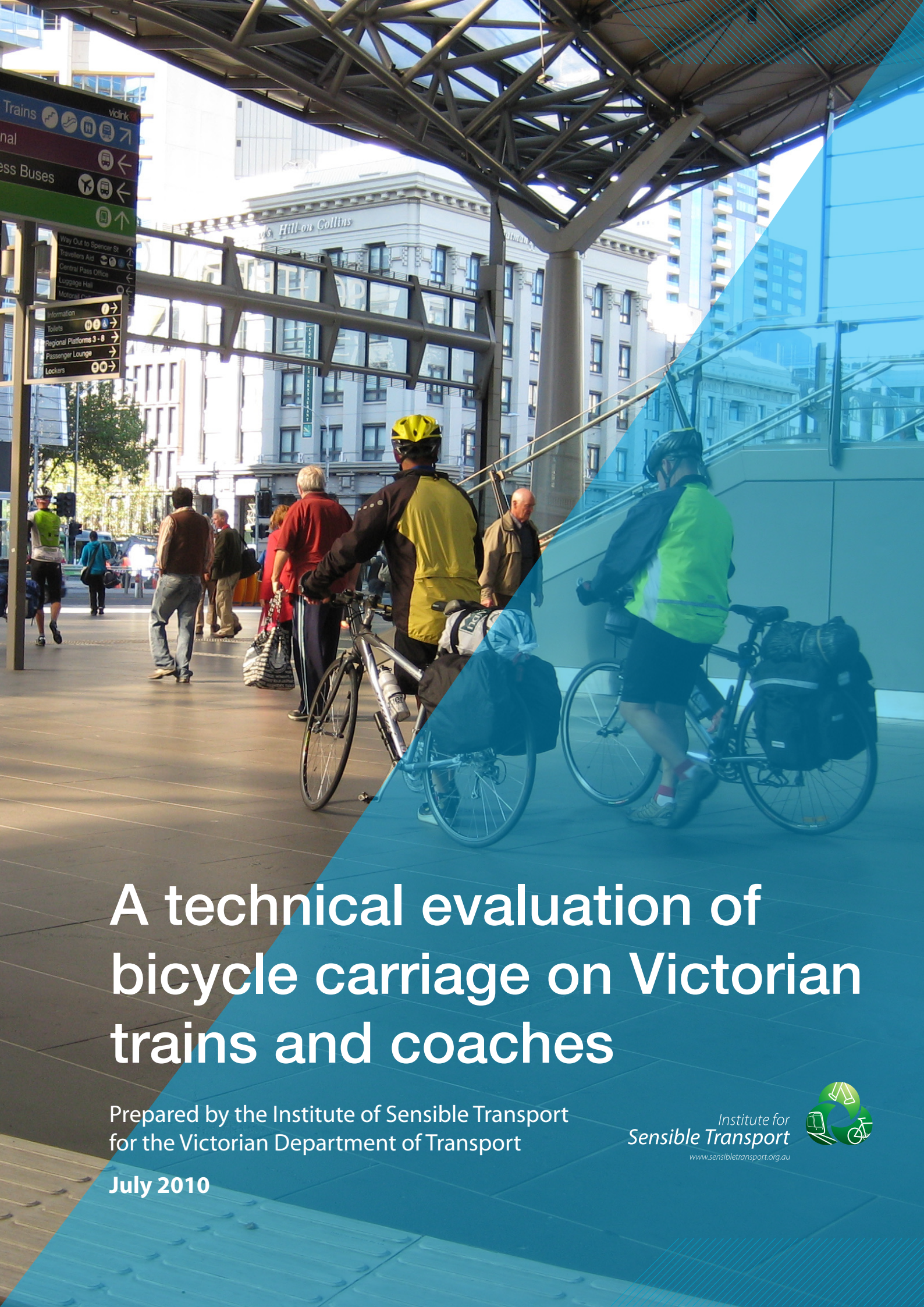


A technical evaluation of bicycle carriage on Victorian trains and coaches

Prepared by the Institute of Sensible Transport
for the Victorian Department of Transport

July 2010

Institute for
Sensible Transport
www.sensibletransport.org.au

About this report

The Institute for Sensible Transport was engaged by the Victorian Department of Transport to conduct a technical evaluation of the carriage of bicycles on regional trains and coaches. This supports the Victorian Cycling Strategy which seeks to increase the combined use of cycling and public transport.

Existing restrictions limit the carriage of bicycles on V/Line trains and prevent bicycles being taken on V/Line coaches. This study investigates practical ways to carry bicycles on regional public transport in Victoria, in order to create a more integrated transport system. Recommendations have been made to support the combination of these sustainable modes of transport, while recognising the requirements of public transport operators and other passengers.

The Institute established the following team to carry out this project:

Project Team

Elliot Fishman
Institute for Sensible Transport
Project Director

Phil Hart
Institute for Sensible Transport
Workshop Facilitator &
Demand Forcasting

Chris Loader
Bus Association of Victoria
Industry Advice & Demand
Forcasting

Phil Sochon
Australasian Railway Association
Industry Advice & Access

Jim Krynan
Public Transport Authority (WA)
Operations Advice

Todd Litman
Victoria
Transport Policy Institute (Canada)
Peer Review & International
Best Practice

Executive Summary

Cycling and regional public transport use has experienced strong growth in recent years. V/Line has seen its third consecutive year of record patronage and Victoria is among the fastest growing regions in the country in terms of cycling participation.

A strategic direction in the Victorian Cycling Strategy is to encourage the integration of cycling with the public transport system. This report seeks to identify current issues and explore options to fulfill this strategic priority. Importantly, this report attempts to strike a balance between meeting the needs of cyclists and the requirements of the operators as well as the needs of other passengers. Ultimately public transport operators will be responsible for implementing many of the recommendations and it is therefore necessary to propose workable, practical solutions.

V/Line currently allows bicycles on its train services, subject to available space. Recent increases in demand have resulted in a small proportion of passengers unable to make their intended journey due to lack of space. Bicycles are not allowed on V/Line coaches, with the exception of folding bicycles, although a small number of operators continue to take passengers with standard bicycles, particularly in bicycle tourism regions such as Wangaratta.

Regulations in other parts of Australia vary widely, but in general, bicycles can be taken on board trains, although similar space restrictions apply. Coach services in other parts of Australia generally accept bicycles although a fee is often charged and it may be necessary to dismantle the bicycle.

Internationally, regulations demonstrate considerable variation, even within the same state. The US, which offers a comparable transport context to Australia, allows bicycles on most coach services. Regional train services generally take bicycles in the US and this is also the case in the UK.

Two stakeholder workshops were conducted as part of this project, one in regional Victoria and the other in central Melbourne. The workshops provided an opportunity for public transport operators, cycling groups and tourism agencies as well as local and state government staff to discuss the current issues and explore possible solutions to the carriage of bicycles on public transport. Both workshops revealed similar issues for integrating cycling with public transport, including the need for a booking system, more space on trains and the inability to take a bike on Victorian coaches.

An online survey was used to gauge the views of the Victorian cycling community and received over 1000 responses from Bicycle Victoria members as well as over 900 completed surveys from other cycling groups. A separate survey was carried out to better understand the views of the general community on combining cycling with public transport and received 300 completed surveys. Most cyclists surveyed use V/Line in combination with their bicycle once or twice a year, usually for recreation.

When asked what could be done to improve the integration of cycling with regional public transport, most respondents in both the cyclists' and general community survey highlighted improvements to the cycling network, more room for bikes on trains, a booking system and the ability to carry a bicycle on board a coach. Moreover, the demand for group bicycle travel on regional public transport and the desire for certainty emerged as key issues for cyclists.

In order to better accommodate passengers wishing to use V/Line in combination with a bicycle, a series of demand forecasting activities were undertaken. Current demand for bicycle carriage on V/Line trains was estimated to be 0.9% of total passengers. In the most optimistic scenario, in which the majority of recommendations are implemented, 3% of train passengers and 2% of coach passengers could be expected to board with a bicycle in 2020.

Key recommendations

- Establish a public transport bicycle advisory committee; to improve the level of coordination between relevant agencies regarding the planning and implementation of initiatives designed to integrate cycling with public transport.

- Introduce an optional booking system for the carriage of bicycles on V/Line services. This is standard practice internationally and addresses a key concern of stakeholders regarding the lack of certainty that currently exists when attempting to board a V/Line train with a bicycle.

- Improve the data collection regime on vital statistics regarding the integration of cycling with public transport. This evaluation found a lack of information to optimally plan for the current and future needs of passengers wishing to travel with their bicycle.

- Vertically store bicycles on trains to improve space efficiency and safety. Vertically storing bicycles is widely accepted internationally as the most space efficient arrangement for the on-board carriage of bicycles. Moreover it assists in the management of a booking system by creating a relatively defined number of storage places for bicycles. Finally, racks reduce the likelihood of bicycles inadvertently moving during transit, which creates a risk to property and personal safety.

- Provide bicycle trailers capable of carrying large numbers of bicycles to better connect Melbourne with rail trails and other popular recreational cycling locations. Public transport operators and cycling groups both expressed an increasing demand from groups to travel on public transport with their bicycle. Expanding the successful trial conducted by Bicycle Victoria to carry large numbers of bicycles on trailers will assist in meeting current and future demand, as well as reduce capacity issues on the train system.

- Accelerate and expand the roll out of Parkiteer high security bicycle parking cages, including at Southern Cross station. This will discourage commuters in particular from carrying bicycles on board trains and create an opportunity for regular passengers to keep a second bicycle at their destination station. This will assist in the integration of cycling with public transport without adding further burden on public transport services. Such an arrangement is commonplace in a number of countries that have the highest levels of integration between the bicycle and public transport system.

- Connect train stations to surrounding areas with high quality bicycle paths and on-road bicycle lanes. Stakeholders, as well as the international literature consider the bicycle network's connection with transport hubs as a prerequisite to successful integration.

The implementation of these recommendations may result in an estimated 30,000 coach journeys with a bicycle on board and over 560,000 bicycle passengers on V/Line trains by 2020. These levels would be in line with good practice at comparable international locations and would meet the goals of the Victorian Cycling Strategy: to support healthy, sustainable transport modes of transport and integrate cycling with the public transport system.

Contents

1. Introduction

Bicycle use is growing, with Victorians increasing their cycling participation faster than most other Australian states (Cycling Promotion Fund, 2008). In Melbourne, census figures show that cycling to work rose by over 40% between 2001 and 2006 (Australian Bureau of Statistics, 2007). Trips by bicycle remain approximately equal in proportional terms between Metropolitan Melbourne and regional Victoria (Department of Transport, 2009).

This increase in cycling activity coincides with substantial growth in regional public transport patronage. V/Line train use grew 9.5% to 12 million trips in 2008-09 (V/Line, 2009). This was the third consecutive year of record patronage. Coach travel has also experienced strong growth, with a 17.6% increase to 1.12 million passenger trips in 2008-09 (V/Line, 2009).

The growth of both bicycle and public transport travel in regional areas has lead to increasing demand for bicycle/public transport integration in the form of bicycle parking at transport hubs and carrying bicycles on public transport vehicles. This demand sometimes exceeds current capacity causing frustration for passengers and public transport staff. With further growth in public transport and cycling travel, these problems are likely to increase unless transit systems respond. In response, the Victorian Department of Transport commissioned this report to provide a technical evaluation of:

- Current demand for the carriage of bicycles on V/Line trains and coaches, including variations that exist relating to season and time of day.
- Differences in demand across regional public transport corridors should improvements be made relating to the carriage of bicycles.
- Specific initiatives to improve opportunities for the carriage of bicycles on regional public transport.
- Alternatives to the carriage of bicycles on public transport vehicles, such as improved bicycle parking opportunities and bicycle rental at train stations.

2. The benefits of integrating cycling with public transport

Integrating cycling with public transport can provide several benefits, many of which are particularly suited to a regional Victorian context where distances from public transport corridors are often beyond a comfortable walking distance. The benefits of integrating cycling with public transport can be summarised as follows (Federal Transit Administration, 2005):

- Expands the catchment area of public transport routes;
- Increases mobility opportunities for passengers at the start and end of their journey;
- Increases public transport patronage and reduces excessive car use; and
- Encourages cycling by offering an option to avoid poor weather, fatigue, unsafe routes, riding after dark, etc. (when bicycles are allowed on board).

Bicycling and public transit are complementary modes: cycling is most effective for moderate-distance (0.5 to 5 kilometre) trips on local streets within a neighborhood, while public transit is most effective for longer-distance (5 kilometres or more) trips on busy corridors connecting different neighborhoods. Together they can provide a high level of mobility within and across regions. A recent report from the Netherlands explains that the combination "*resolves each others' weaknesses, together forming a strong chain*" (Dutch Ministry of Transport, Public Works and Water Management, 2009).

Cycling has been shown to significantly improve personal and population health, reduce transport expenditure and increase the liveability of urban and regional areas (World Health Organisation, 2000; Bauman, 2008; Cycling Promotion Fund, 2008)

3. What's happening in Victoria, Australia and internationally?

Considerable variation exists between different jurisdictions regarding regulations for the carriage of bicycles on public transport. These differences reflect a combination of historical legacy (past practices), constraints and opportunities presented by the current public transport system, as well as cycle culture and policy context. For various reasons, the carriage of bicycles on public transport is sometimes restricted or prohibited, particularly during peak periods. Some authorities have implemented measures to carry bicycles in a manner that minimises the use of valuable carriage space and several jurisdictions have introduced booking and fee systems to better manage demand for the carriage of bicycles on their services.

This section begins by identifying the current regulatory policies regarding the carriage of bicycles on V/Line trains and coaches (see *Appendix 1* for a full description from the Victorian Fares and Ticketing Manual). A description of the current situation in other Australian states and territories is provided, followed by a snapshot of various international jurisdictions of relevance to Victoria.

3.1 Carrying bicycles on public transport in regional Victoria

The carriage of bicycles on regional trains and coaches has varied considerably in Victoria over the last two decades. The box below identifies the current regulatory context regarding the carriage of bicycles on regional public transport.

Trains

A limited number of bicycles can be carried on V/Line trains – depending on the type of train and space demands from other passengers. In general locomotive hauled trains have a larger potential capacity to carry bicycles than newer, Vlocity trains.

Train type	Bicycle spaces (approx.)
Six car Vlocity units	6
Three car Vlocity units	4
Two car Vlocity units	2
ACN cars	4
Short BCH cars	2
Long BCH cars	2
Sprinter	2

Source: V/Line

NB: When available, "D Vans" can accommodate larger numbers of bicycles (est. 30 – 40 bicycles) and can travel during school holidays and for special events. They may be booked for large numbers of cyclists on selected routes. N sets are mainly for long distance runs like Warrnambool, Swan Hill, Bairnsdale, Albury & Shepparton. See Appendix 7 for further V/Line fleet information.

Recent demand for combining cycling with regional train travel has in some cases exceeded available space, preventing passengers from making their planned journey.

There is currently no system to book a place for bicycles and this creates uncertainty for passengers.

Coaches

Bicycles are officially not allowed on V/Line coaches, however some drivers allow bikes onto coaches in some areas. An exception to this can occur for train replacement services, when bicycles can be carried in limited numbers and subject to driver discretion. Folding bicycles can be taken on all V/Line coaches, provided they do not exceed the following dimensions: 82cm long X 69cm high X 39cm wide. Additionally, wheel rims cannot be more than 51cm in diameter and the folded bicycle must be in a bag or cover before boarding (Victorian Fares and Ticketing Manual, 2009).

Source: Victorian Fares and Ticketing Manual, 2009. For additional information see Appendix 1.

A bicycle stored in the designated area of a BCH V/Line train.
Photo: Institute for Sensible Transport

Bicycles stored in the designated area of a V/Line Vlocity train.
Photo: Institute for Sensible Transport

Bicycles stored in a high security Parkiteer cage operated by Bicycle Victoria. These cages are located at both metropolitan and regional stations.
Photo: Institute for Sensible Transport

3.2 Carrying bicycles on public transport in other Australian states/territories

The carriage of bicycles on public transport services in other states and territories varies widely. Metropolitan peak hour services often restrict bicycles travelling in the peak direction. Most regional services carry bicycles although some require bikes to be dismantled and boxed. The following table identifies the regulations in other states and territories regarding the carriage of bicycles on public transport.

State	Regional trains	Regional coaches
South Australia	No passenger services, other than those provided by the Overland, Indian Pacific and Ghan (see Northern Territory section for further details).	Bicycles are generally able to be taken on all regional coaches, for a fee (with the exception of the Kangaroo Island SeaLink coach, which do not charge).
Western Australia	Bicycles can be carried on regional trains in WA subject to space constraints. Some train sets have purpose built racks, with plans to extend this to other services. Bicycles can travel on Transperth trains at all times with the exception of peak periods (7am - 9am and 4.30pm - 6.30pm Monday to Friday) when travelling in peak direction. Fold-up bicycles, when bagged, can be taken on all Transperth trains, buses, Transwa coaches.	Bicycles can be taken on Transwa coaches for a $10 fee. At least two bicycles can be carried on each coach. Bookings are encouraged for larger groups.
Tasmania	No passenger services.	TassieLink coaches are able to carry at least two bicycles on each service. It is requested the front wheel be removed. A fee of $10 is charged and can be booked in advance. Bicycles are usually stored in the luggage bins, but on smaller coaches, racks on the rear of the vehicle are often fitted. Redline coaches have a similar arrangement to TassieLink, with a fee of $15 per bicycle.
New South Wales	Bicycles can be taken on CountryLink train services, although space restrictions apply and it is suggested they be booked when reserving a ticket. Bicycles must be disassembled and boxed and passengers are asked to arrive one hour before scheduled departure. A fee of $12.10 applies. For more information, visit: www.countrylink.info/travelling_with_us/luggage#luggage_bicycle	CountryLink coaches have space for one bicycle. Bicycles must be disassembled and boxed. A fee of $12.10 is charged.

QLD	Regulations for the carriage of bicycles on Queensland rail services vary across the state: Citytrain Connects Brisbane with surrounding cities and towns in south east Queensland. Bicycles can be carried on Citytrain services, with the exception of the following times: 7:00am – 9:30am for CBD bound services 3:00pm – 6:30pm away from the CBD Fold-up bicycles are allowed at anytime, provided it is in a bag and within the following dimensions: 79cm X 59cm X 36cm. Traveltrain Connects major Queensland centres. Bicycles are able to be carried on trains as checked luggage – with the exception of the Tilt Train service, which have no baggage car and no room within the carriages. The charge for carriage of a bicycle on the Traveltrain service is 20% of the adult fare. Bicycles must be partially dismantled by the passenger prior to boarding.	TransLink buses, operating in south east Queensland no longer take bicycles, although no written policies were available at the time of publication.
ACT	Refer to NSW.	Although not a regional provider, ACTION Buses have bicycle racks fitted on the front of vehicles on certain routes and are capable of carrying two bicycles. For more information, see case study or visit: www.action.act.gov.au/bike_n_ride.html
Northern Territory	Great Southern Railways, which operate a service from Adelaide to Darwin carry bicycles ($30 boxed, $40 assembled).	Bicycles cannot be carried on buses travelling in the Darwin area.
Greyhound (Australia-wide)		Greyhound carry bicycles, subject to available space. A disassembled bicycle is charged $25, with an assembled bicycle incurring a fee of $49 per sector travelled. It is possible to book a space for a bicycle before the date of travel. For more information, visit: www.greyhound.com.au/Footer/terms-and-conditions.aspx#05

Case Study: Bicycles on Buses in Canberra (Bike 'n Ride)

Since 2005, ACTION buses have installed bicycle racks on the front of their vehicles, as part of a program known as *Bike 'n Ride*. In December 2007, passengers boarding with a bicycle were able to travel free, as part of the ACT Government's climate change strategy to encourage sustainable transport. In mid-2009, normal fares were introduced – with no additional cost for the use of the bicycle rack.

The Intertown (high frequency) bus route have vehicles equipped with racks and link the four main town centres in Canberra. In addition, all buses on the Redex route 727 are fitted with racks and run every 15 minutes from 7am – 7pm.

In total, 151 buses are fitted with bicycle racks, out of a fleet of 430. By June 30, an additional 54 buses will be fitted with racks and each new bus will have a rack installed, excluding 14.5 metre rigid and articulated buses.

Initially, take up of this service from passengers was slow, but ACTION report a steady increase in patronage, as familiarity with the concept has grown and reliability (all buses on a certain route having a rack) has increased.

By June 2009, ACTION was averaging over 360 passenger boardings per weekday.

Since the beginning of the program, ACTION report no incidents occurring as a result of the racks.

Each rack costs $1,200, plus 4 – 5 hours installation time, which is done in-house. An exemption from certain provisions of the Australian Design Rules as part of the Road Transport Regulation 2000 was granted by the ACT Department of Territory and Municipal Services and a special permit issued to allow the use of the bicycle racks.

A bicycle being loaded on a bus in Canberra. Photo: G. Browne

3.3 Carrying bicycles on public transport - an international snapshot

On an international level, regulations vary widely regarding the carriage of bicycles on public transport. In the United States some 71% of buses are fitted with racks capable of carrying between two and three bicycles (Pucher & Buehler, 2009). In Europe buses rarely carry bicycles in this way. Train services generally carry bicycles although considerable variation exists in terms of whether it is necessary to dismantle the bicycle and/or pay a fee. On many European rail services, particularly in Western and Northern Europe, passengers can reserve a place for their bicycle when they purchase a rail ticket. In cities such as Portland, Oregon, it is possible to carry bicycles on light-rail vehicles and in some regions in California, whole carriages are dedicated to carrying bicycles and their riders. The following table provides a snapshot of current regulations in various transport systems from abroad[1].

