



**Office of Transport Safety Investigations**

# **BUS SAFETY INVESTIGATION REPORT**

**UNCONTROLLED MOVEMENT OF BUS**

**PASSENGER INJURY**

**OATLEY**

**28 JUNE 2017**



# BUS SAFETY INVESTIGATION REPORT

---

UNCONTROLLED MOVEMENT OF BUS

PASSENGER INJURY

OATLEY

28 JUNE 2017

Released under the provisions of  
Section 45C (2) of the *Transport Administration Act 1988* and  
Section 46BBA (1) of the *Passenger Transport Act 1990*

Investigation Reference 04778

*Published by:* The Office of Transport Safety Investigations  
*Postal address:* PO Box A2616, Sydney South, NSW 1235  
*Office location:* Level 17, 201 Elizabeth Street, Sydney NSW 2000  
*Telephone:* 02 9322 9200  
Accident and incident notification: 1800 677 766  
*Facsimile:* 02 9322 9299  
*E-mail:* [info@otsi.nsw.gov.au](mailto:info@otsi.nsw.gov.au)  
*Internet:* [www.otsi.nsw.gov.au](http://www.otsi.nsw.gov.au)

This Report is Copyright©. In the interests of enhancing the value of the information contained in this Report, its contents may be copied, downloaded, displayed, printed, reproduced and distributed, but only in unaltered form (and retaining this notice). However, copyright in material contained in this Report which has been obtained by the Office of Transport Safety Investigations from other agencies, private individuals or organisations, belongs to those agencies, individuals or organisations. Where use of their material is sought, a direct approach will need to be made to the owning agencies, individuals or organisations.

Subject to the provisions of the *Copyright Act 1968*, no other use may be made of the material in this Report unless permission of the Office of Transport Safety Investigations has been obtained.

# THE OFFICE OF TRANSPORT SAFETY INVESTIGATIONS

---

The Office of Transport Safety Investigations (OTSI) is an independent NSW agency whose purpose is to improve transport safety through the investigation of incidents and accidents in the rail, bus and ferry industries. OTSI investigations are independent of regulatory, operator or other external entities.

Established on 1 January 2004 by the *Transport Administration Act 1988 (NSW)*, and confirmed by amending legislation as an independent statutory office on 1 July 2005, OTSI is responsible for determining the contributing factors of accidents and to make recommendations for the implementation of remedial safety action to prevent recurrence. Importantly, however, OTSI does not confine itself to the consideration of just those matters that contributed to a particular accident; it also seeks to identify any transport safety matters which, if left unaddressed, might contribute to other accidents.

OTSI's investigations are conducted under powers conferred by the *Transport Administration Act 1988 (NSW)* and *Passenger Transport Act 1990 (NSW)*. Additionally, all OTSI publications that are considered investigation reports are also conferred by these Acts. OTSI also conducts rail investigations on behalf of the Australian Transport Safety Bureau under the *Transport Safety Investigation Act 2003 (Cwlth)*. OTSI investigators normally seek to obtain information cooperatively when conducting an accident investigation. However, where it is necessary to do so, OTSI investigators may exercise statutory powers to interview persons, enter premises and examine and retain physical and documentary evidence.

It is not within OTSI's jurisdiction, nor an object of its investigations, to apportion blame or determine liability. At all times, OTSI's investigation reports strive to reflect our balanced approach to the investigation, in a manner that properly explains what happened, and why, in a fair and unbiased manner.

Once OTSI has completed an investigation, its report is provided to the NSW Minister for Transport and Infrastructure for tabling in Parliament. The Minister is required to table the report in both Houses of the NSW Parliament within seven days of receiving it. Following tabling, the report is published on OTSI's website at [www.otsi.nsw.gov.au](http://www.otsi.nsw.gov.au).

