



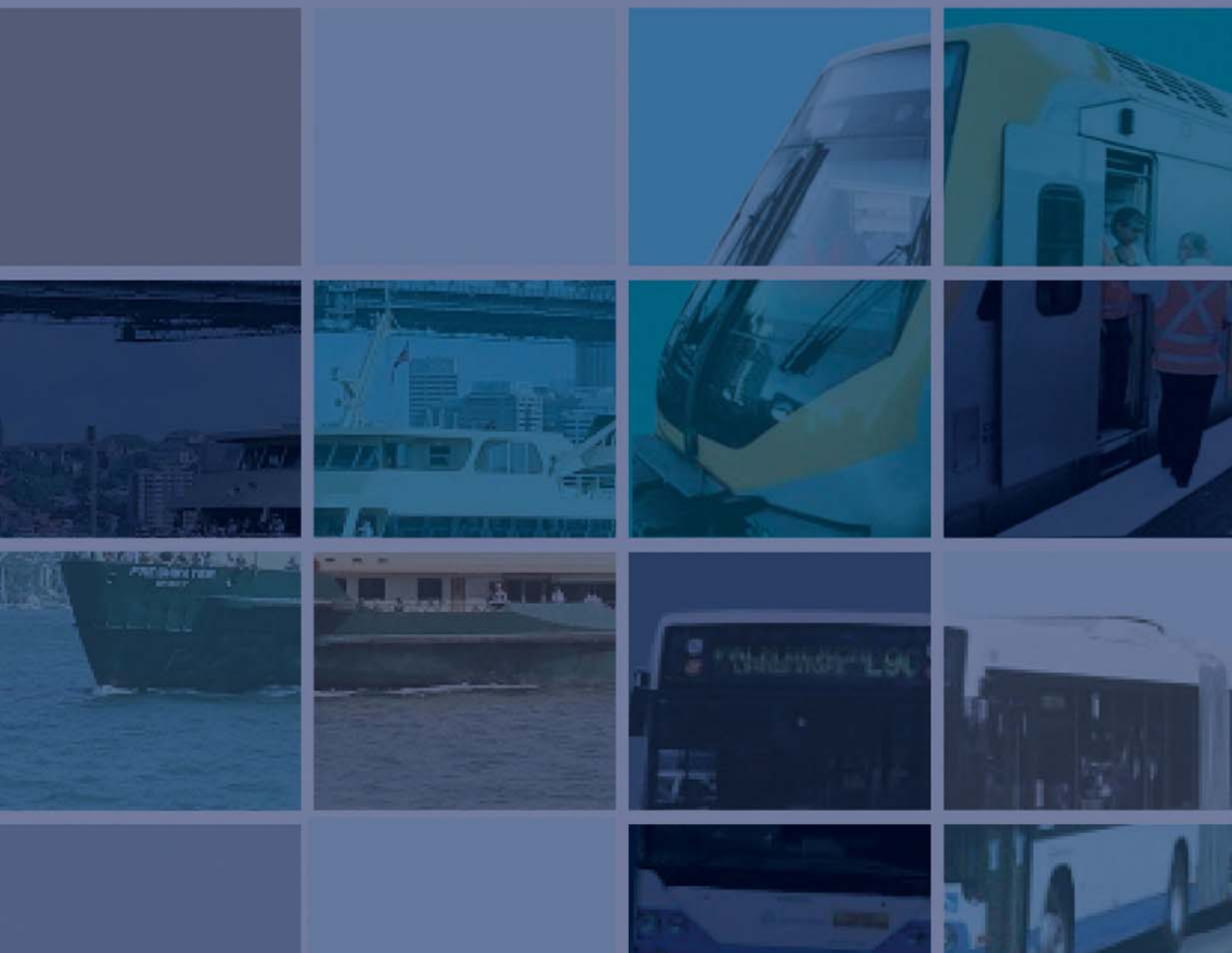
**OTSI** Office of Transport Safety Investigations

## **BUS SAFETY INVESTIGATION REPORT**

### **SERIOUS INJURING OF YOUNG CYCLIST AFTER BEING STRUCK BY A BUS**

**PARKLEA**

**12 NOVEMBER 2007**



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STRUCK BY A BUS

PARKLEA

12 NOVEMBER 2007

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Established on 1 January 2004 by the *Transport Administration Act 1988*, and confirmed by amending legislation as an independent statutory office on 1 July 2005, OTSI is responsible for determining the causes and 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 caused or contributed to a particular accident; it also seeks to identify any transport safety matters which, if left unaddressed, might contribute to other accidents.

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## GLOSSARY OF TERMS

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CARES	Community and Road Education Scheme
CCTV	Closed Circuit Television
MoT	New South Wales Ministry of Transport
OTSI	Office of Transport Safety Investigations
PDHPE	Personal Development Health Physical Education
RTA	Roads and Traffic Authority, NSW

## EXECUTIVE SUMMARY

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### The Incident

About 9:00am on 12 November 2007, a bus travelling Northwards along the newly opened 'T-Way' immediately adjacent to Sunnyholt Road collided with an eight year-old female cyclist (hereafter referred to as the "young cyclist") at a pedestrian crossing in the immediate vicinity of the Parklea Markets. The young cyclist suffered severe head injuries.

