



Office of Transport Safety Investigations

BUS SAFETY INVESTIGATION REPORT

**SCHOOL CHILD PEDESTRIAN FATALITY
ROCKY POINT, NSW**

26 APRIL 2017



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GLOSSARY

Bus stop	A location that incorporates signage, and possibly a shelter, and meets the prescribed standards.
Accident	An unwanted outcome, which includes a collision or crash.
Human factors	The scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance.
Child, children	In this report, it refers to people between the ages 4 to 16 years.

EXECUTIVE SUMMARY

At 1535¹ on Wednesday 26 April 2017, a bus, carrying approximately 25 school children, was travelling north-east on Wolseley Avenue through the suburb of Rocky Point, NSW. The bus halted at a designated bus stop near the intersection of Wolseley Ave and Hastings Street where a number of children disembarked.

As the bus departed the bus stop, the driver received a radio call from the bus company's depot and immediately stopped the bus. The bus had moved approximately half its length before it stopped. One of the children, a five year old girl, reportedly attempted to cross Wolseley Ave in front of the bus, unaccompanied by an adult. The child was struck by a following heavy vehicle and received fatal injuries.

OTSI determined that,

- The radio call delayed the bus from departing the bus stop. The bus became an obstruction and restricted the child's and the heavy vehicle driver's field of view.
- A five year old child's cognitive and motor skills to independently cross a road safely have not yet developed and they cannot safely cross a road on their own regardless of the speed environment, sight distance and traffic volumes.

OTSI highly recommends that,

- Only safety critical communications are to be made to bus drivers of school bus services. Safety critical communications only to occur when deemed safe to do so.
- Parents, guardians and carers meet children on the same side of the road where their child disembarks from the bus. If they are not available ensure a responsible adult is available to carry out this task.

Full details of the Findings and Recommendations of this bus safety investigation are contained in Parts 3 and 4 respectively.

¹ All times are 24 hour clock and Australian Eastern Standard Time

PART 1 FACTUAL INFORMATION

Introduction

- 1.1 The accident occurred shortly after a number of school children disembarked from a school bus on Wolseley Avenue, near Hastings Street, at Rocky Point NSW. The bus drop-off location was a designated bus stop.

Location

- 1.2 The accident occurred at Rocky Point, approximately seven kilometres east of the township of Wyong on the NSW Central Coast and approximately 105 kilometres north of Sydney. (see Figure 1)
- 1.3 The accident occurred on a gazetted 50 km/h section of road.

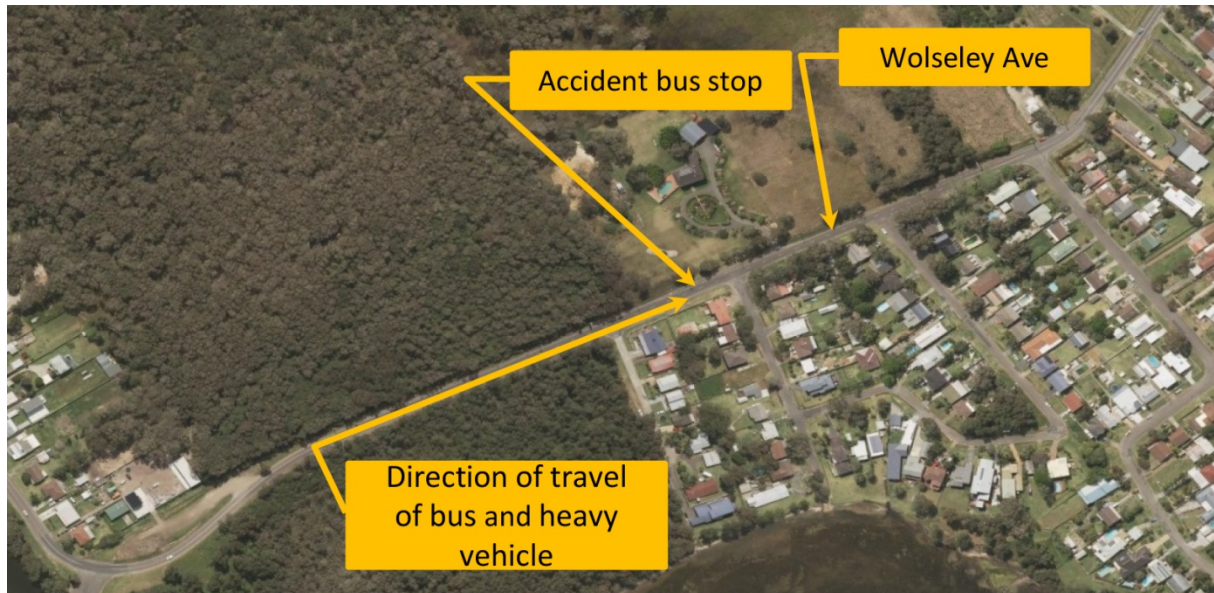


Source: Google Maps, annotated by OTSI

Figure 1: Location of Rocky Point

Wolseley Avenue

- 1.4 Wolseley Avenue is a part of the main thoroughfare between the Central Coast suburbs of Wyong and Tuggerawong. (see Figure 2)



Source: Google Maps, annotated by OTSI

Figure 2: Wolseley Avenue and direction of travel

- 1.5 Wolseley Avenue has a straight stretch of road of approximately 250 m long leading up to the accident bus stop.
- 1.6 Wolseley Avenue has a bitumen surface with a lane in either direction. The lanes are separated by painted broken white lane markers and the edges are marked with continuous white lines.
- 1.7 The road is edged with a grass verge and does not have kerb and guttering, except for a short section adjacent to some designated bus stops.
- 1.8 The accident bus stop has a grass verge of approximately 3 m between the lane edge and the adjacent property fence.
- 1.9 At the time of the accident, the road was wet from localised rainfall and the rainfall continued to increase post the accident.
- 1.10 Central Coast Council is the road authority for this section of roadway.

