



Bikes on Buses Trial
April 2016 - April 2017
Report

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1. Trial Purpose

The purpose of the bikes on bus trial was to assess:

- safety performance;
- equipment suitability;
- operational performance; and
- impact on patronage

The trial ran for a 12 month period from April 2016 through to April 2017. To guide the operation and assessment of the trial, a working group of stakeholders was established to monitor and advise BusVic and trial operators. The working group informed the trial parameters and a set of performance measures which have been used to inform the review of the trial.

The purpose of this document is to report on the operation of the trial and its performance with respect to the trial purpose outlined above.

2. Trial Scope

3 different geographic locations covering 4 routes were chosen to obtain a relevant cross section of urban, regional and rural users and network conditions. In total there were 15 buses that took part in the trial along the following routes:

- Route 510 - 8 buses (City of Moreland, City of Moonee Valley, City of Darebin, and City of Banyule)
- Route 512 - 3 buses (City of Moreland and City of Moonee Valley)
- Route 16 - 2 buses (City of Greater Bendigo)
- Cowes to Wonthaggi - 2 buses (Bass Coast Shire)

All buses received permit approval to operate from the National Heavy Vehicle Regulator (NHVR) and route access approval from VicRoads and the relevant councils for the period of the trial.

3. Stakeholders

A stakeholder working group was established to oversee the development and implementation of the trial. The working group monitored the performance of the trial, providing feedback on performance measures, strategy and community engagement.

The stakeholder working group comprised the following representatives:

<i>Company</i>	<i>Contact</i>	<i>Email</i>
MorelandBus	Robert Wright	rwright@morelandbus.com.au
South Coast Bus	Michael Wright	mwright@morelandbus.com.au
Whitmores Bus Lines	Jamie Whitmore	whitmoresbuslines@bigpond.com
VicRoads	James Ritchie	James.ritchie@roads.vic.gov.au
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PTV	Stephen Ryan	Stephen.ryan@ptv.vic.gov.au
City of Moreland	Craig Griffiths Nicholas Elliot	cgriffiths@moreland.vic.gov.au nelliot@moreland.vic.gov.au

Transport Workers Union	Mike McNess	Mike.mcness@twu.asn.au
City of Greater Bendigo	Trevor Budge	t.budge@bendigo.vic.gov.au
Bass Coast Shire Council	Angus Cameron	Angus.cameron@basscoast.vic.gov.au
City of Moonee Valley	Chris Morris	cmorris@mvcc.vic.gov.au
City of Darebin	Felipe Carvajal	Felipe.carvajal@darebin.vic.gov.au
City of Banyule	Bailey Byrnes	Bailey.byrnes@banyule.vic.gov.au
Bicycle Victoria Network	Garry Brennan	garryb@bicyclenetwork.com.au
Transport Safety Victoria	Shaun Rodenburg	Shaun.Rodenburg@transportsafety.vic.gov.au

4. Bike Rack

The Veloporter 2 bike rack was used for the trial (Refer Appendix A). The unit was selected following initial analysis that identified that this model had the least impact on a bus's on road performance for swept path and frontal swing manoeuvres. The Veloporter 2 bike rack model is manually loaded by the customer. The loading and fastening mechanism used for the system is typical of other similar bike rack systems in operation globally. The rack system is imported from the US. An attachment plate to connect the unit to the bus is manufactured locally.

4.1. Protrusion

The Veloporter 2 bike rack, when loaded with 2 standard bicycles has an overall forward protrusion of 1.2m from the front of the bus. For a typical route bus in Victoria, this creates an overall vehicle length of 13.5m. Computer modelling and on road analysis has shown that buses fitted with the Veloporter 2 rack, and with the rack in the "operational" position, have an on-road manoeuvrability and performance level that aligns with a typical bus in terms of swept path and frontal swing. Section 5 of this report provides further details on the on road performance of the system.

5. Vehicle Approvals

5.1. Vehicle Performance

For buses with the bike rack attachment to operate on Victorian roads, an over dimensional vehicle permit exemption was required from the Australian Design Rules (ADR). This was secured through the National Heavy Vehicle Regulator (NHVR) and VicRoads. The purpose of this was to ensure the vehicle, with the bike racks installed, complies with the design requirements and is able to operate on the road network in a safe manner. To demonstrate consideration for this on-road requirement, a Performance Based Standards (PBS) vehicle assessment for each bus type measured the vehicle performance against two key criteria:

- Vehicle frontal swing
- Vehicle swept path

BusVic engaged Advantia consulting to undertake an assessment of vehicle performance in consideration of the above to on road performance standards both prior to the commencement of the trial and then during the operation of the trial to ensure any post implementation variations were considered. The assessment included the 5 different vehicle types that comprised the fleet for the trial period. The reports are attached in Appendix B and detail pre-trial and during trial analysis. The

reports concluded that all buses complied with the swept path requirement of the PBS standard. The reports found that for the frontal swing performance measure, the standard 12.3m long route buses had an existing frontal swing of approximately 1.52m (with the performance standard being set at 1.50m) and with the addition of a Veloporter 2 bicycle rack, the frontal swing increased to an average of 1.63m. For the 12.5m long route bus, the existing 1.60m frontal swing became 1.77m. For the route buses that were less than 12.3m in length, modelling identified that they had a frontal swing of less than 1.50m, with and without the bike rack fitted.

