**F U T U R E  M E L B O U R N E  ( T R A N S P O R T )  C O M M I T T E E  R E P O R T** **Agenda Item 6.5**

**La Trobe Street Bicycle Lanes Post Implementation Assessment** **11 March 2014**

**Presenter:** Geoff Robinson, Manager Engineering Services

**Purpose and background**

1. The purpose of this report is to provide a post implementation assessment of the physically separated bicycle lanes in La Trobe Street installed in June 2013 following extensive consultation and assessment of options.

2. Attachment 2 is an assessment of the 'before' and 'after' conditions and performance of La Trobe Street.

**Key issues**

Traffic and Cyclist Volumes

3. Motor vehicle traffic has decreased by 25 percent in the morning (AM) peak and 10 percent in the afternoon (PM) peak. Following the installation of the bike lanes, motor vehicle peak hour two-way traffic reduced from 1600 to 1200 vehicles per hour in the morning and from 1450 to 1300 vehicles per hour in the afternoon.

4. Cyclist numbers have been monitored in a series of surveys, and have been steadily increasing since installation. Comparison of February 2012 to February 2014 confirms that cycling numbers have doubled in the AM peak hour and tripled in the PM peak hour following the installation of the bike lanes. The cyclist mode share has increased from 9 percent to 22 percent of trips in the peak periods. Two-way cyclist volumes in February 2014 were approximately 380 in the AM peak hour and 335 in the PM peak hour.

Travel Times

5. Motor vehicle travel times increased immediately after the installation of the bicycle lanes. Following the reprogramming of traffic signal operation times at the Swanston Street and La Trobe Street intersection, the major delays in the AM peak westbound direction and the PM peak eastbound direction have been significantly reduced. The end to end travel times between Adderley Street and Victoria Parade are now back in line with the 10 to 12 minutes time it previously took to travel along La Trobe Street.

Safety

6. Between 2008 and 2012, there were 36 recorded casualty crashes on La Trobe Street involving cyclists, a rate of 7.2 crashes per year. These incidents primarily comprised car door (driver's side) and turning vehicles interactions. Since installation, between July 2013 and January 2014, police reports indicate the occurrence of 9 casualty crashes involving cyclists in 7 months. Only one of these has involved car doors (on the passenger side). While the cyclist casualty crash rate per year appears to have increased, the higher rate is consistent with the doubling and tripling of cyclist volumes observed on La Trobe Street, and hence the increased rate of exposure.

7. An independent post-opening Road Safety Audit has been conducted and is provided as Attachment 3. An assessment of the Road Safety Audit findings is provided in Section 7.2 of Attachment 2. In response to the audit findings, a number of minor modifications have been recommended to improve lane line delineation and heighten the awareness of both cyclists and motorists.

**Recommendation from management**

8. That the Future Melbourne Committee:

   8.1. Notes the findings of the post installation assessment of the physically separated bicycle lanes in La Trobe Street and the need for continued monitoring, and

   8.2. Endorses the implementation of minor modifications to La Trobe Street continuity lines, solid lines, chevron islands, raised pavement markers and bicycle logos and the west to north hook turn storage box at Swanston Street as detailed in Section 7.2 of Attachment 2.

**Attachments:**
1. Supporting Attachment
2. Road Safety Audit

**SUPPORTING ATTACHMENT**

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**Legal**

1. No direct legal issues arise from the recommendation from management.

**Finance**

2. The estimated cost of implementing the Road Safety recommendations is $15,000 which can be funded from the existing Bicycle Program budget.

**Conflict of interest**

3. No member of Council staff, or other person engaged under a contract, involved in advising on or preparing this report has direct or indirect interest in relation to the matter of this report.

**Stakeholder consultation**

4. No further consultation was carried out with stakeholders in preparation of this report.

**Relation to Council policy**

5. The recommendations are consistent with the following:

    5.1. Future Melbourne Plan;

    5.2. The Transport Strategy 2012; and

    5.3. The Bicycle Plan 2012-16.

**Environmental sustainability**

6. The La Trobe Street physically separated bicycle lanes encourage cycling, which is considered to be low cost, energy efficient, space saving, non-polluting and a sustainable mode of transport. Cycling assists in reducing greenhouse gas emissions and is a major source of physical exercise, providing a healthy alternative to motorised transport.

**SUPPORTING ATTACHMENT – LA TROBE STREET BICYCLE LANES POST IMPLEMENTATION ASSESSMENT**

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## 1. Introduction

The following information is supplied to provide a post implementation assessment of the recently completed physically separated bicycle lanes in La Trobe Street, Melbourne.

The La Trobe Street physically separated bicycle lanes were installed in June 2013, following extensive consultation and assessment of options.

Monitoring and assessment of the impacts of the lanes has been undertaken, through a review of the before and after conditions and performance of La Trobe Street.

This attachment contains details on the before and after performance of traffic and transport demands, safety and travel times for La Trobe Street, as well as options for further enhancements.

No direct legal issues arise from the recommendation from management.

## 2. Before and After Conditions

Before – La Trobe Street originally operated with one to two traffic lanes, and on-street parking at mid-block locations. Clearways operated along some road sections to improve traffic performance with clearway bicycle lanes.

***Before photos***

After – La Trobe Street now provides a physically separated bicycle lane, with a narrow median, on-street parking and one traffic lane. At intersections, the carriageway flares to provide two lanes, to maintain traffic throughput.
Parking has been permanently removed to maintain two through traffic lanes between:

- William Street and King Street westbound
- Swanston to Russell Street – half block eastbound
- Exhibition Street to Victoria Street – eastbound.

***After photos***

## 3. Traffic and Bicycle Movements

La Trobe Street 2-way bicycle volumes East of Swanston Street are shown in the following table. This data demonstrates that cycling volumes in La Trobe Street have increased substantially as a result of the bicycle lanes, and are continuing to grow.

**Table 1 – Before and After Peak Hour Bicycle Volumes on La Trobe Street**

| BICYCLE VOLUMES | AM Peak Period (8-9am) | PM Peak Period (5-6pm) |
|---|---|---|
| "Before" Bike Lane February 2012 | 190 | 111 |
| "After" Bike Lane October 2013 | 238 | 246 |
| "After" Bike Lane February 2014 | 381 | 336 |
| Change (Feb 2012 – Feb 2014) | 101% increase | 203% increase |

A comparison of before and after motor vehicle volumes using La Trobe Street at Russell Street is shown on the following table.

**Table 2 – Before and After Peak Hour Traffic Volumes on La Trobe Street**

| MOTOR VEHICLE VOLUMES | AM Peak Period (8-9am) | PM Peak Period (5-6pm) |
|---|---|---|
| "Before" Bike Lane | 567 Eastbound, 1025 Westbound | 865 Eastbound, 599 Westbound |
| "After" Bike Lane October 2013 | 537 Eastbound, 654 Westbound | 784 Eastbound, 524 Westbound |
| Change | 5% (eb) 36% (wb) Decreases | 9% (eb) 13% (wb) Decrease |

Peak hour traffic flows near Russell Street (primarily westbound in AM peak) declined as a result of the bicycle lanes.

A before and after comparison of travel by vehicle mode indicates a significant shift in travel modes.