Environmental information

- 1.11 The Australian Bureau of Meteorology's Norah Head weather station for 26 April 2017 recorded a temperature range between 17.0° C to 24.5° C and 3 mm of rain in the area. Norah Head is approximately 9 km from Rocky Point.

The accident

- 1.12 At 1535 on Wednesday 26 April 2017, a bus operating route 311W, carrying approximately 25 school children, was travelling north-east on Wolseley Avenue through the suburb of Rocky Point, near Wyong on the NSW Central Coast.
- 1.13 The bus stopped at a designated bus stop approximately 20 m before the intersection of Wolseley Avenue and Hastings Street where a number of children disembarked. The bus driver recalled at interview that there was no one at the bus stop when he stopped.
- 1.14 After the children disembarked, the bus moved along the road shoulder in readiness to return to the traffic lane and continue the service. The bus had moved approximately half its length when the driver received a radio call from the bus company's depot. The driver stopped the bus on the road shoulder to safely respond to the radio call. The radio call lasted less than 30 seconds. The rear driver-side² corner of the bus protruded slightly into the traffic lane.
- 1.15 It was unclear where the children moved to after they disembarked the bus, or their position at the time of the accident.
- 1.16 As this was occurring, a heavy vehicle, with a driver and a passenger onboard, was approaching the bus travelling north-east in the same direction as the bus. The heavy vehicle driver had a clear view of the bus. However, the stationary bus had obstructed the clear line of sight between the grass verge and the heavy vehicle driver.
- 1.17 The driver of a car following the heavy vehicle confirmed the heavy vehicle was travelling at the gazetted road speed and it further reduced its speed as it

² Driver-side – the driver was positioned on the right hand side of this bus.

approached the stationary bus. The car driver also recalled observing children on the grass verge on the passenger side of the bus.

- 1.18 The heavy vehicle driver said he reduced the speed of the vehicle to below 40 kilometres per hour (km/h) upon observing the amber flashing warning lights (wig-wag³) operating on the rear of the bus. Nearing the bus, the heavy vehicle driver further observed the bus was not displaying any direction indicator lights (indicators) and commenced passing the stationary bus.
- 1.19 As the heavy vehicle passed the stationary bus, the passenger in the heavy vehicle alerted the driver of a collision. The heavy vehicle driver immediately braked and brought the vehicle to a halt approximately 50 m past the bus.
- 1.20 One of the children, a five year old girl, had commenced crossing Wolseley Ave in front of the stationary bus and was struck by the passing heavy vehicle. The heavy vehicle driver and the passenger disembarked to provide assistance.
- 1.21 The radio communication between the bus driver and the depot concluded as the heavy vehicle was passing the bus. The bus driver was preparing to depart when the driver realised a child had been struck by the heavy vehicle.
- 1.22 The bus driver exited the bus to aid the accident site. The heavy vehicle driver and a by-stander had commenced providing first-aid to the child. The bus driver advised he would call emergency services (000).
- 1.23 The bus driver returned to the bus and immediately contacted the depot by radio and requested for the depot to send emergency services to attend to the accident. The bus driver stayed on the bus to care for the young school children still onboard.
- 1.24 Emergency services were called. NSW Police Service, NSW Ambulance Service and the State Volunteer Rescue Service responded to site. Shortly after, a second bus arrived to carry passengers on to their destinations.
- 1.25 The child had received fatal injuries.

³ The bus industry refers to the 40 km/h flashing warning lights as 'wig-wag' lights. These lights are mounted on the front and the rear of all NSW school buses and operate when the doors are opened and stop 20-30 seconds after the doors close.

Post incident

Remedial safety actions

- 1.26 Busways issued a directive to restrict non-essential communications between the company and the driver of a school bus.
- 1.27 RMS have recently reviewed Technical Specification 142 (TS142): 'Warning signs and lights for school buses' for existing buses and introduced Technical Specification 150 (TS150): 'Warning signs and lights for school buses' for new buses with a first registration on or after 8 February 2019. TS150 specifies an increase in the brightness of wigwag lights and the prominence of signage.

PART 2 ANALYSIS

Introduction

- 2.1 Rarely does only one factor lead to an accident. Usually numerous factors combine to create the situation for an accident to occur.
- 2.2 OTSI has focussed on the factors that contributed to this accident for the purpose of improving safety around school bus transport.

Restrictions and limitations

- 2.3 Closed circuit television (CCTV) footage was retrieved from the bus's onboard CCTV system; however, the system had stopped recording data earlier on the day of the accident.
- 2.4 OTSI chose not to interview the children in close proximity to the accident to minimise the impacts of critical incident stress⁴ on their welfare.
- 2.5 The effects of post-traumatic stress prevented the passenger in the heavy vehicle from being involved in this investigation.

