



# ROAD SAFETY AUDIT

EXISTING CONDITIONS ROAD SAFETY AUDIT

INKERMAN ROAD, ST KILDA EAST

18 OCTOBER 2021

INKERMAN ROAD, ST KILDA EAST

CLIENT: City of Port Phillip

OBT JOB NUMBER: 21276



Suite 2.03, 789 Toorak Road  
Hawthorn East, Victoria 3123

**T:** 61 3 9804 3610  
**W:** [obrientraffic.com](http://obrientraffic.com)  
ABN 55 007 006 037

## AUDITORS

Jemima Macaulay  
Peter Eady

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# 1 INTRODUCTION

## 1.1 SAFETY AUDIT DEFINITION & PURPOSE

Safety Audit is a formalised process to:

- Identify potential safety problems for road users and others affected by a road project; and
- Ensure that measures to eliminate or reduce the problems are fully considered.

It can be carried out at the following project stages:

- feasibility stage;
- preliminary design stage;
- detailed design stage; and
- pre-opening stage.

A road safety audit may also be conducted:

- for roadwork traffic management required during construction of significant projects; and
- on the existing road network.

This is an Existing Conditions Road Safety Audit.

## 1.2 THE AUDIT TEAM

The audit team comprised:

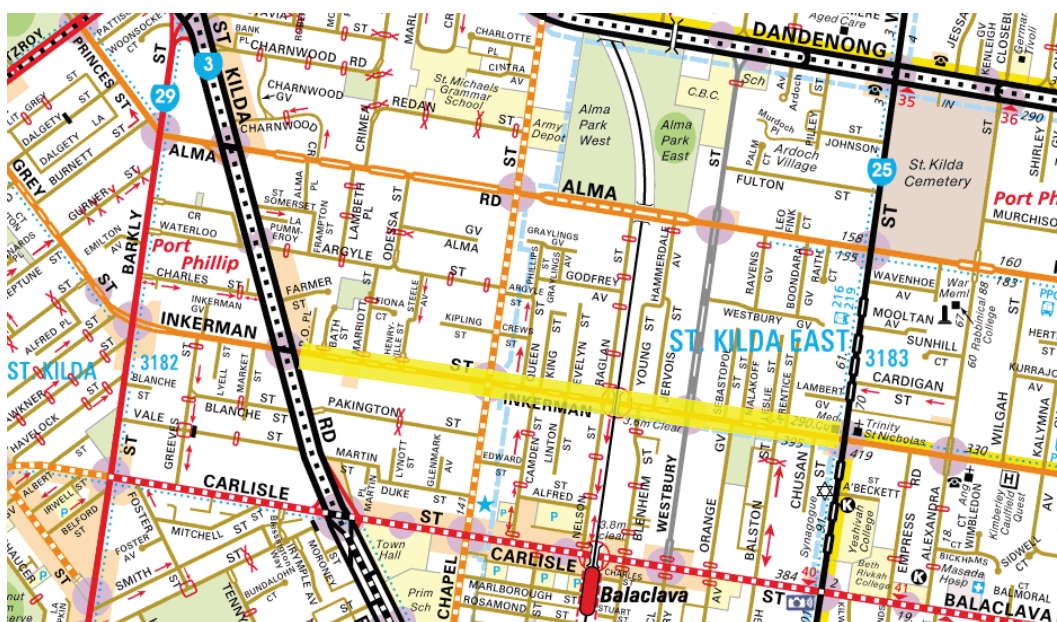
- Jemima Macaulay, Director, O'Brien Traffic – Senior Road Safety Auditor; and
- Peter Eady, Senior Traffic Engineer, O'Brien Traffic – Road Safety Auditor.

As part of this Road Safety Audit the site has been inspected Wednesday 6<sup>th</sup> October 2021, during the afternoon and evening. The weather during the site inspections was fine and mild.

Prior to this audit, the auditors have not had any involvement with the design or development of the project.

## 1.3 AUDIT LOCATION

The audit site is Inkerman Road, between St Kilda Road and Hotham Street, in St Kilda East, as shown in **Figure 1**.



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FIGURE 1: LOCATION OF AUDIT SITE (HIGHLIGHTED IN YELLOW)

Inkerman Street is a Major Council Road. It has a traffic lane, bicycle lane and parking lane in each direction separated by a painted central median with intermittent islands. Kerbside parking restrictions are typically 1P or 2P from 8am to 6pm Monday to Saturday. Signalised intersections are located at St Kilda Road (outside audit area), Chapel Street, Westbury Street and Hotham Street (outside audit area). A 50km/h speed limit applies to Inkerman Street through the audit site.

A view of Inkerman Street is provided in Figure 2.



FIGURE 2: VIEW OF INKERMEN STREET, BETWEEN WESTBURY STREET AND HOTHAM STREET, FACING WEST

## 1.4 PREVIOUS AUDITS

The auditors are not aware of any previous audits of Inkerman Street.

## 1.5 INFORMATION AVAILABLE FOR AUDIT

No documents were provided for the audit.

## 1.6 AUDIT PROCESS & FORMAT

This audit has been carried out generally in accordance with *Austroads Guide to Road Safety Part 6: Managing Road Safety Audits (2019)* and *Austroads Guide to Road Safety Part 6A: Implementing Road Safety Audits (2019)*.