Jurisdiction	Regional trains	Regional coaches
New Zealand	Tranz Scenic Train Services Bicycles are charged at a rate of $10 per train service and are limited to one per passenger. Bookings are recommended, as space is limited on all services and transport of bicycles are only guaranteed with a booking. Removal of pedals, folding of handlebars, covering of chains and all sharp edges may be requested. For more information, visit: www.tranzscenic.co.nz/general.aspx	Bicycles can be carried on InterCity Coachlines throughout New Zealand, subject to space, at a charge of $10. Bicycles must be partially dismantled. For more information, visit: www.intercity.co.nz/info/
California (US)	The regulations for the carriage of bicycles on Californian trains varies across the state. Caltrain, operating between San Jose and San Francisco has a designated bicycle carriage, capable of carrying between 40 – 48 bicycles. It is estimated that around 3000 bicycles travel on this service per day (San Mateo County Transportation Authority, 2010) For more information on the Caltrain service, visit: www.caltrain.com/info_bicycles.html The Santa Clara Valley Transportation Authority (VTA) operates one of the most successful examples of integrating bicycles with public transport in North America – with 5% of light rail passengers and 2% of bus passengers carrying a bicycle. Information on its services and policies can be viewed at: www.vta.org/schedules/bikeways_on_vta.html#bikes_on_buses Amtrak California operate a range of rail and coach services throughout the state and bicycles are generally allowed on these services. For more information on Amtrak California's bicycle policy, visit: http://amtrakcalifornia.com/rail/go/amtrak/all_aboard/bicycles/index.cfm	Most transit buses/coaches in California have the capacity to carry between two and three bicycles.
Portland (OR, US)	TriMet, the public transport operator in the Portland region allows bicycles on all of its light rail services. Each service is capable of carrying four bicycles, although at peak times it may not always be possible to accommodate bicycles in all four designated spaces. For more information, visit: http://trimet.org/howtoride/bikes/index.htm	Every public bus in Portland has a rack capable of carrying two bicycles. For more information, visit: http://trimet.org/howtoride/bikes/bikesonbuses.htm

1. For more information on integrating bicycling with public transport in the United States, visit: www.bikemap.com/bikesontransit/index.php
For more information on international examples of integrating bicycling with public transport, visit:
www.cyclingresourcecentre.org.au/14/Bicycles_Public_Transport
See *Appendix 9* for an illustration of the dimensions required to vertically store a bicycle

Amtrak national services (US)	Amtrak provides passenger rail services between US cities. Bicycles can generally be carried on Amtrak services, although specific regulations vary depending on the particular service. For more information, visit: www.amtrak.com/servlet/ContentServer?c=AM_Content_C&pagename=am/Layout&cid=1241267294303	
Vancouver (CANADA)	Bicycles can be carried on the SkyTrain, with the exception of peak hour (and peak direction). Older SkyTrain carriages lacked any specific bicycle carrying configurations, but new carriages will be fitted with a purpose built area to accommodate bicycles. Bicycles can be carried on the West Coast Express trains for a small fee (Pucher & Buehler, 2009).	All buses in Vancouver are equipped with bicycle racks and can be carried free of charge.
United Kingdom	All National Rail services allow the free carriage of bicycles, provided they do not interfere with other passengers. A bicycle place can often be booked when a ticket is purchased. When a replacement bus is used during periods of rail track maintenance, bicycles are unable to be carried. Restrictions apply on some services during peak periods. Folding bicycles can be carried without charge or restriction, although some services require them to be bagged. For more information, visit: www.ctc.org.uk/DesktopDefault.aspx?TabID=3923 On the 28th September 2009, the then UK Transport Secretary, Andrew Adonis launched a £14m funding package focused on improving the integration of cycling with public transport in the UK. This includes: •Developing 10 major 'Cycle Hubs' at train stations, combining secure bicycle parking, bike hire/repair and retail services. These will be open by 2011. •Over 10,000 new cycling parking places. •£4m to assist regional train operators to become bicycle friendly. •£2m to improve bicycle routes to train stations. For more information, visit: http://nds.coi.gov.uk/content/Detail.aspx?ReleaseID=407056&NewsAreaID=2	National Express is the major coach operator in the UK and only permits folding bicycles. For more information, visit: http://help.nationalexpress.com/help/general/bicycle1
The Netherlands	Bicycles can be carried on Dutch trains, but require a ticket and restrictions are in place at peak times on certain sections. Folding bikes can be carried free of charge on all the trains in the Netherlands, with the exception of a small number of services at peak times. An extensive bicycle hire service, operated by the public transport authority is available to rail passengers	

Bicycles on the front of a regional bus – San Jose to Santa Cruz, California.
Photo: Institute for Sensible Transport

A bicycle on the Portland light rail system.
Photo: Institute for Sensible Transport

Bicycle carriage on the train between San Jose and San Francisco. Photo: Institute for Sensible Transport

Outside the Groningen train station in regional Holland. Photo: Institute for Sensible Transport

4. Stakeholder workshops, data collection and analysis

Several information gathering exercises were carried out as part of this study, including stakeholder workshops, online surveys and field observations. A description of the key themes that emerged as a result of the stakeholder consultation workshops are presented below, as well as the major findings from the online surveys.

4.1 Stakeholder consultation workshops

To better understand the issues surrounding the carriage of bicycles on regional public transport, two stakeholder consultation workshops were conducted, one in Castlemaine and the other in central Melbourne. These workshops bought together various stakeholders including bus and train operators, cyclists' representatives, council officers, non-government organisations and government agency representatives.

These workshops allowed participants to discuss their understanding of the current regulations regarding the carriage of bicycles on regional public transport and issues they have identified with these regulations. The final stage of each workshop focused on proposing and developing solutions to better meet the needs of those wishing to integrate cycling with regional public transport, whilst also being cognisant of the needs of operators and other passengers.

A summary of the key issues concerning the current system for the carriage of bicycles on regional public transport, as identified by workshop participants, is outlined below. This is followed by a summary of the solutions that received the strongest support from workshop participants.

Common issues – Train and coach passengers

- No booking system to ensure a bicycle can be carried on a particular V/Line train (uncertainty).
- Unexpected shifts from trains to coaches with little carriage capacity, which can leave passengers unable to carry bicycles (uncertainty).
- Very limited space to carry bicycles on some trains – competing for space with other large luggage needs (e.g., prams, surfboards etc).
- No racking system to store bicycles efficiently within carriages.
- Lack of awareness regarding regulations for the carriage of bicycles on V/Line vehicles.
- Inability to take bicycles on V/Line coaches.
- Lost tourism opportunity for regional Victoria – the return on investment on rail trails is compromised by a public transport system that limits the number of people that can access them.

Common issues – Train and coach operators

- Bicycles can take up a lot of room in a space-constrained environment.
- Growing demand for public transit travel without comparable increases in transit service makes it increasingly difficult to meet all demands for carrying bicycles and other large items (surfboards, walking aids, prams, etc.) on transit vehicles.
- Difficulty in denying passengers the right to board a train that is too full to carry a bicycle and coach operators' reluctance to prevent a cyclist from boarding a coach.
- Manual handling of bicycles has been recognised as an occupational health and safety (OH&S) issue.
- Inadequate guidance from government as to what they would like providers to do in relation to the carriage of bicycles.

Participants at the Castlemaine stakeholder consultation workshop discuss the issues.
Photo: Institute for Sensible Transport

Participants in the Melbourne stakeholder workshop record their issues with the current regulations on the carriage of bicycles on regional public transport. Photo: Institute for Sensible Transport

Workshop solutions

Train

- More space for bicycles including a better utilisation of D-Vans, particularly for high demand times.
- Improved long and short-term bicycle parking at train stations, especially at high demand stations. This may assist people to use a second bike at their destination station, rather then needing to bring a bike on board.
- Develop and encourage the use of public/share bicycle systems integrated into the public transport system.
- Booking/reservation system should be introduced, even if there was a nominal fee associated with this service.
- Better utilisation of existing space/dual-use space
- Consider bicycle carriage more carefully when ordering new rolling stock.
- Improve provision of information in timetables and on the web regarding the carriage of bicycles.

Coaches

- Introduce a mechanism to carry 2 – 3 bicycles on each coach as standard.
- Re-evaluate the existing ban on the carriage of bicycles on V/Line coaches.
- Introduce a trailer on coaches for popular destinations/long weekends or for train replacement services – capable of carrying a large number of bicycles (ie/ approx. 12 or greater).
- Improved bicycle parking at coach stops
- Consider the provision of low cost bicycle hire at major destinations, such as Southern Cross and key regional destinations

The German railway authority actively encourage passengers to use their bicycle in combination with public transport. Photo: Institute for Sensible Transport

4.2 Online survey of cyclists and general community

To better understand current demand and issues with the carriage of bicycles on regional public transport in Victoria, two online surveys were undertaken, one for cyclists (over 1900 responses) and the other sampling the broader community, using a specialist market research firm (300 responses).

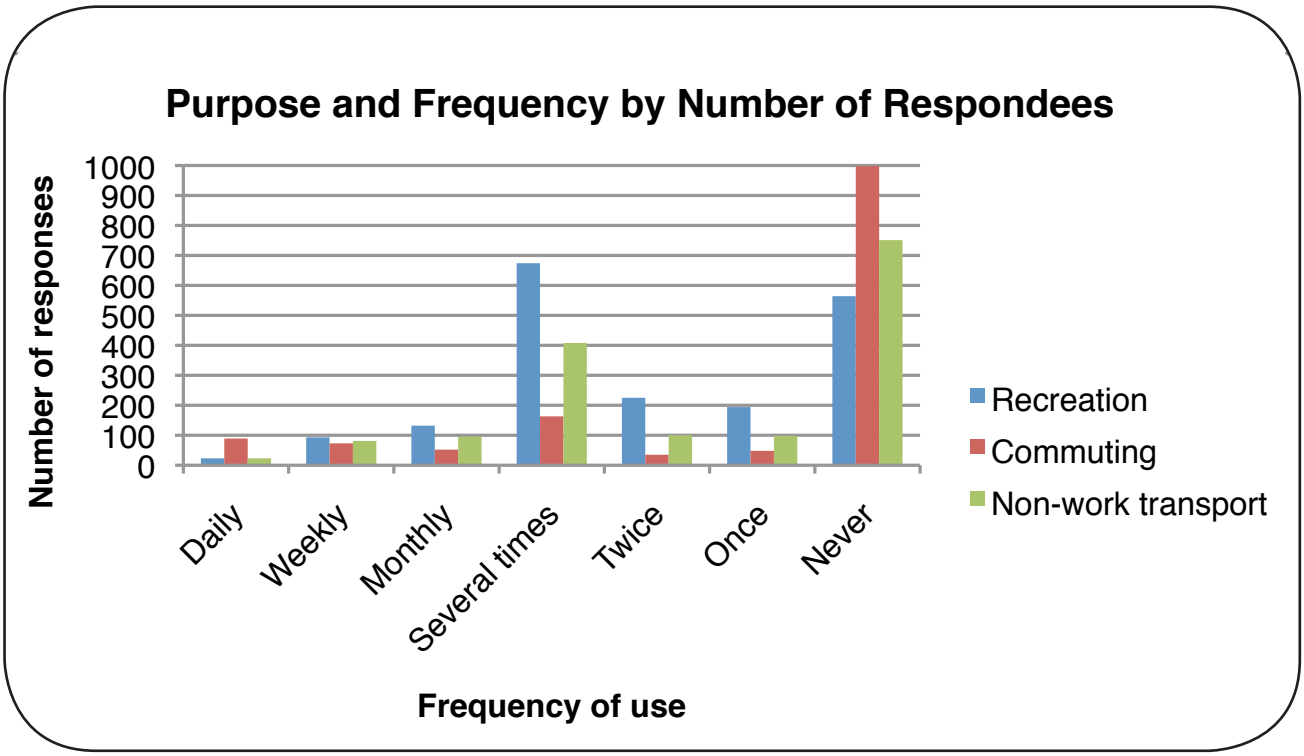
These surveys gauged the current level of regional public transport and bicycle use, the balance between recreational and transport purposes, as well as any differences in demand based on the time of day, week or season. Moreover, the surveys provided an insight into current issues experienced by users of the system, and gave respondents opportunities to express their ideas on how to improve the carriage of bicycles on regional public transport.

The results and analysis of the online surveys are provided below.

4.2.1 Online survey of cyclists

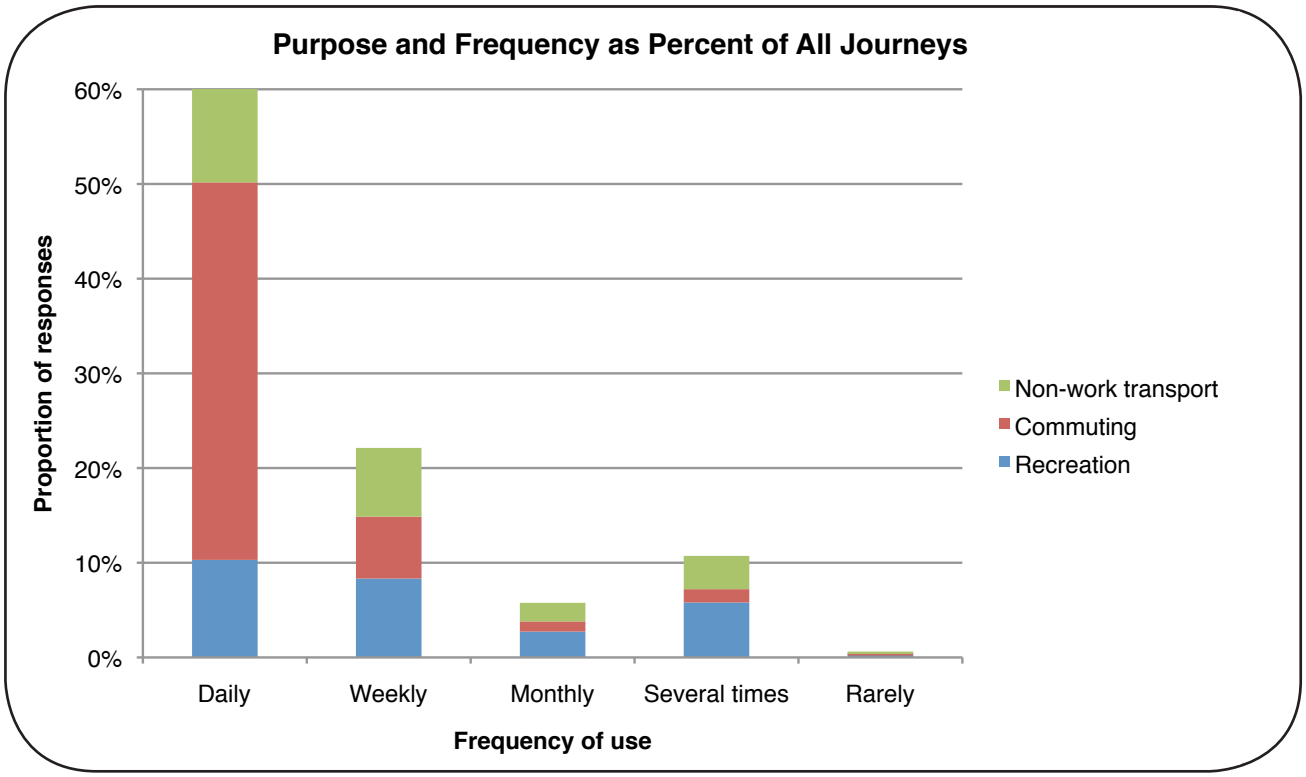
Victorian cyclists were surveyed concerning their use and experience combining cycling with regional public transport. Over 2000 cyclists completed the online survey, including over 1000 from the Bicycle Victoria membership. Most respondents have used a bicycle in combination with a V/Line train service, while around 15% had also used a bicycle in some combination with a coach service (e.g., getting to/from the bus stop).

The graph below illustrates the number of respondents who have used V/Line in combination with their bicycle over the last two years. Most report never using their bicycle with V/Line for commuting and significant numbers have not used V/Line with their bicycle for non-work transport or recreation. Of those that did report using their bicycle with V/Line, several times over the last two years was the most frequent response and this was mainly for recreation, followed by non-work transport.



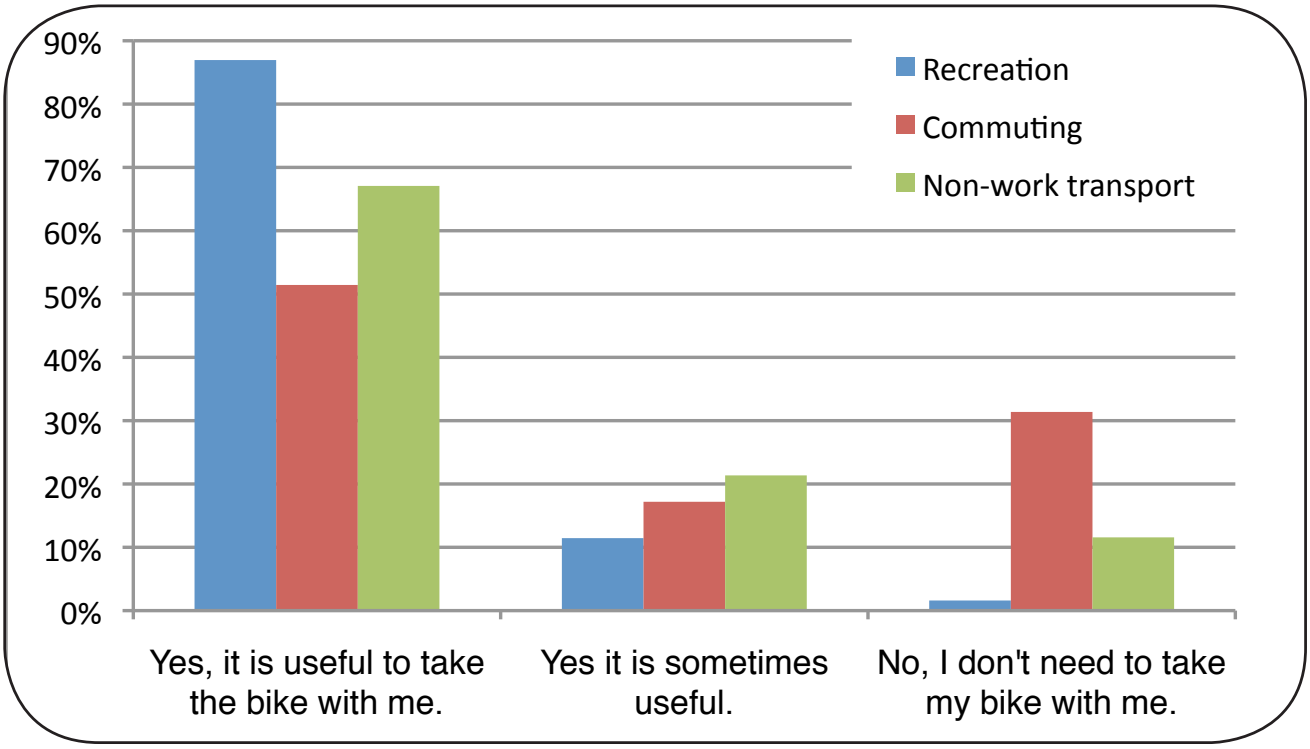
An important distinction needs to be made between the three uses (recreation, commuting and non-work transport). Whilst '*recreation*' is the most common purpose and '*several times*' per year is the most common level of frequency, the number of total journeys included in this scenario is relatively low – as they occur very infrequently. By contrast, few respondents reported using V/Line in combination with their bicycle for commuting, however this use will typically occur five days per week, or around 480 times per year. This distinction is represented in the graph below:

Around 40% of journeys are identified as commuting, whilst recreation and non-work transport account for a further 10% each. Other frequencies and purposes each represent less than 9% of total journeys.



It is important to distinguish between the characteristics of different users. Commuters will generally be predictable making the same, or similar journeys Monday through Friday. Recreational cyclists are more difficult to predict. Recreational cyclists are more likely to travel on weekends, but their numbers can fluctuate, dependent on a range of factors outside V/Line's control, such as weather and regional events. It is not uncommon for large numbers of recreational cyclists to plan on boarding the same service and this can exceed the bicycle carrying capacity of the train, resulting in some passengers being unable to board. The options and recommendations discussed in this report address the different needs of various types of trip purposes.

Of key importance to the policy maker and transport operator alike, recreational cyclists in almost all instances require their bicycle at the other end of their journey, whereas commuting cyclists are more likely to be relatively flexible as to whether a bicycle journey is necessary from their destination station. The results from the survey that illustrate this tendency are presented below:

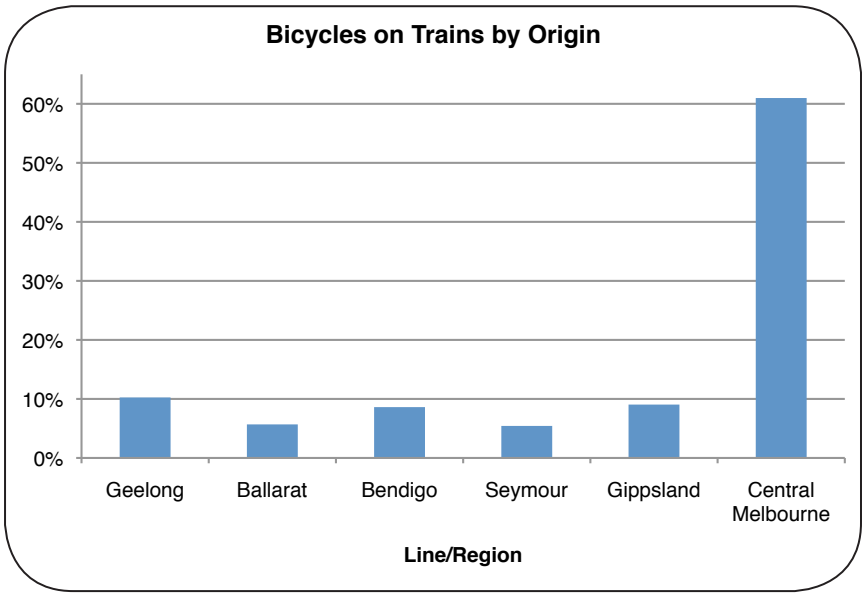


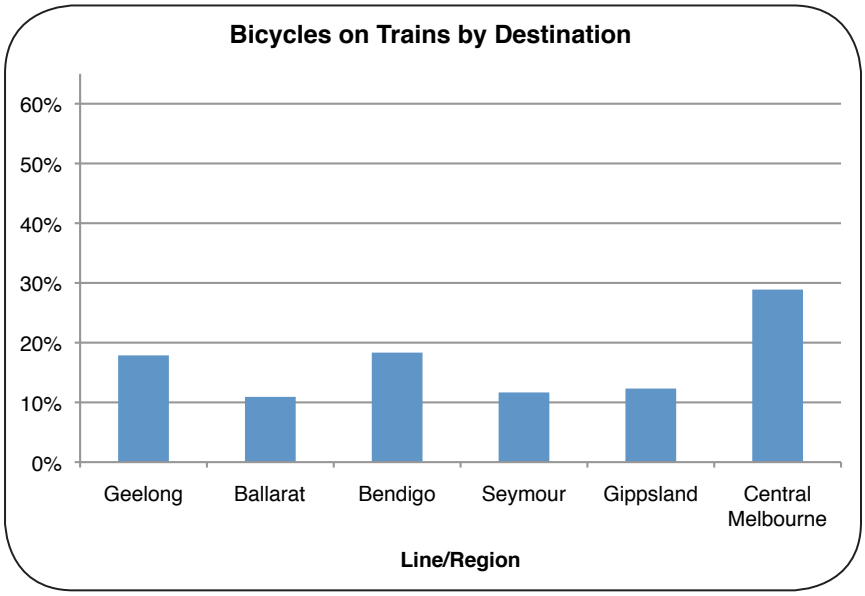
Almost all respondents who currently carry their bicycle on board V/Line trains indicated that they need their bicycle at the other end of their train trip (see *Appendix 8*). The related reason of needing to '*cover greater distance*' was the second most frequent preference, accounting for slightly fewer than 40% of responses. A little over 20% of people reported security concerns for parked bicycles as a reason for boarding the train with their bike. As a whole, these answers suggest that it will be difficult to avoid the requirement for many current cyclists to carry their bicycle on board, without significantly increasing the ease of accessing a hire scheme or a securely parked second bicycle.