5.2.Vehicle Permit Process

The NHVR is responsible for the issue of an exemption permit to the ADR for the buses to operate with a bike rack attachment. The NHVR need to be satisfied that the operation of the vehicle under the exemption permit will not pose a significant safety risk during operation on the road network. Each bus in the trial required a separate permit to operate with a bike rack. The required permits were the:

- Access Class 3 (Miscellaneous) permit; and
- Vehicle Standard Exemption permit

The key safety issues that require to be addressed as part of the permit process are:

- Interaction with other road users (pedestrians, cyclists and other vehicles) of the operation of the bus with the bike rack attachment
- The effect of the increased frontal swing on other vehicle and roadside infrastructure from the additional road space required

For the trial period, these issues were managed through the permit approval process (modelling of on road performance against the Performance Base Standards for frontal projection), appropriate driver training, compliance with existing operator safety accreditation regimes through Transport Safety Victoria (TSV), and a marketing campaign to encourage use and awareness of the bikes on buses program.

5.3.Network Access / Route Assessment

The approval of vehicle permits by the NHVR also required network access approval for operation along specific bus routes from the relevant road manager, either VicRoads and/or local government.

In considering network access, the road manager needed to be confident that the operator demonstrated that a bus fitted with a bike rack will operate safely along the fixed route with the rack in the deployed position. Operators worked closely with VicRoads and councils to identify any potential route issues. Where the road manager identified any potential safety concerns an independent route assessment was commissioned to assess the impact of the bus operation (refer Appendix B). Typically, this assessment considered operation of the bus at intersections and at designated bus stops. In practice, the route assessments identified issues that impacted the operation of the bus even without the addition of the bike rack. Section 6.4 discusses on road and infrastructure matters in more detail.

6. Trial Performance Measures

On-road safety performance is a key performance outcome underpinning the success of the trial. To support high safety outcomes in an operational environment, along with the modelling of the vehicle's on road performance, the trial was supported by a suite of training, education, operational and reporting measures. These performance measures formed the basis for which the bikes on buses program would be assessed on. The list of measures is contained in Appendix C, with the purpose of the measures seeking to address:

- On road performance including negotiating corners, and occupation of road space
- Interaction with other road users including pedestrians, cyclists and other vehicles
- Use of bike racks
- Operational performance of bus to ensure meeting on time running obligations

6.1.Safety

The safety performance measure sought to record two metrics regarding the operation of bike racks on buses:

On road performance - the operation of the bus on the road network

Bike rack usage - property or personal incidents arising through use of the bike rack system

6.1.1. Safety Matters Identified

On Road Performance

- Protrusion of the bike rack from the front of the bus when in the 'deployed' position introduced new operational safety risks for the driver that included:
 - Low speed collision impacts with pedestrians at bus stops and intersections
 - Impacts with general vehicle traffic during on road operation - i.e. turning manoeuvres, stopping, entering/exiting bus bays
 - Bicycles becoming dislodged during transit
 - Low speed impacts when manoeuvring in the depot
 - On the Optare buses which are narrower than standard route buses, the bike rack impacted headlight performance in regional areas where there were no street lights

Bike Rack Usage

- Potential injury to customer through placing / removing bike from rack
- Potential injury to bus driver placing / removing bike from rack
- Bus parking brake not engaged during loading/unloading of bike from rack

6.1.2. Safety Mitigation Strategies

To mitigate against the safety issues identified in Section 6.1.1, bus operators, with support from the appropriate stakeholders implemented the following activities for the purpose of the trial:

- Developed and implemented a driver training program to train the driver in all day to day aspects of operating the bus with a bike rack attached
- Developed a marketing campaign across a number of mediums to provide customers with details of the use of bike racks on buses

- Undertook a risk assessment of the operation of buses with bike racks in accordance with the operator accreditation program which informed driver, maintenance and operational procedures
- Used video footage of the operation of buses fitted with bike racks to provide feedback to drivers as well as update regulators
- Installed a light bar to the front of the bike rack to complement the performance of the vehicle headlight system

These measures will form the basis of a standard training package to be developed by the industry to support a full roll out of the program to align with an operators obligations under their accreditation regime.

Sections 6.1.3 through to 6.1.5 provide observational feedback on safety matters through the operation of the trial period. This information was used to inform day to day operations during the trial as well as training procedures and the marketing campaign to ensure all stakeholders involved in the trial were considered and accommodated.

6.1.3. Bike Rack Operation

From the outset of the development of the trial, it was recognised that it was important to ensure the bike rack was easy to use and that appropriate displays and training material were available for customers. An extensive marketing campaign led by PTV, operators and councils provided a variety of material to inform the customer of how the bike rack should be used. Operationally, it was agreed from a safety perspective, that the bus driver would not assist the customer in loading or unloading their bikes from the rack. To support the initial rollout of the trial, operators provided additional staff on some services to assist or advise customers.