As per Section 3.3 of Part 6, Safe System principles are incorporated into the RSA process. The Safe System approach considers key crash types that may lead to fatal or serious injury crashes and whether crash forces are within the Safe System tolerances for the given crash type. Safe System Impact Speeds for the key crash types (see **Figure 3**) represent collision impact speeds below which the chances of survival are high and the likelihood of serious injury is low.

| CRASH TYPE                                                                                                     | IMPACT SPEED |
|----------------------------------------------------------------------------------------------------------------|--------------|
|  Head on with another vehicle | 70 km/h      |
|  Side impact                 | 50 km/h      |
|  Side impact with tree      | 30 km/h      |
|  Pedestrian & cyclists      | 30 km/h      |

SOURCE: VICROADS SAFE SYSTEM ASSESSMENT REPORT TEMPLATE (2018) – SECTION 1.2

FIGURE 3: SAFE SYSTEM IMPACT SPEEDS

Section 4.8 C of Part 6A presents a useful indication of the level of risk based on crash severity, crash exposure and crash likelihood, and how to respond to it. Tables 4.1 to 4.4 of the Guide are reproduced in **Tables 1 to 4** below.

The frequency of the risk (**Table 1**) and the severity of the risk (**Table 2**) can be used to select the risk category - Intolerable, High, Medium, Low as shown in (**Table 3**), and in turn this risk category can be used to suggest a treatment approach (**Table 4**).

Additionally, we have included a 'Comment' risk category which is an issue of very low significance or an action that may be outside the scope of this road safety audit, but which may improve the overall design or be of wider significance.



| FREQUENCY  | DESCRIPTION                                       |
|------------|---------------------------------------------------|
| Frequent   | Once or more per week                             |
| Probable   | Once or more per year (but less than once a week) |
| Occasional | Once every five to ten years                      |
| Improbable | Less often than once in ten years                 |

SOURCE: AUSTRROADS GUIDE TO ROAD SAFETY PART 6A: IMPLEMENTING ROAD SAFETY AUDITS – TABLE 4.1

TABLE 1: HOW OFTEN IS THE PROBLEM LIKELY TO LEAD TO A CRASH?

| SEVERITY     | DESCRIPTION                                   | EXAMPLES                                                                                                                                                |
|--------------|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Catastrophic | Likely multiple deaths                        | High-speed, multi-vehicle crash on a freeway.<br>Car runs into crowded bus stop.<br>Bus and petrol tanker collide.<br>Collapse of a bridge or tunnel.   |
| Serious      | Likely death or serious injury                | High or medium-speed vehicle/vehicle collision.<br>High or medium-speed collision with a fixed roadside object.<br>Pedestrian or cyclist struck by car. |
| Minor        | Likely minor injury                           | Some low-speed vehicle collisions.<br>Cyclist falls from bicycle at low speed.<br>Left-turn rear-end crash in a slip lane.                              |
| Limited      | Likely trivial injury or property damage only | Some low-speed vehicle collisions.<br>Pedestrian walks into an object (no head injury).<br>Car reverses into a post.                                    |

SOURCE: AUSTRROADS GUIDE TO ROAD SAFETY PART 6A: IMPLEMENTING ROAD SAFETY AUDITS – TABLE 4.2

TABLE 2: WHAT IS THE LIKELY SEVERITY OF THE RESULTING CRASH TYPE?

| SEVERITY     | PROBABILITY OF A CRASH OCCURRING |             |             |            |
|--------------|----------------------------------|-------------|-------------|------------|
|              | FREQUENT                         | PROBABLE    | OCCASIONAL  | IMPROBABLE |
| Catastrophic | Intolerable                      | Intolerable | Intolerable | High       |
| Serious      | Intolerable                      | Intolerable | High        | Medium     |
| Minor        | Intolerable                      | High        | Medium      | Low        |
| Limited      | High                             | Medium      | Low         | Low        |

SOURCE: AUSTRROADS GUIDE TO ROAD SAFETY PART 6A: IMPLEMENTING ROAD SAFETY AUDITS – TABLE 4.3

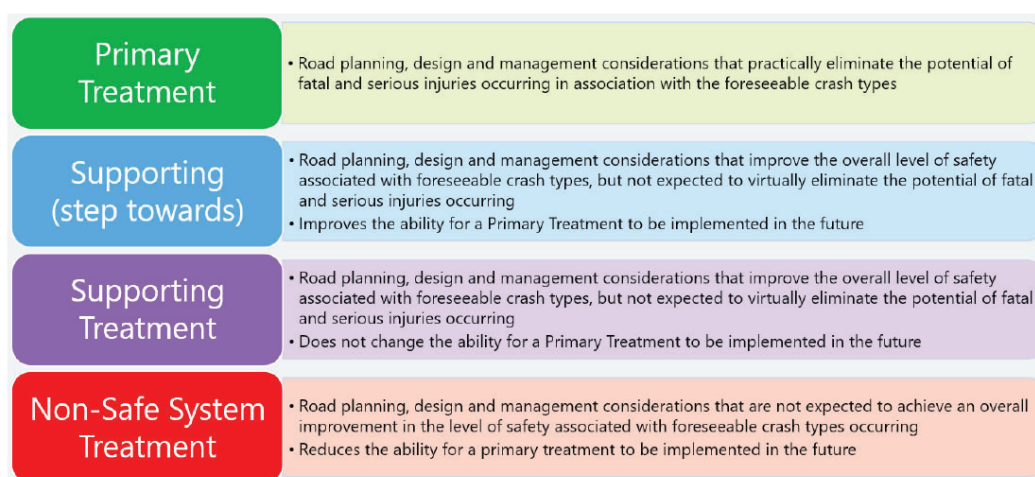
TABLE 3: THE RESULTING LEVEL OF RISK

| RISK        | SUGGESTED TREATMENT APPROACH                                                                            |
|-------------|---------------------------------------------------------------------------------------------------------|
| Intolerable | Must be corrected.                                                                                      |
| High        | Should be corrected or the risk significantly reduced, even if the treatment cost is high.              |
| Medium      | Should be corrected or the risk significantly reduced, if the treatment cost is moderate, but not high. |
| Low         | Should be corrected or the risk reduced, if the treatment cost is low.                                  |

SOURCE: AUSTRROADS GUIDE TO ROAD SAFETY PART 6A: IMPLEMENTING ROAD SAFETY AUDITS – TABLE 4.4

TABLE 4: TREATMENT APPROACH

Section 3.5 of Part 6 presents a hierarchy of primary and supportive Safe System treatment options. Figure 3.2 of the Guide is reproduced in **Table 5** below.