The young cyclist was en route to school and was accompanied by her mother and her younger brother and sister. The mother and the young cyclist's sister were also riding bicycles, while the brother was a pillion passenger on the mother's bicycle. Based on a previous crossing experience at the same location, the mother was concerned that the phasing of the traffic lights would not provide sufficient time for her and her children to walk across the six lanes of Sunnyholt Road to a designated waiting area on a traffic island separating the road from the T-Way and therefore instructed her daughters to ride across the pedestrian crossing. The mother stated that as she and her two daughters commenced their crossing, the lights regulating pedestrian movement changed from green to red. The mother called to the young cyclist, who had proceeded ahead, to stop at the traffic island separating Sunnyholt Road from the T-Way. However, the young cyclist either did not hear this warning or failed to respond to it and continued onto the T-Way, in the face of a red light, into the path of a bus.

### Findings

In relation to those matters prescribed by the Terms of Reference as the principal lines of inquiry, OTSI finds as follows:

a. **Causation**

The accident was a consequence of the inappropriate use of a pedestrian crossing for cycling and the young cyclist's actions in proceeding beyond a designated waiting area in the face of a red traffic signal.

**b. Contributory Factors**

- i. The young cyclist, by virtue of her age, had a limited understanding of her obligations as a road user.
- ii. The young cyclist proceeded ahead of her mother and as a consequence her mother was unable to exercise direct and immediate control over her.
- iii. Notwithstanding that they should not have been riding across the pedestrian crossing, traffic control arrangements in the area of the Parklea Markets are sub-optimal and placed the mother and her children at unnecessary risk.

**c. Effectiveness of the Emergency Response**

The emergency response was very timely and highly effective.

**d. Other Safety Matters**

- i. The young cyclist was wearing an approved helmet at the time of the collision and this almost certainly saved her from suffering fatal injuries.
- ii. The bus driver was not familiar with one of the alarms fitted to the bus he was operating and was behind schedule because he had stopped three times when the related alarm was activated.
- iii. The CCTV equipment fitted to the bus has limited utility and should be replaced with equipment that can cover events both forward and rear of the driver and which can be relied upon to capture high resolution images even when the bus is subject to the forces associated with a collision.
- iv. Parklea Public School is actively encouraging its students to walk or ride bicycles to school and engaged the assistance of the Department of Education and Training to develop its related road safety education program.
- v. While OTSI does not have visibility of the approaches used by all schools throughout NSW, Parklea Public's is superior to some of the other school programs that OTSI has reviewed and might serve as an example of good practice to other schools.



## Recommendations

In order to prevent a recurrence of this type of accident, the following remedial safety actions are recommended for implementation by the organisations specified below.

### a. Roads and Traffic Authority (RTA)

- i. Review the phasing of the traffic lights governing movement across the pedestrian crossing in the immediate vicinity of the Parklea Markets with a view to ensuring that there is sufficient time for pedestrians to safely cross from the North-Western to the South-Eastern side of Sunnyholt Road and the adjoining T-Way.
- ii. Give consideration to altering the phasing of traffic lights to allow pedestrians seeking to cross from the South-Eastern to the North-Western side of the T-Way and Sunnyholt Road to do so in a single bound.
- iii. Review the phasing of the traffic control lights in the vicinity of the Parklea Markets with a view to providing an interval between the time lights governing movement on the pedestrian crossing revert to red and the time those governing vehicle movement on Sunnyholt Road and the T-Way revert to green.
- iv. Install a safety barrier, similar to those that can be seen elsewhere along Sunnyholt Road, on the traffic island between Sunnyholt Road and the T-Way in the immediate vicinity of the Parklea Markets to prevent pedestrians from simply continuing to move straight across the island onto the T-Way.
- v. Install 'Look Both Ways' signs on the carriageway in the immediate vicinity of the pedestrian crossing opposite Parklea Markets.
- vi. Install 'Riders to dismount' signage adjacent to the pedestrian crossing in the immediate vicinity of the Parklea Markets and at all other locations in NSW where a pedestrian crossing that is not equipped with bicycle crossing lights is immediately preceded by a cycle path.

b. **Department of Education and Training**

Consider using Parklea Public School's approach to encouraging students to walk or ride to school and its road safety education program as an example of good practice to other schools throughout NSW.