# CONTENTS

---

<b>TABLE OF FIGURES</b>	<b>ii</b>
<b>EXECUTIVE SUMMARY</b>	<b>iii</b>
<b>PART 1 FACTUAL INFORMATION</b>	<b>1</b>
Events leading up to the occurrence	1
The occurrence	1
Events following the occurrence	1
Incident location	2
Environmental information	2
Punchbowl Bus Company	2
Bus Information	3
Driver information	3
Related occurrences	4
<b>PART 2 ANALYSIS</b>	<b>5</b>
Introduction	5
Examination of the incident	5
Examination of the bus	5
Examination of the Safety Management System	6
Driver Evaluation Checklist	7
Remedial actions	7
<b>PART 3 FINDINGS</b>	<b>8</b>
Contributory Factors	8
<b>PART 4 RECOMMENDATIONS</b>	<b>10</b>
Punchbowl Bus Company	10
Roads and Maritime Services	10
<b>PART 5 APPENDICES</b>	<b>11</b>
Appendix 1: Sources, Submissions and Acknowledgements	11

## TABLE OF FIGURES

---

Figure 1: Incident location	2
Figure 2: PBC MO737 - 1997 Scania bus	3

## EXECUTIVE SUMMARY

---

At approximately 1320 on Wednesday, 28 June 2017, a Punchbowl Bus Company bus, while conducting a service route in the suburb of Oatley, stopped on Douglas Haig Street for a passenger to board the bus.

Due to a car being parked on the approach-side of the bus stop, the bus was not able to stop and align parallel to the footpath. After coming to a standstill, the driver of the bus tried to communicate through the closed doors of the bus for the passenger to walk further along the footpath. This was so the driver of the bus could align the bus parallel to the footpath. Due to communication difficulties, the driver opened the doors of the bus so as the person could hear the driver. The passenger then tried to board the bus but while doing so, fell backwards on to the roadside gutter.

The driver of the bus got up in an attempt to assist the fallen passenger, however the driver had left the bus engaged in gear with the engine running and the park brake not applied. As the driver left his seat, the bus rolled forward for approximately three metres. The driver, on realising the bus was moving, immediately returned to the driver's seat and stopped the bus. Unbeknown to the driver, the front wheel of the bus had rolled over one of the passenger's legs and as a result the passenger received serious leg injuries. The passenger was conveyed to hospital.

## PART 1 FACTUAL INFORMATION

---

### Events leading up to the occurrence

- 1.1 On 28 June 2017, the driver of Punchbowl Bus Company (PBC) signed on at 1001<sup>1</sup> to work shift number 64.
- 1.2 At 1011 the driver departed the depot to commence bus route 52, from Hurstville to Mortdale. At 1318 the driver stopped at a designated bus stop on Douglas Haig Street, Oatley, to pick up a single passenger that was standing at the bus stop. As the driver approached the bus stop, the driver noted that the approach-side of the bus stop was blocked by a car parked in close proximity to the bus stop. The driver was unable to bring the vehicle alongside and parallel with the footpath due to the positioning of the car.

### The occurrence

- 1.3 The driver pulled up to the bus stop at an angle of approximately 30 degrees to the footpath. Through the closed doors of the bus, the driver attempted to instruct the passenger to walk further along the footpath to allow an easier ingress. The passenger was unable to hear the driver, so the driver opened the doors of the bus and repeated the message.
- 1.4 At that point, the passenger began to board the bus. The passenger put one foot on the first step of the bus, then lost balance and began to fall backwards. The driver immediately left the driver's seat to assist. The driver, however, had stopped the bus in gear and had not applied the park brake. As soon as the driver left the seat, the bus moved forward approximately three metres. Unbeknown to the driver the bus rolled over one of the passenger's legs.

### Events following the occurrence

- 1.5 Immediately following the incident, the driver contacted the radio-base at the PBC depot at Riverwood, which in turn contacted emergency services. Police and NSW Ambulance service attended.