SOURCE: AUSTRROADS GUIDE TO ROAD SAFETY PART 6: MANAGING ROAD SAFETY AUDITS – FIGURE 3.2

TABLE 5: SAFE SYSTEM TREATMENT HIERARCHY

This has been adapted for this audit as follows:

- P – Primary treatment
- S – Supporting Treatment
- O – Other Treatment

The issues identified in the audit, and recommendations for action, are set out in tabular format in the **Findings, Recommendations and Decision Tracking** section of this report.

## 1.7 DISCLAIMER

The findings and recommendations in this report are based on an examination of available relevant plans, the road, and its environs, and the opinions of the audit team. However, it must be recognised that safety cannot be guaranteed since no road can be regarded as absolutely safe. Readers are urged to seek specific technical advice on matters raised and not rely solely on the report.

The auditors also point out that no guarantee is made that every deficiency has been



identified. Further, if all the recommendations in this report were to be followed, this would not guarantee that the project is 'safe'; rather, adoption of the recommendations should improve the level of safety of the facility.

While every effort has been made to ensure the accuracy of the report, it is made available strictly on the basis that anyone relying on it does so at their own risk without any liability to O'Brien Traffic.

## 2 CRASH HISTORY

A review of DoT's casualty crash data for the last 6 years of available data (to end of October 2020) indicates there has been 28 crashes on Inkerman Street between (but not including) the intersections of St Kilda Road and Hotham Street. Of the 28 crashes:

- 12 resulted in serious injury (SI) and 16 resulted in 'other' injury (OI);
- 9 crashes involved a pedestrian, including 4 SI crashes;
- 8 were bicycle crashes, including 3 SI crashes;
- 3 crashes involved motorcyclists, including 2 SI crashes;
- 6 occurred at the Chapel Street intersection; and
- 5 occurred at the Westbury Street intersection.

### *Pedestrian crashes*

Of the 9 pedestrian crashes:

- 4 occurred at the Westbury Street intersection (all DCA 100, 2 OI, 2 SI)
- 3 occurred at the Chapel Street intersection (all DCA 100, 2 SI, 1 OI)
- 2 pedestrian crashes occurred mid-block (1 x DCA 100 OI, 1 x DCA 101 SI)

### *Bicycle crashes*

Of the 8 bicycle crashes, 7 occurred mid-block:

- 3 crashes involved a cyclist striking a car door (DCA 163, 1 SI, 2 OI)
- 5 crashes involved a vehicle travelling in the same direction, i.e. side swipe or rear end crashes (DCA 139 SI, DCA 134 OI, DCA 131 OI, DCA 137 OI, DCA 130 SI)

### *Chapel Street intersection*

Of the 6 crashes at the Chapel Street intersection:

- 3 were pedestrian crashes (as noted above)
- one was a cyclist crash (DCA 134 OI);
- one was a rear end crash (DCA 130 OI)
- one involved a right turn vehicle being struck by a through vehicle (DCA 121, SI)

### ***Westbury Street intersection***

Of the 5 crashes at Westbury Street intersection:

- 4 were pedestrian crashes (as noted above)
- 1 was a rear end crash (DCA 130, SI)

## **3 FINDINGS, RECOMMENDATIONS & DECISION TRACKING**

The following table provides the:

- Review findings;
- Review recommendations; and
- Decision tracking form (for completion by the client/project manager).

## FINDINGS, RECOMMENDATIONS & DECISION TRACKING

|                             |                                                                                                    |                     |                     |
|-----------------------------|----------------------------------------------------------------------------------------------------|---------------------|---------------------|
| <b>Project title</b>        | Inkerman Street, St Kilda East                                                                     | <b>Review stage</b> | Existing Conditions |
| <b>Project manager</b>      | Chris Tsiafidis, City of Port Phillip                                                              | <b>Designer</b>     | N/a                 |
| <b>Road Safety Auditors</b> | Jemima Macaulay, Director, O'Brien Traffic<br>Peter Eady, Senior Traffic Engineer, O'Brien Traffic |                     |                     |

| No. | Audit Findings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Frequency /<br>Severity / Risk         | Audit Recommendations<br>P – Primary S – Supporting<br>O – Other Treatment                                                                                 | PROJECT MANAGER RESPONSE |                                                                                                                                                                                                                                                                                              |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                        |                                                                                                                                                            | Accept:<br>Yes/No        | Reasons / Comments                                                                                                                                                                                                                                                                           |
| 1   | <p><b>Car dooring</b></p> <p>Car doors opening into the path of a cyclist is an inherent risk when parallel parking is provided on street with no separation or protection for cyclists. The crash data indicates 3 car dooring crashes occurred in the 6 year period analysed.</p> <p>There is no separation between parked cars and the bicycle lane to mitigate the risk. The car parking lane is approximately 1.9m wide and cars typically park very close or overhang the edge of the bike lane (see Photo 1), thereby increasing the risk of car dooring. With the majority of parking along the street limited to 1 or 2 hours, there is a significant turnover of parking throughout the day, also increasing the risk.</p> | <b>Probable /<br/>Minor /<br/>High</b> | <i>Consider providing separation between parked cars and the bicycle lane, removing parking, or lengthening parking time limit to reduce turnover (O).</i> | Yes                      | <p>Dooring - The design of the corridor will provide greater separation between bike riders and parked vehicles.</p> <p>Parking restriction changes proposed - Review of crashes has indicated dooring crashes have not occurred at clusters and hence no interim treatment is proposed.</p> |