The heavy vehicle and driver information

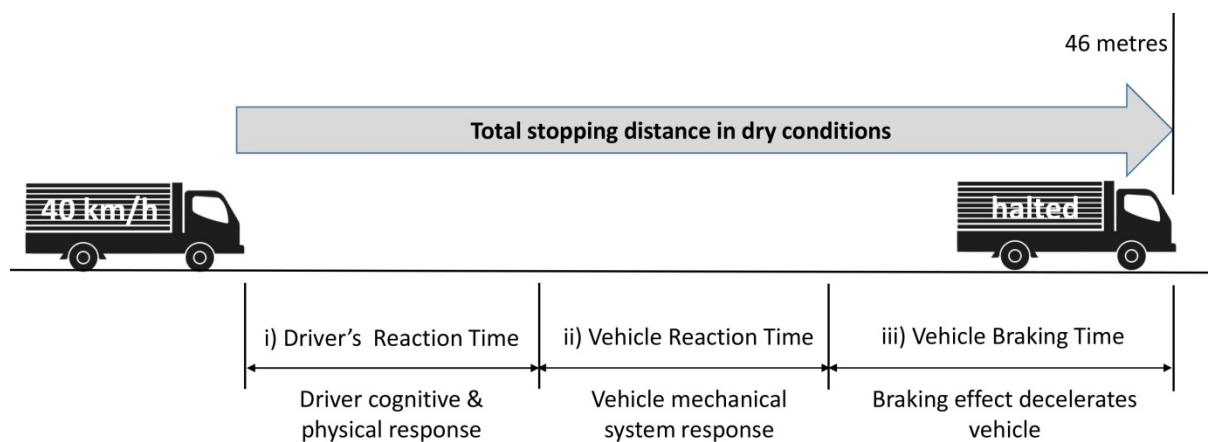
- 2.6 The driver had 20 years heavy vehicle experience and held the relevant Roads & Maritime Service's (RMS) heavy vehicle licence.
- 2.7 The role of the heavy vehicle's passenger was to assist in loading and unloading of the vehicle.
- 2.8 The heavy vehicle was a cab-over 2012 Mitsubishi Fuso FM104 table top carrying steel reinforcing bar. The vehicle had a maximum gross vehicle mass (GVM) of 16 tonnes.

⁴ Critical incident stress – The relatively short term (2 days to 4 weeks) effects suffered by a person following exposure to a high stress event. These manifest in physical, emotional, cognitive and behavioural responses that impact on the person's ability to function normally. (source US Occupational Safety and Health Administration (OSHA))

- 2.9 The heavy vehicle was equipped with a GPS tracking unit⁵ that recorded the vehicle's speed at 38 km/h at the time of the accident.

Stopping distance

- 2.10 A heavy vehicle of this type would need approximately 46 m to brake to a halt from 40 km/h⁶ in dry conditions. This total stopping distance incorporates the driver's cognitive and physical response to a possible collision, the time for the vehicle's braking system to react and the time for the vehicle to decelerate to a halt. (see Figure 3)