Some two thirds of respondents who ride their bicycle to a V/Line station but do not take it on the train state that they do so because it is too difficult to bring it on board. This is consistent with the views of those at the stakeholder consultation sessions, who reported occasional problems when trying to board a train with their bicycle and frustrations regarding the inabilty to book a place for their bicycle when purchasing their ticket.

In future research on the integration of cycling and public transport, it may be useful to specifically gauge the views of passengers not carrying bicycles, regarding the level of acceptability for combining these two forms of transport in terms of passenger comfort.

Survey participants were asked about their origin and destination stations and these results have been categorised by line/region, as illustrated below.





Approximately two-thirds of respondents indicated their journey origin is from central Melbourne stations, which include Southern Cross, Footscray, North Melbourne, Flinders Street and Richmond. The majority of these departures are from Southern Cross. For cyclists starting their journey in regional areas, more are using the Geelong, Bendigo and Gippsland lines than the Ballarat and Seymour lines (although these answers may have been affected by ongoing works on the Seymour line). The Ballarat line only operates Vlocity trains, which have a more limited capacity to carry bicycles and this might explain lower usage on this line. The graphs also show demand is driven by Melbourne, either as an origin or destination.

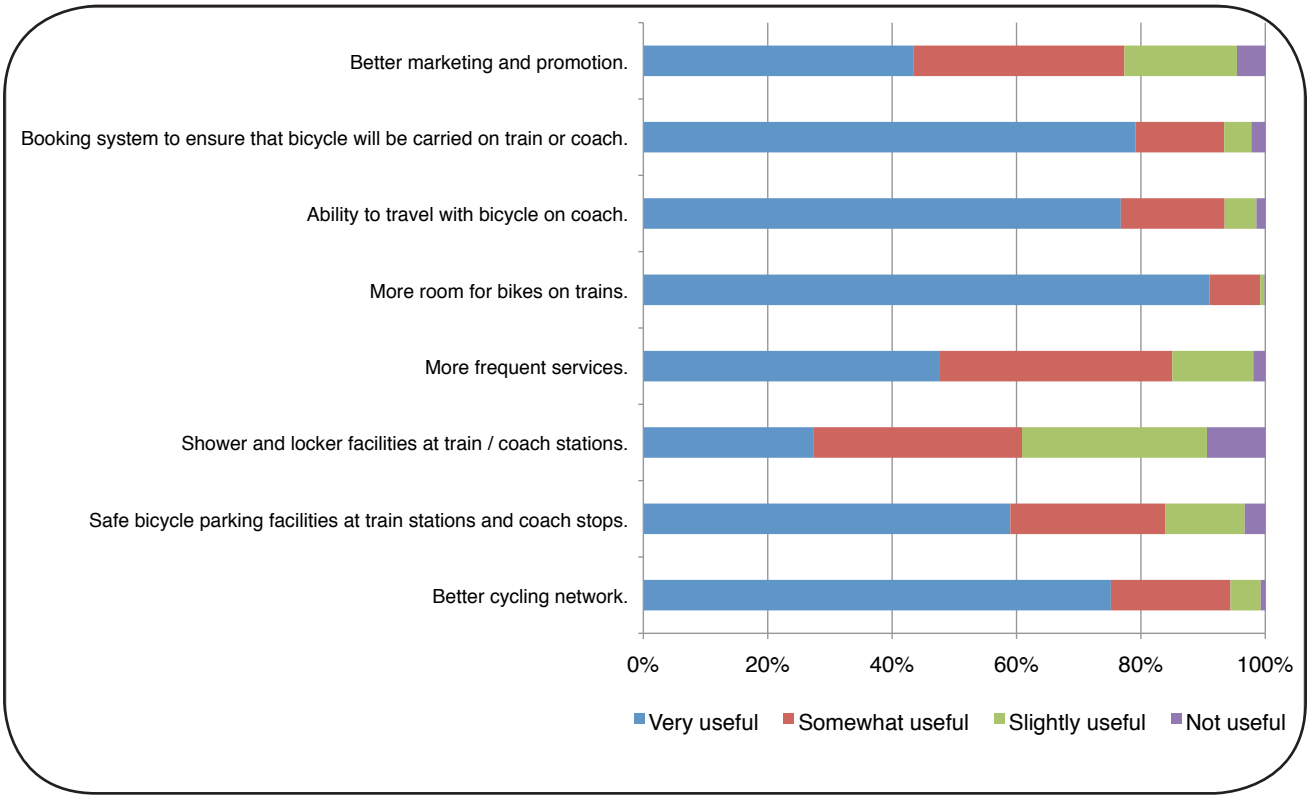
Of the survey participants who do not use their bicycle in combination with regional public transport, over 90% stated that they would, if it was made easier.

Over 75% of respondents identify that they would occasionally carry their bicycle on V/Line coaches if they were able (either once to several times per year). Only 10% stated they would not be likely to use this service (see *Appendix 8* for further information). This suggests a strong recreational focus for most survey respondents, although as previously mentioned, the number of users might be low for '*commuter*', but the fact that they are likely to use the service hundreds of times per year means the total number of boardings will be substantially greater.

Some 90% of survey respondents said they would travel to regions of Victoria they currently do not visit if they were able to take their bicycle on regional coaches. Based on previously discussed results, the '*yes*' respondents are likely to be infrequent users (once or twice per year), suggesting a strong skew towards recreational purposes and this carries a promise of a boost to regional tourism, as well as implications for service providers. Specifically, the demand is likely to be heaviest at weekends, in regions with good recreational cycling possibilities (e.g. rail trails) and when there is the possibility of large groups travelling together (i.e. > 4).

Suggested improvements from cyclists

As mentioned in the introduction, encouraging the integration of cycling and public transport is one of the five strategic directions in the *Victorian Cycling Strategy*. With this strategic direction in mind, cyclists were asked what they would consider useful improvements to better connect cycling with regional public transport. The results appear below:



Several suggested initiatives to encourage the integration of cycling and public transport were rated very highly by survey participants, with more room for bikes on trains, the introduction of a booking system and the ability to carry bicycles on coaches all rating most highly. An improved bicycle network and secure bicycle parking also received strong support.

Although '*more room for bikes on trains*' was the main response selected as '*very useful*', it is worth noting that due to the strong demand for V/Line services generally, it is unlikely that such room can be found on the already constrained system in the short-term. Retrofitting existing rolling stock, to enable the vertical storage of bicycles is a practical method of increasing carrying capacity to meet the need identified by stakeholders. In the medium term, the procurement of new rolling stock may allow for more creative approaches to the storage of bicycles in a manner that does not reduce service levels for other passengers. This has been successfully achieved in countries with very high demand for train services, such as regional trains in northern Europe.

Suggested improvements with greater short-term applicability include a '*booking system to ensure that bicycles will be carried on train or coach*'. This addresses the central concern users have regarding *certainty*. The implemention of such an initiative is not without its complications, but booking systems for bicycles is commonplace in both the US and Europe.

Seasonal preference

Most respondents expressed no preference in terms of seasonal use, but there is some evidence of lower demand in winter. Long weekends are already and will continue to be times of peak demand. It is important to note that respondents could not answer just two seasons in the on-line survey, so in instances where the preference was summer and autumn for example, the respondent may select '*no preference*'.

The views of V/Line staff and customers

V/Line staff and coach operators made significant contributions at the stakeholder workshops.

An additional attempt to gauge the views and opinions of front line V/Line staff was made, through the use of an online survey. No responses were received. A survey targeting V/Line customers was promoted through a notice placed in the customer newsletter *V/Line Voice*, however too few responses were received to draw meaningful conclusions.

4.2.2 Online survey of general community

The Victorian Cycling Strategy sets out to grow the number of Victorians cycling, including those combining bicycle riding with public transport. For this reason, the views of the general community, the majority of whom can be classified as *non-cyclists* (Australian Sports Commission, 2008), were surveyed. A total of 300 respondents, including half from regional areas, completed the survey regarding their use of V/Line and their views on integrating cycling with regional public transport. It should be noted that this is a disproportionally high number of regional responses, with some 25% of the Victorian population living outside Melbourne. However the focus on non-metropolitan Victoria is considered important, given the study is specially concerned with regional public transport.

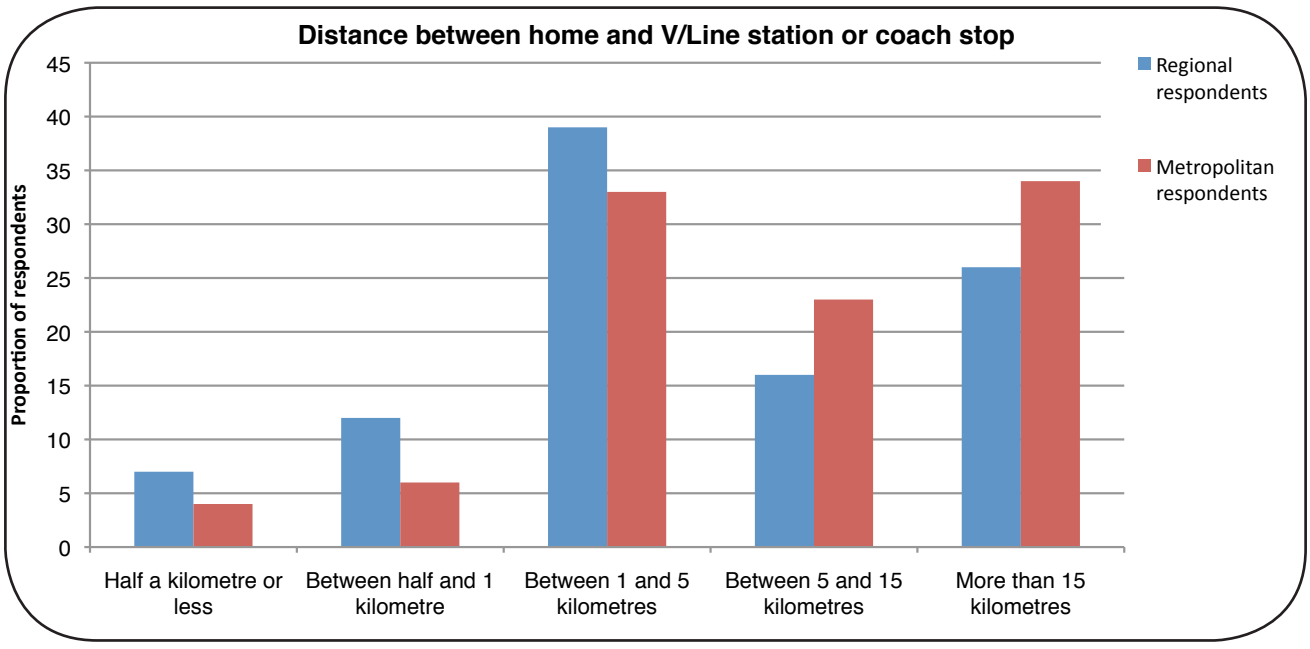
I-View, a specialist market research firm, was engaged to carry out this survey.

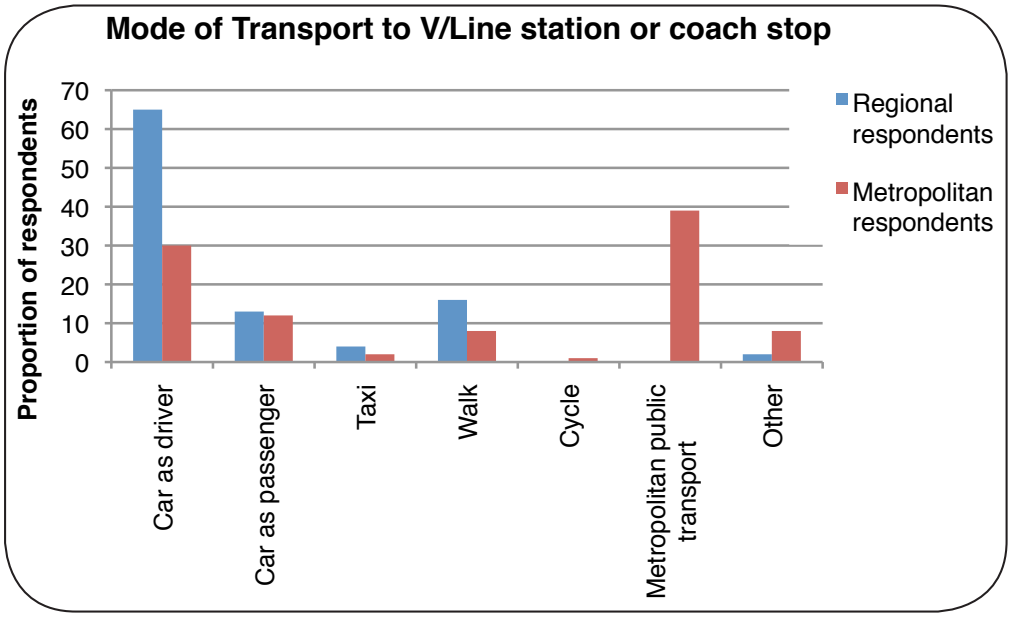
In summary, around 60% of those surveyed reported using V/Line and not surprisingly, significant variation was found between their reported usage and that expressed by the cyclist survey group. Specifically, less than 1% of the general community reported using a bicycle to travel to a V/Line station or coach stop over the last two years.

One quarter indicated that they would combine cycling with regional public transport if it was made easier. Graphs illustrating the results from this general population survey can be found in appendix 8, with a discussion of key findings below.

Of the 300 responses, almost 40% had not used V/Line in the last 24 months while one third travel with V/Line a couple of times per year, suggesting a preference for recreational/social travel rather than commuting. Less than 3% reported using V/Line for commuting.

The two graphs below illustrate the potential cycling offers as a feeder mode to regional public transport. Almost 40% of regional passengers travel between one and five kilometres from their home to their V/Line train station or coach stop, representing a comfortable cycling distance for most of the population, yet such journeys currently represent a negligible proportion of trips. Clearly distance does not represent the barrier to cycling that is often assumed in regional transportation.





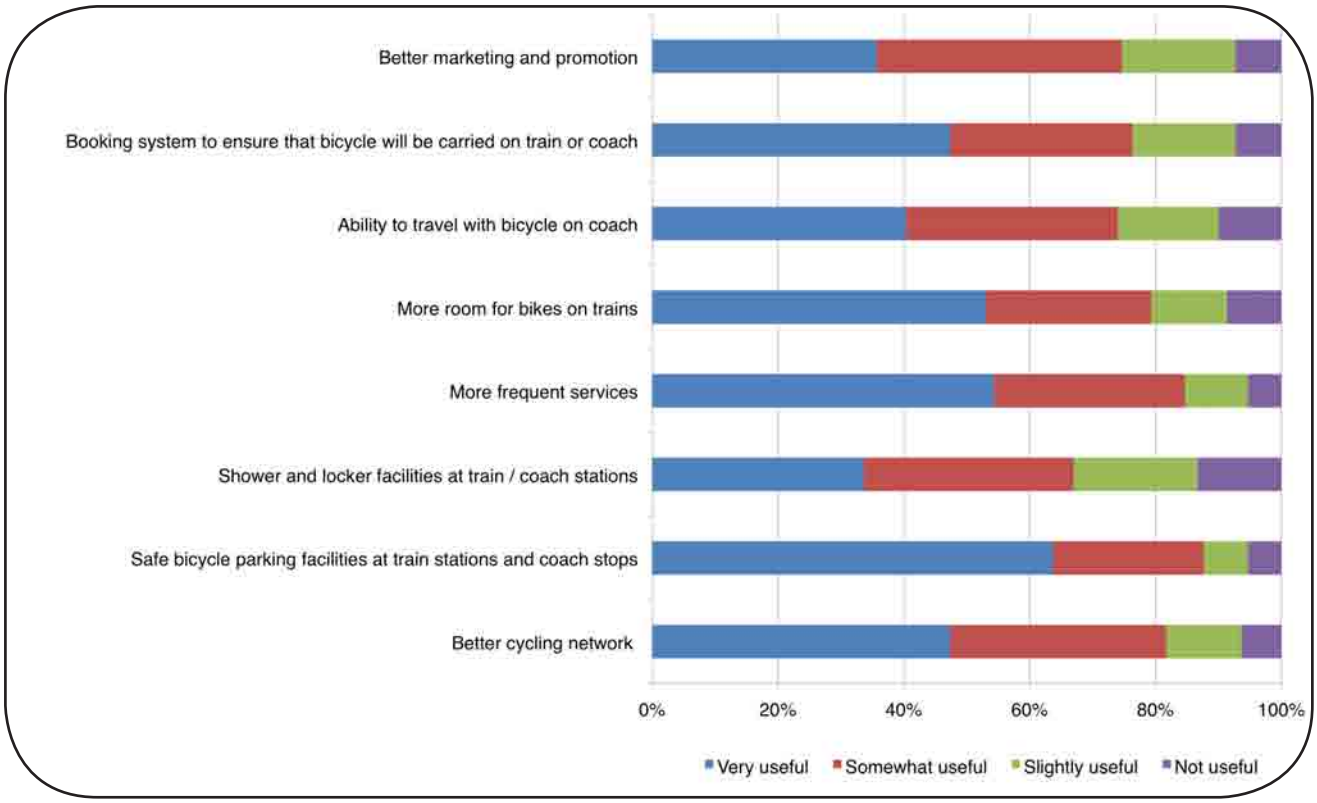
Willingness to consider integrating cycling with V/Line if it was made easier

Just over a quarter of those surveyed agreed that they would use their bicycle with V/Line if it was made easier (albeit with a frequency of just a couple times per year). While this is a surveyed rather than demonstrated response, it still indicates a large number of people who could appreciate and benefit from improved integration of cycling and regional public transport. Regional respondents are more likely to undertake transport-oriented use, while metropolitan respondents are more likely to integrate cycling with V/Line for recreational purposes.

Suggested improvements from the general community

Respondents to the question of '*What improvements they think would be useful in terms of the integration of cycling with the public transport system?*' provided a similar preference to the cyclists survey group, with a few minor differences. Both groups reported more room for bicycles on trains, a booking system and better bicycle parking facilities as very useful. The cyclists group placed slightly higher priority on an improved cycling network. In general, although the pattern of responses were very similar amongst both groups, cyclists usually placed a greater proportion of their responses in the '*very useful*' category, possibly due to greater familiarity with current conditions.

What improvements would make it easier to use a bicycle in combination with regional public transport?



5. Estimating current and forecast demand for the carriage of bicycles on regional public transport

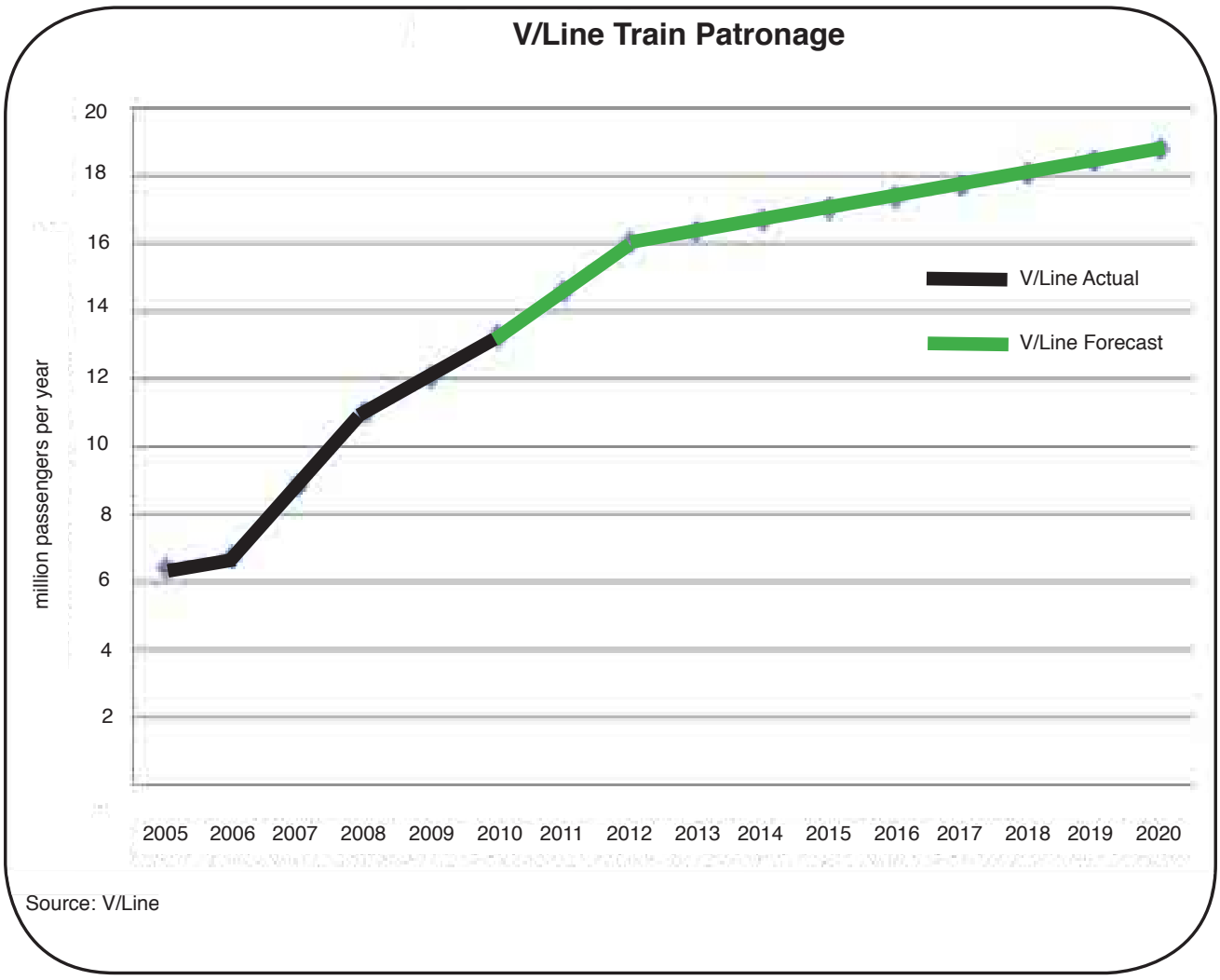
To plan for possible future growth in the number of bicycles carried on regional Victorian trains and coaches, demand-forecasting exercises have been conducted. As there are gaps in the current knowledge base, the best available information has been gathered from a variety of sources to produce a series of estimates based on plausible scenarios.

A key finding from the forecasting exercise was that demand for bicycle carriage on trains would in fact significantly exceed available space should bicycle carrying passengers grow at the same rate as general patronage. This may result in greater levels of uncertainty for cyclists wishing to carry their bicycles on V/Line. This has implications for examining the possibility of retrofitting existing vehicles as well as the design of future trains and coaches.

Our forecasts are broken into 1) V/Line train, 2) V/Line coach and 3) Qualitative forecasting.

5.1 V/Line train quantitative forecasts

Forecasts of passenger numbers have been provided by V/Line. Accordingly, total patronage is assumed to grow at 10% per annum from 2010 – 2013 and 2% per annum from 2014 to 2020.