The following are observations made by operators during the trial:

- There were some customers who initially had difficulty operating the bike racks. One customer ended up not using the rack and one customer tried to board the bus with the bike after failing to load it on the rack.
- One customer did not properly secure the bike on the rack (the bike was specially modified with an extended wheelbase) which resulted in it coming loose during the journey. The bus driver was able to notice this and pull over so that the bike could be properly secured.
- One customer was unable to remove the bike from the rack at the completion of their journey. They ended up forcibly removing the bike from the rack, but did not cause any damage to the bike or the rack (captured on CCTV on the bus).
- When reaching speeds of 80kmh and above, the bike positioned closest to the bus body would hit the bus. This was rectified by adjusting the bracket for the bike rack.
- In wet weather and with the bus reaching speeds of 60kmh and above, the bike closest to the bus body would vibrate and impact the operation of the wiper blades. This was rectified by adjusting the bracket for the bike rack.
- No property damage or personal injury incidents were recorded during the trial.

6.1.4. Incident Reporting

Incident recording and reporting was undertaken in accordance with the Bus Safety Act and an operators TSV accreditation compliance obligations. Operators reported incidents to TSV, VicRoads and council as required. There was one reportable incident during the period, with a couple of non reportable incidents.

- Moreland Route 510 service - Bus and car accident caused by car driver behaving in an erratic manner. The bike rack (which was in the stowed position) was damaged as a result of the accident. The damage was covered by insurance. Car driver was found to be at fault.
- Strathfieldsaye Route 16 service -Bus hit by a kangaroo causing damage to the bike rack (which was in the stowed position).
- There were no incidents involving the operation of the bus with the bike rack in the deployed position.

6.1.5. Video

On board video footage, was used to assist in driver training, incident reporting and to provide feedback to the working group in the performance of the bike racks under various road conditions. Footage was made available to VicRoads, TSV and working group members throughout the trial to assist in understanding operational and compliance aspects.

6.2.Operational

The operational performance measure developed metrics to record the impact of bike rack usage on various operational parameters of the bus service along the route. There are five measures that make up this performance metric:

Bike rack usage: the number of times the bike racks were used, frequency of user, origin /destination etc.

Driver training: Operators had the appropriate systems in place to ensure drivers received required training to operate bus and the number of times a bus was not available due to non trained drivers.

Timetable schedule impact: Cumulative time impact on bus schedule due to bike rack usage.

Cost: Cost to supply, install and maintain bike racks.

Bikes left on racks: Record the number of bikes left on the rack at the end of a run

6.2.1. Patronage

Usage of the bike racks through the trial has delivered varying results across the 3 trial regions. Initially the trial attracted a variety of customers including those who were interested in the concept, regular cyclists, as well as new customers who were able to link bike riding with public transport to access employment, recreational and education facilities. Over the course of the trial, metropolitan patronage remained relatively steady on the 510 and 512 routes. This corridor is well connected to other transport options (public and personal) and is supported by multiple bike paths. Patronage on the two regional services was lower initially, however this grew steadily over the trial period. The Cowes to Wonthaggi service, saw strong patronage growth after the first 4 months as the service became established and in line with a new marketing campaign. Patronage on the Strathfieldsaye corridor in Bendigo remained steady over the trial period with regular users the corner stone of the service.

Table 1: Bike Rack Usage

Route	Bus Numbers	Patronage 2016/17		
		Monthly	Peak	Annual
510	9	25	56 (March 2017)	299
512	3	2	6 (May 2016)	22
Strathfieldsaye (Bendigo)	2	16	39 (Feb 2017)	187
Cowes to Wonthaggi	2	23	48 (Nov 2016)	274

Some of the observations and feedback from customers and operators include:

- Usage was higher in the warmer/drier months
- Usage increased as the exposure of the trial increased, in particular in regional areas
- Customers in regional areas were using a combination of bicycle travel and bus travel to get to work
- There was some use of bike racks on buses to access recreational cycling facilities in regional Victoria
- There were several regular customers who used the service more than once a week, in particular in regional areas

6.2.2. Service Impact

All operators have advised that the use of the bike racks have not impacted the operation of the bus so as to affect the overall service performance along the route.

There were no recorded incidents of where a bike was left on the rack during or at the end of a run.

6.2.3. Bike Rack Technical Performance

The Veloporter 2 rack is an industry standard unit. The unit operates under a simple system where the bike is placed in the rack and a handle is extended and used to clamp the front wheel into the tray. The handle, for new units, is quite stiff and can quickly clamp down when released. Bus drivers observed that some users had difficulty using the clamping device the first time. As users became accustomed to the system, the ease of use improved.

The Veloporter 2 has plastic trays that store the bike during transit. There was a manufacturing fault with the batch of units purchased for the trial that led to a number of plastic trays cracking and warping during normal operations. These units have been replaced and the issues have not reoccurred during the remainder of the trial.

To ensure compliance with speed camera enforcement, operators have been required to attach an additional number plate to the rack that is visible when the rack is in the deployed position. There were some initial issues with regard to attaching the number plate and the size and style of the plate, but these have now been rectified.