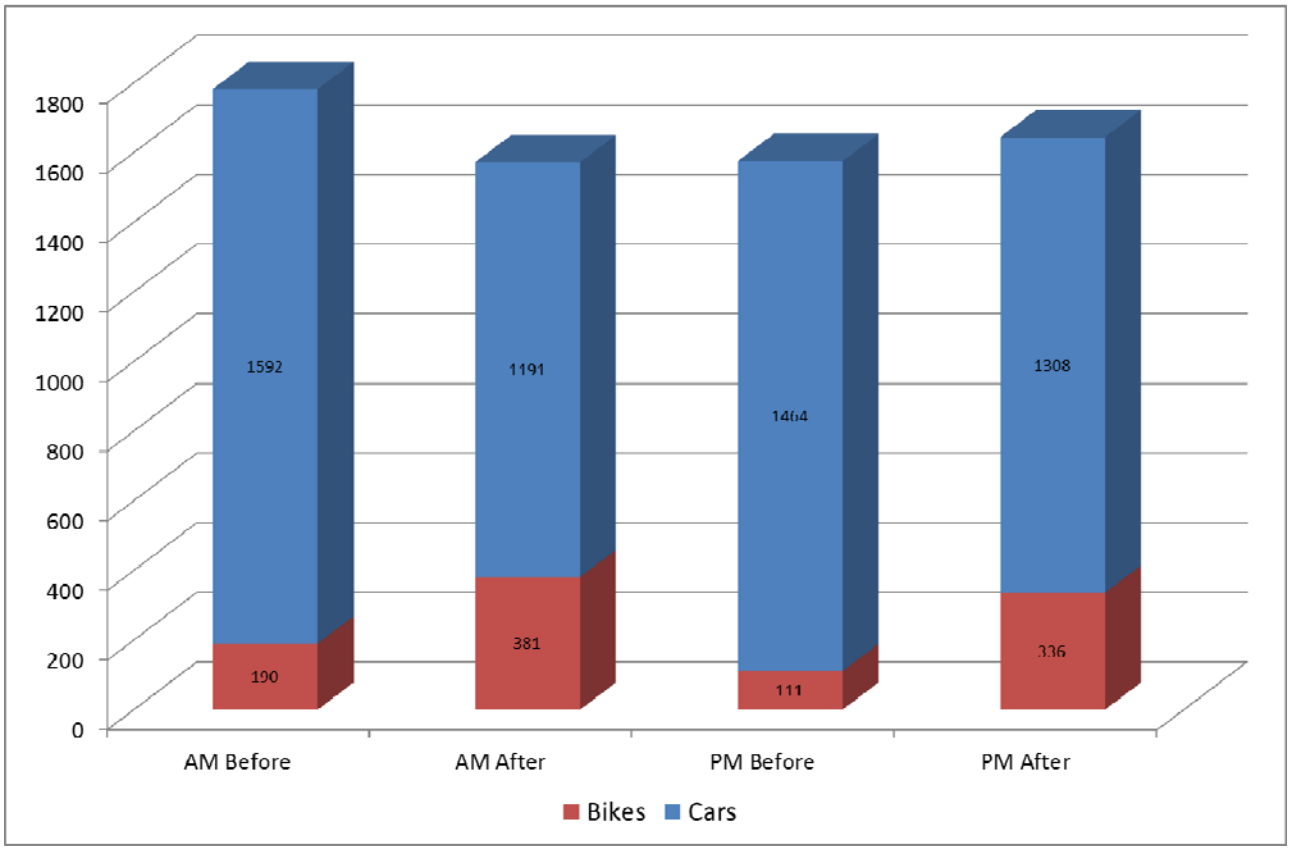
The following chart highlights the two-way traffic flows in the AM peak (8-9) and the PM peak (5-6pm). (Note: Counts did not include trams).

In 2012, 11% of total cycle/vehicle volumes were by bicycle in the AM peak, but have increased to 24% in 2014. In 2012, 7% of total cycle/vehicle volumes were by bicycle in PM peak, but have increased to 20% in 2014. This represents a substantial mode shift for the route (and is representative of route choice changes, rather than just modal shift).

Whilst overall AM travel movements have decreased (by 210 movements two-way), PM peak travel movements have increased (by 70 movement two-way) generated by the tripling of bicycle movements, despite the reduction of 155 car movements.

***Action:*** ***No specific recommendation, monitor travel demands by mode.***

**Figure 1 – Before and After Peak Hour Volumes by Mode**




## 4. Parking

The installation of the bicycle lane had a net impact of parking loss of approximately 150 spaces, including the removal of spaces between William and King Streets, Swanston and Russell Streets, and Exhibition Street and Victoria Parade.

No community complaints or issues have been raised by the public regarding the availability of parking, or the impacts of the parking losses.

Opportunities exist to remove parking in some locations to provide greater reciprocal visibility at driveway and side road/lane entrances, which will help to increase cyclist safety where parked cars may obscure the visibility of approaching cyclists.

Parking losses or clearway extensions at intersection approach/departures may assist in providing more efficient intersection operation, where congestion exists.

Furthermore, opportunities exist to reinstate parking where there are permanent parking bans, where low levels of congestion are observed, which may be used to off-set any further parking losses in the future.

***Action:*** ***No specific recommendation, continue to monitor.***

## 5. Travel Time

Travel time surveys were conducted along the length of La Trobe Street from Victoria Parade to Adderley Street, using multiple runs on multiple days (Tuesdays, Wednesday and Thursdays) before the implementation of the bicycle lanes, and after implementation. AM peak runs were conducted between 8:00 and 9:00am, and PM runs between 5:00 and 6:00 pm.

A number of improvements have occurred to signal timings at Swanston Street/La Trobe Street to improve La Trobe Street traffic flow post implementation, in October/November 2013, discussed in the following section. Subsequently, after results have been presented separately for August/October 2013 data, and February 2014. (Note: Surveys were not conducted in December/January due to school holiday impacts on travel demands, and therefore collection of data to assess the signal changes has occurred in early February).

Furthermore, separate signal timing/off-set changes were installed along Victoria Parade near its intersection with La Trobe Street when the bike lanes were initially installed. These changes have also improved travel times along La Trobe Street.

The results are summarised in the following sections.

### 5.1 Eastbound

Eastbound travel time survey results are summarised in Figure 2 and 3 for AM peak and PM peak respectively.

Before and after data remains relatively consistent in the AM peak.

In the PM peak, there were significant delays to reach Elizabeth Street/Swanston Street immediately after the implementation of the bicycle lane. The altered signal timings at Swanston Street have reduced eastbound travel times by around 4 minutes. Delays at the Victoria Parade intersection have also been dramatically decreased since before the bicycle lane, through improvements to signal phasing. As a result, end to end travel times have decreased since before the bicycle lane was introduced.

### 5.2 Westbound

Westbound travel time survey results are summarised in Figure 4 and 5 for AM peak and PM peak respectively.

AM peak westbound travel times were initially impacted by 2 minute delays at or around Elizabeth Street/Swanston Street. Post signal changes, the average delay at this section has decreased by 1 minute, and the travel time from end to end is now consistent with pre-implementation travel times.

PM peak before and after data remain relatively consistent, with some fluctuations to delays near Spencer Street, which are likely to be unrelated to the bicycle lane.