Source: V/Line

Based primarily on field observations,[2] cyclists with bicycles on board are estimated to make up 0.9% of current 2010 total patronage (~119,000 bicycle passengers per year). In a reference scenario, this percent of total patronage is held constant while total passenger numbers grow as forecast by V/Line. Three alternative scenarios with varying proportion of cyclists reached by 2020 have been developed.

Low Case

This scenario assumes no change to current policies and practices and sees a declining share (as a percentage of total train patronage) of passengers carrying bicycles, due to competing demands for space caused by strong total patronage growth. Cyclists fall to 0.5% of passengers by 2020, dropping from 119,000 per year currently, to 94,000 by 2020.

Reference Case

In this scenario, it is assumed that there are no major changes to current policies and practices, but that the current allocation for bicycles is preserved. The percentage of passengers taking bicycles therefore remains unchanged at 0.9%. This results in modest growth in the total number of bicycles carried on board V/Line trains, in line with general patronage increases. This scenario sees the number of bicycle carried on trains rising from 119,000 in 2010, to 169,000 in 2020.

Mid Case

Continued strong growth in cycling participation in combination with projected V/Line patronage growth sees a more significant increase in the number of people taking bicycles on trains, with cyclists assumed to make up 1.5% of total passengers by 2020 (just over 280,000 bicycle passengers per year). This is still below the rate of bicycle/public transport integration in many comparable countries such as the UK.

High Case

This scenario assumes the implementation of a full suite of initiatives to encourage the integration of cycling with regional public transport, including, but not limited to:

- Improved bicycle routes to train stations
- Improved utilisation of space on current rolling stock, to enable increased capacity for bicycle storage
- New rolling stock to have purpose built bicycle storage areas as well as dual use areas that can store bicycles when needed, but can be used for other purposes where appropriate.
- Bicycle booking system when purchasing train tickets

As a result of these measures, this high case scenario sees the proportion of V/Line passengers carrying a bicycle rise from 0.9% in 2010 to 3% in 2020. This is comparable to levels currently experienced by Virgin Trains in the UK (Virgin Trains Joint Sub Committee, 2002). With such measures in place, total bicycle passenger numbers could be over 560,000 by 2020, compared to 119,000 in 2010.

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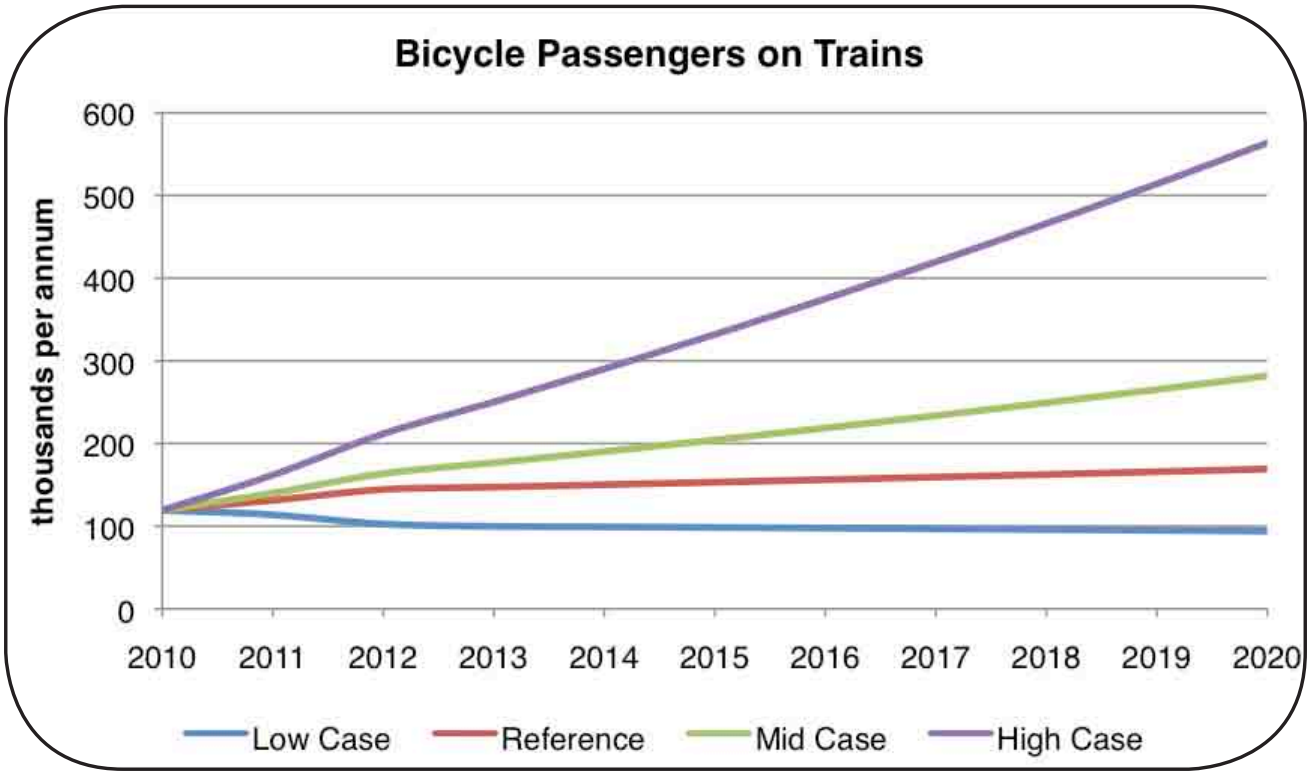
2 Field observation was conducted during a four hour period on both Friday and Saturday morning at Southern Cross station. This involved a count of bicycles boarding and disembarking and comparing this with V/Line records for the number of passengers on this service at the time the count was conducted. Twenty short intercept surveys were conducted with passengers travelling with their bicycle. On the Friday, all passengers reported using their bicycle for commuting and this typically occurred with a frequency of five days per week. On the Saturday, all passengers reported using their bicycle for recreational purposes and frequented V/Line services irregularly. This has obvious implications for service provision

V/Line Train Scenario Summary

		2010	2020	% of passengers with bicycles on board in 2020
	V/Line Trailn Patronage	14,000,000	19,000,000	
Forecast bicycle demand scenarios; 2010 and 2020	Low	119,000	94,000	0.5%
	Reference	119,000	169,000	0.9%
	Medium	119,000	282,000	1.5%
	High	119,000	564,000	3%



Recreational demand, as shown in the survey results, is an important component of bicycle integration with V/Line. A high proportion of people indicated their primary reason for integrating cycling with regional public transport would be for recreational purposes. Catering for recreational demand is in many instances more difficult than for commuting, in that it is irregular and frequently involves larger numbers of passengers than can comfortably be carried with existing levels of bicycle storage on board current rolling stock. Solutions to these issues are discussed in sections 6 and 7.

5.2 V/Line coach quantitative forecasts

Bicycles are currently unable to be carried on board V/Line coaches, with the exception of folding bicycles (see *Appendix 1* for further details). We therefore assume 0% of passengers currently travel with a bicycle as ownership of folding bicycles (and hence demand for carriage) is negligible in terms of total numbers.

Our forecasts are based on survey results, which indicated strong interest in the carriage of bicycles on coaches, as well as international practice in comparable countries and stakeholder consultation.

Reference Case

This scenario assumes no change in policy (see *Appendix 1* for further details) and therefore virtually no people carrying bicycles on V/Line coaches (with the exception of very small numbers of people who may use folding bicycles).

Low Case

This scenario involves a change in policy, similar to the one that existed prior to the adoption of the current policy. This involves bicycles stored in the luggage bins, subject to room and at the discretion of the driver. Projected growth rates see 0.5% of passengers carrying a bicycle by 2020 (or one bike for every four buses carrying 50 people each).

Mid Case

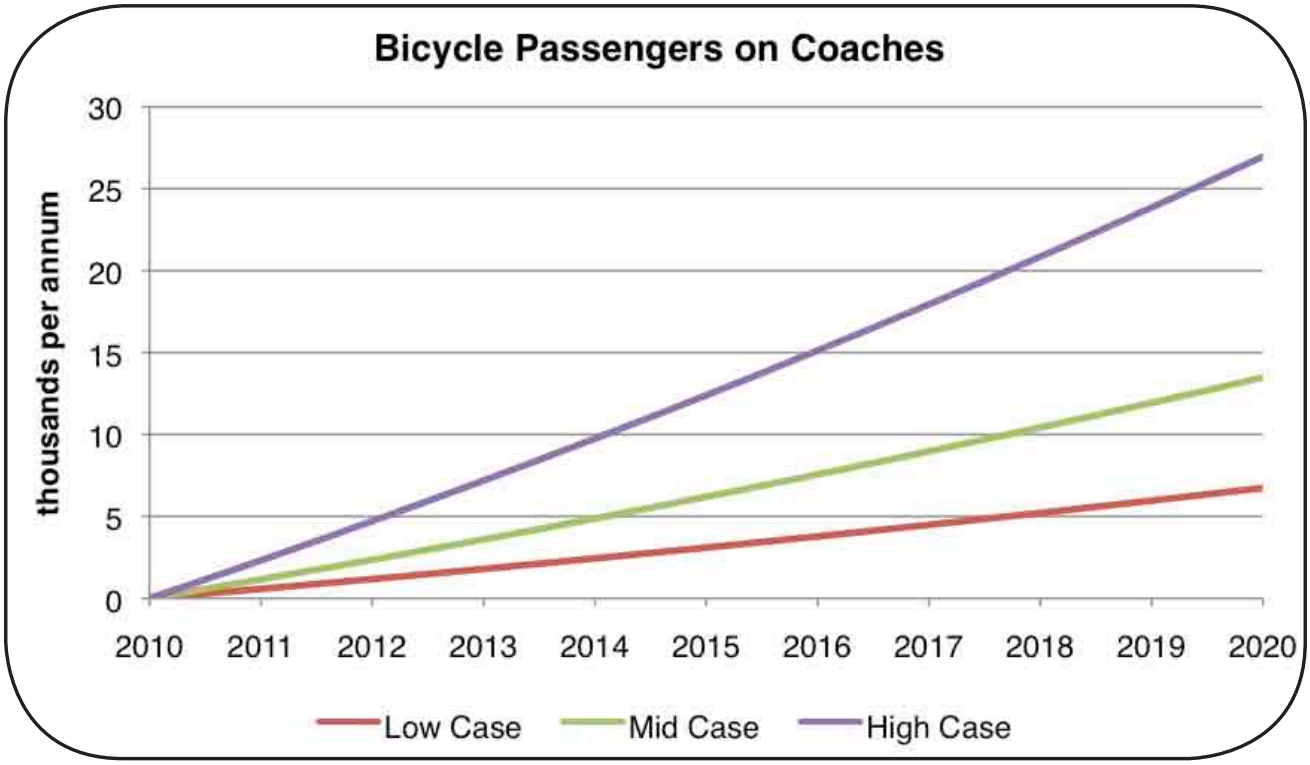
The mid case scenario assumes that buses on a large number of popular coach routes are able to efficiently store two bicycles. As a result, 1% of passengers carry a bicycle by 2020 (or one bike for every two buses carrying 50 people each).

High Case

This scenario assumes that buses on most V/Line coach routes provide storage for at least two bikes. Bicycle trailers able to carry at least 20 bikes are also used to provide larger capacity on popular routes at peak times (e.g., for weekend rail trail rides). As a result, up to 2% of passengers carry a bicycle by 2020 (or one bike on average for each bus carrying 50 people each). This is broadly in line with regions of the US where similar policies have been in place (Pucher & Buehler, 2009).

V/Line Coach Scenario Summary

		2010	2020	% of passengers with bicycles on board in 2020
	V/Line Coach Patronage	1,140,000	1,350,000	
Forecast bicycle demand scenarios; 2010 and 2020	No change in policy	Negligible	Negligible	0.0%
	Low case	Negligible	7,000	0.5%
	Medium	Negligible	13,000	1.0%
	High	Negligible	27,000	2%



The balance between recreational, commuter and non-work transport is likely to be more heavily skewed towards the recreational cyclists for coach use based on feedback provided by coach operators provided during stakeholder consultation. For high demand locations and times, the capacity of a system only designed to carry 2 -3 bicycles may be exceeded frequently, suggesting the use of high capacity bicycle trailers could be an appropriate option for willing coach operators.

5.3 Qualitative forecasts

The quantitative forecasts outlined above provide network-wide estimates for the carriage of bicycles on regional public transport to 2020. The available data was not sufficient to provide precise estimates of demand on individual public transport corridors. The information gathered during this study does allow for a qualitative assessment of future growth on individual corridors and this is provided below.

Top five origin stations in regional Victoria

Our survey of those that use V/Line with their bicycles[3] showed the top five regional stations in terms of arriving with their bicycle are Ballarat, Geelong, Bendigo, South Geelong and Castlemaine. The majority of these passengers are travelling to metropolitan Melbourne as commuters and therefore likely to use the service several times per week, travelling at peak periods.

Origin Station	Passenger/bicycle boarding's
Ballarat	46
Geelong	41
Bendigo	37
South Geelong	34
Castlemaine	29

3. Over 2000 completed surveys were received and 800 people completed this particular question.

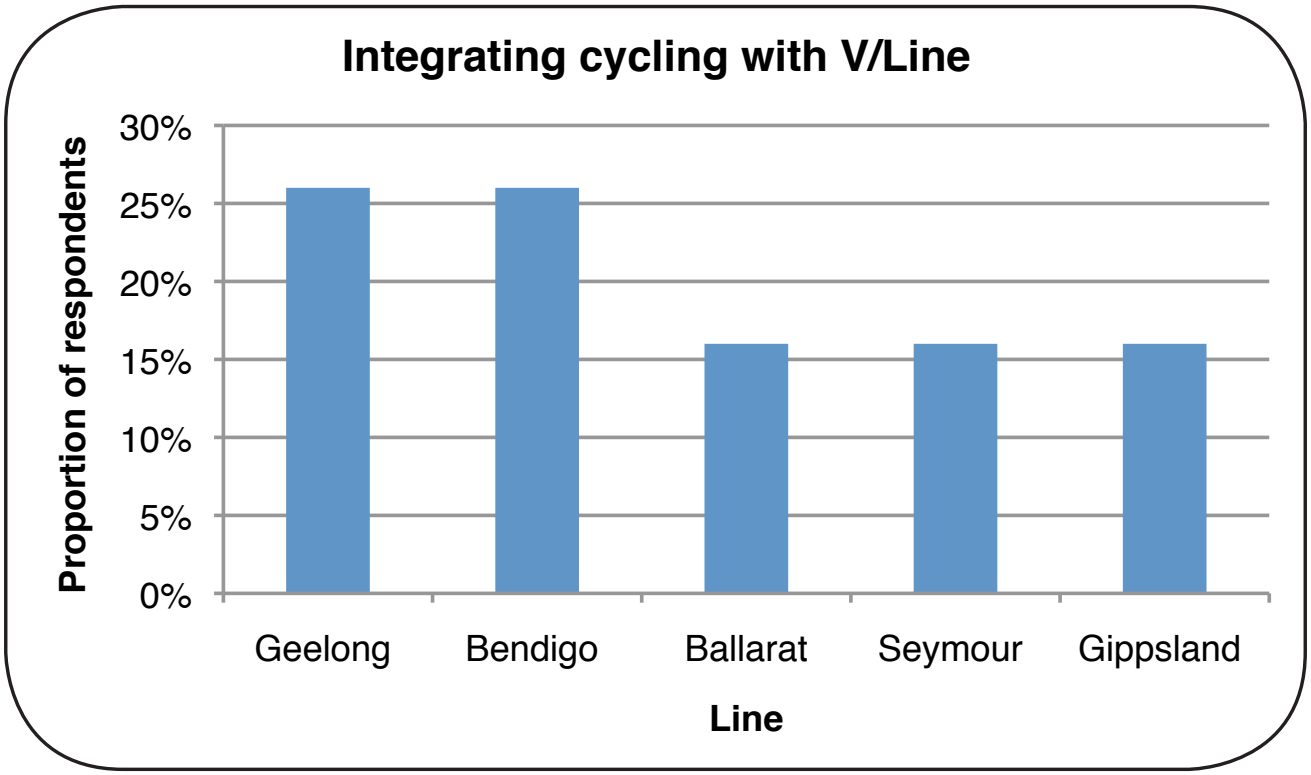
Top five destination stations in regional Victoria

The top five destinations from the survey results were Geelong, Ballarat, Wangaratta, Bendigo and Castlemaine. These users are primarily recreational, using the service infrequently, outside of peak periods, with 'lumpy' demand (large groups wishing to board the same train).

Destination Station	Passenger/bicycle boarding's
Geelong	102
Ballarat	86
Wangaratta	82
Bendigo	64
Castlemaine	64

Top five train lines for cycling integration

When combining information from the above two tables and applying the results to *lines* rather than stations, the lines in the following graph were found to be the most popular for combining cycling with public transport.



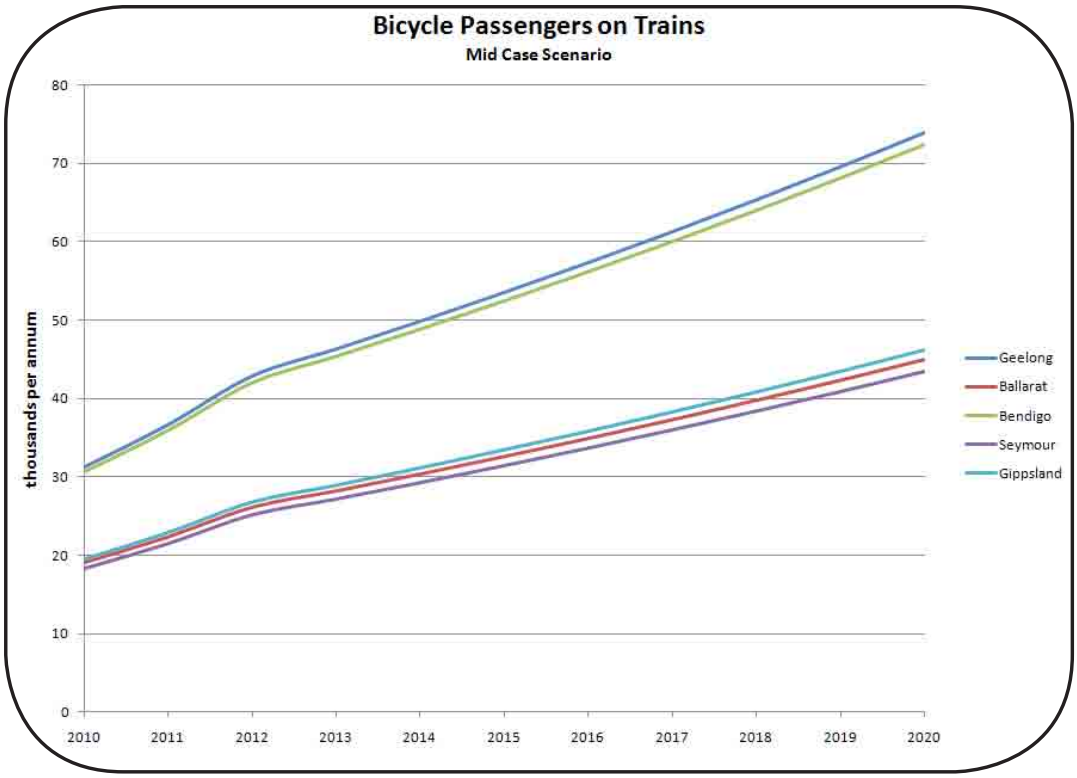
The balance of demand between different train lines is consistent with V/Line general passenger demand (V/Line, 2009), that is, bicycle integrating passengers are a similar proportion of total passengers across the different lines.

The top origin stations provide opportunities to pilot initiatives focused on meeting the needs of commuter cyclists, whilst the top destination stations offer strong prospects for appropriate initiatives catering to recreational cyclists. Commuter growth is likely to occur primarily along the above lines, not beyond the major regional centres of Geelong, Bendigo and Ballarat.

In terms of regional to regional travel, the research team was able to observe that the main user group appeared to be school children travelling a few stops between school and home, with predictable travel times.

Mid Case Forecasts for top five V/Line train lines

With regional population centres growing, Geelong, Bendigo and Ballarat are likely to remain the biggest drivers of demand (see *Appendix 10* for a map of Victorian population centres). Therefore, taking a reasonable assumption that these percentages will not alter significantly in the time period, the total number of cyclists on each line has been estimated for the mid-case scenario in the graph below.



In particular, trips to Wangaratta are driven largely by recreational users of the Murray to the Mountains Rail Trail. Popularity of this route can be expected to continue to grow and it is likely to remain one of the most popular regional rail trails in Victoria. Other popular destinations for rail trail users include Warrnambool and East Gippsland. The newly completed Ballarat-Skipton rail trail as well as others in the planning stages are likely to lead to new demand for the carriage of bicycles on regional public transport.

6. Analysis of results and options development

There are five interrelated, and mutually reinforcing methods of integrating cycling with public transport (Pucher & Buehler, 2009):

- Provide suitable bicycle parking at train stations and coach stops. Such parking should be secure from theft and protected from weather so cyclists can feel comfortable leaving even costly bicycles for extended periods of time.
- Provide opportunities for the carriage of bicycles on coaches. In the US, this usually occurs via external racks on the front of the coach although luggage bin storage and even interior racks are also used.
- Carriage of bicycles inside trains, sometimes in a specific bicycle storage device/rack.
- Established formalised bicycle routes (paths and on-road bicycle lanes) connecting transport hubs with the surrounding catchment area.
- Provide additional end of trip facilities at high demand stations, including opportunities for bicycle servicing, showers, lockers, advice and bike hire.

While these methods largely relate to the facilities and infrastructure required, policies and promotion and the way in which the facilities are managed and operated are also key to successfully integrating cycling and public transport. It should also be noted that the five methods outlined above relate to cycling and public transport integration in general terms. The focus of this evaluation is regional public transport and this tends to favour the need for a bicycle at both ends of a trip.

A large number of ideas have been generated by workshop and survey participants or were identified during research into interstate and international practices. While there are some win-win proposals, in many cases a balance must be found between competing demands for available space and service. This balance is often three-way between passengers with bikes, passengers without bikes, and public transport operators. The table below summarises the main issues and solutions and is followed by a more detailed discussion of the key issues that have been explored during this study.