Fitting of the bike rack to a bus for the purpose of the trial was initially done as a retrofit. Towards the end of the trial period, operators had new buses coming into the fleet and requested that the bike rack be fitted during the manufacture process. The manufacturer advised that in order to comply with the Australian Design Rules (ADR) for the manufacture of new buses they were unable to fit the racks in

the factory. It was agreed with the manufacturer that the bracket for the bike rack would be fitted in the factory and the bike rack itself would be fitted post delivery. This process is similar to that used by Action Bus in Canberra.

6.2.4. Cost

The cost to operate the bikes on buses trial can be broken down into the cost of the rack, the permit approval process and the route assessment (where required). For the bike racks, costs have been further refined as capital cost, operational cost, ancillary (new number plates, spotter mirrors to improve driver vision) and maintenance costs.

Table 2: Trial Costs

Cost Item	Unit Cost
Bike Rack Unit (imported unit including shipping cost)	\$1,550
Bike Rack Installation	\$165
Bike Rack Maintenance	\$0 (part of routine maintenance program)
Ancillary Costs	\$150 - \$500
Vehicle Approvals	\$1,000 (per operator route)
Route Assessment (if required)	\$5,000 - \$10,000 (based on route length and number of intersections)

As can be seen in Table 2 the unit cost of the supply and install of the imported bike rack is approximately \$1,700 per unit (based on current exchange rates and shipping via sea). There were ancillary costs of approximately \$150 per bus for an additional number plate and a spotter mirror. The regional services on the South Coast fitted a light bar (\$350) to complement the headlights in areas where there was no street lights. The most significant cost for the trial was the vehicle exemption permit and route access application process. Due to the unknown nature of the trial, the vehicle exemption permit process required significant time allocation from the operators to ensure appropriate information was made available to VicRoads, the NHVR and local councils. Route access, in particular how a vehicle was able to navigate the narrow streets of inner Melbourne, required an independent assessment of the 510 and 512 routes operated by MorelandBus. The cost of an independent route assessment will vary depending on the length of the route and the number of intersections and turning movements involved. The Cowes to Wonthaggi service and the Strathfieldsaye service did not require an independent route assessment as the local council's were satisfied with the operating parameters of the bus on the proposed route. As noted in Section 6.4.1, the route assessment identified a handful of issues along the route that impacted the operation of the bus with or without a bike rack attached. The route assessment proved a valuable tool in addressing these matters along the corridor with both VicRoads and local council.

Streamlining the approvals process, for both vehicle permits and route access will significantly reduce the costs to operators. The VicRoads proposal to gazette access to the road network for compliant vehicles will further reduce costs to operators.

6.2.5. Driver Training

Driver training is integral to the success of the trial. The development of the training program was managed by the operator as part of their existing accreditation obligations through TSV. Targeted training programs for all drivers within the depots were undertaken to ensure full coverage when operating buses with bike racks fitted to them. These training programs have now been integrated into existing training process. Driver training included on road training, use and operation of bike racks,

customer service, incident reporting and compliance with VicRoads / NHVR operating conditions. There was some initial concern from a few bus drivers, in particular regarding the manoeuvrability of the bus and impact on running time, however during the training period and the actual operation of the buses on the network, these concerns dissipated quite rapidly.

Operators for the trial have undertaken surveys of their drivers attitudes and thoughts to the operation of the trial. The following is a summary of the survey responses:

- Passengers are generally supportive of the concept - Metro more than 66% of respondents were positive and 20% neutral (did not see the concept as having either positive or negative impacts to the bus service); regional 50% of respondents were positive and 50% neutral.
- All bus drivers had operated a bus that carried a bike.
- Two thirds of metropolitan bus drivers thought the concept was a good idea whilst more than 80% of regional drivers were supportive of the concept.
- Within a metropolitan environment, approximately three quarters of drivers thought the use of the bike rack impacted on time running whilst in regional areas, none of the drivers thought that the use of the bike rack impacted on time running.
- Drivers identified some consistent issues through the trial:
 - Many first time users had difficulty understanding how the rack worked
 - Extending the handle to secure the front wheel was difficult (due to it being tight)
 - On metropolitan routes, those users who did not know how to load the bike cause some delay to the bus service
 - Drivers in some instances had to exit the bus to instruct the passenger in how to use the rack
 - The overall level of use is low
 - Require further marketing / advertising to show people how to use the rack

6.3.Patronage

The patronage performance measure developed metrics to record the impact of bike rack usage on patronage numbers along the bus route. There are two measures that make up this performance metric:

No. of bikes on buses related trips: New passengers due to bike rack availability.

No. of regular trips: Standard bus passenger trips.

As shown in Section 6.2.1 the overall patronage numbers along the routes had a steady increase across the trial period. Feedback from users to operators, council and PTV showed that there were a number of regular users who used the service mainly for accessing employment or accessing recreational facilities. Data provided by the operators shows that the majority of customers used the service on weekdays. On Route 510, Saturday was the most popular day with approximately 25% of all usage. A detailed user feedback process will be undertaken post trial to ascertain further user details including origin /destination, new customers and frequency of use.

Anecdotal feedback identified that on the regional routes, new customers used the service to access employment, using their bike to connect with a bus stop that was not easily accessible by walking. These customers were repeat users. The Cowes to Wonthaggi service had to regular customers who used the service on multiple occasions through the week to access employment. The Strathfieldsaye service had a regular customer during the week who used the service to access employment with regular weekend users who used the service to access bicycle riding tracks. The 510 service operated

by MorelandBus had a variety of users with differing demand needs, with a number of customers having used the service multiple times through the trial.