***Action: No specific recommendation, continue to monitor travel times.***

**Figure 2 – Eastbound La Trobe Street Vehicles Travel Times Survey – AM Peak**

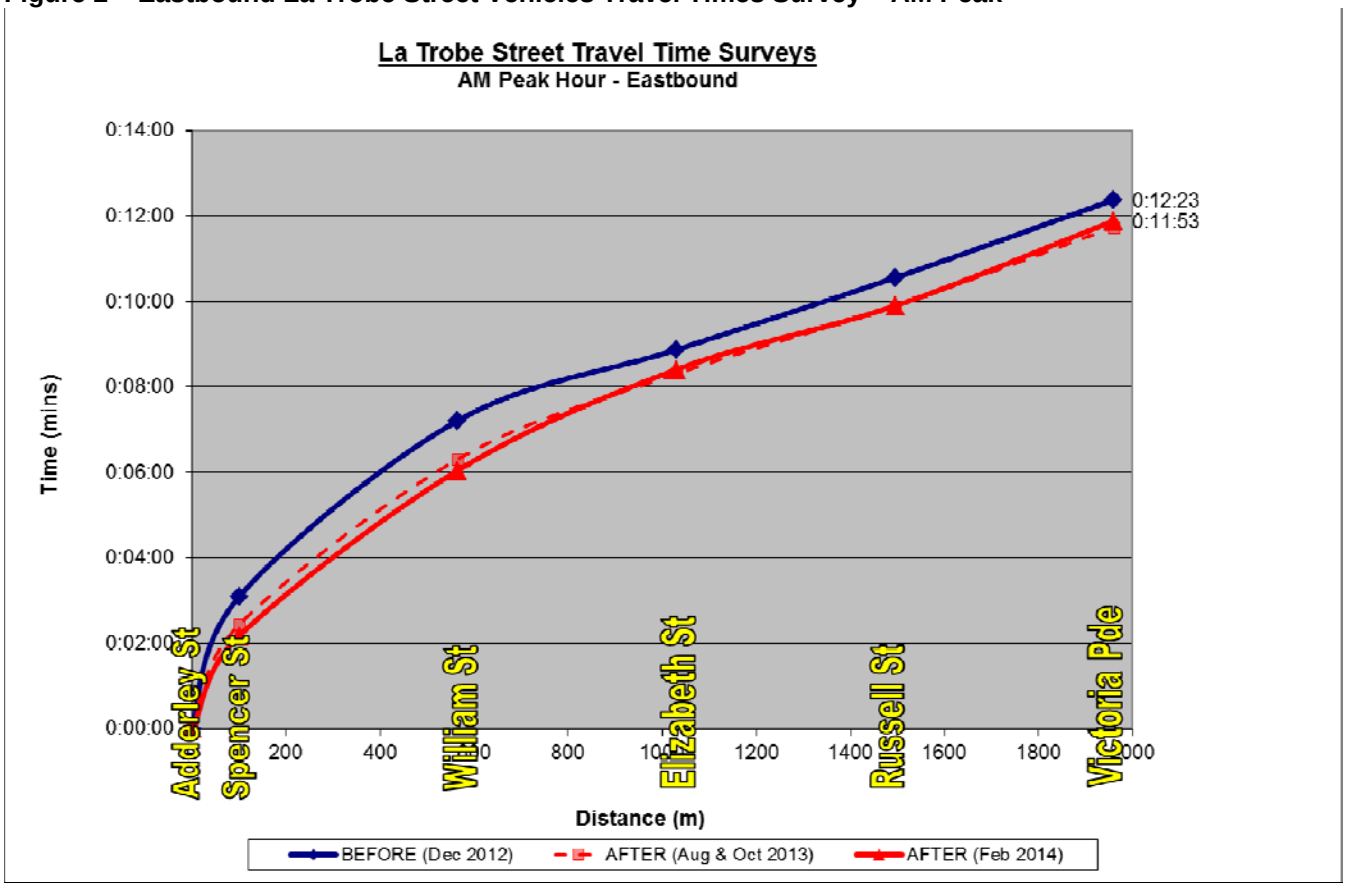



**Figure 3 – Eastbound La Trobe Street Vehicles