## FINDINGS, RECOMMENDATIONS & DECISION TRACKING

| No. | Audit Findings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Frequency /<br>Severity / Risk                         | Audit Recommendations<br>P – Primary S – Supporting<br>O – Other Treatment                                                                   | PROJECT MANAGER RESPONSE |                                                                                                                                                                                       |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                        |                                                                                                                                              | Accept:<br>Yes/No        | Reasons / Comments                                                                                                                                                                    |
|     |  <p>PHOTO 1: PARKED CARS ADJACENT TO BIKE LANE IN INKERMANS STREET</p> <p><i>Safe System Tolerance: Within tolerable</i></p>                                                                                                                                                                                                                                                                                      |                                                        |                                                                                                                                              |                          |                                                                                                                                                                                       |
| 2   | <p><b>Bicycle lanes</b></p> <p>With no protection for cyclists from adjacent vehicles, or any separation between the bicycle lane and the traffic lane, there is a risk of vehicles striking a cyclist from behind or side swiping a cyclist. Given the kerbside parking, cyclists are likely to position themselves closer to the traffic lane to minimising car dooring risk, thereby increasing the risk of being struck by a vehicle.</p> <p><i>Safe System Tolerance: Above tolerable</i></p> | <p><b>Probable /<br/>Serious /<br/>Intolerable</b></p> | <p>Consider providing protected bicycle lanes.<br/>This could potentially be achieved by removing parking and/or the central median (S).</p> | <p>Yes</p>               | <p>Protected bicycle lanes and speed limit reduction will be considered as part of the design of the bike corridor. No interim treatments can be installed to improve conditions.</p> |

## FINDINGS, RECOMMENDATIONS & DECISION TRACKING

| No. | Audit Findings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Frequency / Severity / Risk        | Audit Recommendations<br>P – Primary S – Supporting<br>O – Other Treatment                                                                                                                                                                                                                                                                                                                | PROJECT MANAGER RESPONSE |                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                    |                                                                                                                                                                                                                                                                                                                                                                                           | Accept: Yes/No           | Reasons / Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 3   | <p><b>Filtered right turns at Chapel Street and Westbury Street intersections</b></p> <p>Filtered right turn movements are permitted at the Chapel Street and Westbury Street intersections which increases both the risk of a pedestrian crossing with a green walk signal being struck by a right turning vehicle and right-through type vehicle-to-vehicle crashes. The crash data review indicates a history of these types of pedestrian crashes at both intersections. Typically, right turn vehicles would be travelling at speeds below 30km/h, i.e. within safe system tolerance for vehicle-to-pedestrian crashes. At the Chapel Street intersection illuminated <i>Give Way to Pedestrians</i> signs have been installed facing right turning vehicles on each leg to partly mitigate the risk. Static <i>Give Way to Pedestrians</i> signs are provided on 2 legs of the Westbury Street intersection.</p> <p><i>Safe System Tolerance: Within tolerable</i></p> | <b>Probable / Minor / High</b>     | <p><i>Consider fully controlling right turns at the Inkerman Street/Chapel Street and Inkerman Street/Westbury Street intersections (S).</i></p> <p><i>If fully controlled right turns not implemented at Inkerman Street/Westbury Street, provide illuminated Give Way to Pedestrians signs facing right turning vehicles (S).</i></p>                                                   | Yes                      | <p>Recommendation to fully control right turns at intersections to be considered in design of the corridor as well as GTWP flashing signs.</p>                                                                                                                                                                                                                                                                                                                              |
| 4   | <p><b>Mid-block pedestrian crossing movements</b></p> <p>During the site visit, numerous pedestrians were observed crossing Inkerman Street near Aldi (i.e. west of Marriott Street). There are no facilities in this location to assist pedestrians crossing. Without appropriate facilities, pedestrian crossing movements are spread out and less predictable for motorists, increasing the risk of a pedestrian being struck by a vehicle. Mobility impaired pedestrians or those with prams may find it difficult to cross at this location. It is noted that the only kerb ramps provided to facilitate pedestrians crossing mid-block</p>                                                                                                                                                                                                                                                                                                                             | <b>Occasional / Serious / High</b> | <p><i>Provide kerb ramps and extensions to facilitate pedestrians crossing Inkerman Street near Aldi.</i></p> <p><i>Consider provision of kerb ramps and extensions to facilitate pedestrians crossing Inkerman Street near the railway bridge and opposite Hewison Reserve.</i></p> <p><i>Desirably the crossing points would have a refuge island within the existing median to</i></p> | Yes                      | <p>Inkerman St - west of Marriott St<br/>Future design of the corridor to consider installation of a pedestrian zebra crossing in this location with kerb extensions.</p> <p>In two other locations (opposite Hewison Reserve, and next to railway bridge) pedestrian zebra crossings to be considered subject to pedestrian demand, connectivity and parking impact. If pedestrian zebra crossings are not warranted kerb extensions to be considered with pram ramps.</p> |