Issue	Impact Rating				Evidence	Option & Assessment		Recommendations	
	Commuting	Recreation	Non-work Transport	V/Line Staff				Short term - 2013	Medium term - 2020
Available space on trains not always able to meet level of demand	M	H	M	M	V/Line staff, stakeholder workshops, ABS data, field studies, surveys	Increase capacity for bicycle carriage	H	Modify existing storage areas	Include more flexible storage areas in specification of new rolling stock
						Demand management for cyclists commuting daily/weekly via regional public transport		Support integration with bicycle hire schemes	Continue expanding provision of parking facilities
							M	Increase bicycle parking for second bikes at key destinations	
Uncertainty for cyclists as to whether they will be able to travel	L	H	M	M	Stakeholder workshops, surveys	Free booking system	H	Develop and implement a free booking system integrated within V/Line booking/ ticketing systems, particularly targeted at recreational cyclists Monitor and review effectiveness of booking system	Monitor and review effectiveness of booking system
						Paid booking system	M		
						Increase capacity to match peak demand	L		
Inefficient use of existing space on trains makes it awkward for other passengers accessing luggage behind bikes	M	H	H	H	Stakeholder workshops, field studies	Improve existing storage areas	H	Modify existing storage to allow vertical bike storage	Ensure specification of new rolling stock optimises bicycle storage and other passenger requirements
Competing demands for space during a period of strong growth in patronage	H	H	M	H	Transport operators, stakeholder workshops	Clear strategic direction from government	H	Develop high level strategy to provide guidance on managing competing demands	Expand capacity to meet growing demand
No bicycle access on coaches (except folding bikes)	L	H	H	M	Transport operators, stakeholder workshops, field studies, survey	On board storage (e.g. racks, luggage area facilities) to facilitate small number of cyclists using coaches for non-work transport	H	Develop a number of storage options but allow coach operators to select optimum solution to match their conditions	Expand the number of routes with onboard storage so that ultimately the full V/Line network is accessible to cyclists
						Parallel services to support recreational cyclists at peak weekend times	H	Extend trials of bicycle trailers to cover peak recreational routes and times	

No bicycle access on coaches (except folding bikes) con't						Maintain ban on bicycle carriage for all purposes	L	Allow bicycle carriage on coach routes as facilities are implemented	
Manual handling of bicycles is an OHS issue for coach operators	L	L	L	H	Stakeholder workshops, transport operators	Minimise need for staff to handle bicycle	H	Allow coach operators to select optimum storage solution which reduces manual handling issues Monitor effectiveness at reducing manual handling issues	Monitor effectiveness at reducing manual handling issues
Lack of awareness regarding current regulations	L	H	H	H	Stakeholder workshops, surveys	Increase level of information provided and broader promotion	H	Extensively communicate arrangements to cycling community as they are developed	Monitor and review effectiveness of communication and advisory bodie
						Continuous consultation with cyclists	H	Introduce public transport bicycle advisory committee	
Coaches replacing rail services causes additional complications for cyclists	M	H	H	H	Stakeholder workshops	Bicycle trailers used on recreational routes could also be used to support rail replacement coach services	H	Increase number of bicycle trailers and ensure distribution can provide cover to all rail routes when necessary	Review effectiveness of bicycle trailers at supporting rail replacement services
						Continue with current arrangements	N/A		
Limited availability of bicycle paths connecting with regional stations	H	M	H	L	Stakeholder workshops, field studies, surveys	Improve cycling infrastructure and connections with regional public transport stations/ stops	H	Assess current regional cycling network and prioritise regional centres for new cycling infrastructure	Expand cycling infrastructure to further improve connections with regional public transport hubs
Low level of support for cyclists among some staff	M	M	M	M	Stakeholder workshops, field studies	Develop supportive attitudes towards cycling amongst staff	M	Introduce bicycle encouragement program for staff (with employee health and retention benefits)	Reassess attitudes towards cycling and benefits of staff cycling program
Current and future demand for carriage of bicycles not well quantified	M	M	M	M	Transport operators, field studies	Improve data gathering on carriage of bicycles	H	Develop and implement processes to monitor and record number of bicycle carried	Review planned measures to increase capacity against updated estimates of future demand
						Develop more detailed models of future demand for carriage of bicycles for different purposes, with breakdown by route and time of travel	M	Review planned measures to increase capacity against updated estimates of future demand	

6.1 Clearly defined strategic direction to public transport operators

A clear finding from the stakeholder consultations was the need for public transport providers to receive clear direction from the Department regarding the integration of cycling and public transport. This includes V/Line in relation to the carriage of bicycles on rail services and reviewing the status of V/Line coach contracts.

Including specific requirements within service contracts will assist in meeting the level of service standards consistent with the Departments strategic direction for cycling, as articulated in the Victorian Cycling Strategy.

6.2 Booking system for the carriage of bicycles

One of the key frustrations for cyclists is the uncertainty as to whether they will actually be able to board (and remain on) a rail service. This is particularly the case for those planning longer journeys on less frequent services. In many international locations, it is standard practice to allow passengers to book bicycles on regional rail services when they purchase their ticket.

While cyclists would prefer a free booking system, it is also clear that a paid booking system would be preferable to the uncertainty that currently exists. Dialogue between the Department of Transport and V/Line is required to determine whether this service should incur a small fee. Discussion with the Victorian Transport Ticketing Authority will need to determine how the booking of a bicycle will be integrated into the MYKI system.

6.3 Information on travelling with bicycles in large groups

It is clear from the stakeholder consultation and online survey results that problems arise when large groups of cyclists wish to board the same service. In order to better manage such situations, it is necessary to provide a greater level of information, especially through the V/Line, Viclink, Metlink websites for those wishing to travel in groups by bicycle on regional public transport. This may include suggested private operators who can cater for large groups. A link from the V/Line website may help provide the necessary information to help passengers make the best choice regarding their journey with a bicycle.

6.4 Bicycle encouragement program for regional public transport staff

A bicycle program for regional public transport staff could operate in a similar manner to the *Cycle 100* program conducted by the Public Transport Authority in Western Australia (see case study below). Such a program will achieve the twin challenges of improving the higher morbidity levels among staff (Bus Association of Victoria, 2010), as bicycling has been shown to significantly improve health (Bauman et al, 2008) and address negative attitudes to bicycles among some staff, as shown in responses provided during the study.

Case Study Cycle 100

In 2000/01 *Cycle 100* was developed with the objective of providing incentives for public transport staff to replace some of their car trips to work by bicycle, for health and environmental reasons. The trial program involved 100 people (average age 39 years) who lived between 10 to 15 km of their workplace. Participants were provided with a mountain bike equipped with lights, lock, cycle computer and helmet. As a result of the program, participants replaced over 12,000 kilometres of car commuting with cycling. The evaluation of the *Cycle 100* program indicated that participants' physical work capacity improved, and cholesterol and coronary risk ratio decreased (Marshall, 2001).

Photo: Public Transport Authority, Western Australia

6.5 Data collection

Significant gaps currently exist on a number of key issues related to the carriage of bicycles on regional public transport. It is recommended a program of regular data collection activities be undertaken to ensure policy development is as informed as possible.

6.6 Vertically store bicycles on trains

Internationally, it is standard practice to store bicycles vertically when carried within the interior of a public transport vehicle. The benefits include more efficient use of space and less ability for the bicycle to move around whilst in transit (safer).

With the current arrangements, passenger luggage is often made inaccessible if even one bike has been stored after luggage was placed in the area. Vertical storage makes for a much more efficient use of existing space and allows passengers to retrieve luggage at all times without needing to move bicycles first. See *Appendix 9* for information regarding approximate dimensions required for the vertical storage of bicycles.

Locomotive hauled cargo areas could be redesigned to provide a "dual use" racking area – similar to the artists' illustration below. For OH&S reasons, it may be necessary to regulate that passengers are responsible for fitting their bicycle to the rack, as V/Line staff are currently overburdened and this task may exacerbate stress levels.

Artist impression of a bicycle, vertically stored in the bicycle area of a Vlocity train. The benefit of vertical storage is a more efficient use of existing space and reduced chance of bicycle movement while stored.
Artist illustration: Institute for Sensible Transport.

Artist impression of a V/Line luggage area fitted with bicycle racks: Vertically storing bicycles in appropriate areas of locomotive hauled trains would use space more efficiently and reduces the safety risk posed by unsecured bicycles. Artist impression: Institute for Sensible Transport.

Opportunities exist to vertically store bicycles in Vlocity trains in the area that is currently allocated to bicycle storage (horizontally stored at present). The artists' illustrations above are suggestive of the vertical storage concept.

6.7 Allow bicycles to be carried on V/Line coaches

The stakeholder consultation workshops, as well as the survey of Bicycle Victoria members and other cyclists showed strong support for the ability to carry a bicycle on a V/Line coach. There are a variety of ways of achieving this, such as:

- Bicycle racks on the front of coach (capable of carrying up to three bikes at one time)
- Internal bicycle racks – within luggage bin (capable of carrying up to two bikes at one time)
- Bicycles carried loose in luggage bins (consistent with previous V/Line policy).

The following images illustrate some of the above options.

Bicycle carrying racks on the front of coaches responds to potential space constrains within the luggage bin and reduces the OH&S issues associated with drivers lifting bicycles to and from the luggage bin.
Photo: Institute for Sensible Transport.

Action buses in Canberra have plans to grow the number of bicycle racks on their fleet.
Photo: Action Buses.

Internal bicycle storage rack can carry two bicycles (each can be moved independently of the other). This reduces damage to bicycles and other articles, as well improved loading/unloading ergonomics.
Photo: Sportworks

6.8 Bike trailers

Public transport operators, as well as cycling advocates present at the stakeholder consultation workshops identified the need to be able to carry large numbers of bicycles. Selecting high demand times and routes and publishing this service would potentially reduce the number of groups wishing to board train services with bicycles.

Space constraints on train carriages; coupled with the need to travel beyond the rail network (such as rail trails), confirm the deployment of bicycle trailers maybe an important step towards improving the integration of cycling with public transport. Another benefit of bicycle trailers is that they could be used during train replacement coach services. Currently passengers with bicycles may not be able to board should their train be replaced with a coach.

Bicycle trailers are capable of holding large numbers of bicycles and are well suited to accommodate the needs of recreational cycling groups. Photo: Sportworks

6.9 Bicycle parking at train stations and coach stops

High security bicycle cages, such as those managed by Bicycle Victoria should be deployed in greater numbers, to assist commuters in particular in parking their bicycle at the station, rather than taking it on the train. Importantly, there is currently a high, unmet demand for a Parkiteer style cage at Southern Cross station. A high volume bicycle parking cage at Southern Cross may encourage regional commuters travelling to Melbourne to store a second bicycle at Southern Cross, rather than taking their bike on the train. More generally, crucial to the success of Parkiteer cages is positioning them in a central location, close to platforms and ticketing areas. Consideration should also be given to whether they are placed on outbound or inbound sides of the tracks. Bicycle parking should also be provided at coach stops.

Parkiteer bicycle cages provide a high level of security, catering to users who will have their bicycle parked at a station all day or even overnight. Photo: Institute for Sensible Transport

6.10 Public transport bicycle advisory committee

The rapid rise in bicycling and public transport in Victoria suggests a continued interest from the Victorian community in combining these two sustainable forms of transport. These growth trends, coupled with the Victorian Government's commitment to improve the integration of cycling with the public transport system provides a strong policy foundation for establishing a public transport bicycle advisory committee.

The proposed committee would be led by the Department of Transport and could bring together public transport operators, the Victorian Bicycle Advisory Committee, bicycle advocacy organisations, tourism groups and others to work on an ongoing basis to encourage the integration of cycling with public transport. The need for such a committee was highlighted during this evaluation, with frequent instances of sub-optimal communication and cooperation between the various stakeholders with an influence in this area of public policy. The committee would meet quarterly, or as needed, to plan and implement policies to better integrate cycling with public transport.

6.11 Bicycle infrastructure connecting communities to train stations

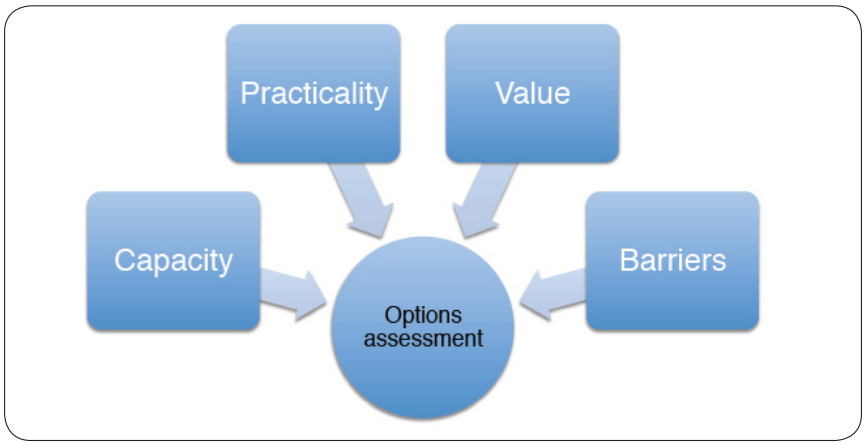
The integration of cycling with public transport requires public transport hubs to be accessible via either, or both, off road shared paths, such as the one pictured below, and on-road bicycle lanes. Developing station catchment plans, or *access audits* that focus bicycle friendly infrastructure within a 4km radius of train stations will make cycling to the station more attractive and reduce short distance car journeys and car parking congestion.

Connecting the bicycle route network with transport hubs increases the catchment area of each train station and reduces car parking congestion. Photo: Institute for Sensible Transport

Finally, when developing initiatives to better integrate cycling and public transport, it is important to determine which segment of the user spectrum you are attempting to accommodate. For instance, high volume bicycle trailers will typically be most useful for groups of recreational riders, whereas high security bicycle parking will be mostly of interest to transport oriented cyclists who intend on leaving their bicycle parked for most of the day. Commuters will typically use the service five days per week and this provides greater opportunity to keep a second bicycle at the destination station, thereby avoiding having to take with a bicycle onboard. This is common practice in the Netherlands where over one-third of train trips start with a bicycle journey, yet only a small proportion of these bicycles are brought on board trains (Cycle Council of the Netherlands, 2007).

7. Assessment

The following framework was used to evaluate the recommendations that emerged from the stakeholder workshops, online surveys and review of the literature.



Capacity refers to the size of the contribution each option can make in achieving the desired outcomes, particularly in terms of meeting estimated demand.

Practicality refers to the ease with which an option can be implemented and operated, including any enabling factors.

Value refers to the achievement of desired outcomes relative to the amount of expenditure required.

Barriers covers negative impacts including safety implications for other passengers, staff and third parties.

Using the evaluation framework above, options identified at the workshops or through surveys and additional research have now been combined and are assessed below. The options have been listed under the following categories:

- Information & Booking Systems
- Vehicle Design (Trains and Coaches)
- Station Facilities & Infrastructure
- Policy & Promotion

Information and Booking Systems

A booking system for bikes

Capacity
High Provides the certainty passengers demand, as well as reducing the frequency to which staff have to deny boarding.
Practicality
Medium System will need to be implemented as a component of the ticketing system as well as dedicated space.
Value
High The benefits of a booking system outweigh costs considerably.
Barriers
Low Smartcard ticketing maybe an obstacle to implementation.
Overall Assessment
High Should be a priority, as it addresses a major issue for cyclists. A booking system would bring Victoria in line with international norms.

Data collection program

Capacity
Provides indirect support for achieving outcomes.
Practicality
High Data collection is a relatively easy initiative to implement.
Value
High Improved data collection provides the information necessary to make informed decisions.
Barriers
Low Resources and time are the only barriers. No conflicts with other passengers or staff.
Overall Assessment
High The lack of information related to the integration of cycling and public transport should be addressed as a matter of priority.

Vehicle design

Bicycle carriage in luggage bins - with holding device (2 bike capacity)

Capacity
Medium When implemented in conjunction with a booking system, this initiative will accommodate the majority of those wishing to use the system.
Practicality
High May require some adjustment of vehicles' luggage space and training. Risk of damage to bicycles and other items is minimised and loading/unloading is more ergnomic.
Value
Medium At approx $5,000 per unit, this is more expensive than a front rack, but does not extend the length of the vehicle. Capable of meeting most cyclists needs.
Barriers
Medium Reduces capacity of luggage bins for other items. Cannot service large groups of cyclists simultaneously.
Overall Assessment
Medium/High Provides a good option for most cyclists and reduces damage to bicycles that might occur if stored loosely.

Bicycle carriage in luggage bins – loose

Capacity
Medium When implemented in conjunction with a booking system, this initiative will accommodate the majority of those wishing to use the system.
Practicality
Medium Only a policy change would be required to implement – no infrastructure provision necessary. However, the practicality of day-to-day use is moderate, given the issues experienced when this policy was in operation up until 2008.
Value
Medium No capital outlay required and a significant improvement in the level of service for cyclists.
Barriers
Low A number of minor barriers exist, such as the uncertainty operators and passengers face when space constraints prevent the storage of a bicycle. A booking system would mitigate against this to some extent. Cannot service large groups of cyclists simultaneously.
Overall Assessment
Low/Medium A fast, simple solution to the issue of small numbers of passengers wishing to board with a bicycle, however on its own, it does not address the issues that led to this arrangement being banned in 2008.

Vehicle design

Bicycle carriage on racks at front of coach (3 bike capacity)

Capacity
High Can satisfy demand in most situations.
Practicality
Medium May require rack modification to prevent interference with headlights on some coaches. Training for staff and passengers required.
Value
High At approx. $A1,200 per unit, this is a very cost effective solution.
Barriers
Medium An exemption will need to be granted from certain provisions in the Australian Design Rules as part of the Road Transport Regulation before the racks can be used. This is what occurred in the ACT. With a max. capacity of three bicycles, racks cannot service large groups of cyclists simultaneously.
Overall Assessment
High Widely used in the US, with a strong record of success, racks on the front of coaches present a practical, cost effective solution to integrate cycling with coach travel.

Bike trailer in parallel with coach and train services

Capacity
High Excellent capacity to meet demand for special events and other high demand situations.
Practicality
Medium Requires the operation of a separate service, which will incur costs, however it has the capability to funnel demand into these specialist services, taking pressure off the rail system.
Value
Medium If heavily utilized this service provides reasonable value but poor uptake may significantly reduce its value.
Barriers
Medium Barriers include lack of awareness of the service and lack of willingness from some members of the public to travel during the specific times the service is scheduled to operate.
Overall Assessment
Medium A bicycle trailer presents a good option for high demand times and to service rail trail users.

Vehicle design

Bicycle carriage inside of coach (2 – 3 bikes)

Capacity
Medium Can meet demand for one or two bicycles in coaches that have been fitted with internal racks and have sufficient entry space for a bicycle.
Practicality
Low Some seats may need to be removed or adapted to accommodate the racks.
Value
High For approx. $A3,000 for a rack storing two bicycles, this system presents reasonable value.
Barriers
Medium Difficulty associated with maneuvering a bicycle in a confined space and reduction of space for other users.
Overall Assessment
Medium Should other options prove impractical, internal storage of bicycles, particularly in low demand locations may be appropriate.

Improve on board carriage of bicycles for Vlocity trains in existing designated space through the use of vertical racks


Artist impression

Capacity
High With the exception of large groups, this initiative will accommodate the majority of passengers wishing to carry a bicycle.
Practicality
High Minimal changes necessary to implement. Space can be used by other passengers for luggage storage whilst a bicycle is in rack. Bicycle is fixed in position, for improved safety.
Value
High Low capital costs and considerable space efficiency savings.
Barriers
Low No significant negative impacts on other users
Overall Assessment
High Vertical racks use space more efficiently and reduce the chance of bicycle movement while train is in motion.

Vehicle design

Improve bicycle storage in loco-hauled trains

Artist impression

Capacity
High With the exception of large groups, this initiative will accommodate the majority of passengers wishing to carry a bicycle
Practicality
High Minimal changes necessary to implement. Space can be used by other passengers for luggage storage whilst a bicycle is in rack. Bicycle is fixed in position, for improved safety.
Value
High Low capital costs and considerable space efficiency savings.
Barriers
Low No significant negative impacts on other users
Overall Assessment
High Vertical racks use space more efficiently and reduce the chance of bicycle movement while train is in motion.

Improve bicycle carrying capacity for new rolling stock

Capacity
High New rolling stock could accommodate significant numbers of bicycles (somewhere between loco-hauled services and Vlocity cars).
Practicality
Low High level of difficulty involved in the design of new rolling stock – especially in balancing the needs of passengers with bicycles and other passengers.
Value
Medium The cost of including bicycle storage in new vehicle design may be high, although if designed as a dual use area, could be used for a variety of large items.
Barriers
Medium Capital costs in designing and purposing new rolling stock is considerable.
Overall Assessment
High When new rolling stock contracts are being drawn up, consideration for bicycle storage should take place, with the aim of storing bicycles as efficiently as possible.

Station Facilities & Infrastructure

Provide additional high security bicycle cages (to reduce demand for on board carriage)

Capacity
High Bicycle cages have excellent potential to reduce the demand for the carriage of bicycles on board public transport vehicles.
Practicality
High Bicycle cages occupy considerably less space than the equivalent number of car spaces and can be delivered using current designs developed through Bicycle Victoria's Parkiteer system.
Value
High This solution is considerably cheaper than storing the equivalent number of bicycles on board public transport vehicles.
Barriers
Low Very few barriers exist to the further roll out of a Parkiteer style facility, although any loss of car parking space may experience opposition from rail operator &/or passengers.
Overall Assessment
High High security bicycle parking is a strong priority in any strategy to encourage the use of bicycles in combination with public transport.

Connect train stations and coach hubs with bicycle network

Capacity
High Safe, attractive bicycle routes to transport hubs act as an important link in the chain integrating cycling with public transport.
Practicality
Medium Implementation can be more intensive given its interaction with the road traffic system and public space more generally.
Value
High Although upfront capital costs are significant, bicycle infrastructure investment has been shown to have a strong Benefit Cost Ratio (AECOM, 2010).
Barriers
Medium Competition for space may limit the cycling routes an authority is willing to provide. A reallocation of road space may present a barrier in some areas.
Overall Assessment
High High priority. Safe bicycle routes connecting transport hubs to the wider community are considered of primary importance in any strategic direction towards the encouragement of cycling with public transport.

Station Facilities & Infrastructure

Bicycle rental at train stations

Capacity
Medium Short (less than 30min) trips maybe attractive to cyclists coming from regional Victoria into Melbourne, thereby reducing the need to carry bicycle on train/coach.
Practicality
High Melbourne bicycle share program currently being rolled out. Integration with public transport hubs is a practical method of boosting use.
Value
High Given the current roll out of the system, minimal additional costs are associated with its close integration with the public transport system.
Barriers
Medium Limited space around train stations and even distribution of bicycles across system may cause some difficulties.
Overall Assessment
High Given the current implementation of the bike share scheme, it is sensible to value add by specifically providing pods around major rail stations on the Melbourne V/Line network.

Policy & Promotion

Introduce a public transport bicycle advisory committee

Capacity
Provides indirect support for achieving outcomes.
Practicality
High Relatively easy to implement.
Value
High Low cost but signifcantl benefit.
Barriers
Low Limited time availability. Need to demonstrate value to participants.
Overall Assessment
High Should be a priority, given its low cost and evidence of success in other jurisdictions.

Policy & Promotion

Staff bicycle encouragement program

Capacity
Provides indirect support for achieving outcomes.
Practicality
Medium Initiative requires considerable effort to implement.
Value
High Program addresses staff health issues and fosters a positive view on cycling.
Barriers
Medium Requires strong commitment from senior management. Requires funding for capital and training costs.
Overall Assessment
Medium Addresses key concerns related to staff health and builds support for cycling.

8. Recommendations

On the basis of stakeholder consultation, an international review of the literature and assessment of online survey results, the following recommendations are made and are divided into policy, information and booking systems, vehicle design and station precinct initiatives.

