

# North West TASMANIA



## Coastal Pathway Plan 2010 DESIGN TOOLKIT



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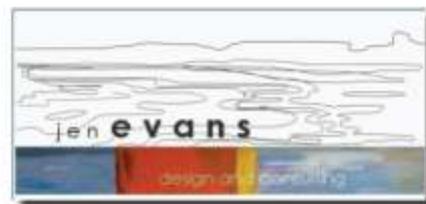
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## Summary

The *North West Coastal Pathway Plan* provides guidance for local councils, State Government agencies and the wider community in regard to the development and operation of the shared pathway between Wynyard and Latrobe. This plan provides a summary of the desired route, its connections to other pathways and proposals for associated pathway infrastructure from a regional perspective. The key purpose of this plan is to assist in the strategic development of a regional shared pathway and to provide useful planning and development tool to the local Councils who may wish to implement sections of the pathway.

The *North West Coastal Pathway Plan* has been developed with the assistance and input from its key stakeholders;

- Waratah-Wynyard Council
- Burnie City Council
- Central Coast Council
- Devonport City Council
- Latrobe Council
- Sport and Recreation Tasmania
- Department of Health and Human Services Tasmania
- Department of Infrastructure Energy and Resources Tasmania
- Cradle Coast Natural Resource Management

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*North West Coast of Tasmania, looking north over Bass Strait*

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## Abbreviations & terminology

CCA – Cradle Coast Authority

The Authority - Cradle Coast Authority

NWCP – North West Coastal Pathway

NWCPS – North West Coastal Pathway Steering Committee

SRT – Sport and Recreation Tasmania

SRCT – Safer Roads for Cyclists Tasmania Incorporated

Pathway – a path used for walking or cycling

Shared pathway – a path used for both walking and cycling

Trail – a path / route used for walking and cycling (usually in a natural setting)

DIER – Department of Infrastructure Energy and Resources, Tasmania

ABS – Australian Bureau of Statistics

Community access path – shared paths located within population centres linking local footpaths to schools, shops parks etc.

Recreation / exercise path – shared paths designed for the primary purpose of recreation and exercise

Community connector path – shared paths that link population centres, villages and towns

Commuter – person using shared and other paths for the primary purpose travel between home and work or other places of interest

Rail Trail – conversion of disused rail lines into walking and cycling pathways

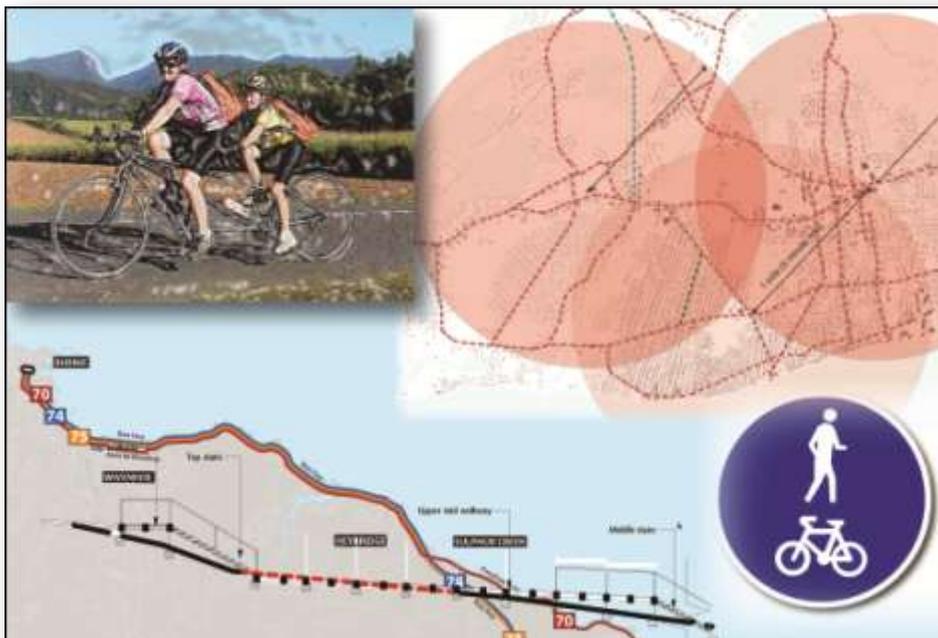
# 1.0 Pathway Design

## 1.1 Design toolkit

The following design toolkit is a guide to assist the development and implementation of the NWCP. The toolkit reflects the current standard of application that the Councils are individually applying to pathway development along the coast. The toolkit covers items such as;

- Types of proposed pathway construction
- Pathway estimate guide
- Barriers and fencing
- Signage
- Furniture
- Bicycle types
- Facilities
- Landscaping
- Natural values
- Community participation
- Community education
- Landowners and managers
- Monitoring and review
- Operational maintenance / sustainability
- Toolkit templates

The standards and approaches in this guide reflect the current approaches to pathway planning, design and implementation in Tasmanian and interstate. Sport and Recreation Tasmania have created a trail planning design toolkit that is also a very useful resource for shared pathway planning.



## 1.2 Estimate guide

The following table (Table 1) is an approximate guide for pathway construction in the North West of Tasmania, by Local Councils. The figures provided here are starting points only and should be used for **preliminary** project estimation purposes. These figures **exclude preliminaries** such as project design and certification, development approval processes, professional reports / advice, site preparation and construction contingencies. As with all quality project planning, each pathway construction development should be considered within its own unique setting. The following table is a guide only;

path type	construction environment	approximate estimate rate \$ per linear metre
Bike lane marking on existing roadway with limited surface treatment	existing roadway	100
2.4 m wide compacted gravel pathway, with treated pine edging	easy going, clear of obstructions and vegetation	200
2.4 m wide asphalt pathway, with treated pine edging	easy going, clear of obstructions and vegetation	250
2.5 m wide asphalt pathway, with treated pine edging	hard going, riparian with obstructing vegetation	460
2.5 – 3 m reinforced concrete pathway – no fencing or barriers	easy going, clear of obstructions and vegetation	300
2.5 – 3 m reinforced concrete pathway – no fencing or barriers	hard going with minor ground levelling / preparation	400
2.5 m suspended concrete pathway with handrail & balustrade	easy going, clear of obstructions and vegetation	750
2.5 m suspended and/or partially supported concrete pedestrian bridge – maximum span of 20 m	Site preparation complete and levelled ready for construction	7,500

**Table 1.** Estimate Guide

### 1.3 Facilities

Many State government departments are now planning for better provisions for end of trip cycling facilities in order to encourage more cycling. The follow suggested parameters are based on those recommended by the Queensland Department of Transport and Main Roads.<sup>1</sup>

The following table is a guide for the number of cycle visitor parking for major developments. Cycling parking should be located in a highly visible area close to the major pedestrian entrance to the facility, and allow for free flow of pedestrians to and within the site.

	<p>office developments - one cycle visitor parking per 750 square metres</p>
	<p>retail developments - one cycle visitor parking per 500 square metres, with a maximum of 10 spaces</p>

The following table is a good rule of thumb guide for end of trip facilities for major employers;

	<p>one bicycle parking space per 500 square metres of gross floor area</p>
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<sup>1</sup> Source: [www.tmr.qld.gov.au](http://www.tmr.qld.gov.au) 5 September 2010.

	<p>one locker per two bicycle parking spaces</p>
	<p>one shower cubicle with ancillary change rooms per 10 bicycle spaces</p>
	<p>change facilities for both male and female per 10 bicycle spaces</p>

The following table is a good rule of thumb guide for pathway facilities;

	<p>One seat per 1 km in high use areas One seat per 2 km in lower use areas</p>
	<p>Drinking fountains should be located at the beginning and end of high use sections of pathway and or at every second rest stop</p>

	<p>Taps are important as they allow people to fill their drinking containers. These should be located in conjunction with the above and designed to prevent constant flow.</p>
	<p>Toilets should be located at major parking areas / pathway access nodes and high use areas. Easy links should be created to existing facilities.</p>
	<p>Bicycle racks should be located at toilets as above, bus stops immediately adjacent to the pathway and at shopping areas / centres of town</p>

The following facility is an example of prefabricated end of trip facility that combines bicycle storage, shower and change room. Marketed as *The Green Pod*, source: [www.pushbikeparking.com](http://www.pushbikeparking.com) and [www.abc.net.au/tv/newinventors](http://www.abc.net.au/tv/newinventors)



## 1.4 Furniture

The following examples of shared pathway furniture may be used so as to complement existing pathway furniture. The items suggested here include those made from recycled plastic products. Such materials are recommended due to their robust nature and lower carbon footprint.