## FINDINGS, RECOMMENDATIONS & DECISION TRACKING

| No. | Audit Findings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Frequency / Severity / Risk        | Audit Recommendations<br>P – Primary S – Supporting<br>O – Other Treatment                                                                     | PROJECT MANAGER RESPONSE |                                                                         |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------------------------------------------------------------------------|
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                    |                                                                                                                                                | Accept: Yes/No           | Reasons / Comments                                                      |
|     | <p>between St Kilda Road and Chapel Street are located east of Henryville Street.</p> <p>Similarly, there are no mid-block crossing facilities between Chapel Street and Westbury Street, or between Westbury Street and Hotham Street. Pedestrian crossing demand was observed near the railway bridge and opposite Hewison Reserve.</p> <p><i>Safe System Tolerance: Above tolerable</i></p>                                                                                                                                                                                              |                                    | <i>provide a protected refuge for pedestrians crossing the road (S).</i>                                                                       |                          |                                                                         |
| 5   | <p><b>Termination of bicycle lanes at St Kilda Road and Chapel Street intersections</b></p> <p>Currently bicycle lanes on Inkerman Street terminate prior to the signalised intersections at St Kilda Road and Chapel Street, although bicycle boxes are provided.</p> <p>At Chapel Street, bicycle lanes re-commence approximately 80m past the intersection. Where cyclists have no dedicated road space they are more likely to be side swiped by a passing vehicle, potentially at speeds exceeding the safe system tolerance.</p> <p><i>Safe System Tolerance: Above tolerable</i></p> | <b>Occasional / Serious / High</b> | <i>Review intersection layout with a view to providing continuous bicycle lanes through and on the departure side of the intersection (S).</i> | Yes                      | Consider recommendation as part of design development of bike corridor. |
| 6   | <p><b>Linemarking on approaches to Chapel Street</b></p> <p>The bicycle lane terminates approximately 80m and 110m prior to the Chapel Street intersection, eastbound and westbound respectively, however, two traffic lanes are not marked until 40m prior to the intersection. When no cars are parked kerbside, it is unclear whether</p>                                                                                                                                                                                                                                                | <b>Improbable / Minor / Low</b>    | <i>Review linemarking on the Inkerman Street approaches to the Chapel Street intersection.</i>                                                 | Yes                      | Consider recommendation as part of design development of bike corridor. |



## FINDINGS, RECOMMENDATIONS & DECISION TRACKING

| No. | Audit Findings                                                                                                                                                                                                                                                                                                                     | Frequency / Severity / Risk | Audit Recommendations<br>P – Primary S – Supporting<br>O – Other Treatment                                                    | PROJECT MANAGER RESPONSE |                                          |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------|--------------------------|------------------------------------------|
|     |                                                                                                                                                                                                                                                                                                                                    |                             |                                                                                                                               | Accept: Yes/No           | Reasons / Comments                       |
|     | <p>traffic should form one lane or two lanes (see Photo 2). This may result in side swipe type crashes.</p>  <p>PHOTO 2: EASTBOUND APPROACH TO CHAPEL STREET INTERSECTION</p> <p>Safe System Tolerance: N/a</p>                                   |                             |                                                                                                                               |                          |                                          |
| 7   | <p><b>Bicycle Lane signage</b></p> <p>Bicycle Lane signage is not provided consistently at the start and end of bike lanes, although bicycle pavement symbols are provided. In accordance with AS1742.9, bicycle pavement symbols may be used in place of the bicycle lane sign in conjunction with the word LANE or LANE END.</p> | <i>Comment</i>              | <p>Review bicycle lane signage and pavement marking and provide consistently along route in accordance with AS1742.9 (O).</p> | Yes                      | <div>Install as interim treatment.</div> |

## FINDINGS, RECOMMENDATIONS & DECISION TRACKING

| No. | Audit Findings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Frequency /<br>Severity / Risk           | Audit Recommendations<br>P – Primary S – Supporting<br>O – Other Treatment            | PROJECT MANAGER RESPONSE |                                                                                |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------------------------|
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |                                                                                       | Accept:<br>Yes/No        | Reasons / Comments                                                             |
| 8   | <b>Bus stop shelters</b><br><br>The bus stop shelters located on the northern side of Inkerman Street, east of Westbury Street, and on the southern side, east of Henryville Street, impinge on the path of pedestrians and are a potential hazard. The see-through glass and brown colouring of the poles and strips on the glass blend into the environment (see Photo 3) and may be unseen, particularly by vision impaired pedestrians or at night.<br><br><br><br>PHOTO 3: BUS STOP SHELTER<br><br><i>Safe System Tolerance: N/a</i> | <b>Probable/<br/>Limited/<br/>Medium</b> | <i>Improve conspicuity of the bus shelters (S).</i>                                   | <div>Yes</div>           | <div>Consider treatment as part of design of bike corridor.</div>              |
| 9   | <b>One Way sign</b><br><br>The One Way sign located on the northern side of Inkerman Street at Queen Street is located in the footpath and is a potential hazard for                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Probable/<br/>Limited/<br/>Medium</b> | <i>Review location of sign and relocate if possible. Otherwise provide reflective</i> | <div>Yes</div>           | <div>Sign to be relocated following site inspection by Council officers.</div> |