Travel Times Survey – PM Peak**

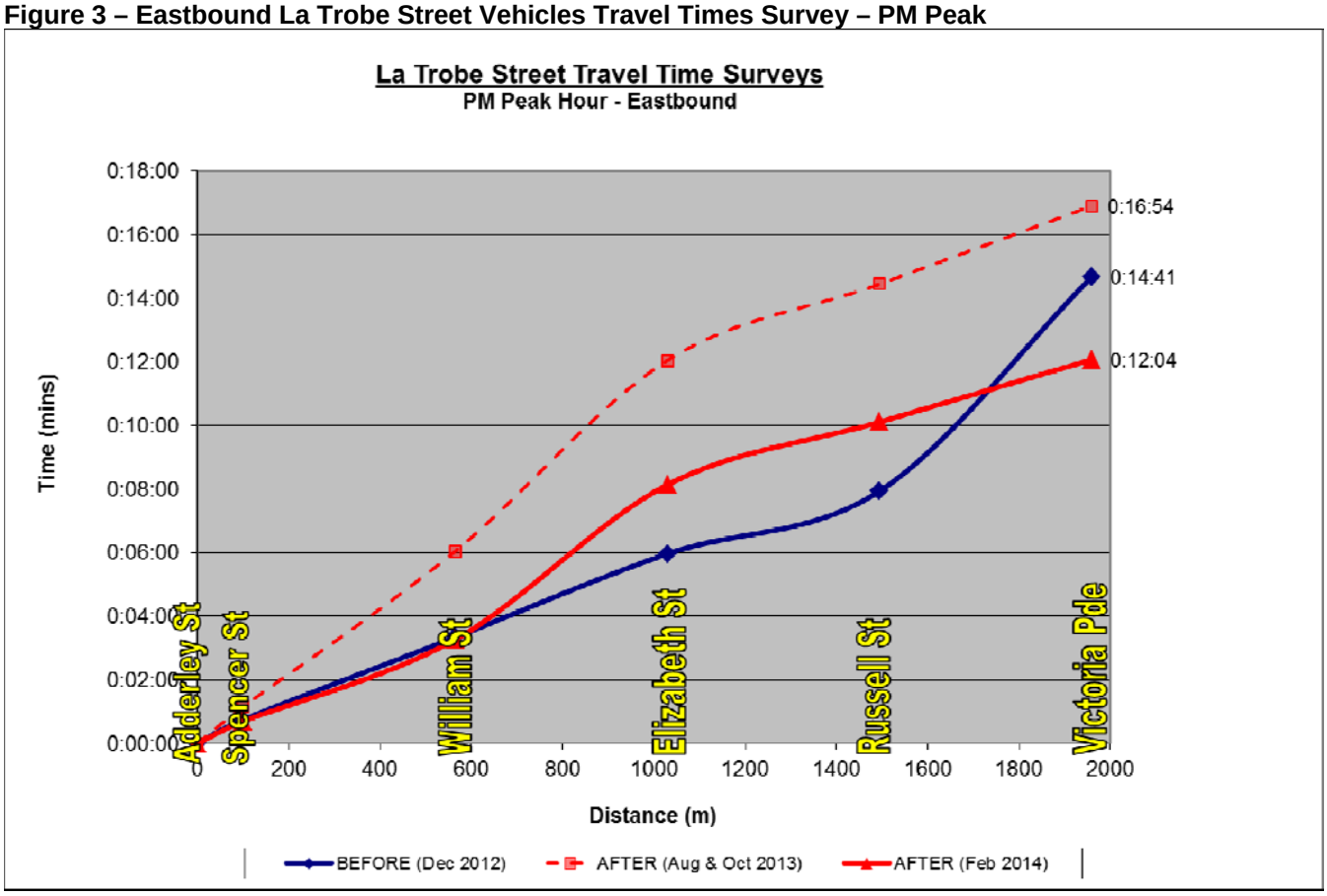


**Figure 4 – Westbound La Trobe Street Vehicles Travel Times Survey – AM Peak**

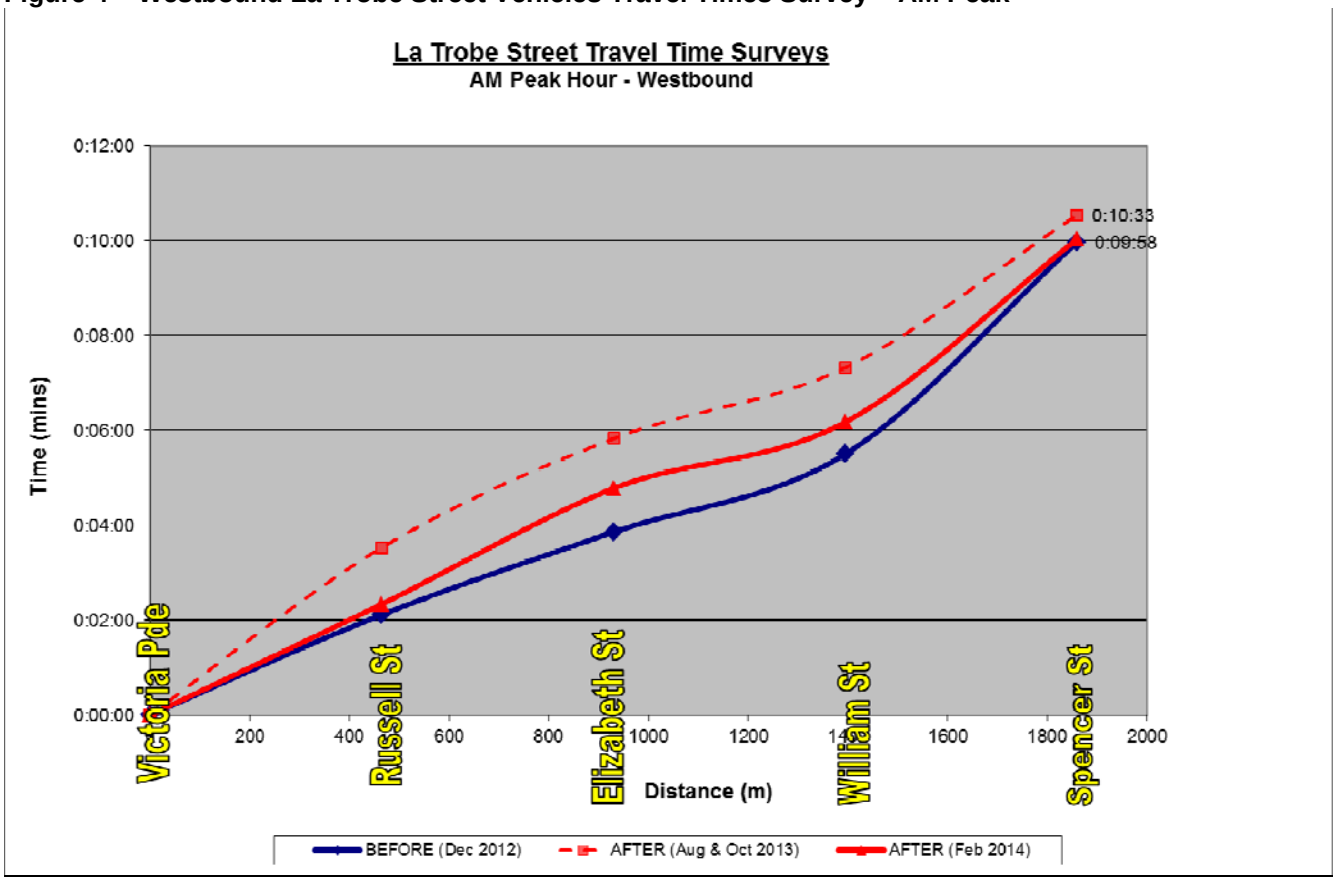
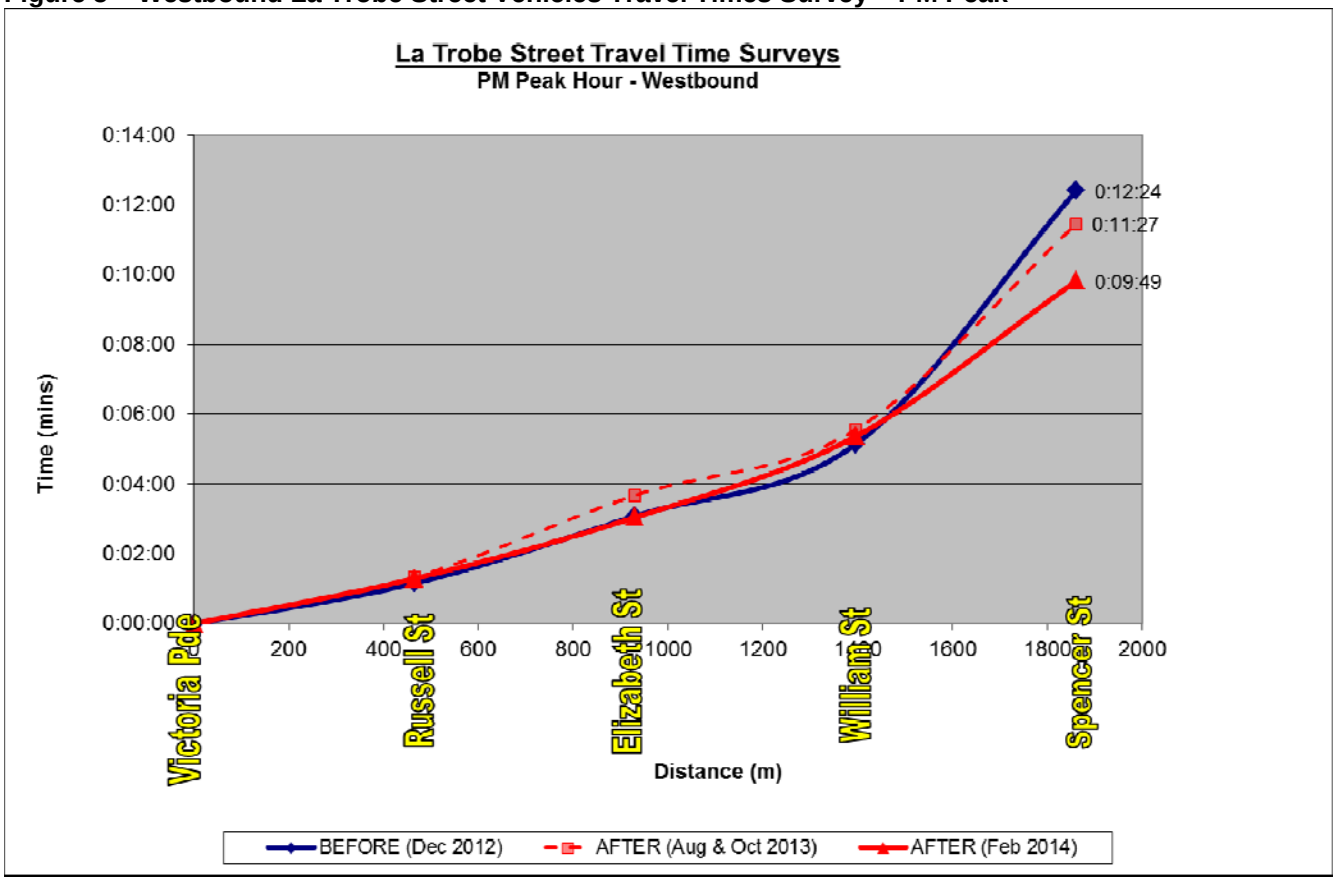