8.1 Short term (by 2013)

8.11 Policy

8.112 Introduce a public transport bicycle advisory committee and an officer responsible for the integration of cycling and public transport within the Public Transport Division.

8.113 Introduce a bicycle encouragement program for public transport staff

8.114 Commission a study to determine the current and future/potential contribution of cycle tourism to the regional Victorian economy

8.12 Information and Booking Systems

8.121 Introduce a booking system for those wishing to travel on V/Line trains and coaches with a bicycle.

8.122 Create a standard 'branding' for initiatives that integrate cycling with public transport, such as bicycle symbols printed within the timetable for train services that have greater bicycle storage capability, to inform passengers of the services that are better equipped to carry bicycles.

8.123 Provide a greater level of information for those wishing to travel in groups by bicycle on regional public transport.

8.124 Initiate and maintain a comprehensive, up-to-date information base on the integration of cycling with regional public transport. At a minimum, it will be necessary to:

- Measure the number of V/Line passengers who carry a bicycle on board rail and coach services broken down by line/service and time of day and by weekday/weekend/long weekend.
- Conduct regular surveys of cyclists and non-cyclists regarding their experience and opportunities for improvement, in terms of the carriage of bicycles on V/Line services

8.13 Vehicle Design

8.131 Redesigning locomotive hauled cargo area to provide a "dual use" vertical racking area.

8.132 Vertically store bicycles in Vlocity trains in the area that is currently allocated to bicycle storage.

8.133 Implement a system to carry a small number of bicycles on each V/Line coach service.

8.134 Provide bicycle trailers to service rail trials and other high demand recreational cycling locations, should a review of the bicycle trailer trail conducted by Bicycle Victoria in March/April 2010 prove successful.

8.14 Station

8.141 Provide more high security bicycle cages, such as Parkiteer structures at train stations, particularly Southern Cross, ensuring as close a position as possible to main platforms.

8.142 Assess whether road and path infrastructure around train station and major coach terminals are adequate and identify initiatives that would greatly increase the safety and attractiveness of bike access to these locations.

8.2 Medium term (to 2020)

Many of the short-term recommendations identified above will need to continue to be implemented in the medium term, as pressure on the network will require the best utilization of scarce space.

8.21 Policy

Review and improve each of the regulatory initiatives implemented in the short-term, to ensure the objective of encouraging the integration of cycling and public transport is being met.

8.22 Review information and booking system, to ensure that the effectiveness of encouraging and monitoring the integration of cycling and public transport is being met.

8.22 Vehicle Design

Train

8.221 Seek purpose built bicycle storage areas in new rail rolling stock, including vertical storage areas and 'dual-use' areas for bicycles equivalent to at least 3% of total train occupancy.

Coach

8.222 Expand the provision of bicycle storage facilities on coaches so that ultimately all Victorian coach services have the ability to carry at least two bicycles. Integrating cycling with the coverage of the V/Line coach network greatly increases the total area of the state which can be accessed by the combination of these sustainable transport modes and would represent a significant improvement in available transport choices.

8.23 Station Facilities and Infrastructure

8.231 Expand Parkiteer bicycle parking cages to stay ahead of growing demand and position cages as close as possible to platforms to provide a competitive advantage to motor vehicle parking.

8.232 Increase safe bicycle route connections between train stations, residential and commercial areas.

9. Conclusion

Cycling and public transportation are complementary modes of transport. Cycling is effective for shorter-distance, circulatory trips within a local area, and public transport is effective for longer-distance trips between neighborhoods. Together they can provide a high level of mobility at relatively low cost to users and society.

The Institute for Sensible Transport has conducted workshops, field observations, online and site surveys and reviewed international literature in relation to the carriage of bicycles on regional public transport. An estimate of current demand has been calculated and the key issues related to the integration of bicycles and public transport have been identified.

After reviewing and assessing a number of proposals, recommendations have been made in this report covering vehicle design, booking and information systems, station facilities and regulatory arrangements. If implemented, these recommendations could see bicycle passengers increase from the current level of approximately 0.9% of rail passengers to 3% by 2020, and from effectively 0% currently on coach services to 2% by 2020.

In parallel with strong total patronage growth on V/Line services, the total number of bicycle passengers could rise from an estimated 119,000 in 2010 to nearly 30,000 bicycle passengers on coaches and over 560,000 bicycle passengers on rail services by 2020. These levels would be in line with good practice at comparable international locations and would meet the goals of the Victorian Cycling Strategy to support healthy, sustainable transport modes of transport and integrate cycling with the public transport system.

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11. Appendix 1: Extract from Victorian Fares and Ticketing Manual

Bicycles, surfboards and other items

Folding Bicycles

Folding bicycles can be carried free on metropolitan trains, trams and buses; V/Line trains and coaches, and regional town bus services at any time. Folding bicycles must not exceed the dimensions of 82cm long x 69cm high x 39cm wide, have wheel rims no more than 20 inches (51 cm) in diameter and be folded up and stored inside a bag or cover before boarding.

A folding bicycle has small wheels and frame latches allowing the frame to be collapsed. Regular bicycles of any size, with or without wheels, are not considered folding bicycles and are subject to the conditions below regarding bicycles on public transport.

On metropolitan buses folding bicycles cannot be stored in parcel racks. On V/Line trains and coaches, folding bicycles cannot be stored in overhead luggage racks.

Bicycles

Metropolitan Trains

Bicycles can be carried free on metropolitan trains at any time. As a courtesy to fellow passengers, cyclists are requested to avoid heavily congested carriages. Cyclists must not, at any time, board at the first door of the first carriage, or store a bicycle in the area adjacent to this door, as this area is reserved for passengers in wheelchairs.

Metropolitan Trams, Metropolitan Buses, Regional Town Buses, V/Line Coaches

Bicycles are not permitted on these services at any time, with the exception of folding bicycles (see above).

V/Line Trains

Bicycles can be carried free on V/Line trains at any time. On V/Line trains, bicycles should be stowed in the location(s) designated by the Conductor. V/Line has several different train types and VLocity and Sprinter trains in particular have limited space for bicycles. Therefore V/Line conductors will determine whether there is sufficient room for bikes to be taken on V/Line trains. As a courtesy to fellow passengers, cyclists are requested to avoid heavily congested carriages. Bicycles must not obstruct passageways or doorways and must not inconvenience other passengers.

Bicycle lockers

Some metropolitan and V/Line train stations have bicycle lockers, which can be used to store bicycles, helmets and safety vests.

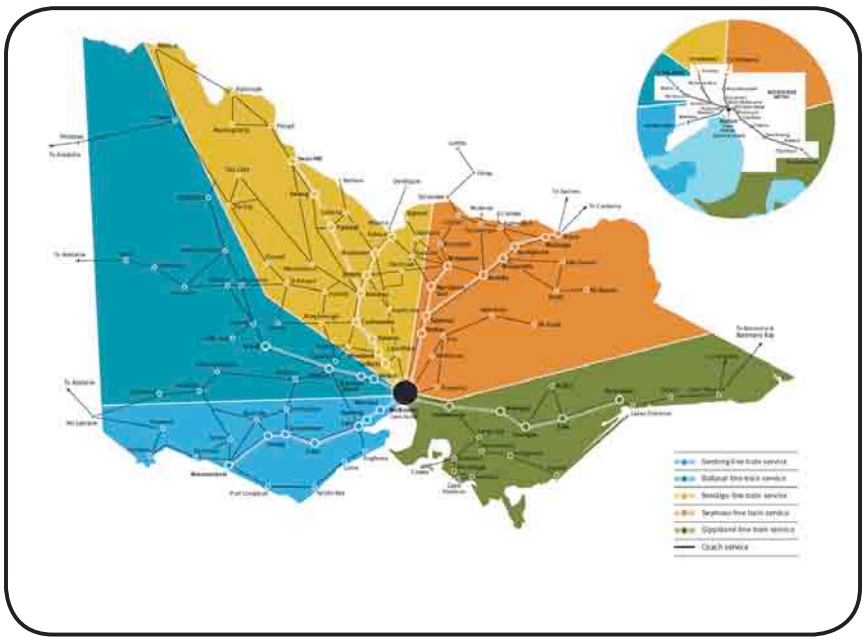
Passengers may obtain lockers for up to 3 months by paying a bond, which will be returned at the end of the period (provided the locker is clean, undamaged and that the locker key is returned in a serviceable condition). This period can be extended beyond 3 months if renewal is applied for on or before the expiry date. Other stations such as Southern Cross have a self-storage locker system.

Bicycle lockers at unstaffed stations may be reserved at a nearby staffed station.

Items are stored in bicycle lockers at the passengers' own risk. Operators will not be liable for any loss of or damage to items stored in bicycle lockers.

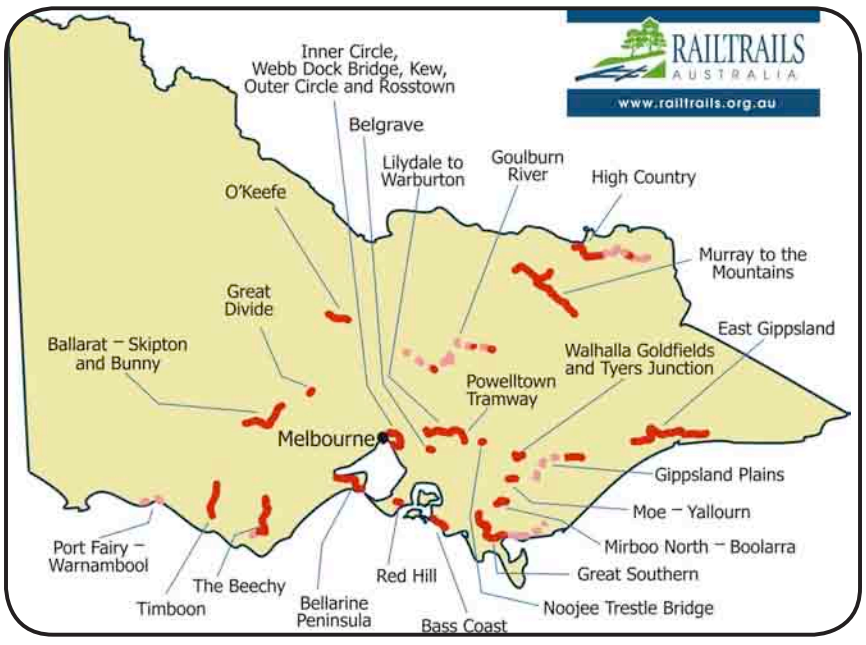
Source: Victorian Fares and Ticketing Manual, Victorian Government

Appendix 2: Map of V/Line Network



Source: V/Line Annual Report 2008/09

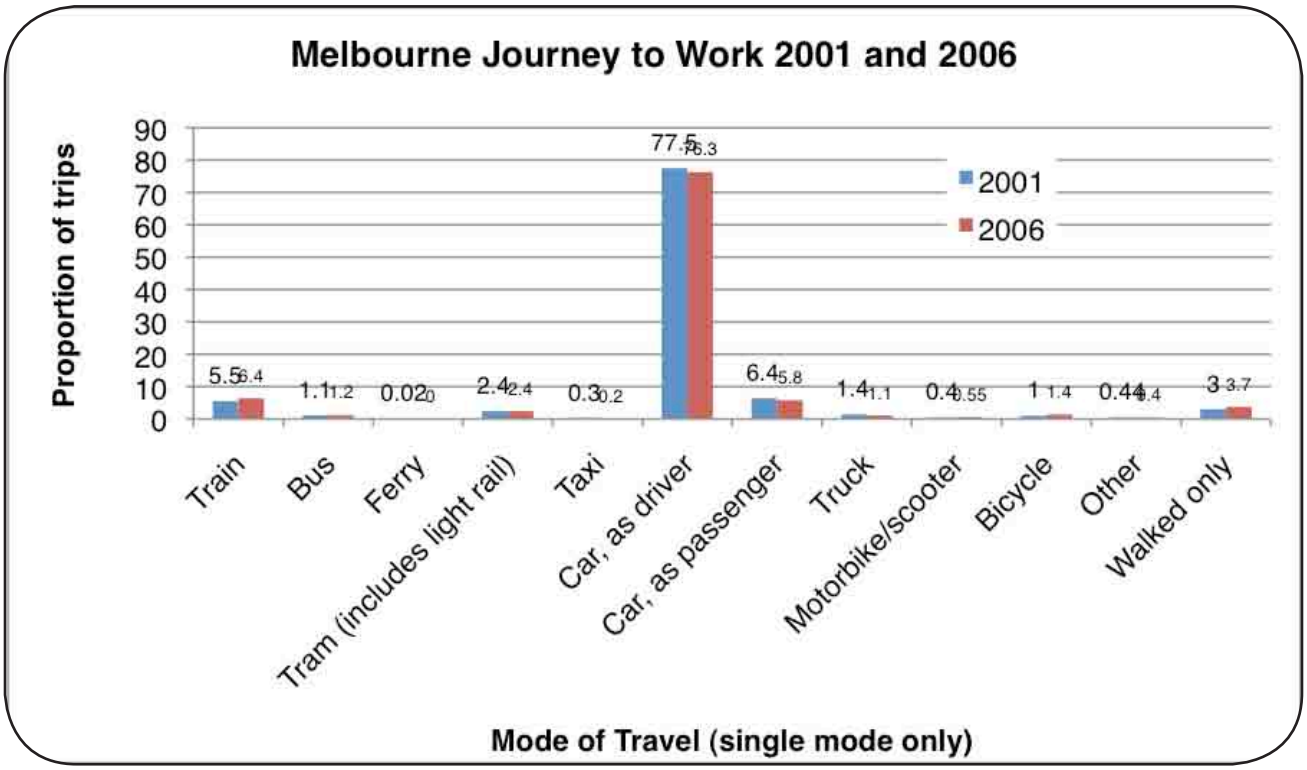
Appendix 3 Map of Victorian Rail Trails



Source: Railtrails Australia Inc

Appendix 4: Transport Data

Source: ABS 2001 & 2006 Census



Source: ABS 2001 & 2006 Census

Melbourne Journey to Work 2001 and 2006

Mode	2001 Mode Share	2006 Mode Share
Train	5.6	6.5
Bus	1.2	1.2
Ferry	0.0	0.0
Tram (includes light rail)	2.5	2.5
Taxi	0.3	0.3
Car, as driver	77.6	76.3
Car, as passenger	6.4	5.9
Truck	1.4	1.2
Motorbike/scooter	0.4	0.6
Bicycle	1.0	1.4
Other	0.4	0.5
Walked only	3.1	3.8

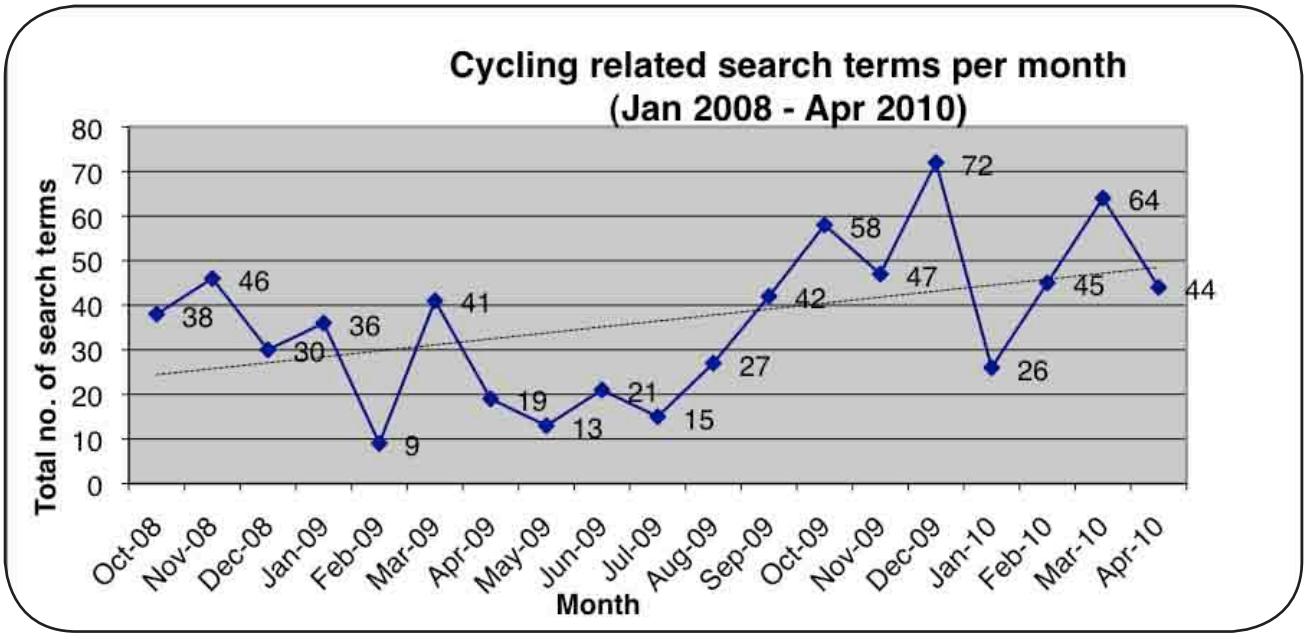
Source: ABS Census 2001 & 2006 (Single Mode Only)

Bicycle and Public Transport All Purpose Journeys – Regional Victoria

Region	Bicycle modal share (all purpose journeys)	Public transport modal share (all purpose journeys)
Shepparton	2%	2%
Bendigo	2%	3%
Ballarat	2%	3%
Geelong	2%	3%
Latrobe	1%	3%

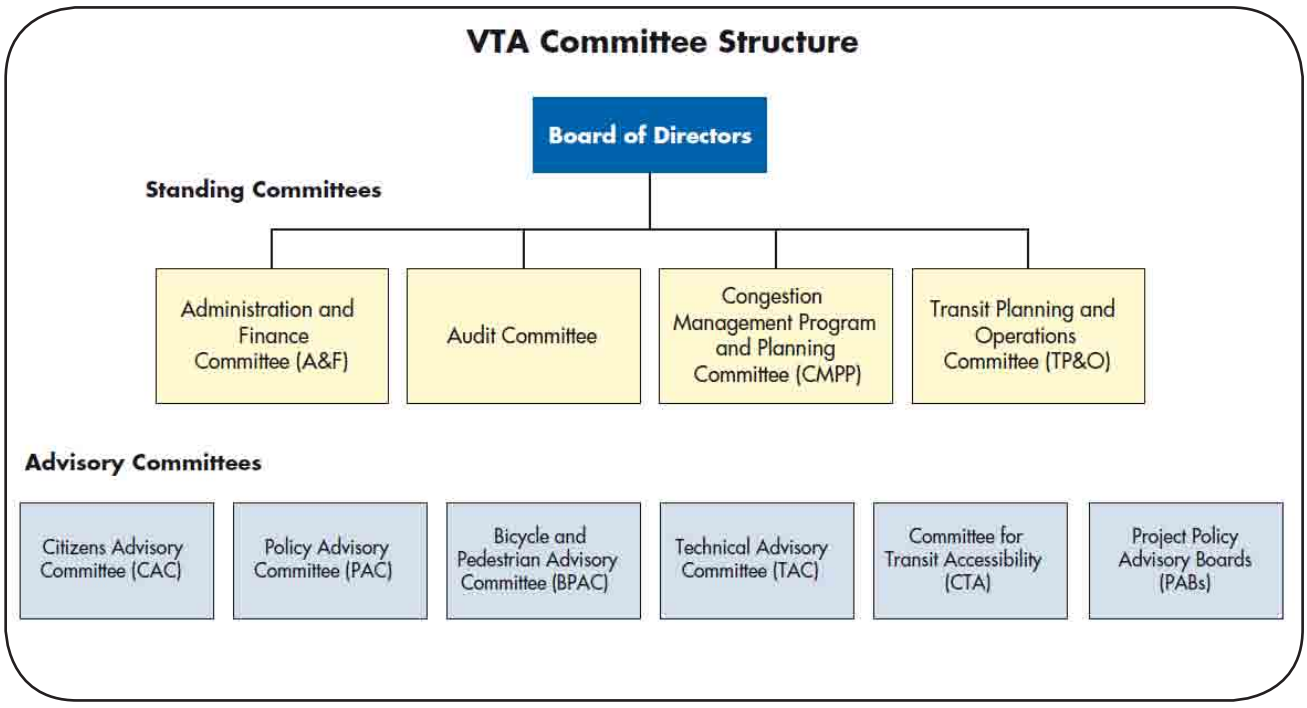
Source: VISTA, 2007 (Single Mode Only)

Appendix 5: Bicycle related search terms on V/Line Website



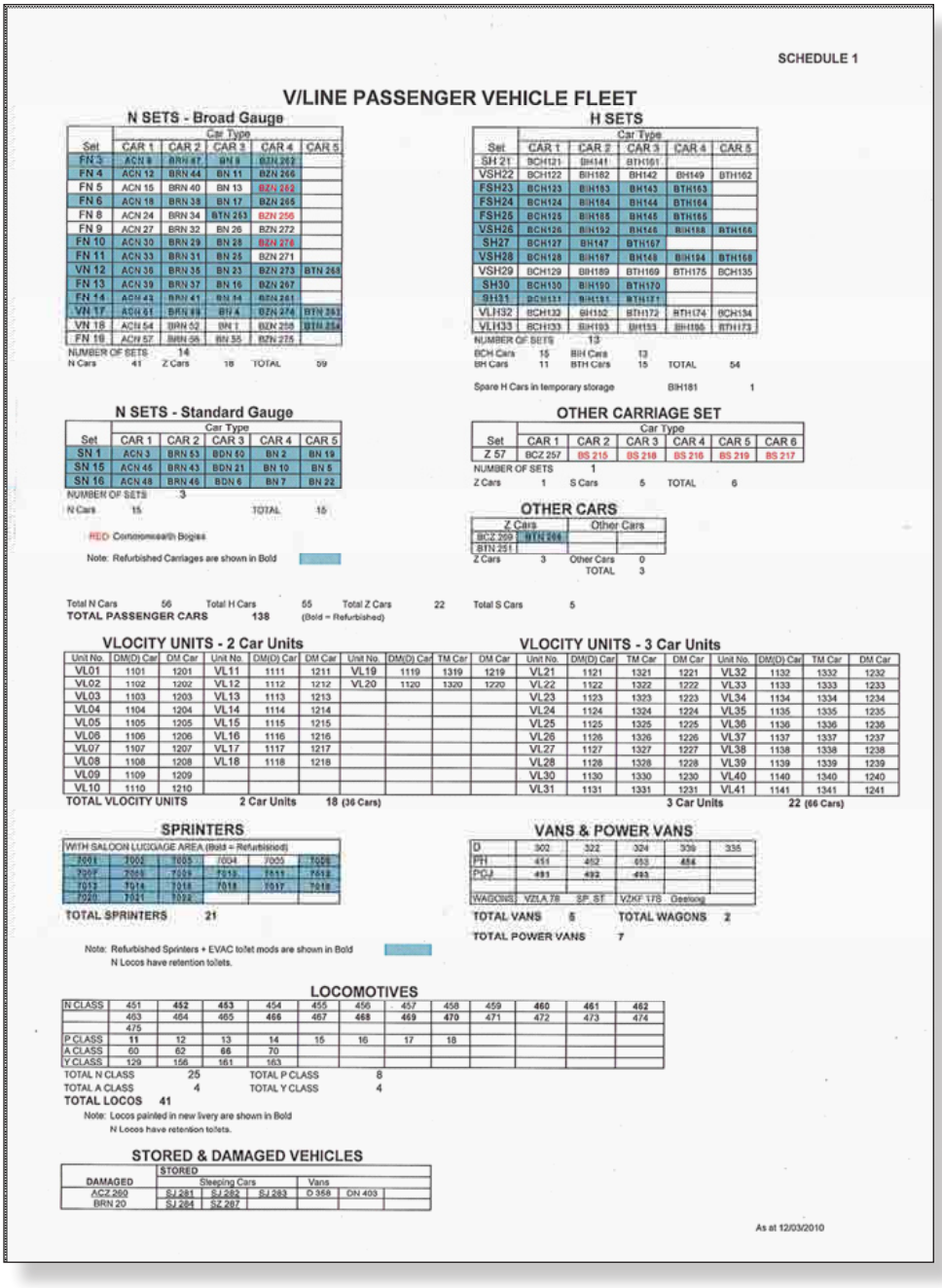
Source: V/Line Webmaster, 2010

Appendix 6: Santa Clara Valley Transportation Authority Committee Structure



Source: Santa Clara Valley Transportation Authority, California.