These bike racks are examples of how a more sculptural approach can be taken to provision of pathway furniture. Sources: [www.dero.com](http://www.dero.com) (left) [www.landscapeforms.com](http://www.landscapeforms.com) (centre) and [www.creativemetalworks.com](http://www.creativemetalworks.com) (right).



These bike racks are more standard in their design and can be sourced from [www.streetfurnitureaustralia.com](http://www.streetfurnitureaustralia.com).



This bike rack (also from [www.streetfurnitureaustralia.com](http://www.streetfurnitureaustralia.com)) allows for several bikes to be parked together.



This free undercover bike parking facility (above left) is managed by Bicycle Victoria and is a great example of affordable bike storage – which is vital in order to encourage people to commute to work.



These recycled plastic seats from [www.streetfurnitureaustralia.com](http://www.streetfurnitureaustralia.com) are a good example of robust and environmentally suitable furniture for the NWCP. (above)

The following examples of drinking fountains allow for direct drinking or filling drinking bottles (also from [www.streetfurnitureaustralia.com](http://www.streetfurnitureaustralia.com)) (below)



Recycled plastic bollards could be used for the finger post signs, and to delineate areas in and around the pathway. (below)



These recycled plastic bollards are from [www.replasrecycledplastics.com.au](http://www.replasrecycledplastics.com.au) .

There are many lighting options available. Solar powered lighting units are both convenient and carbon friendly and would suit many of the community connector sections of the NWCP, where street lighting is currently not available. (below)



Solar powered bollard and flood lighting is particularly useful in areas such as highway underpasses, pathway junctions, nodes and rest stops. (below)



## 1.5 Vehicle modes

When planning for design and installation of support infrastructure such as furniture, signage and bike parking etc. it is important to be aware of the alternative range of cycling and vehicle modes. A specific issue to remember is the height placement of signs and support infrastructure to suit a wide range of needs. The following images provide a snap shot of other popular forms of cycling including the recumbent cycle – used by those with specific mobility challenges.



This is an example of a cycling adaption to a wheelchair (left) and the recumbent cycle (right)



This is an example of a solar powered assisted recumbent cycle (left) and a recumbent mountain bike (right)



The image above shows the lower riding height of recumbent cycling (left) and the more upright elevated position of mountain biking (right)

There many other modes of vehicle use on shared pathways, including; skateboards, roller blades, scooters and prams. (see below)



## 1.6 Signage

There are various sign types required for a shared pathway. These fall into the following broad categories;

- Regulatory signs
- Warning signs
- Directional signs
- Track head signs
- Interpretive signs

It is recommended that standard universal sign design be used for pathway markers and signage so as to reinforce the growing international recognition of pathway information.

### Regulatory signs

Regulatory signs are used to determine the start and end of bicycle lanes and paths as well as their intersections with other road infrastructure. They communicate access priority and user / driver behaviour. Such signage is controlled under State traffic regulations. In Tasmania, the Traffic Engineering Branch of the Department of Infrastructure, Energy and Resources (DIER) is responsible for traffic control devices on all roads in Tasmania and requires all proposals to install or modify traffic control devices to be formally approved by the Chief Traffic Engineer as set out under the *Traffic Act 1925*.

Regulatory signs include bicycle lane designation (exclusive bicycle use, shared path use or separated use), bicycle prohibition and control, give way and bicycles excepted. The following signs are examples of common pathway regulatory signs. For more information refer to the Department of Infrastructure Energy and Resources at [www.dier.tas.gov.au](http://www.dier.tas.gov.au).



Example of regulatory signs – separated path (left), shared use path (right)

## Warning signs

Warning signs are used when a hazard is not obvious to both cyclists and drivers. There are various warning signs such as warning motorists that cyclists are likely to be using the road and crossing the road, warning cyclists that a road is ahead or that steep downhill sections or slippery surfaces may be ahead. Like regulatory signs, warning signs are regulated by the State government.

The following signs are examples of common pathway warning signs. For more information refer to the Department of Infrastructure Energy and Resources at [www.dier.tas.gov.au](http://www.dier.tas.gov.au).



Example of warning signs – cyclists using road (left), steep downhill grade (right)

## Directional signs

Directional signs are very important to cyclists and all users of shared pathways. This type of signage is not regulated but should be designed using international symbols and formats commonly used elsewhere. Directional signage should be clear, and easy to read from approach, especially at expected cycling speeds of up to 30km/hour. These signs also need to be bi-directional and easy to read from multiple directions and approaches. Directional signs should be used in the following context;

- at pathway junctions
- at pathway junctions with roads
- along the pathway to reassure users of distances and directions to destinations and facilities
- along sections of routes where the route itself may not be obvious

In context to the NWCP, directional signs should ideally be installed as follows;

- at all junctions with connecting and side pathway routes
- at every 1 km along the route there should be a distance marker
- at all junctions indicating distances and directions to major population centres and support facilities
- along the route, distances to the upcoming destination and the next destination beyond

The following signs are examples of common directional signs that could be used along the NWCP.



Example of directional signs (above) – blue and white shared pathway (far left & left), red distance marker (right), blue and white direction arrow (far right)



Example of directional signs (above) – blue and white shared pathway with distance marker and directional arrow



Example of directional sign (above) – blue and white shared pathway with distance marker and directional arrow and name to next major population centre



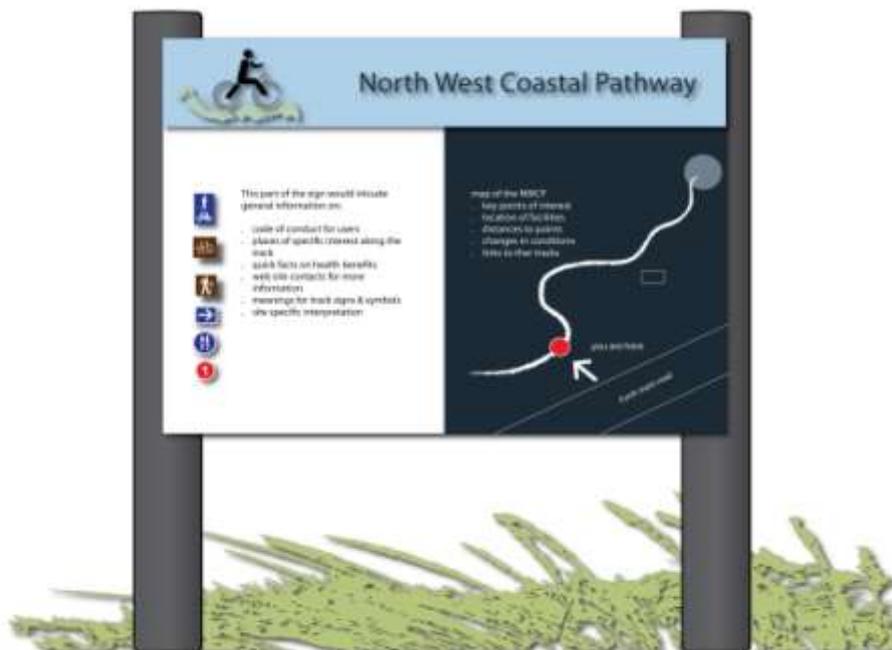
This is an example of a finger post styled directional sign that communicates the type of path (shared), path direction, distance to destination and name of the destination. The use of recycled plastic products for the finger post is a popular and robust option for this sign type.