Source: Diagram by OTSI

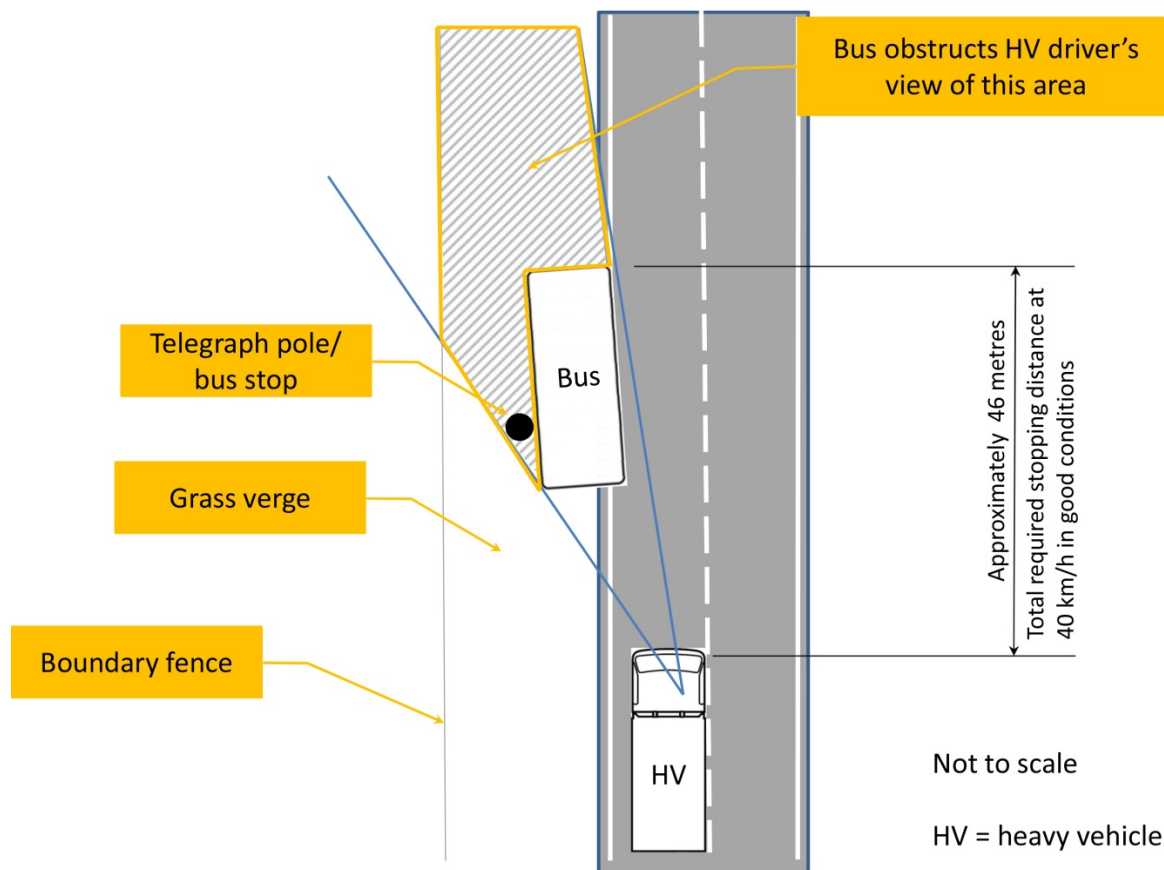
Figure 3: Stopping distance

- 2.11 In this case, the driver would need a clear line of sight greater than the total stopping distance to avoid a collision. At the time of the accident, the wet road surface would have extended the total stopping distance.
- 2.12 Wolseley Avenue provides approximately 250 m of clear line of sight on the approach to the bus stop. However, the stationary bus had obstructed the clear line of sight between the child and the heavy vehicle driver.
- 2.13 In this accident, the heavy vehicle driver's view of the grass verge on the passenger side and the area in front of the bus was obstructed by the stationary bus. This situation prevented the driver and the child pedestrian from detecting the impending collision. (see Figure 4)

⁵ The truck was equipped with a "Response1gps" back to base vehicle tracker that utilises the satellite global positioning system (GPS) to monitor the vehicle's location and speed.

⁶ Braking distance at 40 km/h from the Centre for Road Safety's Braking Distance technical report.

- 2.14 A driver of a vehicle approaching from the opposite direction would incur a similar obstructed view around the stationary bus.



Source: OTSI

Figure 4: Line of sight for heavy vehicle driver

The bus and driver information

- 2.15 The bus, registration 6450 MO, is a 2007 Scania K230UB and is fitted with a Custom Coaches road cruiser CB60 body. The bus's odometer was read at 720819 km at the time of the post-accident inspection.
- 2.16 The bus had received its regular maintenance in accordance with the company's maintenance schedule and had passed an RMS heavy vehicle inspection on 6 January 2017.
- 2.17 The bus was operated by Busways from its Lakehaven Depot. Busways hold a current Transport for NSW (TfNSW) bus service contract and had met the

Bus Operators Accreditation System⁷ (BOAS) requirements. Busways was also accredited by RMS as a public passenger bus service provider in accordance with the *Passenger Transport Act 2014 (New South Wales)*.

- 2.18 The onboard CCTV recorder system had stopped recording earlier on the day of the accident.
- 2.19 The bus driver held the relevant RMS heavy vehicle licence and bus driver authorisation.
- 2.20 TfNSW guidance⁸ recommends bus drivers remind children to remain roadside until the bus has left the bus stop before crossing the road.

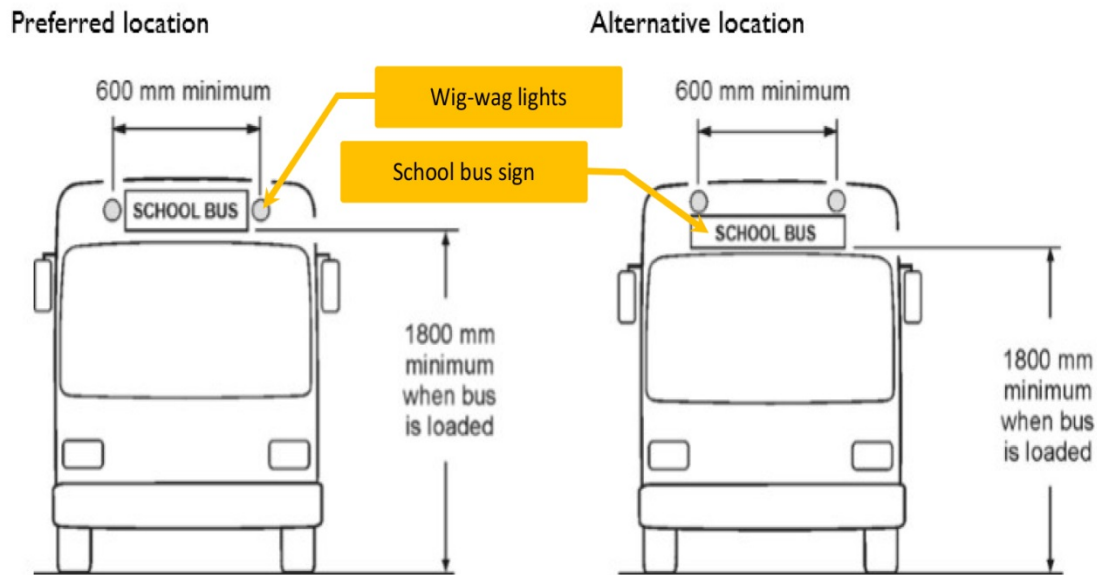
School bus warning lights and signage

- 2.21 In 2000, the Roads and Traffic Authority (RTA), now RMS, introduced Technical Specification 142⁹ (TS142) as a standard for the installation of warning lights and signage on NSW designated school buses.
- 2.22 To comply with TS142, a bus utilised for school bus routes in NSW must display a 40 km/h speed sign on the rear of the bus. The bus must be equipped with alternating flashing amber lights on the front and the rear of the bus. The amber lights must be mounted on either side of the 40 km/h sign on the rear of the bus and the front headlights must flash alternately when the amber lights are activated. The front face of the bus must also carry signage to identify the service as a school bus. (see Figures 5 and 6)

⁷ The purpose of the BOAS accreditation system is to assess whether a person is of suitable character and fitness, and has the competency to operate public passenger transport services.