## FINDINGS, RECOMMENDATIONS & DECISION TRACKING

| No. | Audit Findings                                                                                                                                                                                                                                                                             | Frequency /<br>Severity / Risk  | Audit Recommendations<br>P – Primary S – Supporting<br>O – Other Treatment             | PROJECT MANAGER RESPONSE |                                                                                |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----------------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------------------------|
|     |                                                                                                                                                                                                                                                                                            |                                 |                                                                                        | Accept:<br>Yes/No        | Reasons / Comments                                                             |
|     | <p>vision impaired pedestrians walking along the Inkerman Street footpath or the Queen Street footpath (see Photo 4).</p>  <p>PHOTO 4: ONE WAY SIGN AT QUEEN STREET</p> <p>Safe System Tolerance: N/a</p> |                                 | <i>material on pole to increase conspicuity (S).</i>                                   |                          |                                                                                |
| 10  | <p><b>Footpath surface issues</b></p> <p>At numerous locations along the northern and southern footpaths there are trips hazards as a result of sunken pits, cracked pit lids, tree roots lifting pavement etc. For examples see Photos 5 and 6.</p>                                       | <i>Improbable / Minor / Low</i> | <i>Regularly inspect footpath and remedy footpath trip hazards as appropriate (S).</i> | Yes                      | Advise assets team to include as part of future maintenance works if possible. |

## FINDINGS, RECOMMENDATIONS & DECISION TRACKING

| No. | Audit Findings                                                                                                                                                                                                                                                                                        | Frequency /<br>Severity / Risk | Audit Recommendations<br>P – Primary   S – Supporting<br>O – Other Treatment | PROJECT MANAGER RESPONSE |                    |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|------------------------------------------------------------------------------|--------------------------|--------------------|
|     |                                                                                                                                                                                                                                                                                                       |                                |                                                                              | Accept:<br>Yes/No        | Reasons / Comments |
|     |  <p>PHOTO 5: UNEVEN PAVEMENT SURFACE</p>  <p>PHOTO 6: SUNKEN PIT AND CRACKED PAVEMENT</p> <p><i>Safe System Tolerance: N/a</i></p> |                                |                                                                              |                          |                    |



## FINDINGS, RECOMMENDATIONS & DECISION TRACKING

| No. | Audit Findings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Frequency /<br>Severity / Risk                               | Audit Recommendations<br>P – Primary S – Supporting<br>O – Other Treatment       | PROJECT MANAGER RESPONSE |                                                                                       |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|----------------------------------------------------------------------------------|--------------------------|---------------------------------------------------------------------------------------|
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                              |                                                                                  | Accept:<br>Yes/No        | Reasons / Comments                                                                    |
| 11  | <p><b>Footpath trip hazards</b></p> <p>On the southern side of Inkerman Street, at the carpark on the eastern corner of Balston Street, a bluestone kerb is located along the edge of the footpath. However, the kerb sits outs from the adjacent building and is a potential trip hazard (see Photo 7).</p>  <p>PHOTO 7: BLUESTONE KERB ADJACENT TO FOOTPATH AT NO. 385 INKERNMAN STREET</p> <p>At the petrol station on the south western corner of Chapel Street, the end section of kerb adjacent to the footpath has been removed. The exposed end of kerb is a potential trip hazard, particularly as it is not painted white like the other sections (see Photo 8).</p> | <p><i>Improbable</i><br/><i>/ Minor /</i><br/><i>Low</i></p> | <p><i>Consult land owners with view to mitigating trip hazard risks (S).</i></p> | <p>Yes</p>               | <p>Advise assets team to include as part of future maintenance works if possible.</p> |

## FINDINGS, RECOMMENDATIONS & DECISION TRACKING

| No. | Audit Findings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Frequency /<br>Severity / Risk                     | Audit Recommendations<br>P – Primary S – Supporting<br>O – Other Treatment                                                          | PROJECT MANAGER RESPONSE |                                                               |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|--------------------------|---------------------------------------------------------------|
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                    |                                                                                                                                     | Accept:<br>Yes/No        | Reasons / Comments                                            |
|     |  <p>PHOTO 8: KERB ADJACENT TO FOOTPATH AT 199 INKERMANS STREET</p> <p>Safe System Tolerance: N/a</p>                                                                                                                                                                                                                                                                                                                                                                                    |                                                    |                                                                                                                                     |                          |                                                               |
| 12  | <p><b>Footpath TGSIs</b></p> <p>Warning TGSIs are provided on some kerb ramps along the footpaths (typically the newer kerb ramps). Warning TGSIs should be provided at all kerb ramps where required in accordance with Appendix C of AS1428.4.1 to improve safety of vision impaired pedestrians. Similarly, directional TGSIs should be provided at kerb ramps in accordance with Appendix C of AS1428.4.1. This includes the north-eastern corner of Henryville Street where the building is set back and provides no visual cue to vision impaired pedestrians.</p> | <p><b>Improbable<br/>/ Serious/<br/>Medium</b></p> | <p>Review provision of warning and directional TGSIs at kerb ramps and provide in accordance with Appendix C of AS1428.4.1 (S).</p> | <p>Yes</p>               | <p>Advise assets team to include as part of DDA programs.</p> |