c. **Busways**

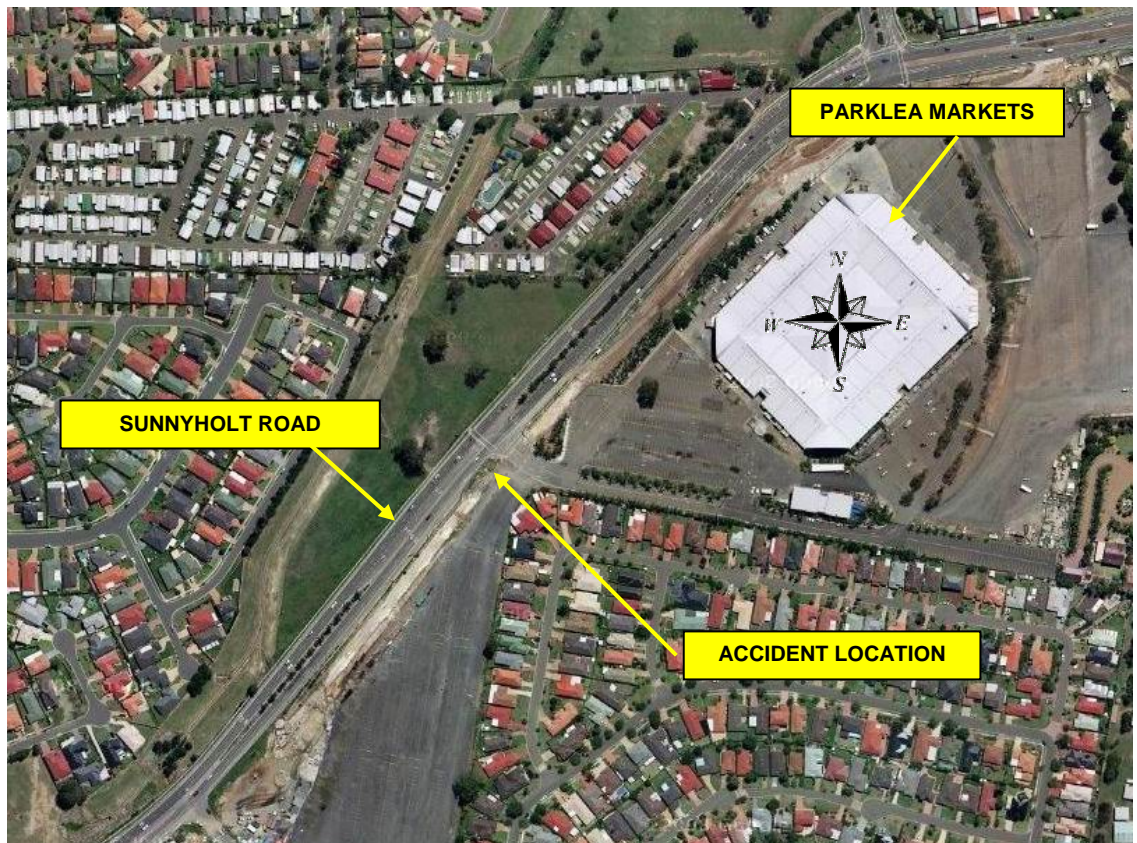
Equip its buses with CCTV recorders that can cover events both forward and rear of the driver and which can be relied upon to capture high resolution images even when the bus is subject to the forces associated with a collision.

## PART 1 FACTUAL INFORMATION

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### Accident Narrative

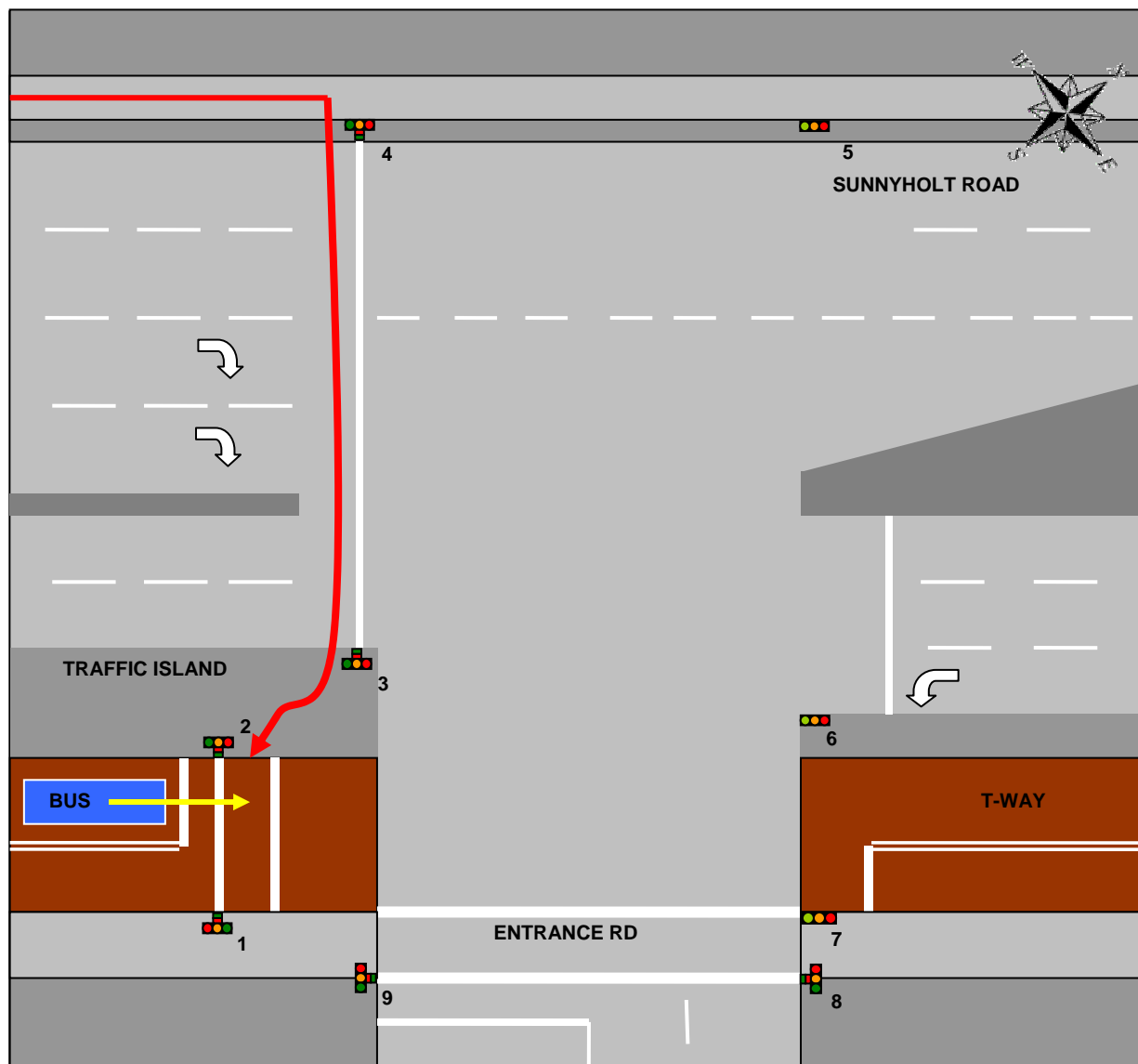
- 1.1 About 9:00am on 12 November 2007, a Busways bus proceeding on Route 745 in a North-Easterly direction along the newly opened T-Way immediately adjacent to Sunnyholt Road collided with an eight year-old female cyclist (hereafter referred to as the “young cyclist”) travelling in a South-Easterly direction on a pedestrian crossing in the vicinity of the Parklea Markets (refer to *Image 1*). The young cyclist suffered severe head injuries.
- 1.2 The young cyclist was accompanied by her mother and her younger brother and sister. The mother and the young cyclist’s sister were also riding bicycles, while the brother was a pillion passenger on the mother’s bicycle.