**Figure 5 – Westbound La Trobe Street Vehicles Travel Times Survey – PM Peak**



## 6. Traffic Signals

Following implementation of the La Trobe Street bicycle lanes, and monitoring of the traffic performance of the route, it was determined that the traffic signal timings at Swanston Street and La Trobe Street were causing delays to through traffic on La Trobe Street, despite relatively minor volumes in Swanston Street. Whilst maintaining tram priority in Swanston Street was paramount, the signal phase for the north approach vehicle traffic was considered to need a lower level of priority in the peak periods, as there is no requirement to promote private vehicle movements along Swanston Street. Subsequently, traffic signal reprogramming was undertaken in October and November 2013, and the performance of the intersection was improved to favour La Trobe Street (as demonstrated by the changes to travel times).

Prior to the installation of the bicycle lanes traffic signal operations along Victoria Parade near La Trobe Street were adjusted to reduce delays to La Trobe Street movements.

***Action:*** ***No specific recommendation, continue to monitor.***

## 7. Safety

### 7.1 Crash Data

'Before' and 'after' casualty crash data has been compared for La Trobe Street. The 'before' data has been sourced from VicRoads CrashStats database, and represents the latest five year period of casualty crashes. The 'after' data has been sourced from Victoria Police, but represents a significantly shorter time period.

**Before** (1/1/2008 -31/12/2012):

- 36 crashes involving cyclists in 5 years
- 10 serious injury and 26 other injury
- Average: 7.2 crashes per year
- Variety of crashes including car doorings (12)

**After** (1/7/2013-31/1/2014):

- 9 crashes involving cyclists in 7 months
- 4 serious injury, 5 other injury
- Average: unknown – potentially higher rate of crashes
- 7 crashes occurred between a car failing to give-way and a cyclist
- 1 occurred between a cyclist and a pedestrian (pedestrian failed to give-way)
- 1 car dooring (passenger side door)

Assuming the current crash trend rate remains stable, the cyclist casualty crash rate is approximately equal to 15 crashes per year. This is consistent with the doubling and tripling of cyclist volumes observed on La Trobe Street, and hence the increased rate of exposure. It does however highlight the potential to further address the locations where cyclists and vehicles are in conflict, to continue to enhance cyclist safety. It is likely that a higher rate of crashes has occurred in response to the new road conditions, which requires motorists, pedestrians and cyclists to adapt to the new road environment and become familiar with conflict points.

***Action:*** ***Continue to monitor casualty crash reports, and consider the need to undertake a crash review of all crashes post-opening, to determine any contributing factors and seek counter-measures.***

### 7.2 Road Safety Audit

A post-opening independent Road Safety Audit has been undertaken. The audit did not raise any major issues associated with the design, but identified a number of minor issues and areas for improvement. Based upon the audit the following recommendations are considered appropriate:

### 7.2.1 Continuity Lines

Continuity lines are proposed at a number of locations between the bicycle lane and the traffic lane, to highlight the presence of the bicycle lane at vehicle crossovers and minor side roads. Continuity lines exist at many side roads and crossovers, but are missing at others. Their presence helps to define and highlight the presence of the bicycle lane, especially across "Keep Clear" areas. It is proposed that they be installed at all locations from which they are currently missing, which includes the following:

Eastbound

- Elizabeth Street to Swanston Street – car park entry/exit
- Russell Street to Exhibition Street – carpark entry/exit east of Bell Place

Westbound

- Swanston Street to Elizabeth Street – car park entry/exit (Melbourne Central)
- Queen Street to William Street – car park entry/exit to Australian Federal Police Melbourne Offices
- William Street to King Street – across 3 side roads/car access points including Commonwealth Law Complex, Park Street and at 485 La Trobe Street.

In addition, a potentially high conflict location, which coincides with multiple post-opening casualty cyclist crashes between cyclists and vehicles, is the entrances to carparks between Swanston and Elizabeth Streets. Subsequently, it is proposed to install continuity lines on both sides of the bicycle lane in this location, on both the north and south sides of the roadway, to further highlight the presence of the bicycle lanes.

### 7.2.2 Solid Lines

Solid lines are recommended to define the edge of the bicycle lane except where crossovers or side roads exist. In some instances, continuity lines extend well beyond the extent of the crossing area required for vehicles, thus enabling vehicles to utilise the bicycle lane over a longer distance, and therefore increase the risk exposure for cyclists. The Audit report identifies "…lines should be 'solid' when there are no driveways". Locations where continuity lines should be returned to solid lines are listed below:

Eastbound

- William Street to Queen Street- on approach and departure to Singers Lane and Wills Street.
- Elizabeth Street to Swanston Street – on approach and departure to car park entry/exit.

Westbound

- Elizabeth Street to Queen Street – on approach and departures to Sutherland Street.

### 7.2.3 Chevron Islands

Chevron islands, or painted traffic islands, are considered desirable in a number of locations to highlight areas of the roadway which are not available for either parking or traffic. These are required in some instances where there is a transition to or from a parking area to reduce the risk of a sudden conflict between travelling vehicles and a parked vehicle, and to reduce the risk of vehicles parking in No Stopping areas, which may be required to maintain safe visibility distances. The locations where chevron islands are proposed include the following:

Eastbound

- Between William and Queen Street, west of Wills Street at 402 La Trobe Street, where a parking bay has been recently removed
- Russell Street to Exhibition Street – on approach to the first parking space at 86 La Trobe Street

Westbound

- Between Queen Street and William Street, after long expanse of No Stopping Area outside of the Australian Federal Police offices.

### 7.2.4 Swanston Street Hook Turn Storage Box

The existing hook turn storage box at Swanston Street, for use by westbound La Trobe Street vehicles turning north, is located clear of two through westbound traffic lanes. Cyclists are required to pass to the south side of the storage box and any vehicles queuing to make a hook turn. The constrained area for cyclists in this location and the need for cyclists to perform quite a sharp turn past queued vehicles results in many cyclists travelling to the north of the storage box (and any queued hook turning vehicles) resulting in increased risks.

Given the very low volumes of vehicles using the adjacent left lane to travel through the intersection and relatively low numbers of hook turns undertaken; it is possible to shift the hook turn storage box 1 metre to the north. This still allows the same transition/merge length from two lanes to one lane west of the intersection, clear of the storage box.