### Track head signs

Track head signage is designed to provide users with detailed information and an overview of the pathway system. Track head signs for the NWCP should include the following information;

- an overview of the entire NWCP and detailed map of the particular section of the pathway that the sign is located at
- key points of interest along the pathway route
- location of support facilities such as public toilets, showers, drinking water, bike racks and lockers
- distances to key points and attractions
- changes in pathway conditions (i.e. surfaces, width) and classification (i.e. single / shared use)
- code of conduct for users
- linkages to other tracks, pathways and trails

This is an example of a track head sign suitable for the NWCP, utilising recycled plastic posts to complement the finger post above.



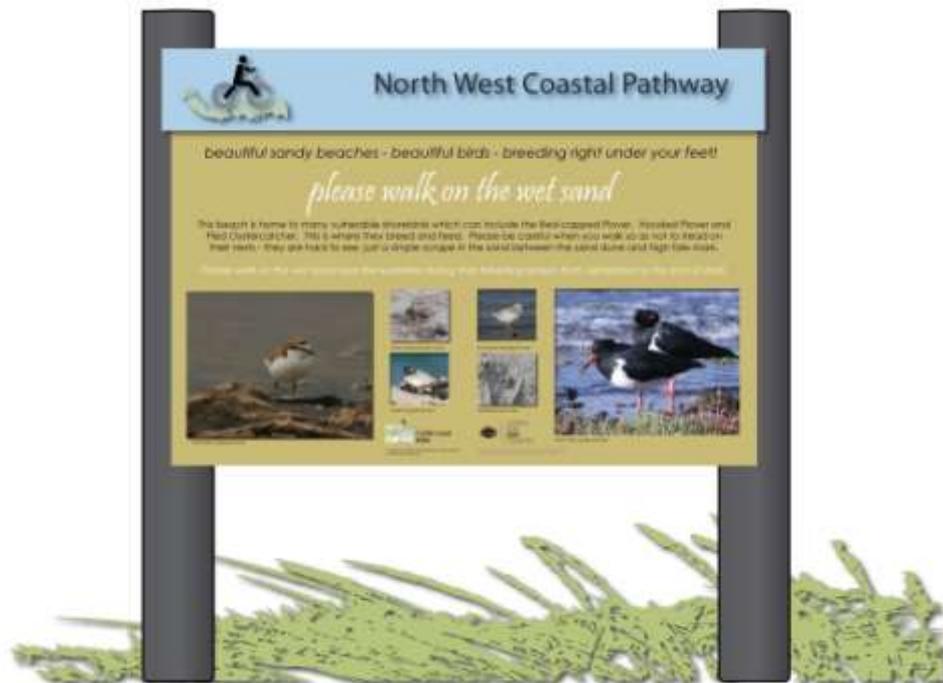
## Interpretive signs

A significant opportunity exists for the placement of interpretive signage along the NWCP route, at specific locations. Such locations would include;

- areas with high valued habitat and natural values – given the coastal location of the NWCP there are several opportunities for interpretation of the coastal environment
- areas with historical and cultural points of interest – such as prior locations of railway stations and other facilities no longer visible
- viewing and scenic areas

The intent of the interpretive material would be to engage with the pathway user and to show them insight into the environment that surrounds them.

This is an example of an interpretive sign suitable for the NWCP, again utilising recycled plastic posts.



## 1.7 Landscaping

Pathway landscaping should be designed to

- improve the aesthetics of pathway infrastructure
- enhance existing coastal habitats and ecosystems
- provide essential rehabilitation and protection to compromised coastal areas

In most instances the utilisation of local endemic plants are recommended. Selection should be made upon the basis of;

- suitability to specific site conditions
- minimal disturbance to pathway users
- minimal safety issues re screening of public openness of pathway route

Planting should be set well back from paths, a clear minimum space of 1.5m for low planting. Shrubbery or higher planting should be located so as to eliminate all potential entrapment spots within a reasonable distance (30 m) for high use pathways. Planting can also be useful in providing anchor points (keeping users on the path) and minimising the chance of users deviating from the path.



*Endemic coastal grass planting at the Wynyard shared pathway.*

The following list of plant species is a guide to local plants suited to the north west coastal environment.

<p><b>Exposed coastal areas</b> Grasses, prostrate plants, low shrubs</p>	<p><i>Caklie species</i> <i>Spinifex sericeus</i> <i>Austrofestuca littoralis</i> <i>Atriplex cinerea</i> <i>Senecio pinnatifolius</i> <i>Carpobrotus rossii</i> <i>Tetragonia implexicoma</i> <i>Acacia longifolia subsp. sophorae</i> <i>Austrostipa stipoides</i> <i>Poa poiformis</i> <i>Distichlis distichophylla</i></p>	<p>sea rocket spinifex coast fescue grey saltbush coast groundsel native pigface bower spinach coast wattle coast spear grass coast tussock grass salt grass</p>
<p><b>More sheltered areas</b> Grasses, sedges, low shrubs</p>	<p><i>Ozothamnus turbinatus</i> <i>Lepidosperma concavum</i> <i>Lepidosperma gladiatum</i> <i>Isolepis nodosa</i> <i>Acaena novae-zelandiae</i> <i>Kennedia prostrate</i> <i>Pelargonium australe</i> <i>Austrostipa flavescens</i> <i>Rhagodia candolleana</i> <i>Lomandra longifolia</i> <i>Correa alba</i> <i>Leucopogon parviflorus</i> <i>Dianella species</i> <i>Dichelachne crinita</i></p>	<p>coast everlasting sand sword-sedge coast sword sedge knobby clubrush buzzy running postman native geranium yellow spear grass seaberry saltbush common sagg white correa coast beard-heath flax-lillies log-hair plume-grass</p>

**Table 2.** Coastal Plant Species list.



## 1.8 Types of construction

This section of the toolkit provides suggestions for possible design solutions and construction approaches for shared pathways. Given the growing popularity around the world for shared pathways, there is a wide range of design solutions and products available.

### Bridging solutions

The following images provide a range of design solutions in regard to utilising existing bridge structures to provide new shared pathways by way of attaching additional structures.



New pedestrian bridge suspended between two existing highway bridges in the USA.



Suspended cycle Bridge attached the underside of an existing bridge on the Nishiseto expressway, Japan.



Shared pathway on an existing rail bridge in the USA.



Fibre Reinforced Recycled plastic decking lookouts and boardwalks in the Tarkine are an example of robust environmentally friendly construction.



Pedestrian bridge at Don, Devonport, providing shared pathway access over the Don River.

## 1.9 Barriers and fences

Specific standards apply to the use and requirements for barriers and fences, as outlined in the *Austrroads Guide to Road Design Part 6A: Pedestrian and Cyclist Paths 2009*. This document provides relevant calculations for instances where barrier fences are required and their design treatments. All sections of the NWCP should comply with this standard.

It is noted that Tasmanian Railways requires an additional standard of fencing above and beyond that of the *Austrroads* standard. This standard involves the erection of an 1800mm minimum high steel mesh fence for sections running parallel to the rail line (including disused sections). In some instances such a fence is located where a pathway is offset 3 metres from the edge of the closest rolling stock. Tasmanian Railways specified the following arrangement at the recently completed pathway from Cooee to west Park;

- minimum 3.0 m separation between the rail line and the edge of the pathway
- erection of a safety fence along the interface of the path and the 3.0 m offset

Recently, (along the section mentioned above) the fence has been reduced down to 1400mm in height due to concerns raised by locals in regard to it blocking sea views. Tasmanian Railways has not clearly articulated a policy in regard to fencing or barrier requirements in context to the location of pathways. Inconsistent application of fencing and barriers to the rail line has taken place as a result.



Lowered section of fence (1400 mm high) along the recently constructed West Park to Cooee shared pathway in Burnie (August 2010).

Given the visual intrusion of such infrastructure some Local Councils have raised this as a significant deciding factor on the location of future pathways, so as to avoid

community dissatisfaction and long term maintenance issues of such fencing in an open coastal landscape.