**Image 1: General location of the accident**

## Location Description

1.3 The accident occurred at Parklea, a suburb to the West of Sydney, on the T-Way bus lane at its intersection with Sunnyholt Road and the entrance to Parklea Markets. The T-Way runs parallel to the South-Eastern side of Sunnyholt Road and only came into service on 1 November 2007. *Figure 1* below and *Photo 1* on page 3 provide two perspectives of the traffic arrangements at the intersection and indicate the relative directions in which the bus and the young cyclist were travelling.<sup>1</sup>



**Figure 1:** Diagrammatic representation of traffic arrangements at the location of the accident, with the direction of travel of the bus and the young cyclist indicated with yellow and red arrows respectively

<sup>1</sup> The numbering of the traffic lights in this photo and others elsewhere in the report is for ease of identification of particular signals.

- 1.4 Sunnyholt Road is a major arterial road with high volumes of traffic during the morning and afternoon peak periods. The T-Way is dedicated for the use of buses only. Parts of the T-Way's road surface are pigmented red (as indicated in *Figure 1* and other photos appearing later in this report) to alert car drivers to the fact that the related lanes are dedicated for the use of buses only.



**Photo 1:** Traffic arrangements, as seen from the direction in which the bus driver was travelling, with the direction of his bus and the young cyclist indicated by yellow and red arrows respectively

### Bus Information

- 1.5 The bus, a 2001 model Renault operated by Busways Pty. Ltd, was being operated on a scheduled service over Route No. 745 from Glendenning via Stanhope Gardens. The bus is licensed to carry 57 seated and 9 standing passengers, but at the time of the collision there were three passengers onboard. The bus is shown at the scene in *Photo 2*.





**Photo 2: Resting place of the bus and cycle after the collision**

### **Bus Driver Information**

- 1.6 The bus driver acquired both his HR Class license and Public Passenger Vehicle Authority in 2005 and has been employed as a casual driver with Busways since October 2007. He had only operated over Route 745 once before and on that occasion was in the company of an instructor.
- 1.7 The bus driver had passed a medical examination in April 2005 and was not required to be re-examined until April 2008.

### **Emergency Response**

- 1.8 The Ambulance Service was notified of the occurrence at 9:02am and arrived at the scene of the accident at 9:12am. In the interim, the young cyclist was

treated by an off-duty doctor and nurse who happened to be in the immediate vicinity. Shortly after the arrival of the ambulance, another doctor arrived in a CareFlight helicopter. This doctor later accompanied the young cyclist in the ambulance to Westmead Children's Hospital where she was diagnosed as having suffered multiple fractures to the skull, internal bleeding to the brain, a fractured clavicle and nose, and lacerations to her arms and legs. Had she not been wearing an approved helmet, it is likely that her injuries could have been fatal.

## PART 2 ANALYSIS

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### Exclusions

- 1.9 The following matters were able to be eliminated as causal or contributing factors at an early stage in OTSI's investigation:
- a. The condition of the bus driver. The bus driver returned negative results when tested by the Police for the presence of drugs and alcohol. He advised OTSI that he did not hold any form of secondary employment and an examination of his roster indicated that he was being tasked within industry guidelines.
  - b. The condition of the bus. The bus had last been serviced on 23 October 2007 and appeared to be in good condition. Following the collision, the bus was subjected to brake testing and the results indicated that the brakes were functioning within the required performance parameters.
  - c. The road surface. The surface of the newly opened T-Way was in excellent condition.