## FINDINGS, RECOMMENDATIONS & DECISION TRACKING

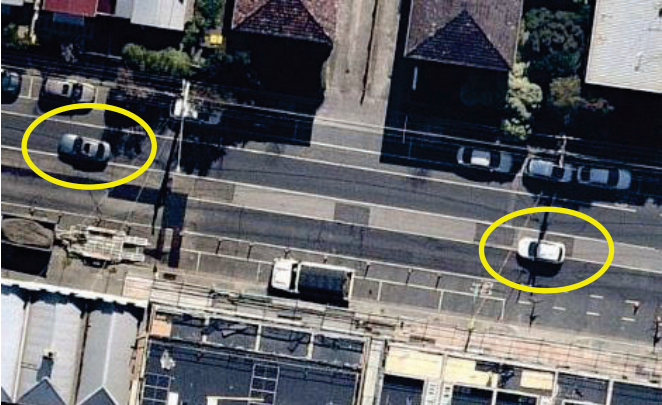
| No. | Audit Findings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Frequency /<br>Severity / Risk            | Audit Recommendations<br>P – Primary S – Supporting<br>O – Other Treatment                                                                                                  | PROJECT MANAGER RESPONSE     |                                                                                                                                                                                       |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                           |                                                                                                                                                                             | Accept:<br>Yes/No            | Reasons / Comments                                                                                                                                                                    |
|     | At the mid-block crossing point east of Henryville Street, directional TGSIs should be provided to give directional orientation to vision impaired pedestrians to access the crossing point.<br><br><i>Safe System Tolerance: N/a</i>                                                                                                                                                                                                                                                                                                          |                                           |                                                                                                                                                                             |                              |                                                                                                                                                                                       |
| 13  | <b>Central median islands</b><br><br>The central median along Inkerman Street has numerous islands with coloured pavement or chevron markings in between. Islands typically have a hazard marker or bollard with reflector at each end. However, these are missing from some islands, increasing the risk of a vehicle hitting the island (see, for example, Photos 9 and 10). Bollards with reflectors should only be used in place of a hazard marker for islands spaced closely together, with hazard markers installed on all end islands. | <b>Occasional/<br/>Minor /<br/>Medium</b> | <i>Ensure hazard markers are provided on ends of all median islands, facing oncoming traffic (bollards with reflectors may be adequate for closely spaced islands) (S).</i> | <div>Yes</div> <div>No</div> | <div>Hazard markers to be considered as part of interim treatment.</div> <div>Installation of bollard not supported given the islands will be removed as part of bike corridor.</div> |
|     | <br>PHOTO 9: MEDIAN ISLAND EAST OF CHAPEL STREET                                                                                                                                                                                                                                                                                                                                                                                                             |                                           |                                                                                                                                                                             |                              |                                                                                                                                                                                       |



## FINDINGS, RECOMMENDATIONS & DECISION TRACKING

| No. | Audit Findings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Frequency / Severity / Risk                 | Audit Recommendations<br>P – Primary S – Supporting<br>O – Other Treatment                                                                                                                                                                                                                            | PROJECT MANAGER RESPONSE |                                                                                                        |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------|
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                             |                                                                                                                                                                                                                                                                                                       | Accept: Yes/No           | Reasons / Comments                                                                                     |
|     |  <p>PHOTO 10: MEDIAN ISLAND WEST OF HOTHAM STREET</p> <p>The median island west of Linton Street has been impact by recent works and is in need of repair (see Photo 11). There is no delineation of the median along this section of street and cars are more likely to veer from the traffic lane.</p>  <p>PHOTO 11: MEDAN ISLAND WEST OF LINTON STREET</p> | <p><i>Improbable / Serious / Medium</i></p> | <p>Reinstate kerb and linemarking in median where works have been undertaken (S).</p> <p>Consider provision of additional median islands between railway bridge and Chapel Street to increase effectiveness of median (S).</p> <p>Consider re-applying coloured pavement treatment in median (S).</p> | <p>Yes</p>               | <p>Maintenance team to reinstate conditions prior to works and install hazard markers as required.</p> |

## FINDINGS, RECOMMENDATIONS & DECISION TRACKING

| No. | Audit Findings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Frequency / Severity / Risk      | Audit Recommendations<br>P – Primary S – Supporting<br>O – Other Treatment                                                                                  | PROJECT MANAGER RESPONSE |                                                                                                                                                                                        |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                  |                                                                                                                                                             | Accept: Yes/No           | Reasons / Comments                                                                                                                                                                     |
|     | <p>Between the railway bridge and Chapel Street, there are few median islands and cars are more likely to veer from the traffic lane (see Photo 12). The coloured pavement within the median is also patchy. This reduces the traffic calming effect of the median, and may increase crash risk/severity, particularly if pedestrians are using the median to stage their crossing.</p>  <p>COPYRIGHT NEARMAP.COM.AU REPRODUCED WITH PERMISSION</p> <p>PHOTO 12: CARS VEERING ACROSS MEDIAN, WEST OF RAILWAY BRIDGE</p> <p><i>Safe System Tolerance: Within tolerable for vehicle crashes</i></p> <p><i>Safe System Tolerance: Above tolerable for pedestrian crashes</i></p> |                                  |                                                                                                                                                             | No                       | <p>Review of crash statistics do no reveal any head on collisions on Inkerman Street. Medians will be removed as part of bicycle corridor. Screenshot appears to be one off event.</p> |
| 14  | <p><b>Visibility of median islands at night</b></p> <p>At night time, visibility of the median and median islands is somewhat difficult, increasing the risk of a car striking the island or veering into the median. It is noted that the provision of RRPM's and hazard</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Occasional/<br>Minor /<br>Medium | To increase conspicuity of median islands at night, provide RRPM's along the edgeline facing oncoming traffic at the start of each island and ensure hazard | Yes                      | <p>Install RRPMs as interim measure.</p>                                                                                                                                               |