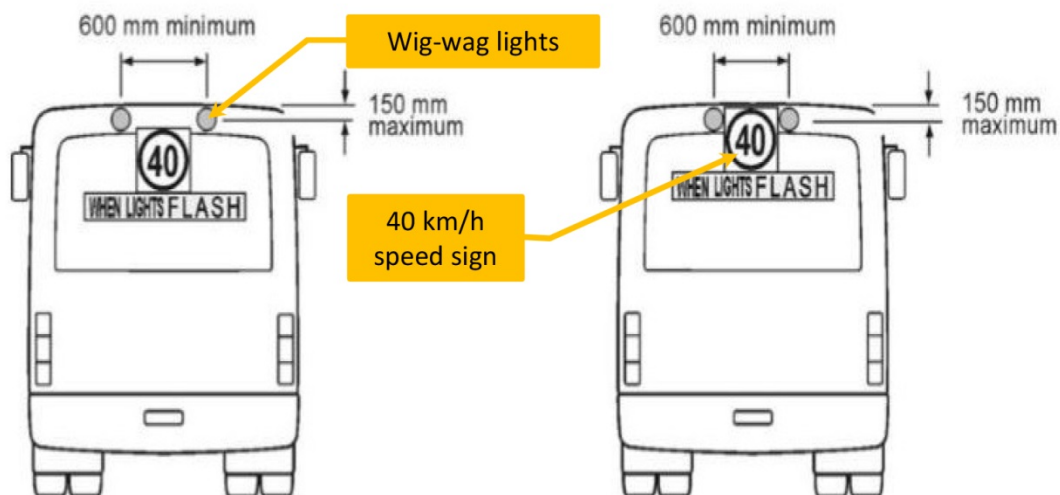
⁸ TfNSW School Bus Safety Guidelines (^{Nov} 2015)

⁹ The NSW Road and Maritime Service Technical Specification 142 is issued in accordance with clause 25 of the Road Transport (General) Regulation and applies to any bus seating more than 12 people, including the driver, for the sole purpose of transporting school children on school days between 0700 to 0930 and 1430 to 1700.



Source: TS142, annotated by OTSI

Figure 5: School bus front warning lights and signage



Source: TS142, annotated by OTSI

Figure 6: School bus rear warning lights and signage

2.23 The intention of the wig-wag lights, flashing headlights and speed sign is to warn drivers that school children may be boarding or disembarking the bus or

crossing the road in the vicinity, and to instruct drivers to reduce their speed to 40 km/h until they have passed the bus.

- 2.24 The 40 km/h speed restriction is enforced on traffic passing a bus that has active wig-wag lights. However the speed restriction only applies to vehicles travelling in the same direction as the bus.



Source: OTSI

Figure 7: Rear view of bus 6450 MO

- 2.25 Bus 6450 MO was equipped with the necessary warning lights, signs and indicators. The warning and direction indicator lights operated as designed during OTSI's inspection of the bus.



Source: OTSI

Figure 8: Front view of bus 6450 MO

Child human factors associated with crossing roads

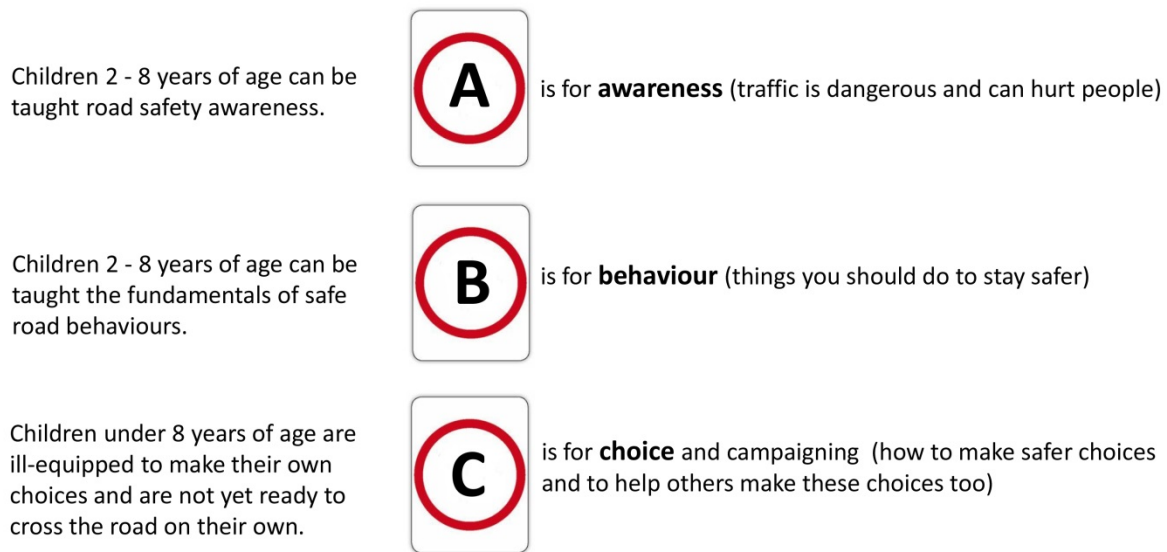
- 2.26 In OTSI's investigation into a child fatality at Coolagolite¹⁰ NSW in 2016, OTSI highlighted that children do not have the perceptual, cognitive and motor skills to safely cross a road without assistance from an adult.
- 2.27 The above mentioned report highlighted that children are not able to recognise blind spots created by obstacles that hinder their line of sight. A suitable crossing must provide for a safe sighting distance for both the vehicle driver and pedestrian.