### Cyclist's Actions

- 1.10 The mother indicated that she was encouraging her children to lead healthy lives and as part of that regime, when the weather permitted, she wanted her children to ride their bicycles to school. She also felt that such activity contributed to reducing congestion at the school during the peak periods when children were dropped-off or picked-up and noted that this had been an issue which the school had pursued with the RTA.
- 1.11 Although the T-Way had only been opened for vehicle operations since 1 November 2007, the mother and her children had used the reconfigured pedestrian crossing once before. On that occasion, the mother felt that the phasing of the traffic lights did not provide sufficient time for her children to complete their crossing on foot. Having arrived at the start of the pedestrian crossing on the North-Western side of Sunnyholt Road on 12 November 2007, and after receiving a green signal indication (refer to Signal 3 on *Figure*



1), she instructed her daughters to ride on the pedestrian crossing. While she did not realise it, Section 248 of the *NSW Road Transport (Safety & Traffic Management) (Road Rules) Regulation 1999*<sup>2</sup> prohibits cyclists from riding across a pedestrian crossing.

- 1.12 The mother described them as having proceeded only a very short distance before the pedestrian lights (Signal 3 on *Figure 1*) changed to red. She recalled that the young cyclist had proceeded slightly ahead of her and that she called out for her to stop at the traffic island that was ahead. However, her daughter did not respond to this instruction and proceeded across the island, in the face of a red light, onto the T-Way and into the path of the bus.

### **Bus Driver's Actions**

- 1.13 The bus driver indicated that he was about 20 minutes behind schedule at the time of the collision as he had stopped his bus on three occasions during the morning to investigate the activation of an alarm on the bus.<sup>3</sup> He recalled proceeding along the T-Way, in a North-Easterly direction, at a speed of between 50 and 60km/h and that as he approached the intersection with the pedestrian crossing he further reduced his speed to approximately 25-30km/h. As he did so, he observed the cyclists crossing from the North-West towards the South-Eastern side of Sunnyholt Road. OTSI noted that the speed limit on the T-Way in this area is 70km/h, but reduces to 50km/h immediately North of the pedestrian crossing.
- 1.14 The bus driver recalled seeing the young cyclist riding across the traffic island, and her bike starting to wobble as she did, and then her continuing onto the T-Way. At this point, the driver was only a short distance from the pedestrian crossing and he immediately braked and swerved to the right. However, the front nearside of his bus struck the young cyclist. Because the bus was not fitted with forward-facing CCTV, the bus driver's statement could not be corroborated by a recording of the event.

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<sup>2</sup> This Regulation was subsequently amended to become the *NSW Road Rules*, incorporating the Australian Road Rules, on 1 July 2008, but Section 248 remains unchanged.

<sup>3</sup> This alarm proved to be the one which indicates if an emergency hammer, which is used to break the toughened glass windows in the event of an emergency, is missing.

## Witness Recollections

1.15 Several motorists who were witnesses to the collision provided accounts which were consistent with those of the mother and the bus driver. In particular, they confirmed that the young cyclist was ahead of the mother as the group cycled across the pedestrian crossing. Importantly, they were certain that the signals governing their vehicles' movement, and therefore that of the bus, changed from red to green while the three cyclists were still crossing Sunnyholt Road.

## OTSI's Examination of incident scene

1.16 OTSI Investigators arrived at the scene after the cyclist had been conveyed to hospital but the bus and bicycle remained unmoved (see *Photo 3*). Significantly, it was apparent that the bicycle had been dragged, from the point of impact, under the near side of the bus until the bus became stationary. Once the bicycle was removed from this position it was examined and its tyres were found to be in good condition and its back pedal brake to be well adjusted and operable.