This matter requires resolution in order to advance the NWCP.



Fencing to the rail reserve at Ulverstone – 1800mm mesh barrier solution applied.



Fencing along the Turners Beach pathway allowing for a 1.5 m verge from the edge of the pathway.

## 2.0 Pathway Development

### 2.1 Natural and cultural values

The North West coast of Tasmania is well endowed with natural and cultural values, especially along the proposed route of the NWCP. Some of these include;

- Tasmanian Aboriginal middens, fish traps and cultural landscapes
- sweeping coastal vistas, beaches, headlands and open sea views
- vital migratory bird breeding habitats
- sensitive shore bird breeding areas
- significant penguin colonies
- significant geological features and forms
- coastal vegetation that creates important habitat and ecological systems

The development and implementation of the NWCP should take into account these special values and ensure their protection, enhancement and rehabilitation. The NWCP also creates an opportunity for interpretation and showcasing of these special values.

There are many useful resources available that can assist in the understanding and appreciation of the natural and cultural values of our local coast (refer to the useful information section of this report).



*Tasmanian Aboriginal fish traps foreground with Goat Island in the background. The proposed NWCP passes near this site*



*Ulverstone beach, typical of the many beaches along the North West Coast*



*Protected Hooded Plover (left) is found on several North West coast sandy beaches and the Fairy Penguin (right) has several breeding colonies nearby the proposed route for the NWCP.*



*Several rocky headlands and beaches are features of the picturesque coastal landscape that the NWCP will pass through*

## 2.2 Community use and development

There are many avenues for the community to participate in and provide support for the ongoing development and implementation and use of the NWCP. Some of these include;

- utilisation of the pathways for fun runs, club training sessions and general events
- promotion of the pathway through clubs, and sporting organisations
- promotion of the pathway through private businesses such as bike and sports shops
- school support through ride to school programs
- special events such as the *Opt-in Health and Well Being* program (from the Central Coast Council), charity bike ride
- ride to work campaigns
- support for events such as *Super Tuesday* – Australia's biggest visual bike count which aims to establish a reliable annual benchmark for bicycle commuting

Opportunities are also available for service clubs to be involved in the development of sections of the pathway, building on existing relationships and histories that service clubs have for example in the East Devonport and Port Sorell area.

Some Local Councils have utilised various employment programs to reduce construction costs of pathway sections and involved sectors of the community in a paid capacity.



North West Professional Cross Country Club race event held on the new section of the Turners Beach shared pathway in August 2010

## 2.3 Community education

Recent studies in New South Wales concluded that the use of cycling infrastructure can be increased where the pathway infrastructure is well marketed and designed to allow people to ride in a safe and social context.<sup>2</sup> It also pressed the point that communication strategies that inform potential users where the infrastructure is located are critical (such as maps and route sign posting).<sup>3</sup>

A vital part of the success of the NWCP will be contingent upon community education programs aimed at informing the community of;

- the location, features, distances and access points to the pathway (eg. smart maps, web information and site specific signage)
- ongoing promotion of the health benefits from regular exercise utilising the pathway system
- specific education of motorists to be patient and respectful toward path users
- code of conduct for shared pathway use

Councils are urged to value add to their pathway networks, by providing up to date information that motivates and encourages increased use.

The following recommendations for considerate use of shared pathways have been adapted from the Queensland government web site – *Road User Code of Behaviour*.<sup>4</sup>

### **Pedestrians to remember when using shared pathways;**

- share the path
- keep left to allow faster path users to pass you safely
- move out of the way, to the left if possible, when a cyclist sounds their bell
- walk on the section designated for pedestrians on separated paths
- stay alert and be aware of other people using the path
- don't block the path if you are part of a group
- check behind you if you are about to pass someone or change direction
- be aware that wearing headphones and using a mobile phone will reduce your awareness of the people around you
- teach children to be aware of other people using the path
- keep your dog on a leash

### **Cyclists to remember when using shared pathways;**

- be aware of other people on the path
- keep left and allow faster path users to pass safely
- be predictable and always look behind you before passing someone to ensure you are not about to cut someone off
- have a bell as a piece of mandatory equipment and sound your bell to let them know you are approaching but do not assume they have heard you
- ride carefully and slow down if the path is crowded and/or when it is raining

<sup>2</sup> Rissel *et al.* *International Journal of Behavioural Nutrition and Physical Activity* 2010, 7:8, p. 10

<sup>3</sup> *Ibid*, p. 10

<sup>4</sup> Queensland Department of Transport, Road User Code of Behaviour, [www.tmv.qld.gov.au](http://www.tmv.qld.gov.au)

- watch out for vehicles entering or exiting driveways when riding on the footpath
- do not threaten or startle other users by passing too close, especially at high speeds
- on shared paths and footpaths, bicycles are the fastest and largest vehicles. Keep this in mind when sharing paths with other users.

**Things to remember when using wheeled recreational devices on shared pathways;**

- give way to other people on the path and keep left unless passing someone
- be considerate
- go slow if it is raining or the path is crowded
- ride or skate at a speed that allows you to move safely around others and that is appropriate for the conditions
- be predictable and avoid startling others
- teach children to be aware of other people using the paths
- helmets and other safety gear are mandatory and will reduce the risk of injury in a crash

**Local Council protocols**

Local Councils may wish to develop protocols for the use of shared pathways in order to fully inform the community of expectations for behaviour and considerate use. Local Councils could utilise digital media such as their own web sites to promote such protocols and encourage pathway users to access this information. Taking a proactive role and promoting the appropriate use of pathways will assist in increased utilisation. Users need to be made aware of protocols in relation to dogs and horses etc. The Central Coast Council recently declared the Turners Beach section of shared pathway as a restricted area requiring that dogs be exercised on leads at all times, acknowledging that this is a suitable compromise that is in keeping with the shared nature of the pathway.



*Enjoying responsible use of the Turners Beach Pathway Ulverstone, image supplied by Matthew Dickson*

### Promoting health benefits

An important part of community education is creating motivation to exercise. It is vital that users who wish to lose weight and increase fitness are made aware of the benefits of exercising for certain periods of time and what pace. The following table can be used to assist in community education of health benefits associated with physical activities. This sort of information could be made available to users by Local Councils as part of their pathway promotional activities and digital media.

	energy expenditure in kilojoules per hour (based on an individual's body mass)					
physical activity	50 kg	68 kg	77 kg	86 kg	91 kg	100 kg
slow walking 3.3 km / hour	276	376	426	477	502	552
brisk walking 4.8 km / hour	368	502	568	635	669	736
fast jogging 8 km / hour	849	1162	1317	1471	1547	1701
slow bicycling 15 km / hour	577	786	890	991	1045	1150
medium bicycling 21 km / hour	920	1254	1421	1588	1672	1839

Source: Bauman, 2004<sup>5</sup>

Table 3. Energy Expenditure of Physical Activity



Ulverstone Beach, looking west

<sup>5</sup> Australian Government, *Cycling: Getting Australia Moving*, January 2008, p. 24

## 2.4 Monitoring & review

Given the inspirational nature of the NWCP, it is important that user data be collected where possible as a means to measure its success. It is important to only collect data that will have specific implications for upgrading and improving pathway connections. It is vital that the pathway network remains relevant to users, making it a viable alternative mode for transport and access to town centres and residential areas. As our community changes and grows, so should our pathways to reflect new needs and uses.