## FINDINGS, RECOMMENDATIONS & DECISION TRACKING

| No. | Audit Findings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Frequency / Severity / Risk               | Audit Recommendations<br>P – Primary S – Supporting<br>O – Other Treatment                                                                                | PROJECT MANAGER RESPONSE |                                                                                                                                                                                                                                                                                               |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                           |                                                                                                                                                           | Accept: Yes/No           | Reasons / Comments                                                                                                                                                                                                                                                                            |
|     | <p>markers at the ends of the islands is inconsistent, and that the bollards with reflectors on islands are less effective than hazard markers.</p> <p><i>Safe System Tolerance: Within tolerable</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                           | <i>markers are provided on ends of median islands, facing oncoming traffic (bollards with reflectors may be adequate for closely spaces islands) (S).</i> |                          |                                                                                                                                                                                                                                                                                               |
| 15  | <p><b>Visibility exiting lanes and driveways</b></p> <p>Vehicles exiting Post Office Place have limited sightlines to pedestrians on the footpath, and vice versa, therefore there is a risk of a pedestrian being struck by an exiting vehicle. Provision of a speed hump at the end of the lane would ensure vehicles slow down prior to exiting.</p> <p>Similarly, at the lane opposite Bath Street, sight lines are restricted by the adjacent building (although is partly improved by a cut out) (see Photo 13).</p>  <p>PHOTO 13: FOOTPATH APPROACH TO LANE OPPOSITE BATH STREET</p> | <p><i>Occasional/ Minor / Limited</i></p> | <p><i>Provide speed humps on Post Office Place and the lane opposite Bath Street to slow exiting vehicles prior to the footpath (S).</i></p>              | <p>No</p>                | <p>Installation of speed hump not supported. This is similar to multiple lane ways within municipality. As part of corridor design consider the installation of pavement markings to advise drivers of pedestrians and bike riders upon egressing from laneway if considered appropriate.</p> |

## FINDINGS, RECOMMENDATIONS & DECISION TRACKING

| No. | Audit Findings                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Frequency /<br>Severity / Risk | Audit Recommendations<br>P – Primary S – Supporting<br>O – Other Treatment                                                                                                                                                                   | PROJECT MANAGER RESPONSE |                                                                                                                                                                                                                                   |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                |                                                                                                                                                                                                                                              | Accept:<br>Yes/No        | Reasons / Comments                                                                                                                                                                                                                |
|     | <p>At the Aldi car park exit, a sight triangle has been provided, however sight lines are still somewhat restricted. Cars are also exiting on a downhill gradient to the footpath. Given the number of vehicles exiting, provision of a speed hump at the exit would be desirable to improve safety for pedestrians on the footpath.</p> <p>At several locations, foliage or walls adjacent to private driveways restrict sightlines between exiting motorists and pedestrians on the footpath (see, for example, Photo 14).</p>  <p>PHOTO 14: FOLIAGE AT DRIVEWAY OF NO. 208</p> <p>Safe System Tolerance: N/a</p> |                                | <p><i>Consult with land owner with a view to providing a speed hump on the exit from the Aldi carpark (S).</i></p> <p><i>Consult with land owners to prune foliage to improve sightlines for exiting vehicles where appropriate (S).</i></p> | No                       | At ALDI carpark, yellow hold line reiterates to drivers to give way to pedestrians.                                                                                                                                               |
| 16  | <p><b>Bins on footpath</b></p> <p>During the site inspection, a bin and drum was located on the Inkerman Street northern footpath, just west of Post Office Place. Objects on the footpath along the building line are a potential hazard for vision impaired pedestrians.</p>                                                                                                                                                                                                                                                                                                                                                                                                                        | Occasional/<br>Limited/<br>Low | Consult with land owner to provide an alternate location for bin.                                                                                                                                                                            | No.                      | Site inspections indicated bins are being stored close to kerb line to avoid obstructing pedestrians. Land owner to be contacted by relevant team if bins are observed to stored in location that obstructs pedestrian movements. |

## FINDINGS, RECOMMENDATIONS & DECISION TRACKING

| No. | Audit Findings                                                                                                                                                                                                                                                                                                                                                                                                                                        | Frequency /<br>Severity / Risk                 | Audit Recommendations<br>P – Primary S – Supporting<br>O – Other Treatment | PROJECT MANAGER RESPONSE |                                                     |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------------------|--------------------------|-----------------------------------------------------|
|     |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                |                                                                            | Accept:<br>Yes/No        | Reasons / Comments                                  |
|     |  <p>PHOTO 15: BIN AND DRUM ON FOOTPATH ON NORTH WESTERN CORNER OF POST OFFICE PLACE</p> <p>Safe System Tolerance: N/a</p>                                                                                                                                                                                                                                            |                                                |                                                                            |                          |                                                     |
| 17  | <p><b>Fire hydrant cover</b></p> <p>During the site inspection, the fire hydrant cover was off the fire hydrant on the north eastern corner of Inkerman Street and St Kilda Road, creating a potential trip hazard for pedestrians.</p>  <p>PHOTO 16: FIRE HYDRANT, NORTH EASTERN CORNER OF INKERMAN STREET AND ST KILDA ROAD</p> <p>Safe System Tolerance: N/a</p> | <p><i>Occasional/<br/>Limited/<br/>Low</i></p> | <p>Replace cover on fire hydrant</p>                                       | <p>Yes</p>               | <p>Assets to be advised and action accordingly.</p> |



## 4 CONCLUSIONS

Safety concerns have been identified in this Existing Conditions road safety audit, and it is considered that actions should be implemented to improve likely safety outcomes.

The issues identified in the audit need to be reviewed and necessary actions/changes made. Where recommended actions are not taken, this should be reported in writing providing reasons for that decision.

## 5 AUDIT STATEMENT

We certify that we have examined the specified road and environs to identify features that could be changed, removed or modified in order to improve safety. The problems identified have been noted in this report, together with recommendations, which should be studied for implementation.

### Auditors

A handwritten signature in black ink, appearing to read 'J Macaulay'.

Jemima Macaulay  
Director  
O'Brien Traffic

A handwritten signature in black ink, appearing to read 'Peter Eady'.

Peter Eady  
Senior Traffic Engineer  
O'Brien Traffic