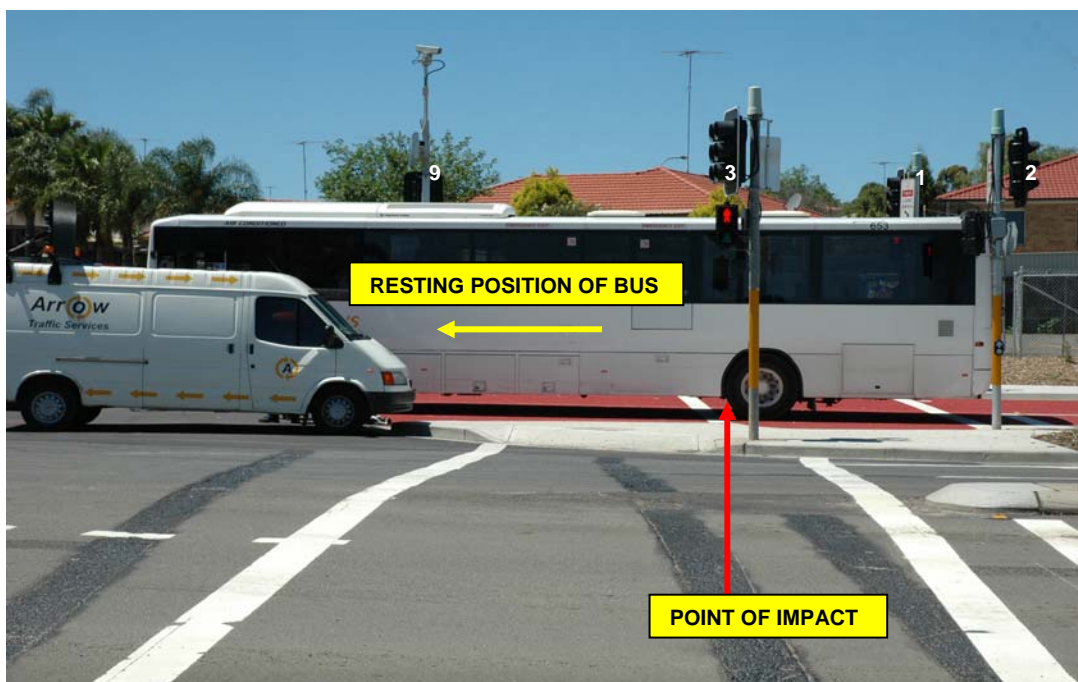


**Photo 3: Front of bus where it came to rest after the accident, with the bicycle underneath**

- 1.17 New markings on the surface of the T-Way at the pedestrian crossing were determined to have been caused by the bicycle's white pedals and handle bar grips and assisted in determining the point at which the collision occurred (See *Photos 4 and 5*). These markings and the resting place of the bus showed that the bus travelled a distance of 8.4m after the collision. This short distance and the absence of skid marks validated the driver's indication of the speed at which he was travelling immediately prior to the collision. The bus came to rest with its front offside, or the driver's side, protruding 0.9 metres into the South-Eastern bound lanes, which is consistent with his description of him having swerved to avoid the young cyclist.



**Photo 4: Marking on roadway at the point of impact**



**Photo 5: Point of impact on the pedestrian crossing**

- 1.18 The accounts offered by the mother, bus driver and independent witnesses were consistent with the physical evidence at the scene and it was readily apparent that the accident was primarily a consequence of the young cyclist's action of proceeding beyond the traffic island separating Sunnyholt Road from the T-Way in the face of a red pedestrian signal (Signal 1). However, OTSI also sought to examine whether the actual traffic arrangements at the intersection and the pedestrian crossing might have contributed in any way to the accident.

### Traffic Arrangements at the Intersection



**Photo 6: Layout of intersection**

- 1.19 In the vicinity of the Parklea Markets, Sunnyholt Road has six lanes. Four lanes carry traffic in a North-Easterly direction but two of these lanes become turning lanes, into the Markets, as is indicated in *Figure 1*. There are also two lanes carrying traffic in a South-Westerly direction, plus a turning lane, and these are also indicated in *Figure 1*. In the adjacent T-Way, there are two lanes; one conveys traffic North-Eastwards and the other South-Westwards. On the North-Western and South-Eastern sides of Sunnyholt Road and the T-

Way respectively, there are pathways designated for the shared use of both pedestrians and cyclists.

- 1.20 To cross from the North-Western to the South-Eastern pathway, or vice versa, a pedestrian or a dismounted cyclist must traverse eight lanes and a traffic island separating Sunnyholt Road and the T-Way. The passage of vehicles along Sunnyholt Road and the T-Way in the area of the Parklea Market, and the passage of vehicles across the two carriageways, is regulated by the traffic lights indicated in *Figure 1* and in *Photo 6*.
- 1.21 The phasing of the traffic lights governing pedestrian movement from the North-West to the South-East, i.e., across Sunnyholt Road and the T-Way, is activated by an 'on demand' button. A pedestrian seeking to move from the North-West to the South-East must first activate a button on Signal 4 and then wait for a green walk indication on the facing pedestrian signal (Signal 3). When Signals 3 and 4 change to green, Signal 1 which governs pedestrian movement across the T-Way also changes to green. Six seconds after turning green, Signals 3 and 4 switch to a flashing red indication, while Signal 1 remains green. After a further 20 seconds, Signal 1 also switches to flashing red for a period of 6 seconds, after which Signals 1, 3 and 4 all switch to a constant red indication. This sequence indicates that the red indication the mother recalled seeing after she and her children had only travelled a short distance on the crossing was almost certainly a flashing rather than a fixed red signal indication.
- 1.22 The signal sequence described in the preceding paragraph provides a pedestrian with a total of 26 seconds in which to cross the six lanes of Sunnyholt Road and the two lanes of the T-Way. Given the total distance involved is approximately 37m, this means that a pedestrian who steps onto the crossing as soon as he/she has received a green signal indication must walk at a speed of approximately 1.4m/s or 5.1km/h if they are to complete their crossing in a single bound. While this might not seem too demanding for many, it is higher than the usual design target of 1.2m/s, specified in the RTA's *Traffic Signal Design Section 2 – Warrants*. OTSI considers that it is unrealistic to expect that everyone seeking to use the crossing will step off the instant Signals 3 and 4 turn green which means that pedestrians might be



required to walk even faster and, as such, certain members of the community e.g., young children, the infirm and some older citizens, may be placed at risk.

- 1.23 Significantly, at the same time as pedestrian Signal 1 reverts to a fixed red indication, the traffic signals governing vehicle movement on Sunnyholt Road and the T-Way in a North-Easterly and South-Westerly direction respectively, i.e., traffic Signals 1, 2, 3, 4, 5 and 6, immediately turn green, which means there is no time margin for pedestrians who, for whatever reason, are still in the crossings, to reach safety before through traffic is released. In addition, OTSI considers that scope for confusion exists when pedestrians, particularly young children, cross from North-West to the South-East if they focus on pedestrian Signal 1 when it is green rather than pedestrian Signal 3 which will be at red. *Photo 7* indicates how such confusion might arise.