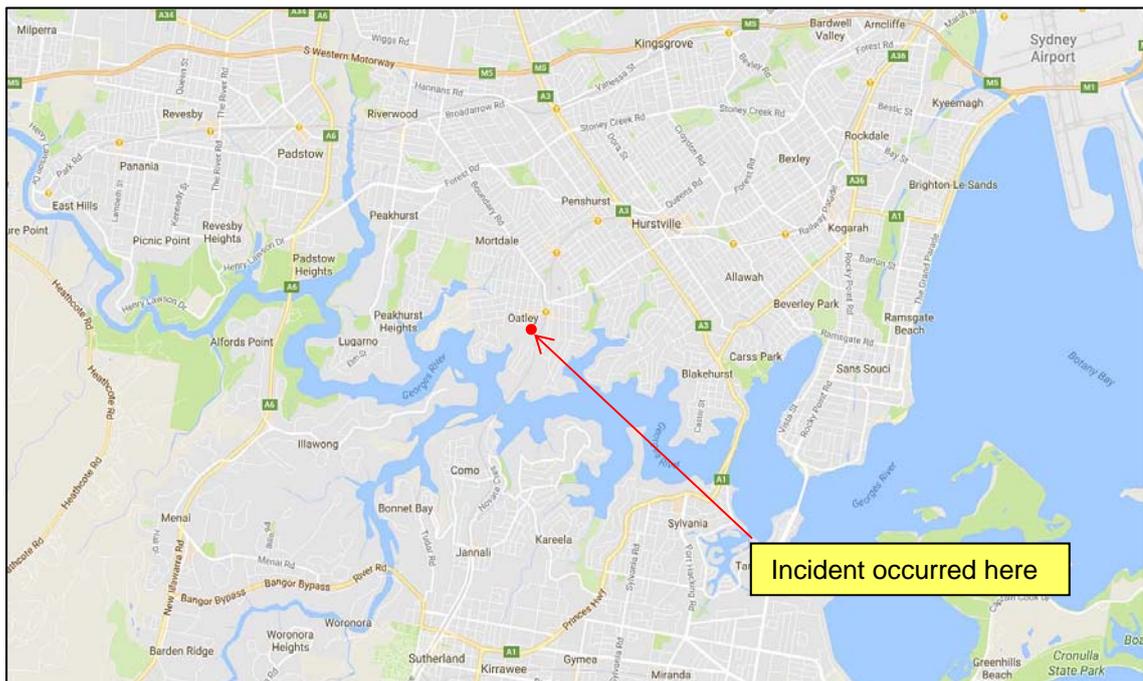
---

<sup>1</sup> Times in this report are in 24-hour clock format in Australian Eastern Standard Time (AEST): Coordinated Universal Time (UTC) + 10 hours

- 1.6 A PBC manager deployed to the site, the location of the incident was only a ten-minute drive away. On arrival, the manager began a preliminary investigation into the incident.

## Incident location

- 1.7 The incident occurred in Oatley, a southern suburb of Sydney. Oatley is approximately 18 km from the Sydney Central Business District. (See Figure 1)



Source: Geoscience Australia – Annotated by OTSI

Figure 1: Incident location

## Environmental information

- 1.8 The afternoon of 28 June 2017 was dry and sunny. The Bureau of Meteorology recorded a temperature of 14°C at 1500 at the Sydney Airport weather station which is approximately 15 km from Oatley. It was determined that the environmental conditions played no part in the incident.

## Punchbowl Bus Company

- 1.9 PBC is a family owned business and had been operating bus services in the southwest of Sydney since 1947.
- 1.10 PBC currently operates with a fleet of 78 buses within the Sydney metropolitan area.

## Bus Information

- 1.11 The bus was a diesel powered, 05/1997 K112 model Scania single door route bus registered in NSW as MO737. It was fitted with a Pressed Metal Corp (PMC) body manufactured by Jaguar-Rover Australia Limited (JRA). The bus was operated by PBC from their Riverwood depot. (See Figure 2)



Source: OTSI

Figure 2: PBC MO737 - 1997 Scania bus

- 1.12 It was noted that the bus was not subject to RMS Technical Specification 146<sup>2</sup> (TS 146) as the bus had been built prior to the introduction of TS146.
- 1.13 As part of the TfNSW replacement program this specific bus was scheduled to be removed from the route fleet in August 2017
- 1.14 At the time of the incident, PBC had 12 buses that were manufactured prior to the implementation of TS146.

## Driver information

- 1.15 The driver had been employed since 27 March 2017. The driver was the holder of a NSW driver's HR/R<sup>3</sup> licence and a Drivers Authority issued by the NSW Roads and Maritime Services (RMS).

<sup>2</sup> On 17 July 1997 as a result of two fatal bus accidents, the then Roads and Traffic Authority of NSW (now RMS), following consultation with the bus industry, published Technical Specification 146. The intent of the document was to specify a door safety standard to prevent passengers from being trapped in a bus door and dragged by a moving bus. The specification provides details of the door interlock mechanism and its operations.

<sup>3</sup> HR, R; Heavy Ridged Vehicle, Motorcycle licence.