Collection of the following information may be useful;

- numbers of users for popular sections of the pathway
- approximate time duration of each use
- repeat use patterns
- popular times during the week for use
- how many children are using the pathway
- purpose of use (i.e. recreation, mode of transport, work commuting etc)

It may be useful for communities and Local Councils to set certain targets for increased pathway use. These may include increased;

- number of children riding bicycles to school
- regularity of pathway use
- use of recreational / exercise pathways
- use of community connector pathways
- number of people commuting to work

In 2002, 4.2% (3,500) of Tasmanians in the Mersey Lyell area cycled, capital cities have seen 22% increases in cycling participation between 2001 and 2006. Communities may wish to set some more specific targets in conjunction with support from government and the cycling industry, such as;

- to turn around the drop off of girls aged 9 onwards in cycling and aim to sustain their interest into adulthood
- targets could be set that sees North West Coasters increasing their cycling activity by 5% annually over the first few years the NWCP is in place



## 2.5 Risk management

Risks management starts at the beginning of the life of the asset at the design phase. Good design can reduce the risk exposure of Local Councils by ensuring that appropriate pathway design takes into consideration the following;

- adequate path width
- adequate sight lines and distances
- appropriate downhill gradients
- adequate lighting
- minimal vegetation
- appropriate grates and covers to pits / drains / culverts etc.



The above cycle friendly grates are an example of important details (not only type but location) that must be considered throughout pathway design in order to minimise potential hazards to users.

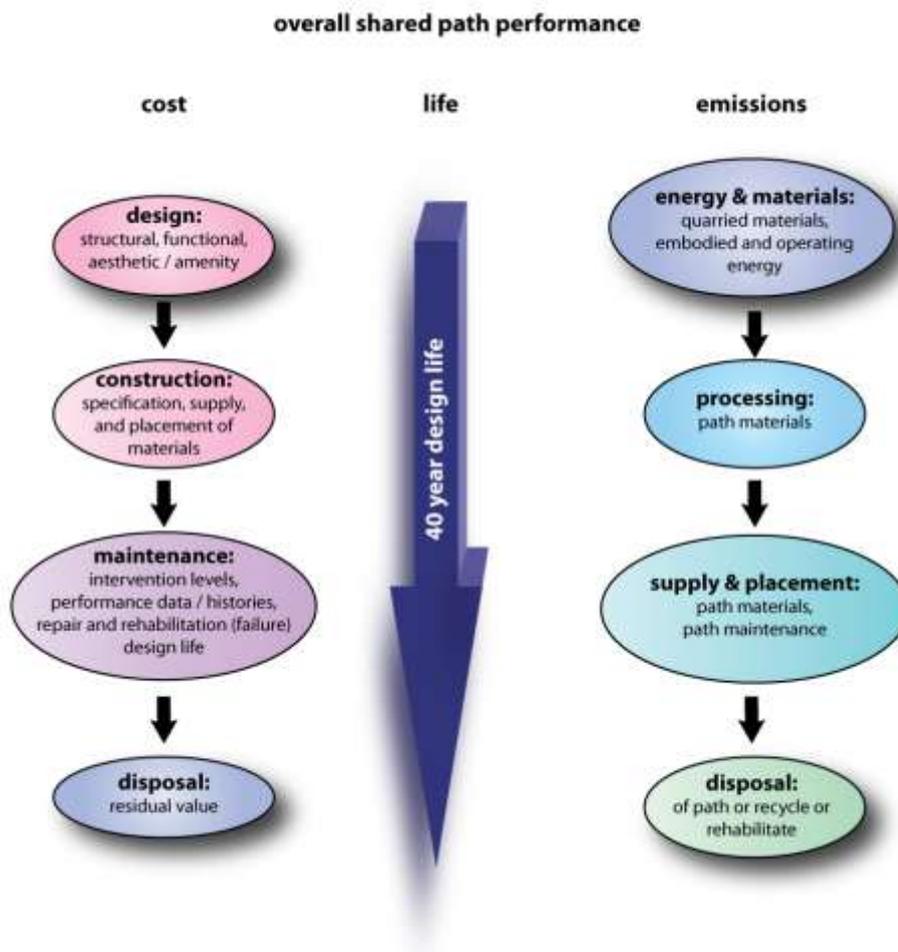
Risk assessment scheduling will be undertaken by the Local Councils to a frequency that reflects their organisational priorities. Shared pathways should be inspected for condition and risk assessment throughout the life of the asset, to include observations and actions such as;

- identification of potential safety hazards
- identification of defects (not meeting the accepted maintenance standards)
- severity and condition score / rating for issues such as surface / pavement condition, vertical displacement, cracking and appearance, vegetation encroachment etc.
- determining the asset risk
- priority actions to remedy identified risks

## 2.6 Operational maintenance & sustainability

Appropriate ongoing maintenance and asset management practices are vital to the successful uptake and safety of shared pathways. All shared pathway infrastructure should be incorporated into existing asset management plans and managed to meet the requirements of standard industry practice such as *AS/NZS 4360 Risk Management*.

The overall operational performance and sustainability of pathway infrastructure can be considered in terms of its holistic life cycle. (Refer to Figure 1. *Shared Path Life Cycle*). That is, whole of life cost (cost to design, construct, maintain and ultimately dispose of the pathway) plus the environmental cost (impacts of the emissions in the supply, processing, placement, maintenance and disposal of the pathway) over its design life.<sup>6</sup>



**Figure 1.** Shared Path Life Cycle

<sup>6</sup> Arrb Transport Research, *Advancing safety and efficiency in transport through knowledge, Bicycle and Shared Path Design – Taking into Account Whole of Life Costing*, sourced from [www.arrb.com.au](http://www.arrb.com.au) 12 September 2010.

### Annual maintenance costs

Ongoing operational and maintenance costs for shared pathways have been raised as a significant resource issue for Local Councils during the development of this project. Local Councils have indicated that communities need to understand that cost implications for the NWCP extend beyond the capital funding and must include whole of life costs. Such costs include operational, maintenance and total asset life costs. (refer to section 2.5 of the NWCP for more detail)

The following table (table 4.) is a guide for pathway maintenance costs based upon feedback provided by participating North West Coast Councils. The figures provided are preliminary and reflect the early stages of annual costs for shared pathway infrastructure and are limited to a small range of shared pathway settings.

path type	setting	Annual maintenance cost (\$ / km)	lifecycle (years)
asphalt	existing open space areas that are currently maintained	720	20
timber boardwalk	existing open space areas that are currently maintained	1,500	10 - 15
concrete (no fencing)	existing open space areas that are currently maintained	750	30 - 40
Concrete (with fencing and barriers)	new open space areas including allowance for mowing and general open space management	2,500	30 - 40

**Table 4.** Maintenance Costs of Path Types in specific settings

General maintenance issues that need to be considered and assessed include;

- pavement structure and surface
- earthworks
- sightlines and lateral clearance
- impacts of increased or decreased use on the above
- pavement surface run off
- physical disturbance of the pathway
- rubbish and debris
- barrier / fencing condition
- furniture (signage, seating etc.) condition

Key factors in deterioration of pathways include;

- vehicular access across paths to adjoining properties
- access to paths within the rail corridor for rail maintenance purposes
- vehicle impacts on cycle pathways located within the road corridor
- tree root invasion into asphalt paths

Table 4 (*Path Maintenance Frequency*) is an example of maintenance frequency for various path types as recommended by *Arrb Transport Research*.<sup>7</sup>

Pavement type	Maintenance type		Frequency (yr)
	routine	periodic	
unsealed granular	erosion repairs ( <i>after rain</i> )	Resurfacing and reshaping	3 - 5
asphalt	pothole repair	30 mm overlay	10
	edge break repair	patching	5 – 10
	crack sealing ( <i>regular</i> )	rut regulation	5 - 15
concrete	edge damage repair	joint repairs	4 – 6
	spalling repair	retexturing	15
	cracking repair ( <i>regular</i> )	patching	
		slab replacement	10

**Table 5** Path Maintenance Frequency

In some instances capital cost is a deciding factor in the selection of pavement types for pathways, as is the maintenance costs. Various path types have advantages and disadvantages in terms of capital cost, maintenance and carbon footprint.

<sup>7</sup> Arrb Transport Research, *Advancing safety and efficiency in transport through knowledge, Bicycle and Shared Path Design – Taking into Account Whole of Life Costing*, sourced from [www.arrb.com.au](http://www.arrb.com.au) 12 September 2010.