6.4. Infrastructure

The infrastructure performance measure developed metrics to record the physical operational performance of a bus along the route. There are two measures that make up this performance metric:

Compliance with road geometry / lane markings: On road performance of bus along route

Bus infrastructure - bus bays, lanes and road furniture: Adequate bus infrastructure to support access to bus.

6.4.1. On-Road Performance

The following on-road and operational matters were identified during the trial. As noted previously, the majority of matters raised during the trial in relation to on road performance affected the operation of buses whether they had a bike rack fitted or not.

- Line marking at an intersection that was offset to the main road reduced the drivers vision of oncoming traffic when turning. Working with the City of Moreland, the intersection line marking was adjusted to improve the drivers vision to manage the hazard.
- A dip in the road caused the rack to "bottom out" when travelling at the signed speed limit. This was an existing hazard along the route. VicRoads undertook works to reduce the impact of the dip. After these works were completed, there were still issues of the rack bottoming out, so the operator implemented an instruction to reduce the operating speed along the road to manage the hazard.
- Parked cars along a side street impacted on the ability of the bus to manoeuvre around a corner in one move (this had been an issue along this corridor even prior to the trial). The City of Moreland introduced parking restrictions within the vicinity of the intersection during operating hours to eliminate the hazard.
- The 510 route requires buses to stop within the intersection of Normanby Road and St Georges Road, between 2 tram lines. The bus bays are 15m in length and a bus is able to safely pull up in the bay without impinging on the path of the trams operating along St Georges Road. This issue will need to be considered when assessing other routes as the program is rolled out where similar operations occur.
- The length of bus stop bays along the road and at key bus terminals should be reviewed and adjusted as required to account for the additional length of the vehicle with the bus rack in the deployed position. The majority of bus bays are 15m in length, to allow a bus to enter exit the bus stop. This works well in most situations, however in sections of inner Melbourne, those bays may be shorter, end in a saw tooth arrangement at a bus/rail terminal, or, due to road calming works, be more difficult to access. PTV is aware of this matter and, in conjunction with operators and councils, will develop a program to support installing appropriate bus bays as required along routes and at terminals.

6.4.2. Route Deviation

Under the vehicle permit approval process, permitted vehicles are required to operate on a specific route with the bus in the 'deployed' position (a bus can operate on the general road network with the rack in the stowed position). During periods of planned and unplanned network disruptions, a bus may be required to take a detour from its allocated route. As the road managers, VicRoads and councils are responsible for how these events are managed. Under the Heavy Vehicle National Law vehicles that

are required to deviate from their permitted route must follow the direction of the road manager or an authorised officer, or select an alternative route that returns the vehicle to the permitted route in the shortest and safest route.

For planned disruption events, i.e. planned road maintenance, events etc, the responsible party undertaking the works/event is required to have a traffic management plan (TMP) approved by the relevant road network manager (i.e. council or VicRoads). The TMP must consider public transport impacts and engage with the transport providers to ensure that they are able to continue to provide services to the community. An operator under their TSV operating obligations must ensure that any proposed alternative route is safe for travel. A TMP will not be approved if it does not provide an alternate safe route of operation for bus operators.

For unplanned disruption events, i.e. accidents, burst water main, train boom gates malfunctioning, etc, the extent of the disruption event is unknown. The standard practice for bus drivers in this situation, where the incident is not being actively managed by the police or other authorised officers, is to contact the depot and advise to the best of their knowledge what the situation is. The depot will advise the driver of an alternative route whilst the disruption is occurring, taking into account the need to pick up and drop off passengers. The depot takes into consideration the existing routes, location of bus stops, local knowledge of street capacity (parked cars, width of street, overhanging branches etc) when allocating an alternative route during the disruption. Other drivers on the route are then advised of the disruption and the alternative route.

The road network managers on the working group were satisfied that the process in place for planned disruptions to the network, the TMP, would address the identification of an appropriate temporary route deviation to meet operational and safety requirements for the community and operator. Road network managers also advised that the procedures that bus operators had in place under their TSV operational obligations were adequate to manage unplanned service disruptions.

For rail replacement services, where buses perform planned and unplanned support to the rail network, PTV and operators advised that the bus replacement corridors are fixed with designated corridors and bus stops. PTV will need to work with Metro Trains who are responsible for procuring bus replacement services to ascertain the need and timing of undertaking this work considering the current low permeation of bike racks on buses. Further to a future arrangement between PTV and Metro Trains, the necessary route access approvals will be obtained for the operation of buses with bike racks on these corridors to ensure an appropriate fleet mix can be provided to meet all passenger needs during rail network shutdowns.

VicRoads are proposing to gazette and map all bus routes for approved vehicles under the Controlled Access Bus Network. This network mirrors the majority of the road network under the management of VicRoads. Operators will have access to these maps indicating the allowed road network as well as those sections of the road network that buses under the bikes on buses program will not be allowed access. This information can be used when determining a detour for both planned and unplanned disruptions to the network by the operator.