**Photo 7: Looking South-East across Sunnyholt Rd towards the T-Way**

- 1.24 Pedestrians seeking to cross from the South-East to the North-West must activate the 'on demand' button on Signal 1. The initial green indication will allow a pedestrian to cross only as far as the traffic island where they must activate a button on Signal 3 and wait for a green pedestrian indication on this

Signal and Signal 4, after which they can commence to cross Sunnyholt Road. This means that while pedestrians may be able to cross Sunnyholt Road and the T-Way in a single bound from the North-West to the South-East, they must complete the crossing from the South-East to the North-West crossing in two bounds. OTSI considers that this creates the potential for confusion. It also notes that while the traffic island separating Sunnyholt Road and the T-Way might serve as a useful 'refuge' for small numbers of pedestrians who might not have been able to complete their crossing, from the North-West to the South-East in a single bound, its limited size does not make it a suitable mandatory stopping point for all pedestrians crossing in the opposite direction. Accordingly, OTSI believes that the RTA should give consideration to altering the signal timings in a way that allow pedestrians to cross in both directions in a single bound.

### Signage and barriers

- 1.25 While pedestrians and cyclists are permitted to travel on the paths that are adjacent to Sunnyholt Road and the T-Way, OTSI noted that there are no signs requiring/reminding cyclists to dismount before they attempt to use the pedestrian crossing<sup>4</sup>. OTSI also noted that there are no signs on the surface of the carriageways to alert pedestrians to 'look both ways'. While the use of such carriageway signage is not required, it is becoming increasingly common (refer to *Photo 8* for an example of carriageway signage) and is considered by OTSI to serve a useful purpose.



**Photo 8: Example of carriageway signage**

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<sup>4</sup> The *NSW Road Rules*, incorporating the *Australian Road Rules (Rule 248)*, require cyclists using marked crossings to dismount and walk across the crossings.

- 1.26 Further, there is no barrier or fence on the traffic island, such as that depicted in *Photo 9*, to deter pedestrians from simply continuing onto the T-Way or Sunnyholt Road, depending on the direction of their movement, without regard to signal indications. However, such barriers are installed at similar locations elsewhere along Sunnyholt Road and the T-Way.



**Photo 9: Pedestrian barrier at another location on Sunnyholt Road**

## **Emergency Response**

- 1.27 The young cyclist benefited greatly from the actions of a doctor and a nurse who happened to be in the immediate area, and an ambulance arrived at the scene within 10 minutes of the accident being notified to '000'. The efforts of the doctors, the nurse and ambulance officers were supplemented when another doctor arrived on a CareFlight helicopter. While the helicopter was not used to evacuate the young cyclist, the doctor who had been onboard did accompany the ambulance which was used to transport the young cyclist to Westmead Hospital. The ambulance departed the scene at 9:22am and arrived at Westmead at 9:34am.
- 1.28 Police from Rooty Hill Police Station and representatives from the RTA, Busways and OTSI also attended the scene. In sum, the emergency response was very timely and highly effective.



### Anticipation and Management of Risk

- 1.29 The mother's action in accompanying her daughters to school, and her insistence that they wear approved safety helmets, was consistent with the anticipation and management of risk. While the mother's decision to instruct her daughters to ride across the pedestrian crossing was also based on her assessment of risk, the resulting action contravened Rule 248 of the *NSW Road Rules* and introduced the risk that she might lose control of her charges, and this subsequently transpired.
- 1.30 The bus driver's actions in slowing down his bus from approximately 50-60 km/h to 25-30 km/h on his approach to the pedestrian crossing, even though he had a green light, when he saw the cyclists riding across Sunnyholt Road indicated that he was driving defensively. His immediate reactions, in braking and swerving to the right when it became apparent that a collision was imminent were also significant in that the young cyclist was struck with less force than would have been the case had he not slowed his bus and not swerved.
- 1.31 Parklea Public School is encouraging its students to lead active lives. OTSI was advised that it was among the first schools in NSW to participate in the 'Walking School Bus™' programme and currently operates three 'Walking School Buses™' daily. Similar endeavours in some schools have folded because of issues associated with public liability, child protection and the day to day administration required, but Parklea Public has successfully overcome these issues. As a consequence, up to 60 fewer motor vehicles converge on the school during the peak drop-off and pick-up times. The School has also engaged the assistance of the Department of Education and Training and drawn on its Road Safety Education Program<sup>5</sup> to develop and deliver the road safety component of its Personal Development, Health and Physical Education (PDHPE) curriculum. In addition, the School also conducts an excursion day to the Community and Road Education Scheme (CARES) centre at St Marys to further educate its students and to reinforce the outcomes of road safety instruction. Further, it insists that this component of

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<sup>5</sup> This program was developed and is funded by the RTA.

its education be delivered by teachers who have undergone specific preparation to do so. While OTSI does not have visibility of the standard of such programs across NSW, it has reviewed the efforts of a number of schools in the course of several of its investigations and none of them was as developed as that of Parklea Public's. The School is ensuring that that key content in the Department's Road Safety Education program is taught well and has benefited from consultancy support provided by the Department and the use of related resources developed by the RTA. Given the maturity of the School's approach, it might be appropriate for the Department to highlight Parklea Public's approach to other schools.