Table 5 (*Maintenance Considerations of Path Types*) provides advantages and disadvantages for selection and ongoing maintenance of various pathway types.<sup>8</sup>

advantages	disadvantages	comments
<p><b>Concrete path:</b></p> <ul style="list-style-type: none"> <li>• long life &gt; 40 years</li> <li>• durable</li> <li>• constructible</li> <li>• adaptable</li> <li>• good cold weather surface</li> </ul>	<ul style="list-style-type: none"> <li>• joints reduce rideability</li> <li>• highest initial cost</li> <li>• cracks with settlement</li> <li>• failure involves major repairs</li> <li>• joints move with unstable subgrade</li> <li>• unattractive</li> </ul>	<ul style="list-style-type: none"> <li>• performance influenced by joint movements</li> <li>• suitable for weak subgrades</li> </ul>
<p><b>Asphalt path:</b></p> <ul style="list-style-type: none"> <li>• moderate life &gt; 20 years</li> <li>• hard / smooth surface</li> <li>• withstands movement</li> <li>• lower repair cost than concrete</li> <li>• suits local environment</li> </ul>	<ul style="list-style-type: none"> <li>• needs frequent maintenance</li> <li>• subgrade change can cause failure</li> <li>• needs space to construct</li> <li>• needs edge constraint</li> <li>• needs weed spraying</li> </ul>	<ul style="list-style-type: none"> <li>• suitable where maintenance is well managed</li> <li>• not suitable for expansive clays (needs thick pavement)</li> </ul>
<p><b>Granular unsealed:</b></p> <ul style="list-style-type: none"> <li>• moderate to low cost</li> <li>• natural surface</li> <li>• smooth surface if well maintained</li> </ul>	<ul style="list-style-type: none"> <li>• unsuitable to road bikes</li> <li>• only suitable to bikes with mountain bike type tyres</li> <li>• unrideable in the wet</li> <li>• needs regular and frequent maintenance</li> <li>• erodible</li> <li>• needs periodic regravelling</li> <li>• no good for steep grades</li> </ul>	<ul style="list-style-type: none"> <li>• low trafficked paths left unsurfaced</li> </ul>

**Table 6.** Maintenance Considerations of Path Types

<sup>8</sup> Arrb Transport Research, *Advancing safety and efficiency in transport through knowledge, Bicycle and Shared Path Design – Taking into Account Whole of Life Costing*, sourced from [www.arrb.com.au](http://www.arrb.com.au) 12 September 2010.

## Carbon footprint

A recent case study considered the carbon reduction opportunities for concrete versus asphalt shared pathways.<sup>9</sup> It indicated that a 3 metre wide **concrete** shared user path created 96.6 tonnes of CO<sup>2</sup> – e per kilometre of length in comparison to 3 metre wide **asphalt** shared user path created 18.75 tonnes of CO<sup>2</sup> – e per kilometre of length. This indicates that asphalt paths have 80% less carbon footprint than concrete.

Alternative materials such as geopolymer concrete are now available which produces 80% less greenhouse gas emissions than traditional Portland based concretes.<sup>10</sup>

The selection of recycled plastic based furniture will assist in the overall reduction of the carbon footprint of pathway development also.



*Geopolymer concrete construction provides a lower carbon footprint than standard concrete materials*

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<sup>9</sup> Vic Roads, Calculating the Carbon Footprint of Road Construction, 2009 National Local Government Asset Management & Public Works Engineering Conference, 28 April 2009, sourced from the web, 12 September 2010.

<sup>10</sup> CRC for Sustainable Resource Processing (CSRP), sourced from [www.csrp.com.au](http://www.csrp.com.au), 12 September 2010.

### 3.0 Existing pathways

In recent years the Local Councils of the North West Coast have individually completed various sections of shared and single use pathways. Some sections have been in use for many years, but an increase of pathway development has taken place in the last 12 months. Some sections include existing walking / mountain bike trails, existing footpath and road links.

The following existing pathways and links maps highlight the completed sections of the NWCP, those planned for construction and sections identified by Local Councils and community groups for future strategic connections (*refer to the following three pages*).