6.5. Passenger Satisfaction

The passenger satisfaction performance measure records the customer and passenger views and satisfaction levels regarding the usage of bike racks along the bus route. Reporting on this measure is via an online survey of bus passengers and users of the bike racks:

Undertake survey of passengers: Passenger and bike rack user survey.

6.5.1. Marketing Program

PTV coordinated the marketing of the bikes on buses trial in conjunction with the councils and bus operators. There were two marketing campaigns during the trial. The first campaign aligned with the launch of the trial in April 2016. The second marketing campaign was launched in November 2016.

Each marketing campaign was tailored to meet the objectives of the relevant stages of the trial. The working group considered a targeted marketing campaign as being critical to support the implementation of the trial at the local level and deliver safety outcomes. A range of tools were developed to support users in understanding the operation of the bike racks and the associated safety considerations. The marketing strategy focused on 3 key areas: Awareness; How to use the Bike Rack; and Customer Feedback. Engagement with customers was through multiple forms including online, direct engagement with user groups, posters on buses, on bike paths and in targeted retail sectors, decals on bike paths, and at several local community events. A community based marketing campaign was developed in conjunction with councils for each specific route and was targeted to the type and frequency of users. An on-line how to use video and onboard posters to assist customers were also produced. Appendix D provides a snapshot of some of the marketing tools used in the trial as well as a summary of on line activity.

PTV, in conjunction with operators and local councils will undertake a detailed post trial survey of users and passengers to provide a holistic feedback process of the bikes on buses trial. The output from the survey will be used to inform the subsequent marketing campaigns for the next stage of the program as well as any operational improvements to meet customer expectations.

7. Regulatory

Section 5 of this report detailed the approvals process undertaken for both vehicles and route access. The following is a summary of the operators observations during the implementation of the trial and through the operation of the trial.

- The initial vehicle permit approval process was longer than expected as the process and scheme was new to the majority of stakeholders
- Authorities were engaged in the process, however, during the initial vehicle approvals process, there were some coordination issues between authorities
- Once the vehicle approvals process was finalised for the trial, it was a more efficient process for the addition of new vehicles (replacement buses)
- Fitting a new bike rack to a new bus during the manufacturing process does not comply with existing ADRs. The bike racks need to be fitted after bus has been delivered to the operator
- Route access was well coordinated and relevant road agencies engaged actively through the process
- The proposed gazette process by VicRoads and mapping of approved road network will further facilitate the road access approvals process

8. Recommendations

The Bikes on Buses working group recommends that the trial has met its objectives, that is safety, operational impact and customer (accessibility) performance measures were met and that the program should be rolled out across all route buses in metropolitan and regional Victoria in a structured program. The rollout of the program will be agreed with PTV and VicRoads.

Considering the need to implement a set of template vehicle and access approval processes as a result of this trial, it is recommended that the rollout aim for 100-200 buses per annum for the first two years, expanding to approximately 300 buses per annum for the subsequent 5-7 years to aim for a 100% fleet coverage (refer Table 3).

The rollout will target depots / regions to ensure full coverage along routes and customers. Rollout program to be negotiated with operators.

VicRoads to implement a Gazette for road access for the Controlled Access Bus Network in Victoria which will incorporate a map of approved routes for VicRoads and local government managed roads. The map will be updated as required to reflect new approved bus routes.

Work with the NHVR to establish a blanket vehicle permit approval for accredited bus operators for route buses. The permit will apply for the contract life of the vehicle.

Work towards having an agreed network access approvals process with local government for buses that receive NHVR approval under.

Support the local manufacture of bike racks in Victoria. BAV is working with a local manufacturer on a bike rack system that will be quality and cost comparative to the imported product as well as creating jobs within the Victorian automotive sector.

The VicRoads conditions of operation for buses fitted with front mounted bike racks for the purposes of a trial (draft) banned the carriage of electric bikes. Additionally, Transport Safety Victoria didn't support the bike racks to be used on School Bus routes (Myki enabled) for the trial. Further to the completion of the trial and support of the working group it is recommended that:

- Electric Bikes (e-bikes) be approved to be carried (provided they weigh 25 kgs or under).
- Baskets (permanently fixed) are allowed to be carried (i.e. that do not obstruct drivers view).
- School Bus Route (Myki enabled) – allow usage by students 13 + years of age with adult assistance

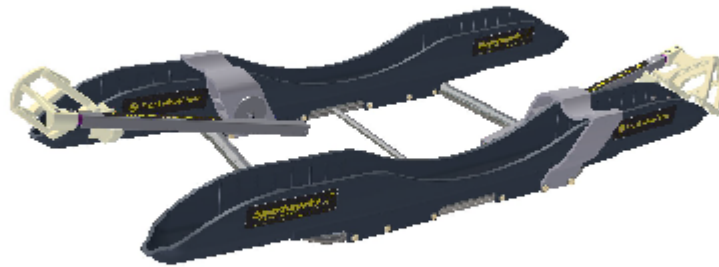
Align the next phase of the marketing campaign to focus on how to use the bike rack. This will be linked with a maintenance regime by the operators to ensure that the handle is fully lubricated and easy to engage for all users.