Appendix 7: V/Line Fleet Information



SCHEDULE 1

V/LINE PASSENGER VEHICLE FLEET

N SETS - Broad Gauge

Set	Car Type CAR 1	CAR 2	CAR 3	CAR 4	CAR 5
FN 3	ACN 9	BRN 47	BN 8	BZN 262	
FN 4	ACN 12	BRN 44	BN 11	BZN 266	
FN 5	ACN 15	BRN 40	BN 13	BZN 262	
FN 6	ACN 18	BRN 38	BN 17	BZN 265	
FN 8	ACN 24	BRN 34	BTN 263	BZN 256	
FN 9	ACN 27	BRN 32	BN 26	BZN 272	
FN 10	ACN 30	BRN 29	BN 28	BZN 276	
FN 11	ACN 33	BRN 31	BN 25	BZN 271	
VN 12	ACN 36	BRN 35	BN 23	BZN 273	BTN 268
FN 13	ACN 39	BRN 37	BN 16	BZN 267	
FN 14	ACN 42	BRN 41	BN 14	BZN 261	
VN 17	ACN 51	BRN 49	BN 4	BZN 274	BTN 251
VN 18	ACN 54	BRN 52	BN 1	BZN 258	BTN 254
FN 19	ACN 57	BRN 55	BN 55	BZN 275	

NUMBER OF SETS 14
N Cars 41 Z Cars 18 TOTAL 59

H SETS

Set	Car Type CAR 1	CAR 2	CAR 3	CAR 4	CAR 5
SH 21	BCH121	BH141	BTH161		
VSH22	BCH122	BH182	BH142	BH149	BTH162
FSH23	BCH123	BH183	BH143	BTH163	
FSH24	BCH124	BH184	BH144	BTH164	
FSH25	BCH125	BH185	BH145	BTH165	
VSH26	BCH126	BH192	BH146	BH188	BTH166
SH27	BCH127	BH147	BTH167		
VSH28	BCH128	BH187	BH148	BH194	BTH168
VSH29	BCH129	BH189	BTH169	BTH175	BCH135
SH30	BCH130	BH190	BTH170		
SH31	BCH131	BH191	BTH171		
VLH32	BCH132	BH192	BTH172	RTH174	BCH134
VLH33	BCH133	BH193	BH153	BH195	RTH173

NUMBER OF SETS 13
BCH Cars 15 BH Cars 13
BH Cars 11 BTH Cars 15 TOTAL 54

Spare H Cars in temporary storage BH181 1

N SETS - Standard Gauge

Set	Car Type CAR 1	CAR 2	CAR 3	CAR 4	CAR 5
SN 1	ACN 3	BRN 53	BDN 40	BN 2	BN 19
SN 15	ACN 45	BRN 43	BDN 21	BN 10	BN 5
SN 16	ACN 48	BRN 46	BDN 6	BN 7	BN 22

NUMBER OF SETS 3
N Cars 15 TOTAL 15

RED Commonwealth Bogies

Note: Refurbished Carriages are shown in Bold

OTHER CARRIAGE SET

Set	Car Type CAR 1	CAR 2	CAR 3	CAR 4	CAR 5	CAR 6
Z 57	BCZ 257	BS 215	BS 218	BS 216	BS 219	BS 217

NUMBER OF SETS 1
Z Cars 1 S Cars 5 TOTAL 6

OTHER CARS

Z Cars	Other Cars		
BCZ 259	BTN 244		
BTN 251			

Z Cars 3 Other Cars 0
TOTAL 3

Total N Cars 56 Total H Cars 55 Total Z Cars 22 Total S Cars 5
TOTAL PASSENGER CARS 138 (Bold = Refurbished)

VLOCITY UNITS - 2 Car Units

Unit No.	DM(D) Car	DM Car	Unit No.	DM(D) Car	DM Car	Unit No.	DM(D) Car	TM Car	DM Car
VL01	1101	1201	VL11	1111	1211	VL19	1119	1319	1219
VL02	1102	1202	VL12	1112	1212	VL20	1120	1320	1220
VL03	1103	1203	VL13	1113	1213				
VL04	1104	1204	VL14	1114	1214				
VL05	1105	1205	VL15	1115	1215				
VL06	1106	1206	VL16	1116	1216				
VL07	1107	1207	VL17	1117	1217				
VL08	1108	1208	VL18	1118	1218				
VL09	1109	1209							
VL10	1110	1210							

TOTAL VLOCITY UNITS 2 Car Units 18 (36 Cars)

VLOCITY UNITS - 3 Car Units

Unit No.	DM(D) Car	TM Car	DM Car	Unit No.	DM(D) Car	TM Car	DM Car
VL21	1121	1321	1221	VL32	1132	1332	1232
VL22	1122	1322	1222	VL33	1133	1333	1233
VL23	1123	1323	1223	VL34	1134	1334	1234
VL24	1124	1324	1224	VL35	1135	1335	1235
VL25	1125	1325	1225	VL36	1136	1336	1236
VL26	1126	1326	1226	VL37	1137	1337	1237
VL27	1127	1327	1227	VL38	1138	1338	1238
VL28	1128	1328	1228	VL39	1139	1339	1239
VL30	1130	1330	1230	VL40	1140	1340	1240
VL31	1131	1331	1231	VL41	1141	1341	1241

3 Car Units 22 (66 Cars)

SPRINTERS

WITH SALOON LUGGAGE AREA (Bold = Refurbished)					
7001	7002	7003	7004	7005	7006
7007	7008	7009	7010	7011	7012
7013	7014	7015	7016	7017	7018
7020	7021	7022			

TOTAL SPRINTERS 21

Note: Refurbished Sprinters + EVAC toilet mods are shown in Bold
N Locos have retention toilets.

VANS & POWER VANS

D	302	322	324	339	335
PH	451	452	453	454	
PCJ	491	492	493		
WAGONS	VZLA 78	SP ST	VZKF 178	Geelong	

TOTAL VANS 5 TOTAL WAGONS 2
TOTAL POWER VANS 7

LOCOMOTIVES

N CLASS	451	452	453	454	455	456	457	458	459	460	461	462
	463	464	465	466	467	468	469	470	471	472	473	474
	475											
P CLASS	11	12	13	14	15	16	17	18				
A CLASS	60	62	66	70								
Y CLASS	129	156	161	163								

TOTAL N CLASS 25 TOTAL P CLASS 8
TOTAL A CLASS 4 TOTAL Y CLASS 4
TOTAL LOCOS 41

Note: Locos painted in new livery are shown in Bold
N Locos have retention toilets.

STORED & DAMAGED VEHICLES

DAMAGED	STORED Sleeping Cars			Vans		
ACZ 260	SJ 281	SJ 282	SJ 283	D 358	DN 403	
BRN 20	SJ 284	SZ 287				

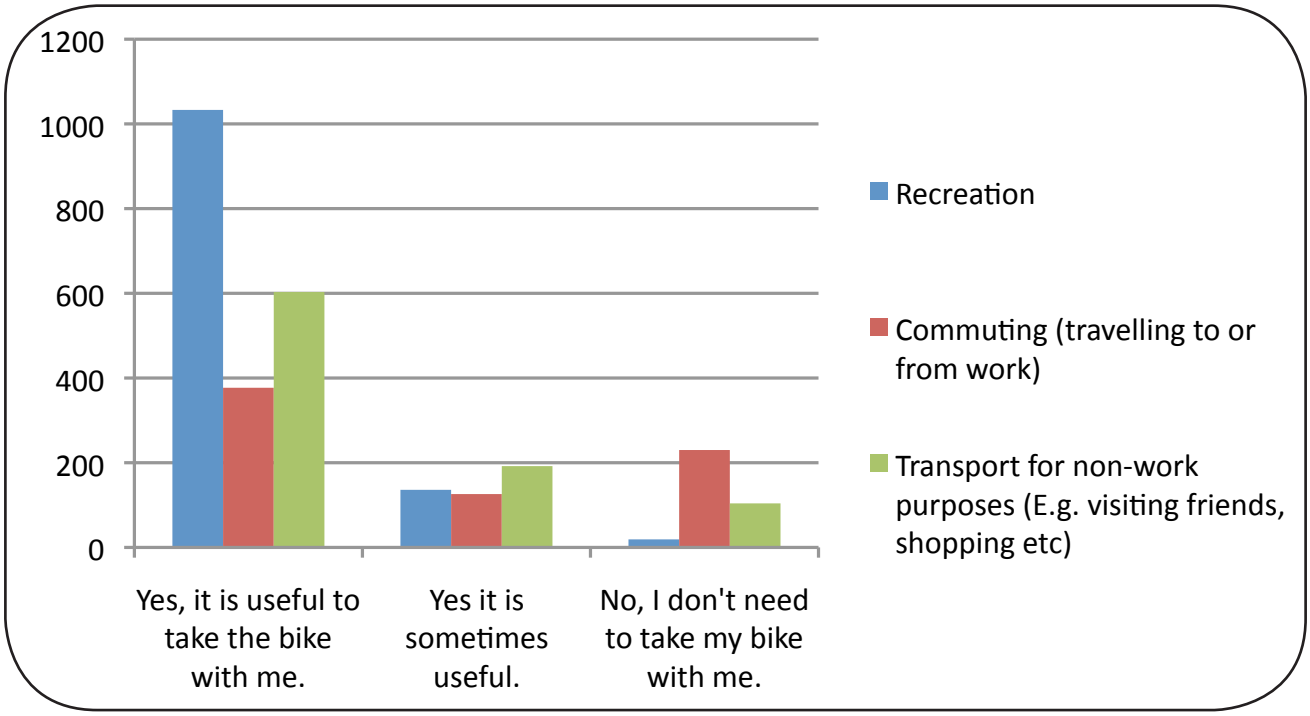
As at 12/03/2010

Source: V/Line, 2010

NB: N sets are mainly for long distance runs like Warrnambool, Swan Hill, Bairnsdale, Albury & Shepparton. The SG N sets are for the standard gauge Albury line (not yet in operation). The Vlocity Units are mainly used for mid distance runs like Ballarat, Bendigo, Traralgon & Geelong. The H sets and Sprinters are used for short commuter runs like Bacchus Marsh, Kyneton & Seymour. D vans are usually used on the long distance trains. Note vehicles are not confined to any particular line or service and are transposed as the need arises.

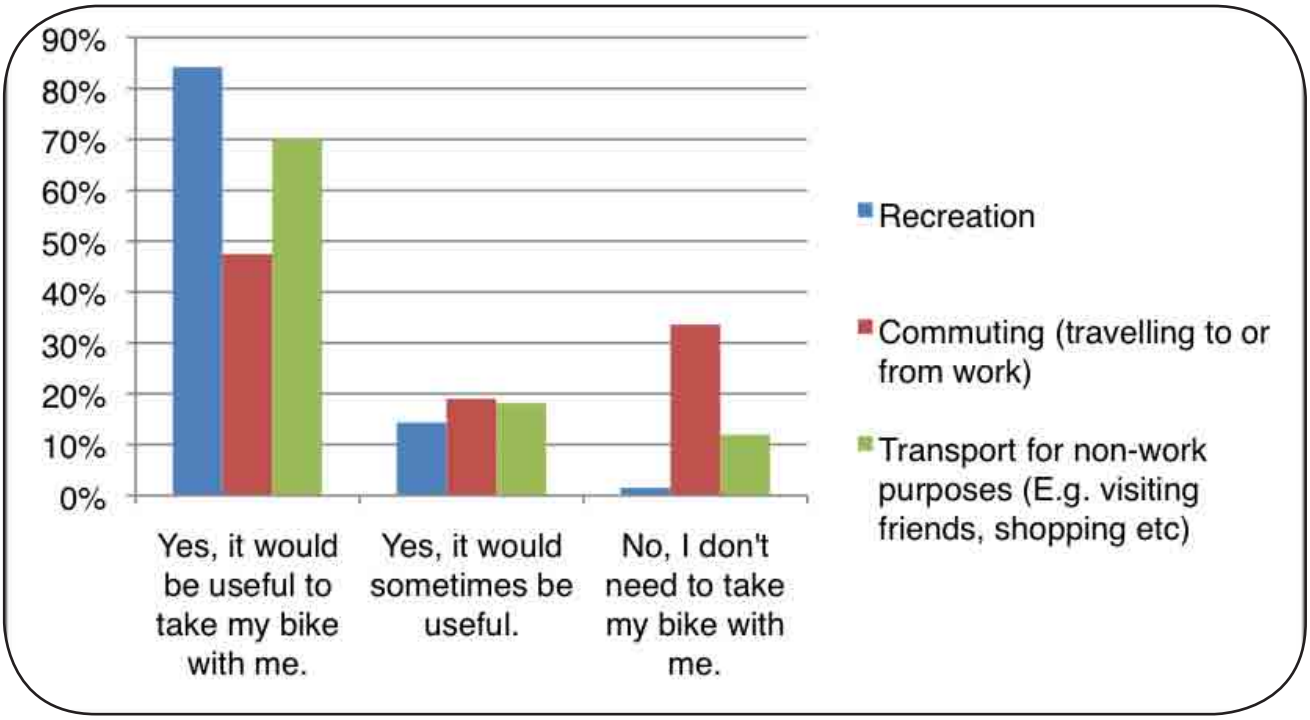
Appendix 8: Additional survey results

When travelling by bike to a train station, please indicate for each trip purpose whether it is useful to take your bike with you on the train.

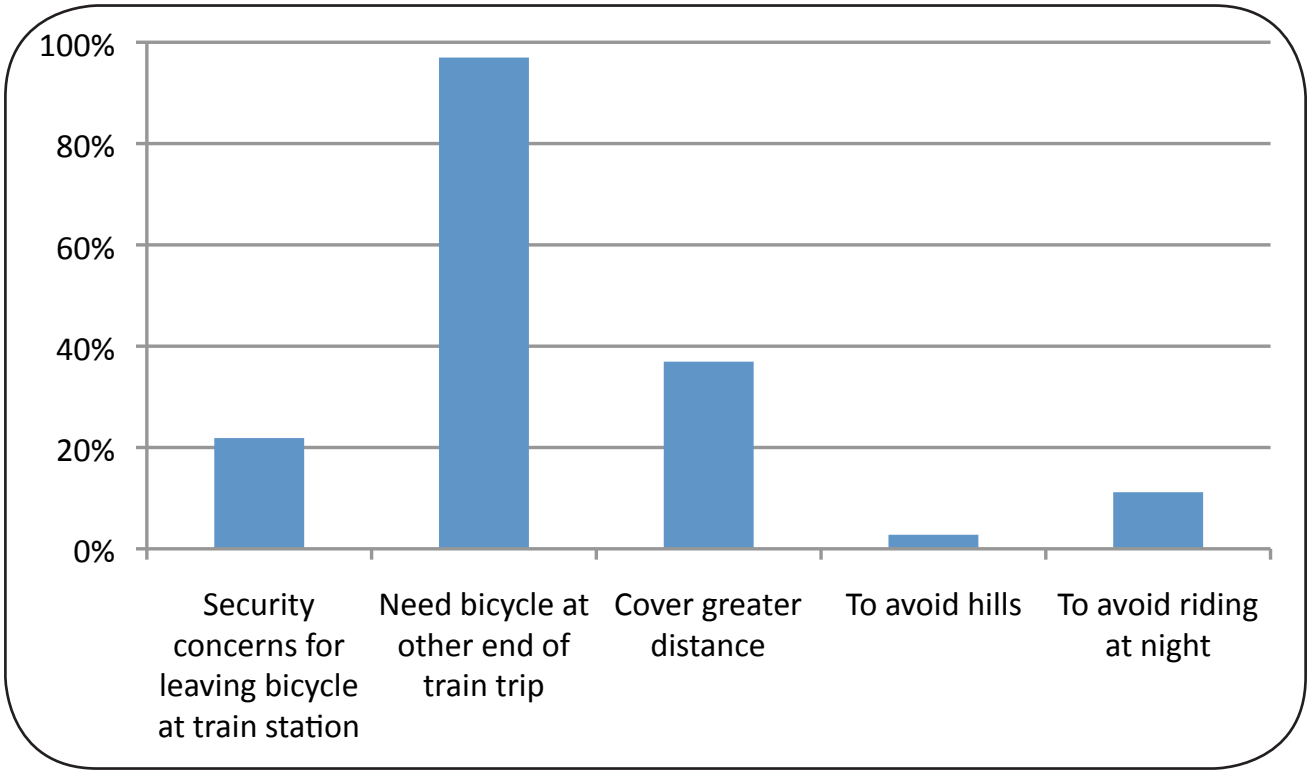


Those participating in recreational cycling show the strongest preference to take their bicyce on board trains, followed by transport for non-work purposes. A significant number still considered it useful to be able to take their bicycle on board trains for commuting purposes, although this was the trip purpose with the lowest preference for bicycle carriage.

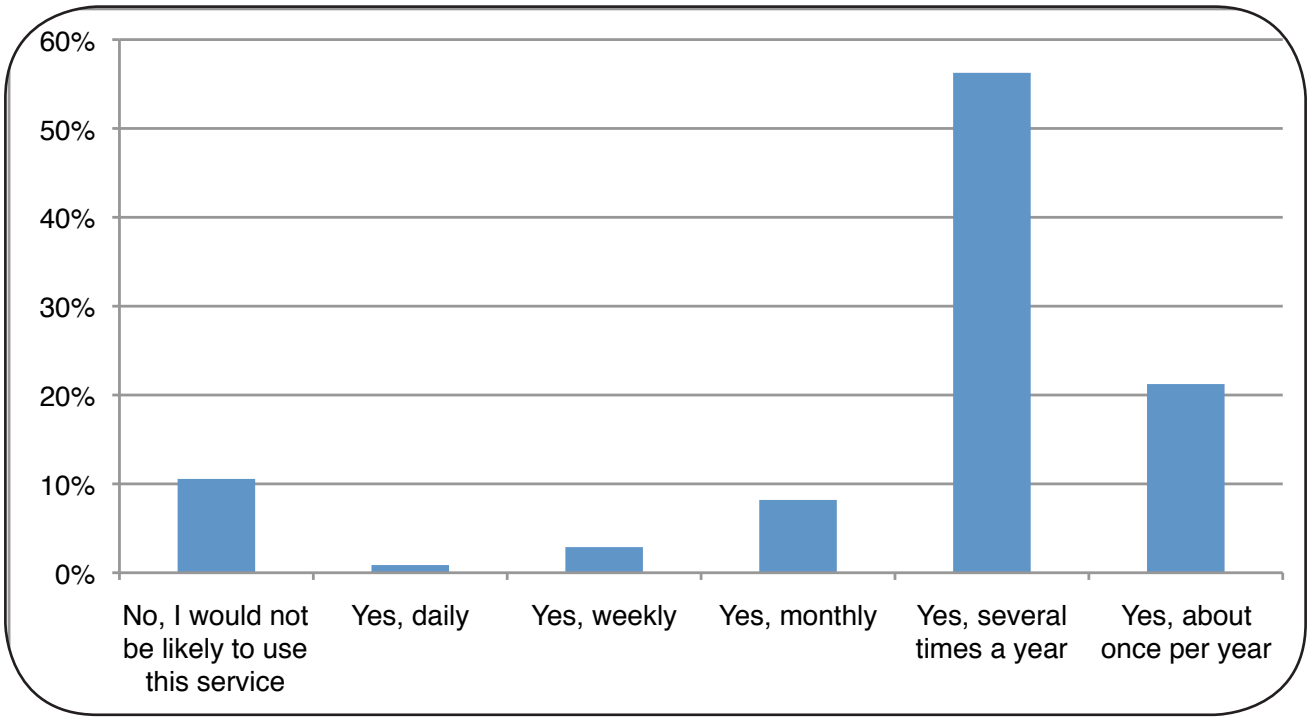
When travelling by bike and coach, for each type of trip, would it be useful to take your bike with you on the coach?

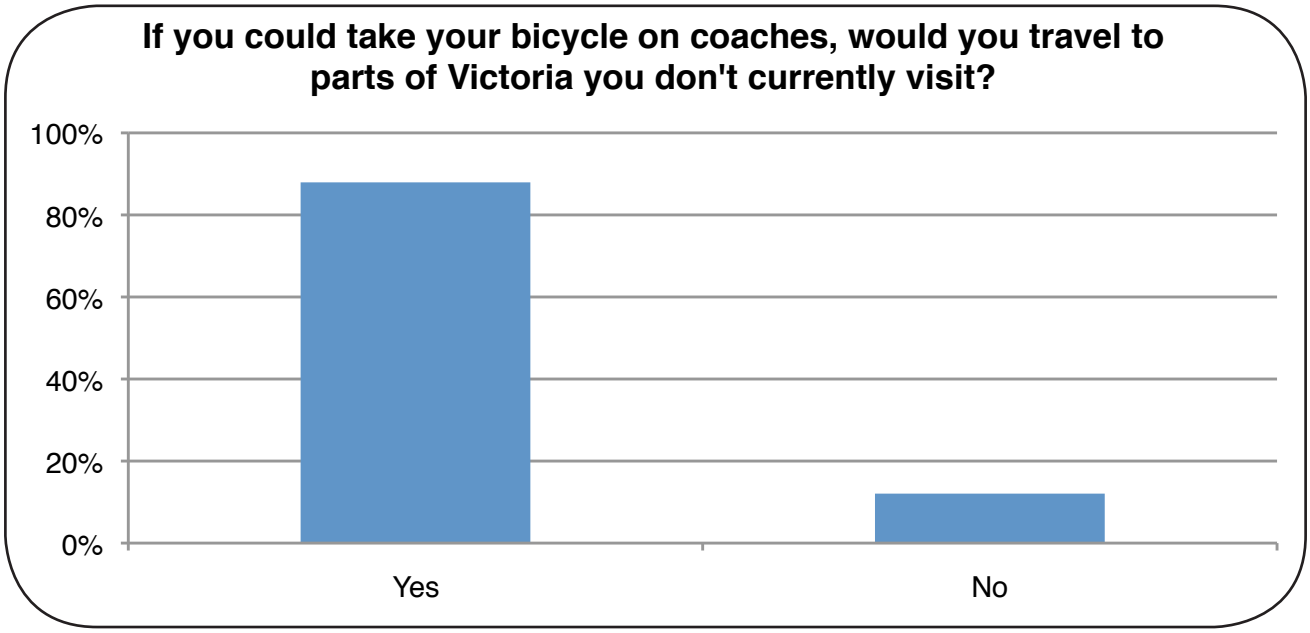


If you take your bike on a V/Line train, what are the reasons for doing so?