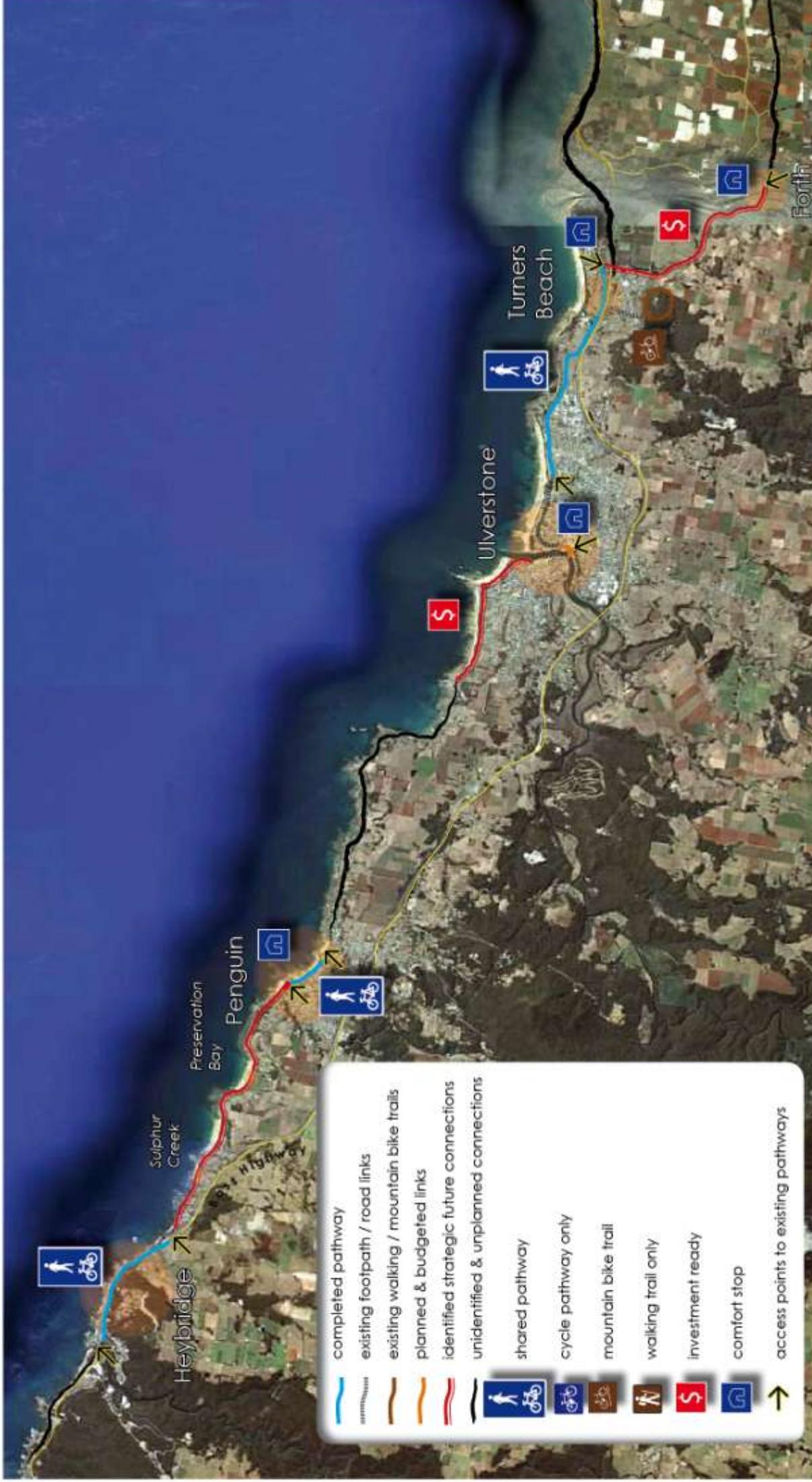


*New Turners Beach shared pathway near Ulverstone opened in June 2010.*



North West Coastal Pathway Plan  
existing pathways and links, November 2010



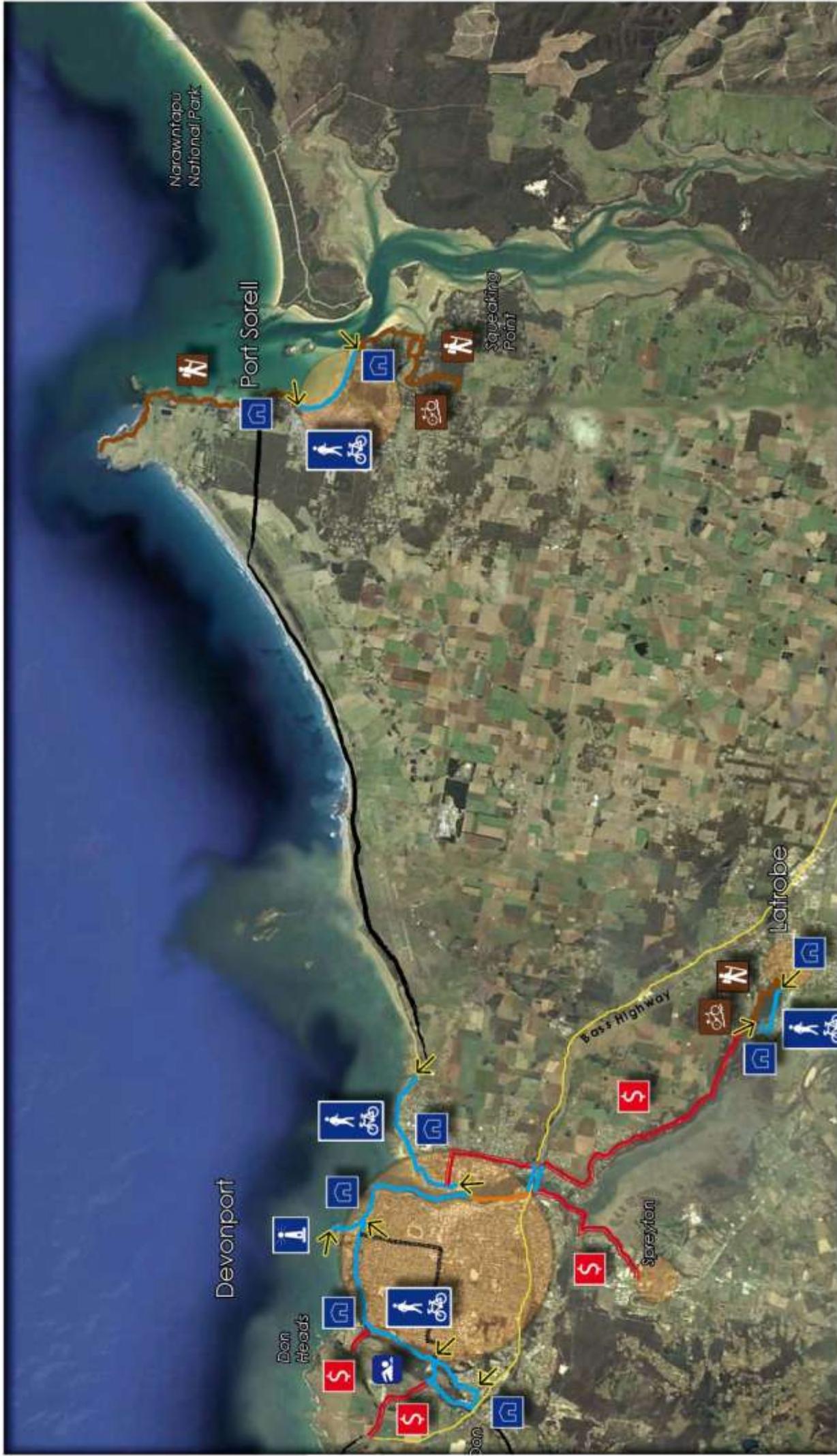


	completed pathway
	existing footpath / road links
	existing walking / mountain bike trails
	planned & budgeted links
	identified strategic future connections
	unidentified & unplanned connections
	shared pathway
	cycle pathway only
	mountain bike trail
	walking trail only
	investment ready
	comfort stop
	access points to existing pathways



**North West Coastal Pathway Plan**  
existing pathways and links, November 2010





**North West Coastal Pathway Plan**  
existing pathways and links, August 2010



### 3.1 Existing pathway typologies

The following table indicates the existing path types and others proposed within the NWCP project area. Some sections of these existing paths will form the overall NWCP (Refer to page 33 for more detail).

existing path no.	environment	path type	width (mm)	surface	barriers	locations
01	off road	shared	3000	concrete	none	Ulverstone to Turners Beach, South Burnie Beach, Wynyard foreshore, Somerset foreshore
02	off road	shared	2000	asphalt	none	Devonport, some sections of Heybridge to Sulphur Creek, Ulverstone & Wynyard town centres
03	off road	shared	3000	concrete	1500 offset from path edge	Ulverstone to Turners Beach
04	off road	shared	2400	concrete	none	Devonport
05	off road	shared	3000	concrete	to rail corridor and Bass Highway	Burnie to Cooee
06	off road	shared	2200	asphalt	varies	Heybridge to Sulphur Creek
07	off road	shared	2400	gravel	750 offset to road	proposed for River Road, Devonport to Latrobe
08	on road	cycle only (one way)	1500	asphalt	rubber delineation to road	Devonport, some sections of Bass Highway (line marking only)
09	off road	shared	2400	concrete	600 offset to road	proposed for Devonport (Formby Road)
10	on road	cycle only (two way)	2200	asphalt	concrete nib to separate road traffic	Devonport

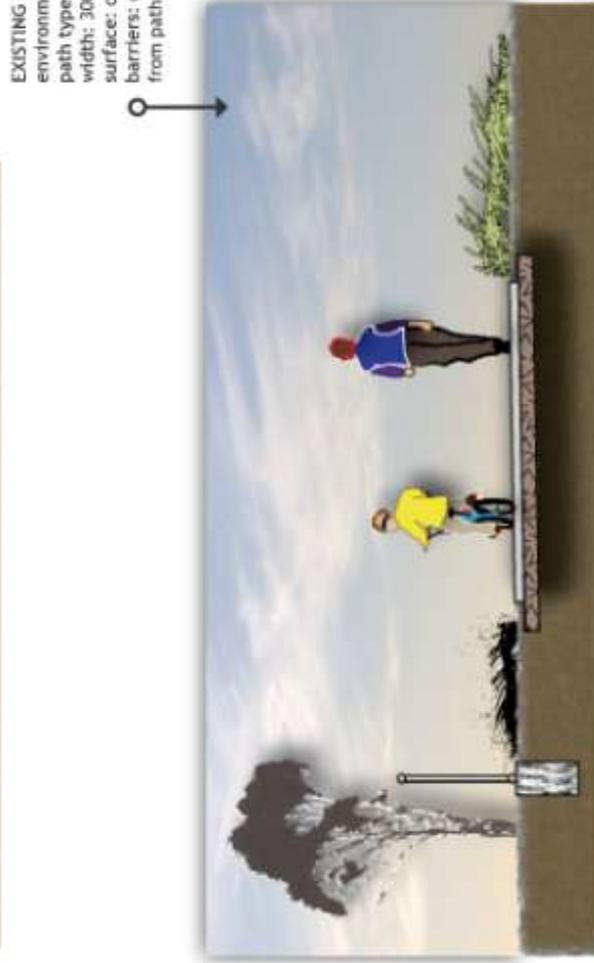
**Table 6.** Existing and proposed path types



**EXISTING PATH 01**  
 environment: off road  
 path type: shared  
 width: 3000 mm  
 surface: concrete  
 barriers: none



**EXISTING PATH 02**  
 environment: off road  
 path type: shared  
 width: 2000 mm  
 surface: asphalt  
 barriers: none

