Item	1500

ref: Appendix A Cost Estimate/ss

pitt&sherry

Treated Pine Deck Option

Section	Description	Material	Unit	Qty	Bitumen/ m2	Concrete/ m2	Gravel/ m2	Sure pave + gravel	2m Concrete Path	2.5m Concrete Path	2m Bitumen Path	2.5m Bitumen Path	2m Stabilised Gravel Path	2.5m Stabilised Gravel Path	2m Gravel	2.5m Gravel
1	Generally cleared alignment – no veg removal required	Concrete path	M	1360	90	120	60	90	326400	408000	244800	306000	244800	306000	163200	204000
2	Steep embankment	Concrete path	M	200	90	120	60	90	48000	60000	36000	45000	36000	45000	24000	30000
		Retaining wall and barrier	M	200	400	400	400	400	80000	80000	80000	80000	80000	80000	80000	80000
3	Dolerite outcrops present, most likely require rock breaking to continue route along river bank alternate to go over top of hill	Concrete path	M	190	90	120	60	90	45600	57000	34200	42750	32400	42750	22800	28500
		Rock breaking	M	190	90	90	90	90	34200	42750	34200	42750	34200	42750	34200	42750
4	Generally good ground conditions	Concrete path	M	230	90	120	60	90	55200	69000	41400	51750	41400	51750	27600	34500
5	March land, Quite wet	Boardwalk	M	70	2000	2000	2000	2000	280000	350000	280000	350000	280000	350000	280000	350000
6	Reasonably ground conditions 5m back from bank	Concrete path	M	285	90	120	60	90	68400	85500	51300	64125	51300	64125	34200	42750
7	Good ground conditions	Concrete path	M	655	90	120	60	90	157200	196500	117900	147375	117900	147375	78600	98250
8	If built out onto river	Boardwalk in river	M	270	4000	4000	4000	4000	2160000	2700000	2160000	2700000	2160000	2700000	2160000	2700000
9	Previous sheet piling and erosion on bank	Sheet piling or boardwalk in river	M	340	4000	4000	4000	4000	2720000	3400000	2720000	3400000	2720000	3400000	2720000	3400000
10	Good conditions some erosion protection required	Concrete path	M	200	130	130	130	130	52000	65000	52000	65000	52000	65000	52000	65000
11	Water logged Marshland	Boardwalk over land	M	770	500	500	500	500	770000	962500	770000	962500	770000	962500	770000	962500
		Bridge over Clarks Rivulet	Item	1	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000
12	Path required to be constructed in river	Path built on pile	M	200	4000	4000	4000	4000	1600000	2000000	1600000	2000000	1600000	2000000	1600000	2000000
13	Good ground conditions	Concrete path	M	330	90	120	60	90	79200	99000	59400	74250	59400	74250	39600	49500
14	Poor ground conditions, thick waterlogged marshland, would most likely require boardwalk and bridge over inlet to prevent negative impact to wetlands	Boardwalk	M	1260	2000	2000	2000	2000	5040000	6300000	5040000	6300000	5040000	6300000	5040000	6300000
		Bridges	M	40	4000	4000	4000	4000	320000	400000	320000	400000	320000	400000	320000	400000
15	Tie into existing boardwalk	Boardwalk	M	330	500	500	500	500	330000	412500	330000	412500	330000	412500	330000	412500
								Subtotal	**$14,186,200.00**	**$17,707,750.00**	**$13,991,200.00**	**$17,464,000.00**	**$13,991,200.00**	**$17,464,000.00**	**$13,796,200.00**	**$17,220,250.00**
Contingency (20%) plus design, approvals and project mgmt. (12%)									$4,539,584.00	$5,666,480.00	$4,477,184.00	$5,588,480.00	$4,477,184.00	$5,588,480.00	$4,414,784.00	$5,510,480.00
								Total including contingency	**$18,725,784.00**	**$23,374,230.00**	**$18,468,384.00**	**$23,052,480.00**	**$18,468,384.00**	**$23,052,480.00**	**$18,210,984.00**	**$22,730,730.00**

Indicative cost environment and heritage based on similar length pathway	Item	15000

pitt&sherry

Huonville to Franklin Foreshore Shared Pathway

Feasibility Study

Contact

Leigh Knight
6323 1973
lknight@pittsh.com.au

Pitt & Sherry (Operations) Pty Ltd
ABN 67 140 184 309

Phone 1300 748 874
info@pittsh.com.au
pittsh.com.au

Located nationally —
Melbourne
Sydney
Brisbane
Hobart
Launceston
Newcastle
Devonport
Wagga Wagga