¹⁰ OTSI bus safety investigation number 04740 is available at www.otsi.nsw.gov.au.

- 2.28 Additionally, children have a limited ability to detect objects in their peripheral vision and they have poor visual search capabilities for detecting oncoming traffic.
- 2.29 Further, children lack the ability to accurately estimate vehicle approach speed and estimate the time they need to safely cross the road.
- 2.30 In many cases, a child makes what is termed a “critical behavioural error” by either failing to stop or slow down or otherwise choosing the incorrect response. This is due to incomplete cognitive development, particularly in relation to analysis and planning.
- 2.31 In almost all cases, children’s capabilities are significantly underdeveloped compared to those of adults. Therefore, reliance for their safety in a hazardous environment (such as the road traffic environment) cannot be placed on the assumption that they will behave as “little adults”.
- 2.32 “Brake”, a UK road safety charity¹¹ (UK Brake), suggests teaching road safety to children from 2 years through to 18 years of age. UK Brake recommends teaching awareness, safer behaviours and making safer choices. They also recommend this training is adapted for the relevant age groups. (see Figure 9)

¹¹ Brake is a charity working with communities and organisations to promote safe and sustainable transport and provide support to the victims of road crashes. Further information at <http://www.brake.org.uk/>

Extract from UK Brake, the road safety charity's road safety guidance



Source: UK Brake the road safety charity

Figure 9: UK Brake – awareness, behaviour, choice

- 2.33 UK Brake also advises that children under 8 years can be taught awareness and safer behaviours from the age of 2 years old. However, whilst they can be taught, children under 8 years require adult supervision when roadside and when crossing a road.
- 2.34 UK Brake also advise that children under 8 years are ill equipped to make their own choices and adults should, at all times, hold children's hands when near traffic and when crossing a road.
- 2.35 NSW Centre for Road Safety's (CRS) guidance suggests that primary aged children (4 to 12) are still developing an understanding of danger and safety around the road environment. CRS also recommend that adults accompany children when crossing the road.
- 2.36 Zeedyk (et al 2002), studied the behaviour of fifty six children (aged 5-6 years) when crossing a road in simulated realistic traffic conditions. The children's performance was coded for behaviours such as stopping at the kerb, looking for traffic, direction of gaze and style of crossing (i.e. walking or running). The results revealed children of this age are exceedingly poor at crossing roads safely.

- 2.37 OTSI's review of the available information has determined that children 8 years of age and under are at risk when near the roadside environment and they cannot safely cross a road on their own regardless of the speed environment, sight distance and traffic volumes.
- 2.38 Any obstruction to the child's line of sight of the traffic will increase the risk of a critical behavioural error.

Current safety controls around school buses

- 2.39 Currently there are a variety of risk controls in place to protect school children around school bus travel.

These include;

- Parent and child education about pedestrian safety.
 - Advice on when children may be ready to cross the road by themselves and highlight the importance of adult supervision to safely cross a road.
 - Instructing school children to not attempt to cross the road until their school bus has departed and the children have a clear line of sight over the safe sighting distance.
 - Advising parents that they hold the hand of children when crossing the road or when near the road environment.
 - The provision of designated bus stops.
 - School children are transported in specially identified and equipped school buses, (fitted with wig-wag lights and speed advisory signage).
 - The enforcement of a 40 km/h speed restriction on traffic travelling in the same direction when passing a stationary school bus.
 - In some cases, school bus routes are designed to minimise the need for school children to cross a road.
- 2.40 These controls rely on parents, guardians and carers being mindful of their child's capabilities. Additionally, it relies on drivers to reduce their speed when approaching or passing a stationary school bus and to be vigilant for children that may have made an error of judgement.

- 2.41 The CRS's website "Safetytown¹²" provides online road safety resources for teachers, children, parents and carers. The CRS suggests that primary aged children are still developing an understanding of danger and safety, and although they may be keen to do things for themselves, an adult must always be responsible for their child in the traffic environment.
- 2.42 Current available guidance suggests adults hold the hands of children up to the age of 8 years old when near or crossing a road and adults hold the hands of children up to 10 years old when crossing a road. Additional advice is provided for children aged 11 and 12 years of age on when not to cross a road near school buses and when it is safe to do so. (see references, TfNSW guidance, CRS website and NSW Education Department PDHPE syllabus).
- 2.43 Where the 11 to 12 year old child is recognised as not yet ready to cross roads on their own, then it is imperative that a parent, guardian or carer is present to ensure a child is aided to cross the road safely. If a parent, guardian or carer is not available, then they must ensure a capable adult is present for this task.
- 2.44 The CRS provides early childhood road safety resources for parents, guardians and carers to prepare their child for the start of primary school. This resource provides a 'Kindergarten Orientation Road Safety Library Bag' containing advice on bus safety for school children. This information is provided by the school during Kindergarten orientation day or on the first day of school.
- 2.45 To improve safety around school bus travel, in 2000 the NSW Government trialled the 40 km/h speed restriction around stationary school buses. The trial introduced wig-wag lights and 40 km/h speed signs mounted on the trial buses. The trial also introduced an enforceable 40 km/h speed restriction on traffic travelling in the same direction as the school bus. The trial expanded to other parts of NSW, and apart from a slight modification, the system is relatively unchanged.