### **Remedial Actions**

- 1.32 Following communication from OTSI, the CEO of Busways confirmed that all its drivers have been be re-familiarised with onboard alarms and that this matter is now an integral component of training for new drivers joining the Company.

## PART 3 FINDINGS

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3.1 In relation to those matters prescribed by the Terms of Reference as the principal lines of inquiry, OTSI finds as follows:

**a. Causation**

The accident was a consequence of the inappropriate use of a pedestrian crossing for cycling and the young cyclist's actions in proceeding beyond a designated waiting area in the face of a red traffic signal.

**b. Contributory Factors**

- i. The young cyclist, by virtue of her age, had a limited understanding of her obligations as a road user.
- ii. The young cyclist proceeded ahead of her mother and as a consequence her mother was unable to exercise direct and immediate control over her.
- iii. Notwithstanding that they should not have been riding across the pedestrian crossing, traffic control arrangements in the area of the Parklea Markets are sub-optimal and placed the mother and her two daughters at unnecessary risk.

**c. Effectiveness of the Emergency Response**

The emergency response was both very timely and highly effective.

**d. Other Safety Matters**

- i. The young cyclist was wearing an approved helmet at the time of the collision and this almost certainly saved her from suffering fatal injuries.
- ii. The driver was not familiar with one of the alarms fitted to the bus he was operating and was behind schedule because he had stopped three times when the related alarm was activated.
- iii. The CCTV equipment fitted to the bus has limited utility and should be replaced with equipment that can cover events both forward and rear of the driver and which can be relied upon to capture high resolution images even when the bus is subject to the forces associated with a collision.

- iv. Parklea Public School is actively encouraging its students to walk or ride bicycles to school and has engaged the assistance of the Department of Education and Training to develop its related road safety education program. While OTSI does not have visibility of the approaches used by all schools throughout NSW, Parklea Public's is superior to some of the other school programs that OTSI has reviewed and might serve as an example of good practice to other schools.

## PART 4 RECOMMENDATIONS

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4.1 In order to prevent a recurrence of this type of accident, the following remedial safety actions are recommended for implementation by the organisations specified below:

**a. Roads and Traffic Authority (RTA)**

- i. Review the phasing of the traffic lights governing movement across the pedestrian crossing in the immediate vicinity of the Parklea Markets to ensure that there is sufficient time for pedestrians to safely cross from the North-Western to the South-Eastern side of Sunnyholt Road and the adjoining T-Way in a single bound.
- ii. Give consideration to altering the phasing of traffic lights to allow pedestrians seeking to cross from the South-Eastern to the North-Western side of the T-Way and Sunnyholt Road to do so in a single bound.
- iii. Review the phasing of the traffic control lights in the in the immediate vicinity of the Parklea Markets with a view to providing an interval between the time lights governing movement on the pedestrian crossing revert to red and the time those governing vehicle movement on Sunnyholt Road and the T-Way revert to green.
- iv. Install a safety barrier, similar to those that can be seen elsewhere along Sunnyholt Road, on the traffic island between Sunnyholt Road and the T-Way in the immediate vicinity of the Parklea Markets to prevent pedestrians from simply continuing to move straight across the island onto the T-Way.
- v. Install 'Look Both Ways' signs on the carriageway in the immediate vicinity of the pedestrian crossing opposite Parklea Markets.
- vii. Install 'Riders to dismount' signage adjacent to the pedestrian crossing in the immediate vicinity of the Parklea Markets and at all other locations in NSW where a pedestrian crossing that is not equipped with bicycle crossing lights is immediately preceded by a cycle path.

**b. Department of Education and Training**

Consider using Parklea Public School's approach to encouraging students to walk or ride to school and its road safety education program as an example of good practice to other schools throughout NSW.

**c. Busways**

Equip its buses with CCTV recorders that can cover events both forward and rear of the driver and which can be relied upon to capture high resolution images even when the bus is subject to the forces associated with a collision.

## PART 5 SOURCES AND SUBMISSIONS

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### Sources of Information

- Ambulance Service of New South Wales
- Bureau of Meteorology (NSW)
- Officers of the NSW Police Force
- Officers of the Independent Transport Safety and Reliability Regulator
- Parklea Primary School
- Family of the young cyclist
- Witnesses who gave evidence on the basis of the provisions of Section 45C(3) of the *Transport Administration Act 1988 (NSW)* that they would not be identified by name in any material published by OTSI.

### Submissions

Although he is not required to do so, the Chief investigator provided a briefing on the preliminary findings of the Draft Report to all Directly Involved Parties (DIPs). He subsequently forwarded a copy of the Draft Report to the 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:

- Busways Pty Ltd
- Department of Education and Training
- Independent Transport Safety and Reliability Regulator
- Ministry of Transport
- Roads and Traffic Authority, NSW
- Family of the young cyclist

Submissions were received from the following Directly Involved Parties:

- Busways Pty Ltd
- Department of Education and Training
- Independent Transport Safety and Reliability Regulator
- Ministry of Transport
- Roads and Traffic Authority, NSW
- Family of the young cyclist

The Chief Investigator considered all representations made by DIPs and responded to the author of each of the submissions advising which of their recommended amendments would be incorporated in the Final Report, and those that would not. Where any recommended amendment was excluded, the reasons for doing so were explained.