- 1.16 On commencement with PBC, the driver completed a staff induction program. This program is designed to induct the drivers to the PBC practices, policies and procedures. PBC utilises a 'Staff Induction Checklist', where the driver is required to sign off each respective item to confirm they have read and understood all policies and procedures.
- 1.17 On 29 March 2017, the driver also endorsed all pages of a PBC 'Employment Agreement'. The driver was placed on a six month probation period.

### **Related occurrences**

- 1.18 According to data from the RMS Bus Incident Management Data Base, there have been 91 incidences of uncontrolled bus movements since the beginning of 2010. Of these incidences, 28 have occurred with the driver out of the driver's seat and on-board the bus.

## **PART 2 ANALYSIS**

---

### **Introduction**

2.1 The investigation focussed principally on the factors that contributed to the incident and aspects of the RMS TS146.

### **Examination of the incident**

2.2 On 30 June 2017, an OTSI investigator deployed to the site of the incident. Measurements taken recorded that the bus had rolled approximately three metres following the driver leaving their seat.

2.3 CCTV footage was reviewed and revealed that the driver had stopped at the bus stop at an angle of approximately 30 degrees to the gutter. It appeared that the driver was trying to communicate to the passenger; however the passenger indicated to the driver that they couldn't hear the driver's instruction. It is at this point that the driver opened the door so the passenger could hear what the bus driver was saying.

2.4 The passenger then tried to board the bus. In viewing the CCTV footage, the person had difficulties in raising their leg high enough to board the bus. The passenger leant back to gain more leverage and height on the forward leg and began to fall backwards. The driver then left their seat in an attempt to assist the passenger. As the passenger falls, the driver tried to assist the passenger; however, the bus began to move. While the driver tried to return to his seat and stop the bus, the passenger had already fallen and the bus rolled over the passenger's leg.

2.5 The bus driver immediately contacted the PBC radio base who in turn contacted emergency services. The passenger was taken to a local hospital with leg injuries.

### **Examination of the bus**

2.6 OTSI examined the bus maintenance records and found no outstanding issues or defects relating to the incident. It was noted that the bus build date was prior to the implementation of TS 146.

## Examination of the Safety Management System

- 2.7 In reviewing the PBC Safety Management System, OTSI determined that the driver had been supplied with adequate information in regards to securing a bus at a bus stop. The securing of a bus and the operation of the bus's door was documented in the 'Drivers Handbook' and captured in the PBC 'Safety Management System'.
- 2.8 PBC instructions in relation to avoiding bus runaways were issued to the driver prior to the incident. The procedures aligned with the RMS Bus Operator Accreditation Scheme Information Alert 1/16 titled "*Runaway Bus Information Procedure*" issued to all SMBSC<sup>4</sup> contracted operators on May 2016.
- 2.9 With PBC 'Safety Management System – Runaway Bus Prevention Policy & Procedures', PBC documented a six point list for drivers operating buses within PBC. These were:
- a) *"Do not leave the driver's seat without engaging the park brake.*
  - b) *Do not rely on an open door (buses with door interlock brakes<sup>5</sup>) to secure bus.*
  - c) *If the bus is fitted with an external door close control, you must use this control to close the door of the bus.*
  - d) *Under no circumstances are driver's to access the bus controls via the driver's window.*
  - e) *Should a runaway bus occur do not engage with the bus, stand clear and alert anyone in the area of the impending danger".*
- 2.10 The driver had signed-off on the PBC Safety Management System and had endorsed this particular policy.

---

<sup>4</sup> The **Sydney Metropolitan Bus Service Contracts** are contracts issued by the Government of New South Wales to metropolitan bus operators in Sydney, Australia. Since 2005, the government has moved from individual contracts with operators to larger contract regions, leading to the consolidation of bus operators:  
[https://Sydney\\_Metropolitan\\_Bus\\_Service\\_Contracts](https://Sydney_Metropolitan_Bus_Service_Contracts)

<sup>5</sup> Type II door systems (door systems manufactured to comply with TS146) are fitted with throttle deactivation and apply air pressure to the rear service brakes to secure the bus when the passenger doors are open. The incident bus was a Type I door system that does not have either of these features.

## **Driver Evaluation Checklist**

2.11 On 7 April 2017 and 29 May 2017 the driver completed training and assessment by a PBC driver trainer. He was assessed and deemed competent in bus securing procedures.

## **Remedial actions**

2.12 MO737 was part of 10 buses scheduled for replacement in August 2017 as part of the TfNSW replacement program. This reduced the number of pre 1997 buses in the route fleet.