¹² The Centre for Road Safety's Safetytown website is located at <https://www.safetytown.com.au>.

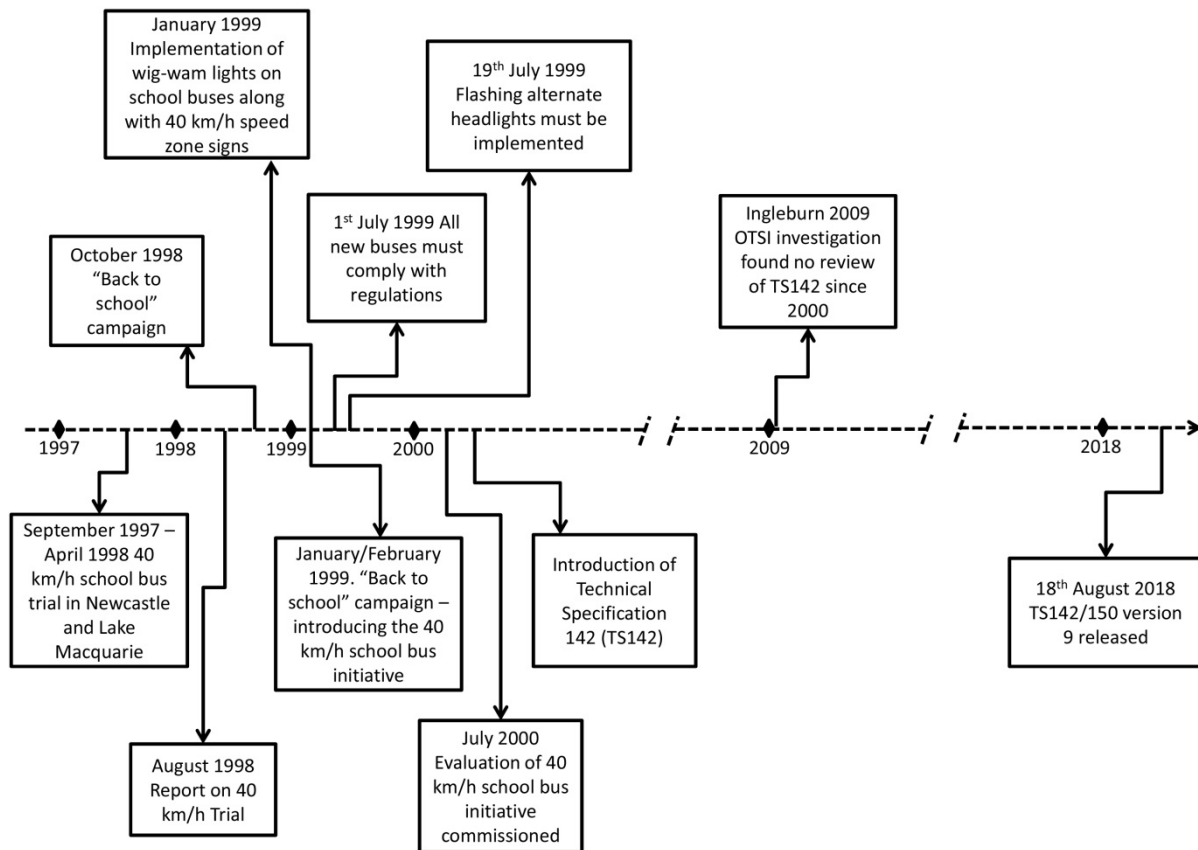


Figure 10: Timeline of school bus safety initiatives

- 2.46 In OTSI’s investigation into a child fatality at Ingleburn NSW in 2009, OTSI highlighted that TS142 had been enacted for 10 years without review. At the time, OTSI had recommended the RTA review the effectiveness of TS142.
- 2.47 The New Zealand Government has reduced speed limits around stationary school buses from 30 km/h to 20 km/h. The speed restriction is enforceable on all traffic in both directions. They cite the reduction in speed increases pedestrian survivability after a crash with a vehicle.
- 2.48 North America (USA and Canada) require all traffic (from both directions) to come to a halt on non-dual carriage ways when a stationary school bus has its warning lights set to red.

PART 3 FINDINGS

- 3.1 Children do not have the perceptual, cognitive and motor skills to safely cross a road without assistance from an adult.
- 3.2 The child crossed the road without adult supervision. The child most likely did not identify the dangers associated with crossing the road in front of the bus.
- 3.3 The child and the heavy vehicle driver had no warning of the impending collision.
- 3.4 The radio call between the depot and the bus driver stopped the bus departing as scheduled. The stationary bus obstructed the line of sight between the child and the heavy vehicle driver.
- 3.5 The bus had the required equipment necessary to operate on school bus services. The bus driver held the required licencing and was deemed competent to operate a passenger transport vehicle.
- 3.6 The heavy vehicle driver had the relevant licence and complied with the 40 km/h speed restriction when approaching and passing the stationary bus. The heavy vehicle had undergone the required scheduled maintenance.
- 3.7 A number of NSW Government agencies have developed, and made available, tools and information to parents, schools and children to promote safety around school bus travel. Specifically, advice for children under the age of 8 years of age to hold the hand of an adult when roadside and when crossing the road.
- 3.8 Children 10 years and under must hold the hand of an adult when crossing the road. Additional advice is provided for children aged 11 and 12 years of age on when not to cross a road near school buses and when it is safe to do so.
- 3.9 Internationally, governments and non-government organisations have sought to reduce speeds around operating school buses to minimise vehicle pedestrian accidents and to reduce the severity of the outcome.
- 3.10 The NSW 40 km/h speed restriction applies to the traffic travelling in the same direction as the bus. Traffic travelling in the opposite direction can maintain

the gazetted road speed and may affect a pedestrian's escape route to a safe place after an error of judgement when crossing a road.