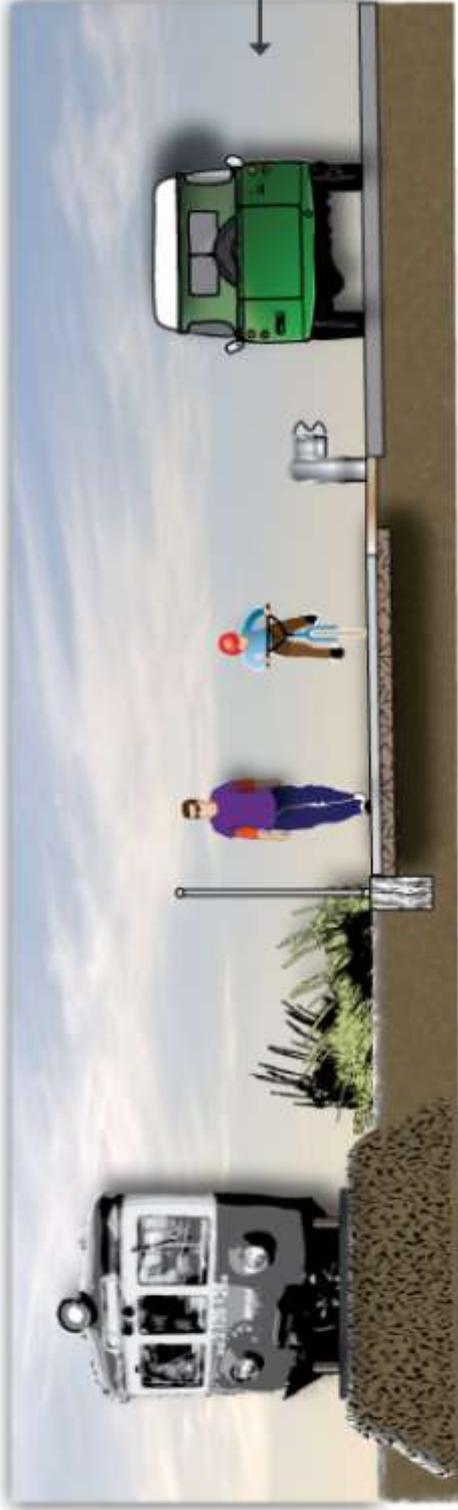


**EXISTING PATH 03**  
 environment: off road  
 path type: shared  
 width: 3000 mm  
 surface: concrete  
 barriers: offset 1500  
 from path edge



**EXISTING PATH 04**  
 environment: off road  
 path type: shared  
 width: 2400 mm  
 surface: concrete  
 barriers: none





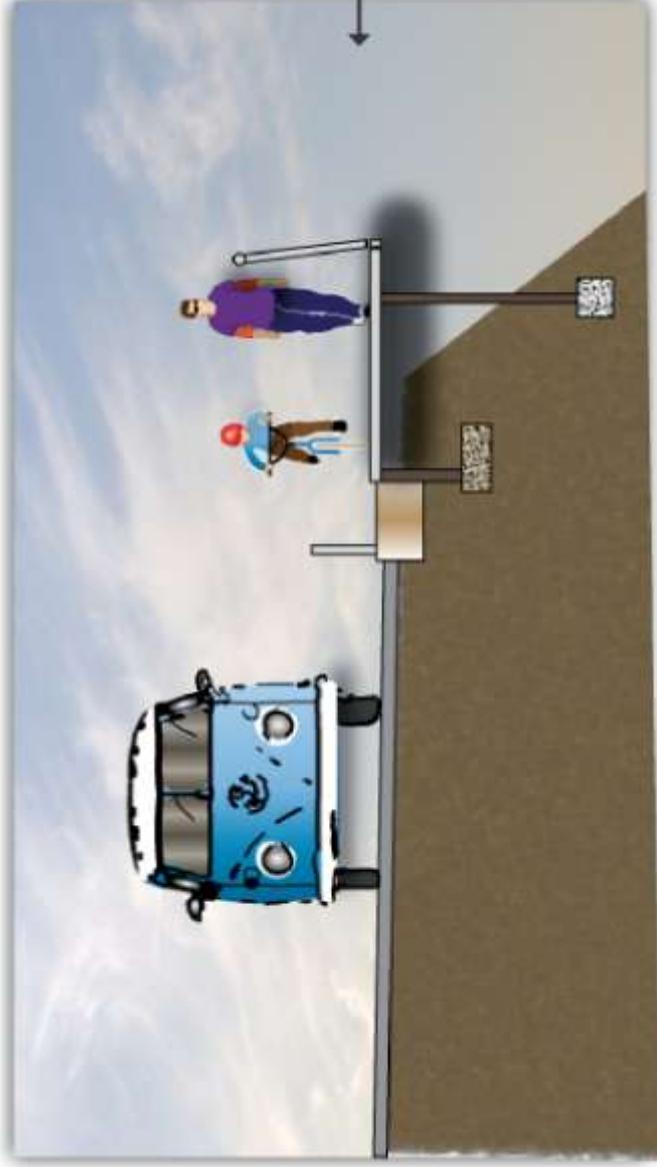


EXISTING PATH 07  
 environment: off road  
 path type: shared  
 width: 2400 mm  
 surface: gravel  
 barriers: offset 750 mm  
 to road



EXISTING PATH 08  
 environment: on road  
 path type: cycle only, 1 way  
 width: 1500 mm  
 surface: asphalt  
 barriers: rubber delineation





**EXISTING PATH 09**  
 environment: off road  
 path type: shared  
 width: 2400 mm  
 surface: concrete  
 barriers: offset 600 mm to road



**EXISTING PATH 10**  
 environment: on road  
 path type: cycle only, 2 way  
 width: 2200 mm  
 surface: asphalt  
 barriers: 300 mm wide on road



## 4.0 Useful information

### 4.1 Web sites and organisations

The following list provides a range of useful websites and organisations for planning of shared pathways;

Bicycle Tasmania [www.biketas.org.au](http://www.biketas.org.au)

Bicycle Victoria [www.bv.com.au](http://www.bv.com.au)

Cycling Resource Centre [www.cyclingresourcecentre.org.au](http://www.cyclingresourcecentre.org.au)

Cycling Promotion Fund [www.cyclingpromotion.com](http://www.cyclingpromotion.com) '*Child Safety and Bike Riding*' and '*Economic Benefits of Cycling in Australia*'

Department of Sustainability and Environment Victoria  
[www.dse.vic.gov.au/planning/urbandesign/](http://www.dse.vic.gov.au/planning/urbandesign/) '*Safer Design Guidelines for Victoria*'

Queensland Transport's State Cycle Unit [www.transport.qld.gov.au/cycling](http://www.transport.qld.gov.au/cycling)

New South Wales Government [www.rta.nsw.gov.au](http://www.rta.nsw.gov.au) '*Action for Transport 2010*'

Tasmanian cycling groups and organisations can be found at;  
[www.biketas.org.au/homeNorthWest.php](http://www.biketas.org.au/homeNorthWest.php) and [www.biketas.org.au/linksTas.php](http://www.biketas.org.au/linksTas.php)

## References

Arb Transport Research, Advancing safety and efficiency in transport through knowledge, *Bicycle and Shared Path Design – Taking into Account Whole of Life Costing*, sourced from [www.arrb.com.au](http://www.arrb.com.au) 12 September 2010

Australian Government, *Cycling: Getting Australia Moving*, January 2008

CRC for Sustainable Resource Processing (CSRP), sourced from [www.csrp.com.au](http://www.csrp.com.au), 12 September 2010

Queensland Department of Transport, Road User Code of Behaviour, [www.tmv.qld.gov.au](http://www.tmv.qld.gov.au)

Rissel *et al.* *International Journal of Behavioural Nutrition and Physical Activity* 2010

Vic Roads, Calculating the Carbon Footprint of Road Construction, 2009 National Local Government Asset Management & Public Works Engineering Conference, 28 April 2009, sourced from the web, 12 September 2010

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