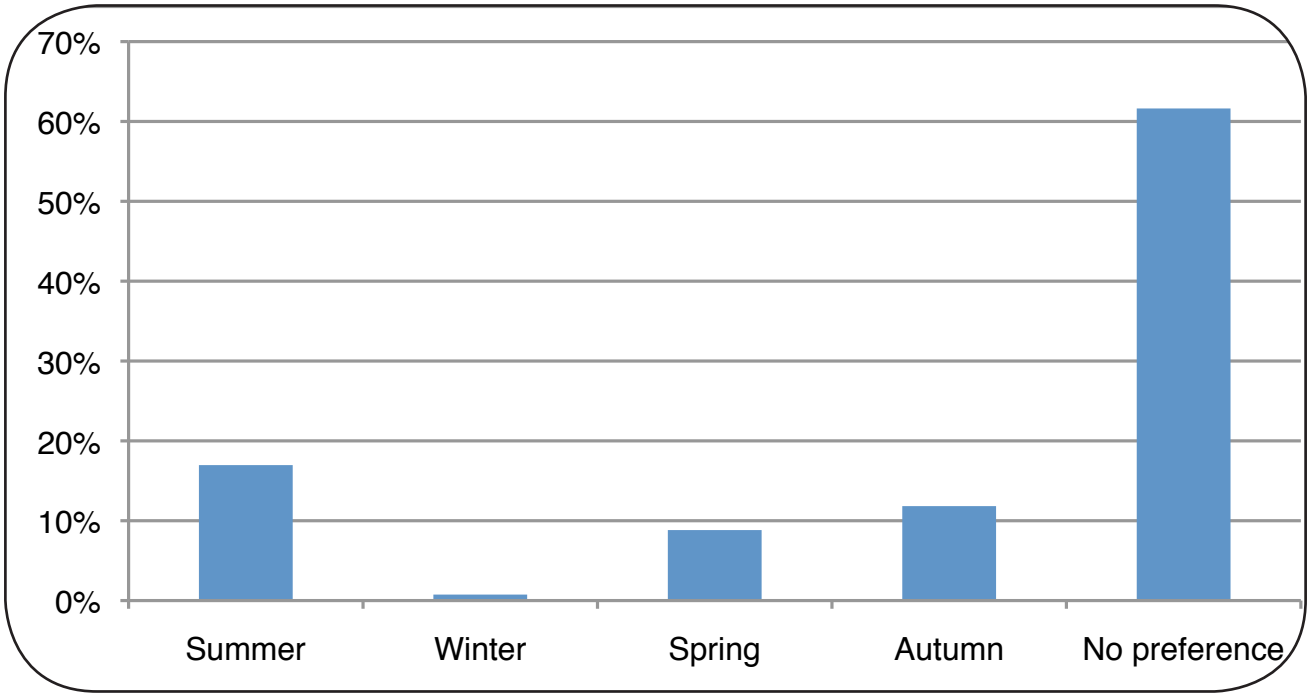


If you were permitted to carry your bicycle on V/Line coaches, would you use this service? How often?

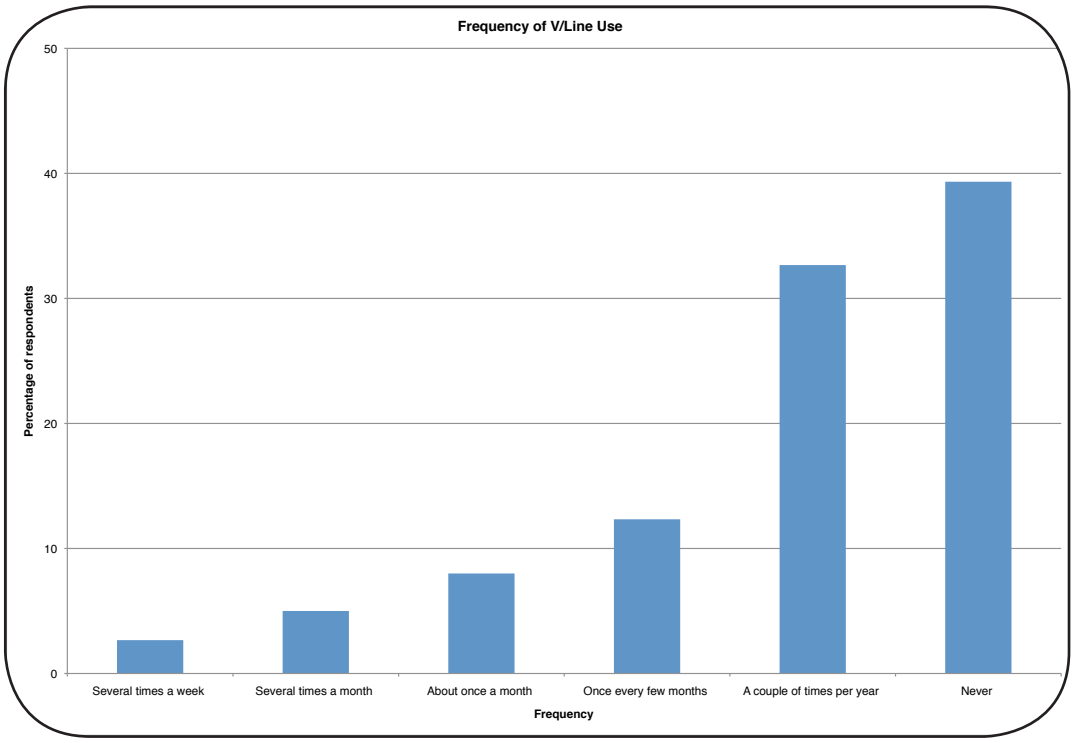


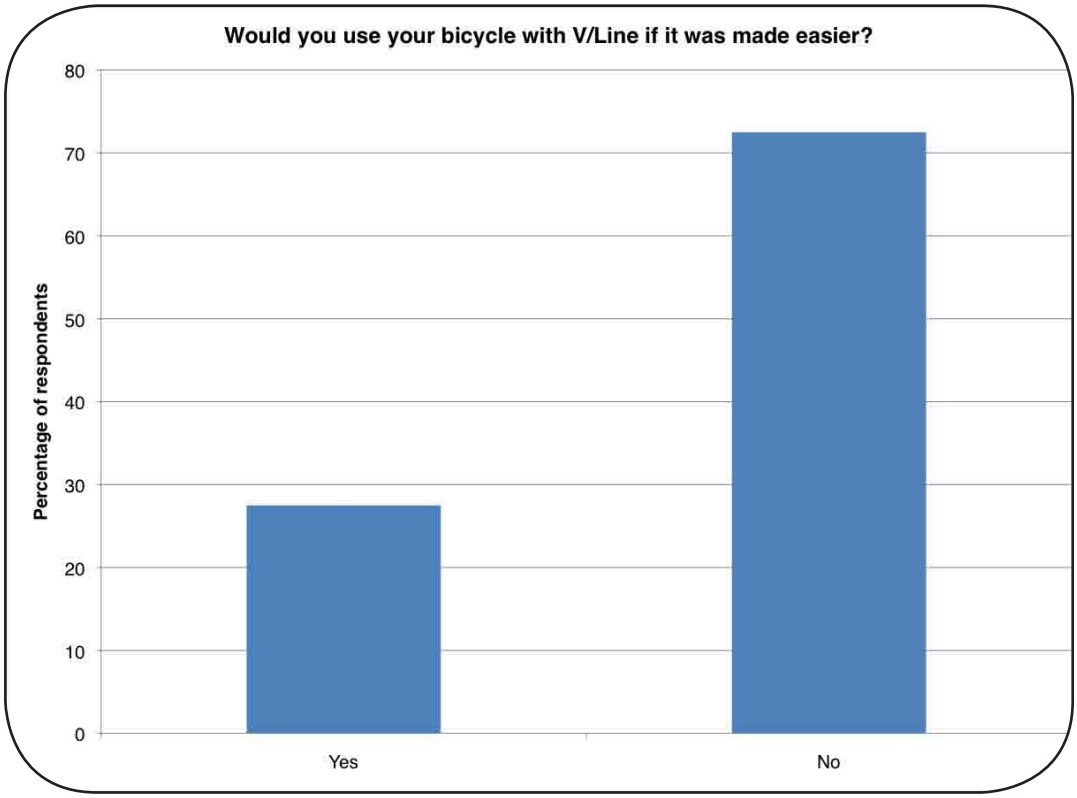


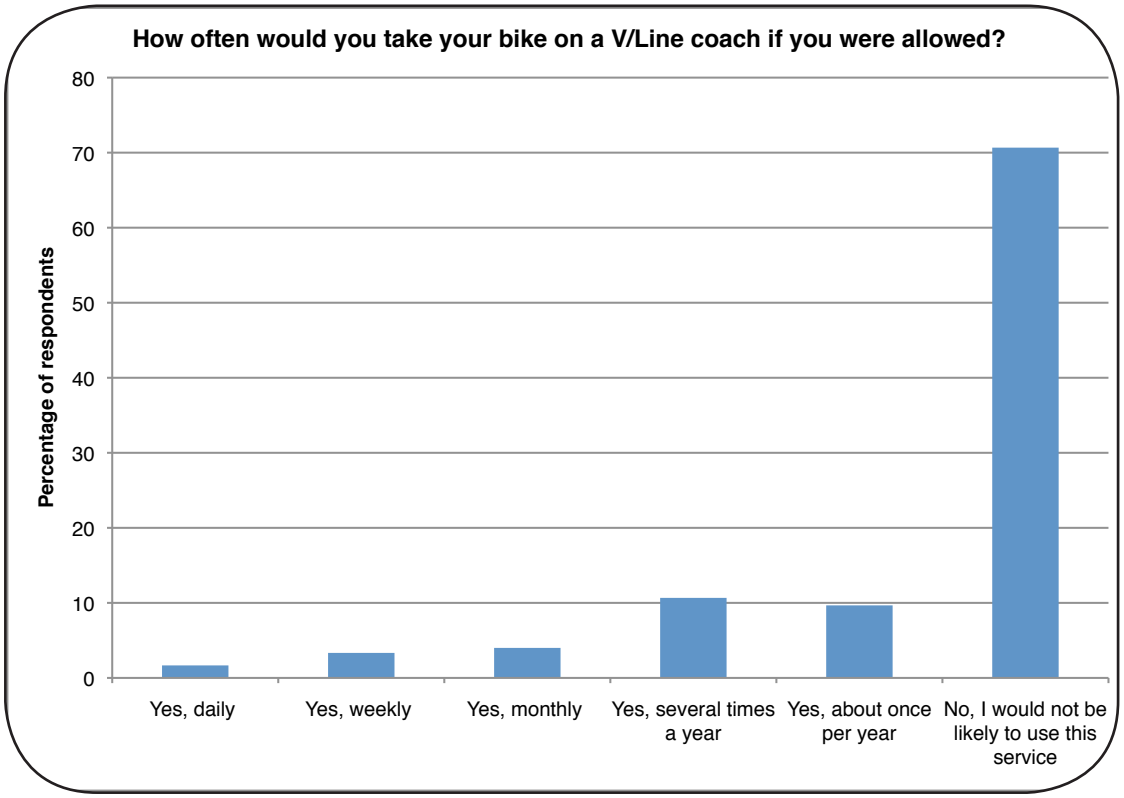
If you were to use your bicycle in combination with regional public transport, in which season would you be most likely to travel?

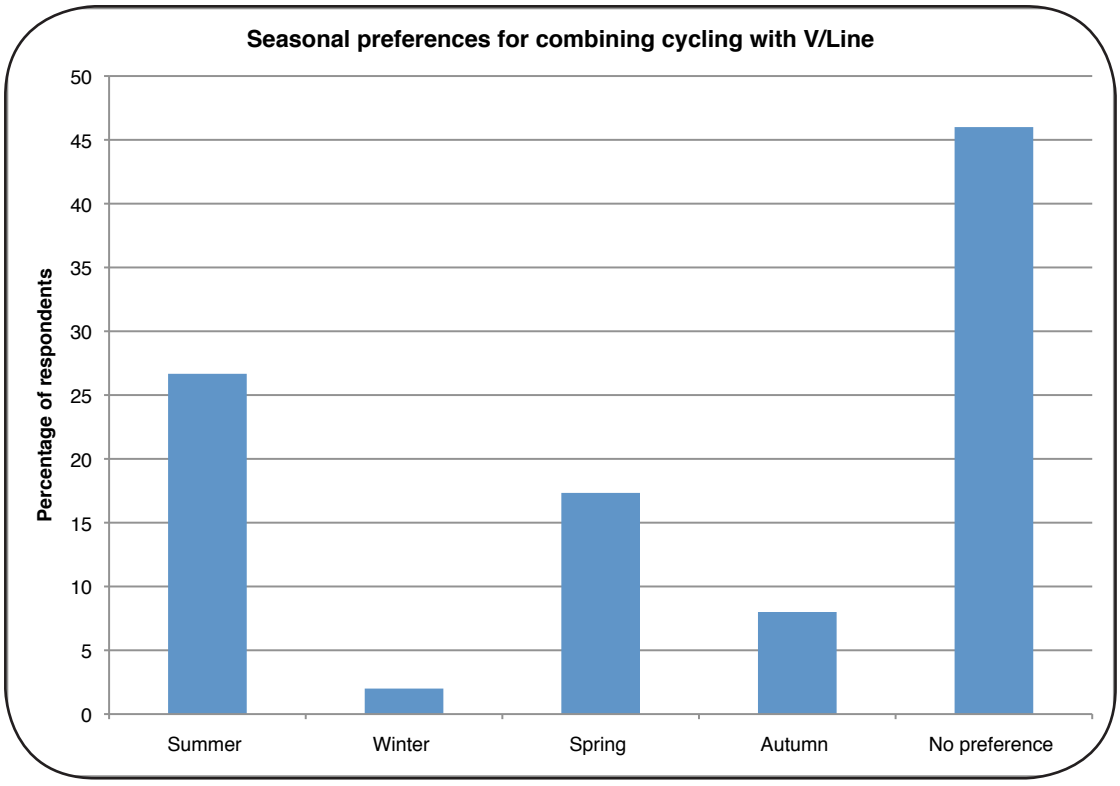


Results from the general community survey on combining cycling with V/Line

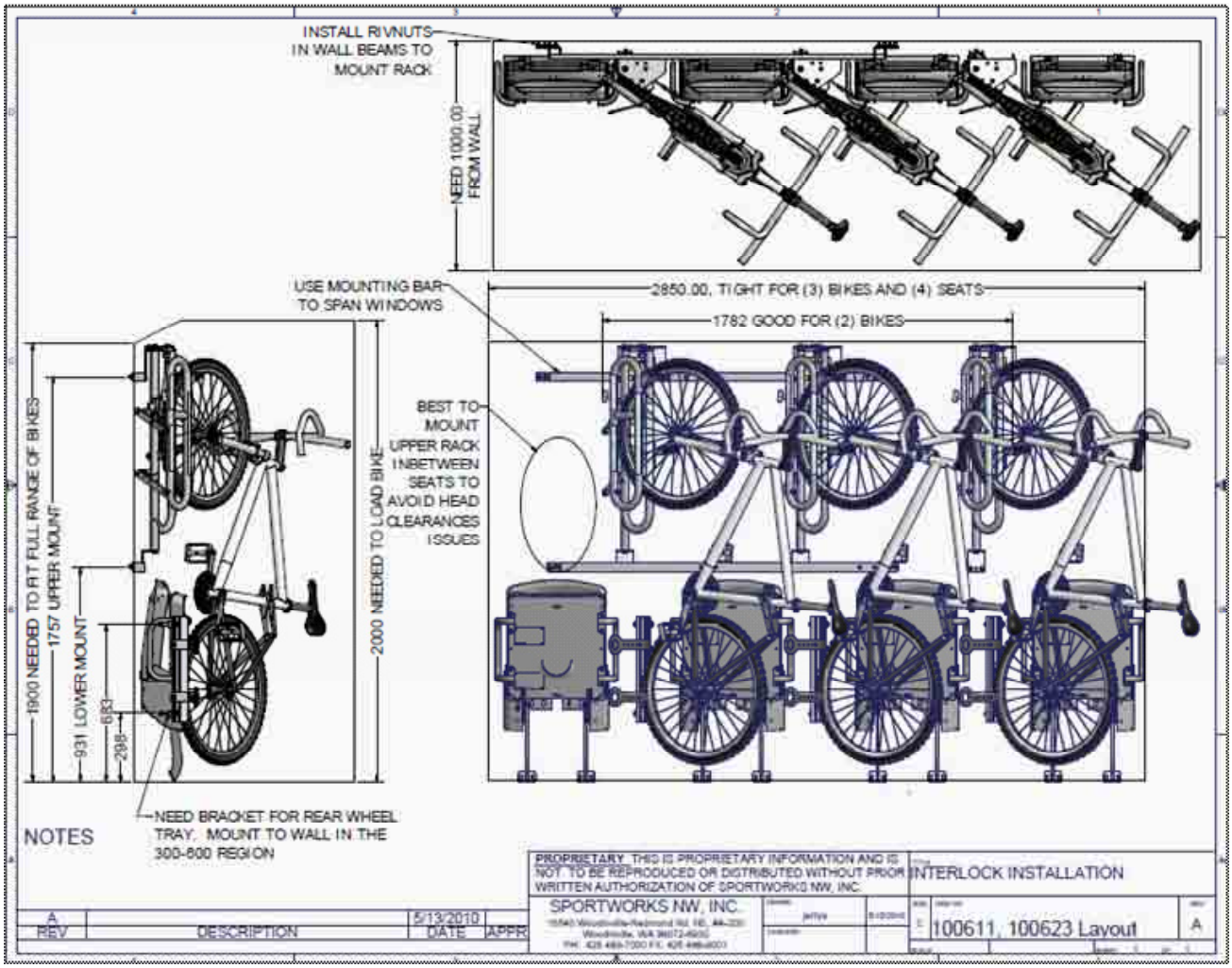





How often would you take your bike on a V/Line coach if you were allowed?
Percentage of respondents
80
70
60
50
40
30
20
10
0
Yes, daily
Yes, weekly
Yes, monthly
Yes, several times a year
Yes, about once per year
No, I would not be likely to use this service

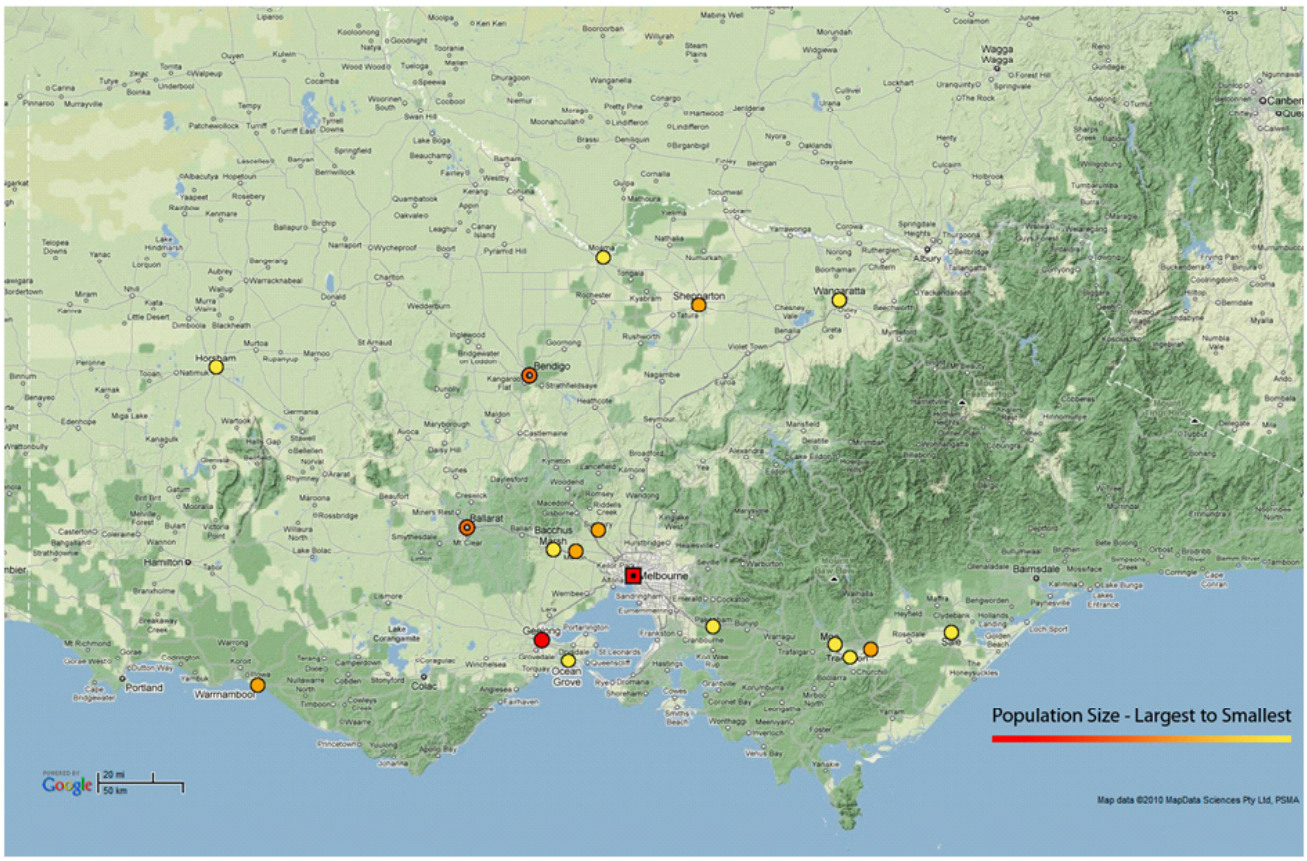

Seasonal preferences for combining cycling with V/Line
Percentage of respondents
50
45
40
35
30
25
20
15
10
5
0
Summer
Winter
Spring
Autumn
No preference

Appendix 9: Dimensions for vertically storing a bicycle



Source: Sportworks

Appendix 10: Victorian population centres



Source: http://www.citypopulation.de/php/australia-victoria.php

Prepared by the Institute of Sensible Transport for the Victorian Department of Transport

Institute for Sensible Transport
www.sensibletransport.org.au