A survey undertaken on Wednesday 30 October 2013 confirmed approximately 32 vehicles in the AM peak and 30 vehicles in the PM peak hour utilised the left lane for through movements, or an average of less than one vehicle per signal cycle. This is significantly less than the volume of westbound cyclists (220 AM peak, 76 PM peak) who will benefit from the improved treatment.

### 7.2.5 Lane markers

It is proposed to install raised pavement markers at the intersections with Russell Street and William Street to better delineate the paths through the intersections for east and west bound La Trobe Street traffic. Both of these intersections are located on crests, and it is difficult for motorists to align their vehicles with the lanes on the departure to the intersection. This may inadvertently result in motorists veering out of their lanes and increased conflicts.

### 7.2.6 Bicycle pavement logos

It is proposed to install bicycle pavement logos, to improve the prominence of the bicycle lane and reinforce cyclists right-of-way, at the following locations:

Eastbound

- Elizabeth Street to Swanston Street – before and after the car park access point.

Westbound

- Victoria Street to Exhibition Street – near 33 La Trobe Street.
- Swanston Street to Elizabeth Street – after the car park access point.

***Action:*** ***Implement the proposed minor modifications to the bicycle lane treatment from the Road Safety Audit including: continuity lines, solid lines, chevron islands, adjustments to hook turn storage box, raised pavement markers and bicycle logos.***

## 8. Summary of Actions

Following a review of the post-implementation conditions, the following actions are recommended;

***Action:*** Monitoring: continue to monitor travel demands by mode and motor vehicle travel times.

***Action:*** Continue to monitor casualty crash reports, and consider the need to undertake a crash review of all crashes post-opening, to determine any contributing factors and seek counter-measures.

***Action:*** Implement the proposed minor modifications to the bicycle lane treatment from the Road Safety Audit including: continuity lines, solid lines, chevron islands, adjustments to hook turn storage box, raised pavement markers and bicycle logos.

# La Trobe Street Bicycle Lanes, Melbourne

**Post-opening Audit of La Trobe Street Bicycle Lanes – Road Safety Audit Report**
**Audit Team – Stephen Pelosi, Jose Mantilla**
**Date – 12 November 2013**

CITY OF MELBOURNE

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# Contents Page

# 1. Introduction

## 1.1 The Context

The City of Melbourne has recently installed bicycle facilities on La Trobe Street, in Melbourne's CBD, between Victoria Street and Adderley Street. This report details the results of a **post-opening audit** of the bicycle facilities, which has been undertaken in accordance with the road safety audit process outlined in the Austroads document ***Guide to Road Safety Part 6: Road Safety Audit***, covering the aspects associated with a **"Post-opening Stage Audit"**. This has included a review of the installation drawings and field audits during peak, intra-peak and evening periods – undertaken by the audit team as both *car driver* and *bicycle rider*.

# 2. The Road Safety Audit Process

A road safety audit is *"a formal examination of a future road or traffic project or an existing road, in which an independent, qualified team reports on the project's crash potential and safety performance"* Austroads (2009). An audit has the greatest potential for improving safety and is most cost-effective when it is applied to a road or traffic design before the project is built. It can be conducted on any design proposal that involves changes to the ways road users will interact, either with each other or with their physical environment. It is a formal process using a defined procedure. To be effective it must be conducted by people who are independent and who have appropriate experience and training. A road safety audit is a good way to ensure that safety is given thorough consideration throughout each phase of the project. Road crashes have a wide range of contributing factors and thus an audit cannot guarantee that every possible potential safety concern has been identified. Adoption of road safety audit recommendations will reduce risk – it will not eliminate such risk entirely.

# 3. Road Safety Audit of the Bicycle Lanes in La Trobe Street, Melbourne

## 3.1 Description of the Project area

La Trobe Street is a local road that runs in an east-west direction from the eastern end of the CBD (at Victoria Street / Victoria Parade) to Docklands. (Melway 43 J6 to D8). It is also a critical east-west CBD bypass bicycle route connecting heavily-used Docklands and Carlton bicycle lanes/paths as well as providing connection to/from CBD streets. In mid-2013, Copenhagen-style bicycle lanes were installed between Victoria Parade and Spencer Street on both sides – with standard on-road bicycle lanes installed west of Spencer Street up to Adderley Street (joining up with existing bicycle facilities on the Docklands section of La Trobe Street).

La Trobe Street features mild gradients in various sections – the most noticeable being uphill gradients from Elizabeth Street to the east towards Russell Street and to the west towards William Street. In the eastward direction La Trobe Street then continues downward from Russell Street to Exhibition Street and upward to Victoria Parade. In the westward direction it enters into a downhill gradient from William Street to King Street. Footpaths are generous and well maintained and busiest between Swanton Street and Elizabeth Street, adjacent to the Melbourne Central shopping complex. Pedestrian activity in all other areas is comparatively modest.

A central tram reservation exists along the entire length of La Trobe Street. Parallel parking typically exists on both sides with no-stopping restrictions in some sections either full or part-time, supporting peak period traffic flow direction. Traffic volumes vary significantly along the length of La Trobe Street – estimated at 12,000 vehicles per day at its western (Spencer Street) end and 18,000 vehicles per day at its eastern end. Abutting development is mixed and includes commercial, retail and residential uses. The speed limit is 40km/h along its entire length, consistent with a CBD-wide 40km/h speed environment.

***Map of La Trobe Street along which bicycle lanes have been recently installed.***

The potential safety issues identified in this audit have been given a risk rating by the audit team. This has been based on the likelihood of a crash event or other adverse event occurring due to the identified issue, together with the potential consequences of that event.

| RISK RATING TABLE |
|---|
| **VERY HIGH RISK** |
| **major safety issues with a high probability that traffic crashes will occur and/or that those crashes will result in multiple deaths** |
| **HIGH RISK** |
| **major safety issues with a high probability that traffic crashes will occur and/or that those crashes will result in serious injury or death** |
| **MEDIUM RISK** |
| **safety issues with a lesser risk that traffic crashes will occur and/or that those crashes will result in less serious/minor injuries only** |
| **LOW RISK** |
| **safety issues that can be reasonably expected to result in few traffic crashes and/or that those crashes will result in minor injuries only** |
| **VERY LOW RISK** |
| **safety issues that can be reasonably expected to result in few traffic crashes and/or that those crashes will result in property damage only** |

## 3.2 The road safety audit team

This *Post-Opening Stage Audit* was undertaken by a two member audit team comprising Stephen Pelosi (chief auditor) and Jose Mantilla. Stephen was supported by a driver during "drive-through" stages of the audit allowing him to alternate as both a driver and observer.

Neither Stephen nor Jose have been involved in any aspects of the design and implementation of this project and are independent of the project.

## 3.3 This road safety audit

This *Audit* has included several site inspections throughout August, September and October 2013.

The audit focussed on the recently built bicycle lane features that may present a safety concern. Audit reports cover exceptions only – and thus those features that are not considered to give rise to a safety concern and/or are fully endorsed/agreed by the auditor, are not listed in this report. The chief auditor previously conducted a Detailed Design stage audit of this project in November 2012.

# 4. Concluding Statement

The audit team has inspected the project site and its environs and a "post-opening" stage audit has been undertaken in accordance with the audit process detailed in Austroads *Guide to Road Safety – Part 6 Road Safety Audit (2009)* for the purpose of identifying features of the recently-installed bicycle lanes on La Trobe Street that could be altered or redesigned to improve safety. It is intended that these matters be referred back to the design group for their attention and re-evaluation. The identified safety concerns are noted in this report.