Contributory factors

- 3.11 The radio communication was made to the bus driver at a safety critical time, requiring the driver to stop the bus.
- 3.12 The stationary bus obstructed the line of sight of both the heavy vehicle driver and the child pedestrian.
- 3.13 The child, being under 10 years of age, had not yet developed the necessary skills to cross a road safely without adult supervision.

Other safety factors

- 3.14 A vehicle was able to pass the stationary school bus.

Key Issues

- 3.15 Available research concluded children have not developed the requisite cognitive and motor skills required to cross a road safely.
- 3.16 A stationary or departing bus prevents a pedestrian from having a clear line of sight of oncoming traffic in both directions.
- 3.17 Vehicles are able to pass a stationary bus up to 40 km/h in the same direction and at the gazetted road speed in the opposite direction.

PART 4 RECOMMENDATIONS

Transport for NSW's Centre for Road Safety

- 4.1 Review NSW's current controls related to child pedestrians around school bus travel, including driver awareness.
- 4.2 In conjunction with RMS, review the effectiveness of the current safety equipment on designated school buses.
- 4.3 Review the effectiveness of the 40 km/h speed limit for traffic passing a stationary school bus and explore whether this speed restriction should be further reduced.
- 4.4 Provide existing road safety material earlier than currently distributed, to assist parents, guardians and carers of preschool children to teach road safety to their child before they commence full time primary school.

Roads and Maritime Services

- 4.5 In conjunction with CRS, review the effectiveness of the current safety equipment on designated school buses.

Bus Operators

- 4.6 Develop and implement procedures that restrict non-urgent communications to and from school bus drivers at safety critical times on designated school bus services.
- 4.7 Ensure bus drivers inform children to remain roadside until the bus has departed the bus stop, before crossing the road.

NSW Schools (Public and private)

- 4.8 Schools are to remind children not to cross the road until the bus has departed, the bus is clear of the bus stop area and ensure there is a clear line of sight to oncoming traffic.

- 4.9 Schools are to remind parents, guardians and carers to meet children on the same side of the road where their children disembark from the bus.
- 4.10 Schools are to remind parents, guardians and carers to hold the hand of children who are 8 years of age and under when roadside and to hold the hand of all children 10 years and under when crossing a road.
- 4.11 Schools are urged to direct teachers, parents, guardians, carers and Parent & Citizen Associations to the Centre for Road Safety's Safetytown website at <https://www.safetytown.com.au> as a resource for road safety information.

Parents, guardians and carers

- 4.12 It is highly recommended parents, guardians and carers meet children on the same side of the road where their children disembark from the bus. They should also hold the hand of children who are 8 years of age and under when roadside and to hold the hand of all children 10 years and under when crossing a road.
- 4.13 Parents, guardians, carers are urged to visit the Centre for Road Safety's Safetytown website at <https://www.safetytown.com.au> as a resource for road safety information.

PART 5 APPENDICES

Appendix 1: Sources, Submissions and Acknowledgements

Sources of Information

- Transport for NSW (TfNSW)
- Centre for Roads and Safety (unit of TfNSW)
- Roads and Maritime Services (RMS)
- Busways

References and reading material

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- Hommel, B., et al (2004) Visual search across the lifespan. Developmental Psychology, 40(4), 545-558.
- Congiu M., et al (2008) Child pedestrians: Factors associated with ability to cross roads safely and development of a training package. Monash University Accident Research Centre.
- Centre for Road Safety – Safetytown website at <https://www.safetytown.com.au>
- TfNSW (2012) Pedestrian Safety Guide.
- DaCoTA (2012) Children in road traffic. European Commission Directorate General in Mobility and Transport; European Commission.
- NSW Centre for Road Safety (2014) Vehicle stopping distance trial.
- TfNSW (2015) School bus safety guidelines. For contract holders of Transport for NSW rural and regional bus services.
- TfNSW (2016) (Literature review) Factors associated with safe crossing abilities in child pedestrians. Brief summary of literature. The Centre for Road and Maritime Safety.
- Board of Studies NSW Personal Development, Health and Physical Education (PDHPE) syllabus for primary and secondary school children syllabus years K-6 http://k6.boardofstudies.nsw.edu.au/wps/wcm/connect/330e5ccb-782a-432b-8ce5-122a8c42967e/k6_pdhpe_syl.pdf?MOD=AJPERES and

syllabus years 7-10:

http://www.boardofstudies.nsw.edu.au/syllabus_sc/pdf_doc/pdhpe-7-10-syllabus.pdf

- “Brake” the UK road safety charity, Teaching road safety: guide for educators of 2-18 year olds: <http://www.brake.org.uk/educators>

Additional reading material

- World Health Organisation (2017) Save LIVES: a road safety technical package.

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:

- Transport for NSW and its Centre for Roads Safety
- Roads and Maritime Services
- Busways
- NSW Police Service