Table 3: Indicative Bikes on Buses Rollout Program

2017/18	Location	2018/19	Location	2019/20	Location	2020/21+	Location
100-200 Units	Healesville / Yarra Ranges	100-200 Units	Geelong	200-300 Units	Inner West Melbourne	300 Units (approx. Per annum)	Various regional centres TBC
	Latrobe Valley		Ballarat		Inner South East Melbourne		Various Melbourne metropolitan areas TBC
	Mildura		Darebin / Banyule		Doncaster area		
	Warrnambool		Sunshine / Caroline Springs		Clayton Area (Monash University)		
	Bendigo		Werribee		Various regional centres TBC		
	Wonthaggi Town Service and Wonthaggi to Traralgon Service		Mornington Peninsula				
	Timboon						
	Moreland/Moonee Valley / Darebin						

Appendix A:

sportworks®



VeloPorter 2™

Two position bicycle rack p/n 100634

Features & Benefits

- **Modular Design** – Reduce maintenance costs and lower the total cost of ownership with easily replaceable parts
- **Energy Absorbing Wheel Trays** – Provides a much safer product in the public arena
- **Wider Wheel Trays** – Accommodates bicycle tire widths up to three (3) inches
- **Support Arm Design** – Accepts wider variety of bicycle wheel sizes ranging from 16"-29" in diameter
- **Stainless Steel & Composite Materials** – Highly corrosion resistant
- **Backwards Compatible** – Upgrade to the VeloPorter using existing Sportworks hardware. Maximize your initial investment in Sportworks mounting brackets and DL2, DL2 S/S and Trilogy pivot plates.

Available Options

- Advertising Frame Kit, 13 x 32 P/N100756
- Multi-Language Decals-P/N various
- Deployment Kit-P/N 100634-DPLY or 100732 for existing rack
- Ten Second Bracket (TSB)-P/N various

Veloporter 2 Rack loading



Veloporter 2 Rack in deployed position



Appendix B: Advantia Reports -

Swept path of buses fitted with
front-mounted bicycle racks -
December 2015

In Trial Assessment - December
2016

Swept Path - City of Moreland

Appendix C: Trial Performance Measures

Grouping	Activity	Measure	Key Performance Indicator(s)	Responsibility
Safety	On road incident recording and reporting	Property Damage	Number of incidents, \$ value	Operator
		Personal Injury	Number of incidents, type of incident	Operator
		Near miss	Reported near misses	Operator
	Bike rack usage	Property Damage	Number of incidents, \$ value	Operator
		Personal Injury	Number of incidents, type of incident	Operator
		Near miss	Reported near misses	Operator
Operational	Bike rack usage	Usage of bike rack	Number of times rack use (one bike, two bikes, users unable to access bus, number of times used along the route (if multiple passengers boarding and alighting), An origin destination survey of customers	Operator / PTV
	Driver training	Drivers complete training program to safely operate bus with bike rack	Number of drivers who have completed the training, No. of times bus with rack not operational due to non trained drivers	Operator
	Timetable schedule impact	Cumulative time impact on bus schedule through bike rack usage	Time taken to load and unload bikes on rack, cumulative time impact on bus route time table	Operator
	Cost	Cost to supply and maintain racks	Capital cost, operational cost	Operator
	Bikes left on racks	Bikes left on rack at end of run	Number of bikes left on bus, number of bikes reclaimed	Operator
	Patronage	No. of Bikes on Buses related trips	New bus passengers due to bike rack availability	Number of passengers that use bike racks (survey/ manual count),

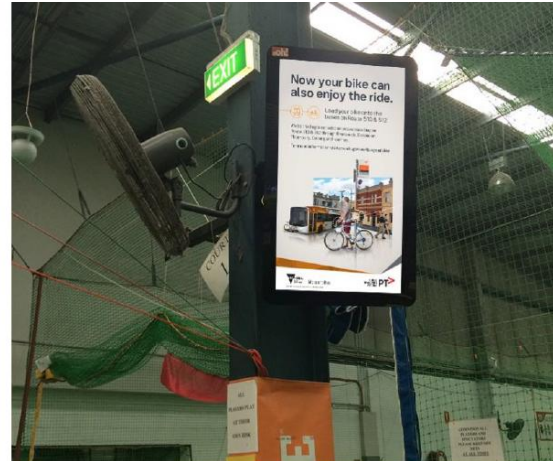
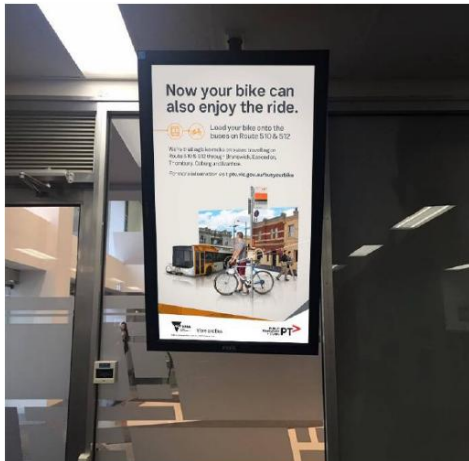
Grouping	Activity	Measure	Key Performance Indicator(s)	Responsibility
			Number of new passengers (survey), Origin / destination survey of BOB customers (survey)	
	No. of regular trips	Standard bus passenger trips	Number of standard bus passenger trips (manual count, survey, MYKI data)	
Infrastructure	Compliance with road geometry / lane markings	On road performance of bus along route	Reporting be drivers of any issues, Customer/Community feedback, VicRoads monitoring (on board bus camera)	Operator / VicRoads / LGA
	Bus infrastructure - bays, lanes, furniture	Adequate bus infrastructure to support access to bus	Operator feedback, customer and community feedback, PTV / LGA audits, reported incidents	Operator / LGA / PTV
Passenger Satisfaction	Undertake Survey of passengers	Passenger and bike rack user survey	Quarterly survey during trial period (survey content to be determined)	Operator / LGA / PTV