Stephen Pelosi 11 November 2013

Director, movendo Pty Ltd

# 5. Documents Used During the Audit

- Austroads ***Guide to Road Safety Part 6: Road Safety Audit***.
- As-built Drawings of the La Trobe Street bicycle lanes provided by City of Melbourne

# 6. Findings and Recommendations

The following table contains the issues detected in this safety audit and recommendations for each.

| No | Safety Concern | Risk | Recommendation | Client Response |
|---|---|---|---|---|
| **1** | OVERALL COMMENT: The width of bike lanes on the approaches to all major street intersections is comparatively narrow, posing a potential safety hazard to bike riders. The photos illustrate that there is potential to widen the bike lanes at these locations without impacting on the functional/operational capacity for motor vehicles. | MEDIUM | Consider widening the bike lane at its approach to all major intersections by, possibly, up to 300 to 400 mm. at most locations. Sufficient space exists to accommodate the widening of the bike lane without affecting the width of the vehicle travel lane(s) significantly.<br><br>The main exception may be at Swanston Street (eastbound approach) where limited space exists (see photos below). | |

The above photos show that bike lanes can potentially be widened at many locations with a re-arrangement of traffic and bicycle lane widths.

| No | Safety Concern | Risk | Recommendation | Client Response |
|---|---|---|---|---|
| **2** | The westbound transition of the bicycle treatment along La Trobe Street, across Swanston Street, is poorly aligned and not utilised by cyclists – who instead prefer to travel to the right of "hook turn" vehicles, rather than following the linemarked path to the left of the hook turners. The photo illustrates a bicycle rider undertaking the "less desirable" and more risky manoeuvre to the right of the stationary hook-turn vehicle. There is generous space available to shift the existing linemarking treatment to the north – enabling cyclists to travel along the intended and safer alignment to the left of hook-turn vehicles. | MEDIUM | Explore options for and implement a redesign of the westbound bicycle treatment across Swanston Street that enables cyclist to travel to the left of stationary hook turn vehicles.<br><br>Note – the photo below shows the space available between moving westbound traffic and the edge of the hook-turn box. | |

| | | | |
|---|---|---|---|
| **3** | North side – outside 402 La Trobe Street. One parking bay has been removed to improve reciprocal visibility (between motorists exiting the property and those travelling on La Trobe Street). However there is no linemarking to reinforce the intent to prevent parking in this area (see photo below). The prohibition on parking should be reinforced by installation of chevron linemarking as has been done for a similar treatment outside 332 La Trobe Street. | LOW | Install chevron linemarking as shown in photo below (taken outside 332 La Trobe Street). |

| | | | |
|---|---|---|---|
| **4** | The ***keep right*** signs located on the separator medians (the intent of which is clearly directed at motor vehicle drivers only) may provide a conflicting message for cyclists (see photo below). | LOW | To avoid potential confusion for cyclists, one of the following two approaches could be implemented: (1) add “bicycles excepted” label to each of the ***keep right*** signs; or (2) replace the ***keep right*** signs with non-directional hazard markers. |
| | The *Road Safety Road Rules 2009* state in Rule 19 that “*unless otherwise expressly stated a reference in these Rules to a **driver** includes a reference to a **rider***” – which includes a bicycle rider. Rule 99 states that “*a driver driving past a **keep right** sign must drive to the right of the sign*”. This rule also states that *“this rule does not apply to the rider of a… bicycle …if the rider: (a) is riding on a footpath, nature strip or shared path; and (b) is permitted to ride on the footpath, nature strip or shared path under these Rules.”* This exemption does not apply to a bike rider on an on-road bike lane. Consequently, as per Rule 99, we interpret the ***keep right*** signs on the separator medians as instructing a bike rider to “ride to the right of the sign” – away from the bike lane and onto either parked vehicles or the path of motor vehicles. This message is potentially confusing (as bike riders are required to comply with the Road Rules) and contradicts the intention of a bike rider remaining in the bike lane as indicated by the green paint and bike symbols (see photo above). While it seems unlikely that a bike rider on the bike lane will in fact keep to the right of the sign, there could be safety implications if a bike rider did in fact obey the sign and ride directly into the path of a motor vehicle. | | |

| No | Safety Concern | Risk | Recommendation | Client Response |
|---|---|---|---|---|
| **5** | At a number of ***keep clear*** locations on both sides of La Trobe Street, the continuous lines that are painted at right angles to the direction of traffic flow (and that define the keep clear space) have been extended across the bike lane (see photos in the 'recommendation' column of this table). Whilst it is understood that this treatment is intended to help alert cyclist of the possible presence of cars – the treatment may potentially prove confusing. The *Road Safety Road Rules 2009* state in Rule 96 that "a driver must not stop on an area of a road marked with a ***keep clear*** marking". The intent is clearly to prevent the formation of stationary queues across these spaces by encouraging drivers to not stop over keep clear areas when there are downstream queues, so that this can help vehicles to enter/exit laneways and driveways at these locations. However, the continuous line across the bike lane may provide a confusing message to both bike riders and drivers– especially at times when vehicles are stopped on the adjacent traffic lanes and have "stayed off" the ***keep clear*** area. Under these circumstances the following could occur:<br><br>(1) motorists entering/exiting La Trobe Street from/to either side laneways or properties, may have a false expectation of priority when performing their entry/exit manoeuvres, as they may perceive that the keep clear space also governs the bicycle lane (by virtue of the keep clear area being 'defined and boxed-in' by continuous lines all the way to the edge of footpath; and<br>(2) cyclists (who under the Road Rules would only need to stop if there was downstream queuing on the bike lane – a virtual impossibility) are likely to keep riding on the bike lane believing (correctly) that they do not need to stop before the ***keep clear*** area – but may be confused by the presence of those perpendicular lines across the bicycle lane. | MEDIUM | Carefully monitor cyclist/motorist behaviour in the vicinity of the ***keep clear*** areas –in order to establish whether the presence of the line that cuts across the bike lane is helping to reinforce appropriate cautious behaviour by all road users or whether it may be unintentionally confusing to cyclists or, worse still providing a false sense of priority for car drivers.<br><br>*Photos – example of existing 'keep clear' areas* | |

| No | Safety Concern | Risk | Recommendation | Client Response |
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| **6** | The dashed lines along the bike lane for entry/exit points to laneways and parking garages are inconsistently painted – a number of locations have them while others do not. It is desirable that all locations be treated consistently. Upon review of the alternate design (with and without dashed lines) it is considered that the dashed line version provides greater definition for both cyclists and motorists about desired travel paths – and thus it is considered the safer option.<br><br>The photos below show a number of locations where the dashed lines are missing.<br><br>*First 2 photos – Car park entrance west of Exhibition Street (north side)*<br>*Third photo – Laneway at the westbound approach to Russell Street (south side)* | LOW | Paint dotted lines for all entry/exit points to laneways and parking garages across the entire length of La Trobe Street on both sides of the road.<br><br>Examples of where dashed lines have been used across laneways and driveways are shown over the page.<br><br>The photos show (clockwise from top left); the access to Eagle Alley between William and King Streets westbound (south side); mid-block section Queen to William Street (south side); mid-block section King to Spencer Streets (south side). However lines should be 'solid' when there are no driveways. | |