2.13 PBC has made a number of changes in its policy and procedures to mitigate such events occurring, including the acquisition of new buses. Driver training was also enhanced to ensure drivers fully understood the implications of runaway incidents and the associated hazards to the general public and PBC employees.

## PART 3 FINDINGS

---

- 3.1 The bus industry and its governing bodies have invested considerably into the prevention of uncontrolled bus movements; however the common factor behind all departures from procedures is human behaviour.
- 3.2 In a study conducted by Transport Safety Victoria in November 2016 titled, *“Human Factors Analysis of Bus Rollaways”* quotes Professor James Reason: *“people will always make errors and commit violations”*<sup>6</sup>.
- 3.3 The actions of the driver in this accident are consistent with a momentary lapse in situational awareness induced by an inability to align the bus correctly with the marked bus stop, difficulty communicating with the passenger and concern for the passenger’s safety.
- 3.4 OTSI’s investigation into this incident has found that PBC’s defences to uncontrolled bus movements were compliant to industry standards.
- 3.5 An additional factor is that the bus involved was not fitted with any safety systems that would have arrested the movement of the bus, or alerted the driver to the fact that the park brake was not applied whilst the driving position was unattended.

### Contributory Factors

- 3.6 The driver did not align the bus parallel to the footpath correctly.
- 3.7 The driver left the bus in gear and did not apply the park brake when initially stopping for the passenger and left the driver’s seat while in gear and with no park brake applied.
- 3.8 The driver’s actions were consistent with a momentary lapse in situational awareness.
- 3.9 As a result of being manufactured prior to the implementation of TS146, the door system fitted to the bus did not have an automated door interlock safety function that would prevent the bus from moving while the doors of the bus

---

<sup>6</sup> Human factors analysis of bus rollaways, Transport Safety Victoria Nov 2016. “Controls and equipment should be designed to take account of these capabilities so that an honest mistake does not lead to a catastrophic accident. Accept that, as Professor Reason points out, “people will always make errors and commit violations”. Reason, J, 1997, *Managing the Risks of Organizational Accidents*, Ashgate, Farnham, p. 153.

were open. Due to the driver still having the bus engaged in gear and with no park brake applied, the bus moved forward the moment the driver left the driver's seat.

## **PART 4 RECOMMENDATIONS**

---

- 4.1 Noting that some remedial safety actions have already been implemented, it is recommended that the following additional safety actions be undertaken by the specified responsible entity.

### **Punchbowl Bus Company**

- 4.2 Further develop their driver training to be aware of the limitations in the door safety systems of pre TS146 model buses.
- 4.3 In Section 16 of the Driver Evaluation Checklist, add an additional subset for drivers to simulate either a blocked bus stop and/or when the approach side of a bus stop is hindered by a parked vehicle. This would then reinforce to all drivers not to park a bus at an angle to the curb. This would eliminate the possibility of a passenger alighting or boarding the a bus parked at such angles.
- 4.4 Send out operational notices to all current drivers within PBC to advise them of the risks in stopping at an angle to bus stops and the flow-on risks to passengers alighting or boarding.

### **Roads and Maritime Services**

- 4.5 Issue a general bulletin for operators/owners of the risks associated with buses manufactured prior to the implementation of TS146, specifically the different operating characteristics of Type I and Type II door systems.

## PART 5 APPENDICES

---

### Appendix 1: Sources, Submissions and Acknowledgements

#### Sources of Information

- Punchbowl Bus Company
- Roads and Maritime Services
- Google Maps
- <http://fleetlists.busaustralia.com>
- <https://appln.transport.nsw.gov.au>

#### References

- Transport NSW 2010, Moving Together Corporate Plan 2010 – 2014, Sydney
- RMS Technical Specification 146 Issued 16 July 1997. Republished 10 November 2017

#### Submissions

The Chief Investigator forwarded a copy of the Draft Report to the Directly Involved Parties (DIPs) to provide them with the opportunity to contribute to the compilation of the Final Report by verifying the factual information, scrutinising the analysis, findings and recommendations, and to submit recommendations for amendments to the Draft Report that they believed would enhance the accuracy, logic, integrity and resilience of the Investigation Report. The following DIPs were invited to make submissions on the Draft Report:

- Punchbowl Bus Company
- Roads and Maritime Services
- Transport for New South Wales