Appendix D: PTV Marketing

Media Post Report:

OOH panels in Sports Centres and Gyms

- Creative ran across 12 Panels in rotation with 6 other advertisers.
- It ran at various locations in Metro North



Pole Bubbles on Network

- Placed at key bus stops on the Cowes to Wonthaggi Route and Bendigo's Route 70
- Reminded people at the bus stop that they can bike and bus from here



Bus Sides and Bus Backs

- Side panels and bus backs on the MorelandBus and SouthCoast Bus Route

On Network Bus Posters on South Coast Bus, Moreland and Whitmore Buses



Decals in Bendigo, Darebin and Banyule Council

- Larger, easier to read decals placed in key areas along the route to encourage and remind people they can take their bike on the bus

Community Radio

- Locally produced radio ads to encourage people to explore when they bus their bike

Social Postings

- Multiple posts on Twitter during October
- PTV homepage tile for the month of October

PTV @ptv_official · Nov 6
 Bike racks on buses are now being trialled in #Melbourne & regional #Victoria - find out how to #BusYourBike here ow.ly/igzt305Q7AK



15 18

PTV @ptv_official · Oct 29
 Let us know your thoughts about the first trial of bike racks on buses in #Victoria - get involved! #BusYourBike ow.ly/rxxm305gWqU



7 16

PTV @ptv_official · Oct 24
 Have you heard? #BusYourBike on some Cowes to Anderson to Wonthaggi & Route 70 (Bendigo) buses in regional #Victoria ow.ly/Lh3r305gVU1



2

Location Targeted Digital Display across key websites in Metro North, Bendigo, Strathfieldsaye, Cowes and Wonthaggi



Creative Size	Impressions	CTR
300x250	124749	0.13
300x50	6429	0.03
320x50	171765	0.17

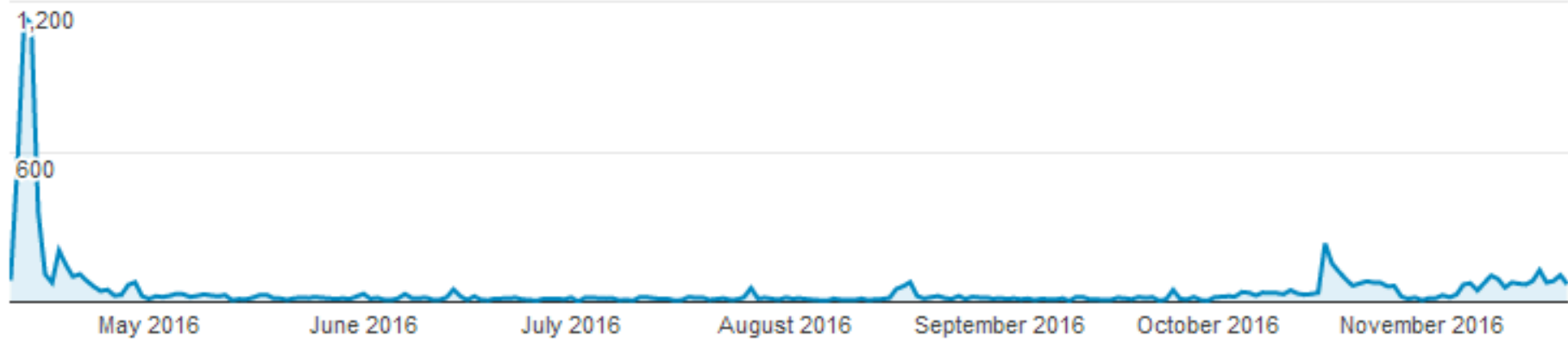
- Chrome browsers received the highest amount of ads served
- The 300x50 banner incurred maximum number of impressions

Bike Your Bus – Digital Analytics

Website Page Views: April – November 2016

- 10,071 times (9214 unique views),
- 4976 times searches

● Page Views



Social Mentions: Twitter

- 120 twitter posts since launch
- Average Engagement Rate per PTV post: 1.82%
 - Aligned with Vic Govt Benchmark of 1.8%
- Average Impression per PTV post: 2907



PTV @ptv_official - Nov 6

Bike racks on buses are now being trialled in [#Melbourne](#) & regional [#Victoria](#) - find out how to [#BusYourBike](#) here ow.ly/igzt305Q7AK

Now your bike can also enjoy the ride.



For more information visit ptv.vic.gov.au/busyourbike