*First 2 photos – Melbourne Central car park entrance (south side)*
*Third photo – Federal Police building carp park at 383 La Trobe Street (south side)*

*Driveways between William and King Streets westbound (south side).*

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| **7** | Potentially confusing line-marking in an eastbound direction (north side of La Trobe Street) between Russell and Exhibition Streets (midblock). Two types of lines have been used in immediate proximity to each other – namely “T” shaped parking bay outlines and dashed traffic lane guides. The dashed lines are in place for the evening peak “no stopping” restriction – which acts to facilitate 2-lane flow for eastbound traffic. However, outside of the peak period, it is possible for some motorists to be ‘misled’ and position their vehicles, when parking, close to the outer dashed line (as indicated by the arrow pointing to the second car in the photo below) – which is not meant to be the edge of parking but rather define the moving traffic lane. | LOW | Investigate options to better highlight the different functions of the 2 line-marking types, in order to make it clear for motorists where they should park. |

| No | Safety Concern | Risk | Recommendation | Client Response |
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| **8** | An undefined wide “empty” space exists in front of the Federal Police building – midblock between Queen Street and William Street on the south side of La Trobe Street. The width of this area is due to the absence of parking (understood to be a security matter). The “traffic lane” treatment on both the approach and departure sides of this zone only allows one westbound traffic lane. However the width that has been provided in front of the Federal Police building can accommodate 2 traffic lanes (between the tram fairway line and the bike lane). This space could therefore be mistakenly interpreted by motorists as a widening of the road (given the significant length). During the audit, a number of westbound vehicle was observed veering left (from travelling behind another vehicle) and using this space as a traffic lane – but only to have to quickly turn back to the central travel lane to avoid hitting the parked cars just ahead. | MEDIUM | Install line-marking to clearly delineate the travel lane and avoid motorists interpreting that the road has widened to two travel lanes at this location. Consider chevron marking and/or RPMs to better define a single traffic lane only.<br><br>Yellow ‘scribble’ line defines space that should be made visually unattractive to motorists – not to appear as trafficable space.<br><br>Parked Vehicle<br><br>Parked Vehicle<br><br>Need to define only one traffic lane in this area<br><br>Wide carriageway capable of carrying 2 traffic lanes | |

| No | Safety Concern | Risk | Recommendation | Client Response |
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| **9** | The intersection of La Trobe Street with Swanston Street exhibits regular congestion in an eastbound direction during the PM peak period (manifested in long queues that extend west from Swanston Street occasionally reaching Queen Street and beyond). It is understood that Council in collaboration with VicRoads is implementing traffic signal changes at this intersection with a view to alleviating the congestion issues.<br><br>The delays associated with prolonged queuing can, at times, force some motorists to take unnecessary risks and/or otherwise engage in unsafe manoeuvres in an attempt to “reduce their waiting time”. | LOW | Monitor the effectiveness of the traffic signal changes at this intersection and evaluate the need for any additional action if significant congestion persists. | |

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| **10** | The disabled space at the westbound approach to Swanston Street (south side of La Trobe Street) forces users to park on the edge of the bike lane to avoid being at risk from a collision with passing vehicle traffic. In addition, there is no pram ramp to allow access to the footpath. | MEDIUM | Discussions with Engineering Services have revealed that a solution has been developed and approved by Council to address issues at this location. This includes narrower bike and traffic lanes to provide greater space for disabled motorists. The effectiveness of the new treatment should be monitored. | |
| **11** | Buses do not fit in the parking bay midblock between Russell and Swanston Streets on a westbound direction (south side). Some motorists were observed moving partially onto the tram tracks, creating a potentially unsafe condition for trams and cars (see photos below). | LOW | The new treatment approved for the disabled parking (referenced above) also incorporates a dashed line treatment for the length of the entire block that may help address issues near the bus parking. Its effectiveness should be monitored. | |

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| **12** | Poor visibility across Russell Street and William Street (in both directions). The photos below illustrate the view from the driver positions at the two stop lines respectively.<br>*View from stop line looking west along southern side of La Trobe Street at Russell Street (left photo) and looking east along northern side of La Trobe Street at William Street (right photo* | MEDIUM | Consider improved lane designation (such as RPMs) to allow drivers and cyclists to select a safe travel path. | |
| **13** | Temporary construction barriers on the south side of La Trobe Street, west of Spencer Street compromise the width of the bike lane, particularly as the presence of a vertical barrier can influence cyclists to move away from the barrier and into the edge next to the vehicle travel lane. | LOW | Consider marginal widening of the bike lane adjacent to the construction barriers – there appears to be sufficient space to enable this to occur without unduly impacting on the traffic lane or forcing cars into the tram fairway area. | |

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| **14** | There is a lack of definition in the transition for eastbound cyclists from La Trobe Street into Victoria Parade. Motorists in the left lane currently tend to drift northward when executing the right turn into Victoria Parade – possibly squeezing cyclists to their left (who are making the same turn).<br><br>Prior to the installation of the bike lanes on La Trobe Street, the number of cyclists using the route was not as high as it now is. The bike lanes have been successful in attracting more cyclists to the route. Observations before and after the installation of the bike lanes indicated that, at this intersection, the number of eastbound cyclists may be 3-4 times higher compared with the pre-installation period. It is now common to observe 6-7 cyclists per traffic signal cycle travelling through the intersection. Thus the 'exposure' of cyclists to cars has greatly increased. The photos below illustrate the nature of the issue and highlight the tendency by many cyclists to 'drift' across to the perceived safety of the pedestrian crossing in order to avoid travelling too close to right turning vehicles. | MEDIUM | The right turning path from La Trobe Street into Victoria Parade should be clearly delineated (such as raised pavement markers and/or linemarking and possibly green treatment in the central portion of Victoria Parade – in the area clear of the east-west traffic flow trajectories) to ensure optimum definition of the travel path for cyclists and adequate separation from right turning vehicles. The photo below shows the area of most interest – the 'squeeze point' when cyclists approach the Victoria Parade median. |

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| **15** | North side – just east of William Street. Three parking spaces have been designated 'no stopping' during the PM peak period, in order to help facilitate vehicle merging manoeuvres from the west side to the east side of the intersection. There is some evidence of this possibly being useful in the morning period as well. | VERY LOW | Continue to monitor traffic flow in this area to determine the necessity for the adoption in the AM peak period of a part-time parking ban similar to the one that exists in the PM peak. | |

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| **16** | There are sections of La Trobe Street where the speed of some cyclists appears excessive in the context of the inner city environment that they are riding through (characterised by frequent and, at times, unpredictable cross-street movements by pedestrians as well as the regular presence of delivery/service personnel crossing the bike lanes on both sides of La Trobe Street from loading zones). The sections in question are those with the steepest downhill grades – that enable some cyclists to attain comparatively high speeds (these sections include, but are not necessarily limited to, the blocks of William to Elizabeth Streets – eastbound; Russell to Elizabeth Streets – westbound, particularly the section between Russell and Swanston Streets where fast-moving cyclists can interact with groups of children and disabled motorists (using bus and disabled parking facilities on the south side of La Trobe Street) attending the Library complex | MEDIUM | Undertake regular monitoring of cyclist speed and, where regular high speed riding is detected, investigate actions to moderate speed to levels that are more compatible with a CBD environment. | |