Office of Transport Safety Investigations

BUS SAFETY INVESTIGATION REPORT

BUS AND PEDESTRIAN FATAL ACCIDENT

BRUNKER ROAD, ADAMSTOWN, NSW

5 NOVEMBER 2019

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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.

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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 Roads 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.

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GLOSSARY

Bus stop	means a stop, including a transit stop, or station along a bus route for buses designated to set down or pick up passengers
Accident	An unwanted outcome, which includes a collision or crash.
Incapacitated	Unable to work or do things normally, or unable to do what you intended to do.
Contributory factor	A factor that either influenced or caused a single event or chain of events that contributed to the accident.
Safety Factor	A safety related factor that is relevant to the accident but has not directly influenced or caused the accident
Human factors	The multi-disciplinary science that applies knowledge about the capabilities and limitations of human performance to all aspects of the design, operation and maintenance of products and systems.

EXECUTIVE SUMMARY

At 1526 on Tuesday 5 November 2019, the driver on a school bus route became incapacitated and lost control of the bus whilst travelling southbound along Brunker Road, Adamstown, New South Wales.

As a result, a person standing at the pedestrian crossing on Brunker Road near Mandalong Road was struck and fatally injured. Several parked cars were also damaged by secondary collisions.

OTSI recommends that Transport for NSW (TfNSW) assess the health assessment standards for commercial passenger vehicle drivers after consideration of health assessment standards in other transport modes.

OTSI also recommends that bus operators review their policies and practices to ensure their bus drivers are aware they should stop their bus when they recognise they are affected by ill health and potential incapacitation.

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

During the course of this investigation, the *Transport Administration Amendment (RMS Dissolution) Bill 2019* was passed by both Houses of the NSW Parliament. This Act amended the *Transport Administration Act 1988* to dissolve Roads and Maritime Services (RMS) and to transfer its assets, rights, liabilities and functions to TfNSW. While RMS is still mentioned in this report, recommendations have been directed to TfNSW.

PART 1 FACTUAL INFORMATION

Introduction

1.1 At 1526[1] on Tuesday 5 November 2019, the driver of bus m/o1591 on school route 551 became incapacitated and lost control of the bus while travelling southbound along Brunker Road, Adamstown, New South Wales. As a result, a person standing on the kerb at the pedestrian crossing was struck and fatally injured. Several parked cars were also damaged by the bus colliding with them. There were no reported injuries from the bus driver and passengers from the accident.

Location

1.2 The accident occurred on the pedestrian crossing on Brunker Road near Mandalong Road, Adamstown (Figure 1). Brunker Road is a two-way road with designated parking lanes either side of the main carriageway. Adamstown is approximately five kilometres (km) west of the Newcastle CBD.

Source: OTSI

Figure 1: Pedestrian Crossing on Brunker Road

[1] Times are in 24 hour clock Australian Eastern Daylight Time (AEDT)

1.3 The pedestrian crossing was upgraded in February 2019 to include kerb extensions to increase driver awareness of its location.

1.4 Prior to this accident, there had not been any other recorded accidents at the pedestrian crossing in the previous 10 years.[2]

1.5 The roadway and pedestrian crossing were designed and built to meet Austroads and Newcastle City Council Road Geometry Standards[3]. The speed limit posted for the area was 40 km/h.

1.6 The bus's direction of travel at this part of Brunker Road was northeast to southwest.

Bus driver

1.7 The bus driver was employed since 1 July 2017 with Newcastle Transport - Keolis Downer Hunter (KDH) and was based at their Hamilton depot. Prior to his employment with KDH, the driver worked as a bus driver for the State Transit Authority (STA)[4].

1.8 The bus driver held a current RMS Driver Authority[5] (expiry 6/3/2020) and an RMS Heavy Vehicle Driver Licence (HR)[6] (expiry 14/8/2021). Both the Driver Authority and HR licence had been issued without conditions.

1.9 The bus driver had previously been involved in other minor accidents while working for KDH, however these were not attributed to his actions.

1.10 The bus driver's last KDH bus operator observation[7] was performed on 26 October 2019. There were no issues identified with his bus driving and operation.

1.11 The bus driver had driven route 551 on five separate occasions prior to the day of the accident.

[2] Crash Report data from the NSW Centre for Road Safety

[3] Austroads Guide to Road design and Newcastle City Council A1200 standards (see References)

[4] STA is the government-owned authority responsible for the operations of Sydney Buses and previously Newcastle buses and ferries.

[5] A driver of a bus or coach in NSW must hold a NSW "Driver Authority" issued by RMS. To obtain a Driver Authority a bus driver must meet a set of required criteria including a Driver Authority Training Course.

[6] (HR) is the RMS licencing code for any ridged vehicle with three or more axles.

[7] This is a KDH audit of the driver's operational performance.

1.12 The bus driver had not been subjected to a KDH pre-employment medical. This was consistent with employees transferring from the STA at the time of KDH commencing their contract[8] with TfNSW.

1.13 At the time of the accident, the bus driver was 61 years old. According to his employer's records he was absent from work from 3 May 2019 to 3 June 2019 due to "suffering a medical condition".

1.14 On 2 May 2019, the driver suffered a non-ST elevation myocardial infarction[9] (heart-attack). The driver underwent a corrective medical procedure and commenced prescription medication. His cardiologist cleared him to return to his usual work as a commercial bus driver on 30 May 2019 with a plan to see him again in six months. At interview, the bus driver confirmed he was taking the prescribed medications.

1.15 On 30 May 2019, RMS received notification from the bus driver of his medical clearance with a review date in 6 months.

1.16 On 31 May 2019, RMS issued a letter to the bus driver stating he was fit to continue to hold his current driver licence class with a review in November 2019. This was consistent with the cardiologist's planned follow up medical assessment.

1.17 The driver returned to work on 3 June 2019.

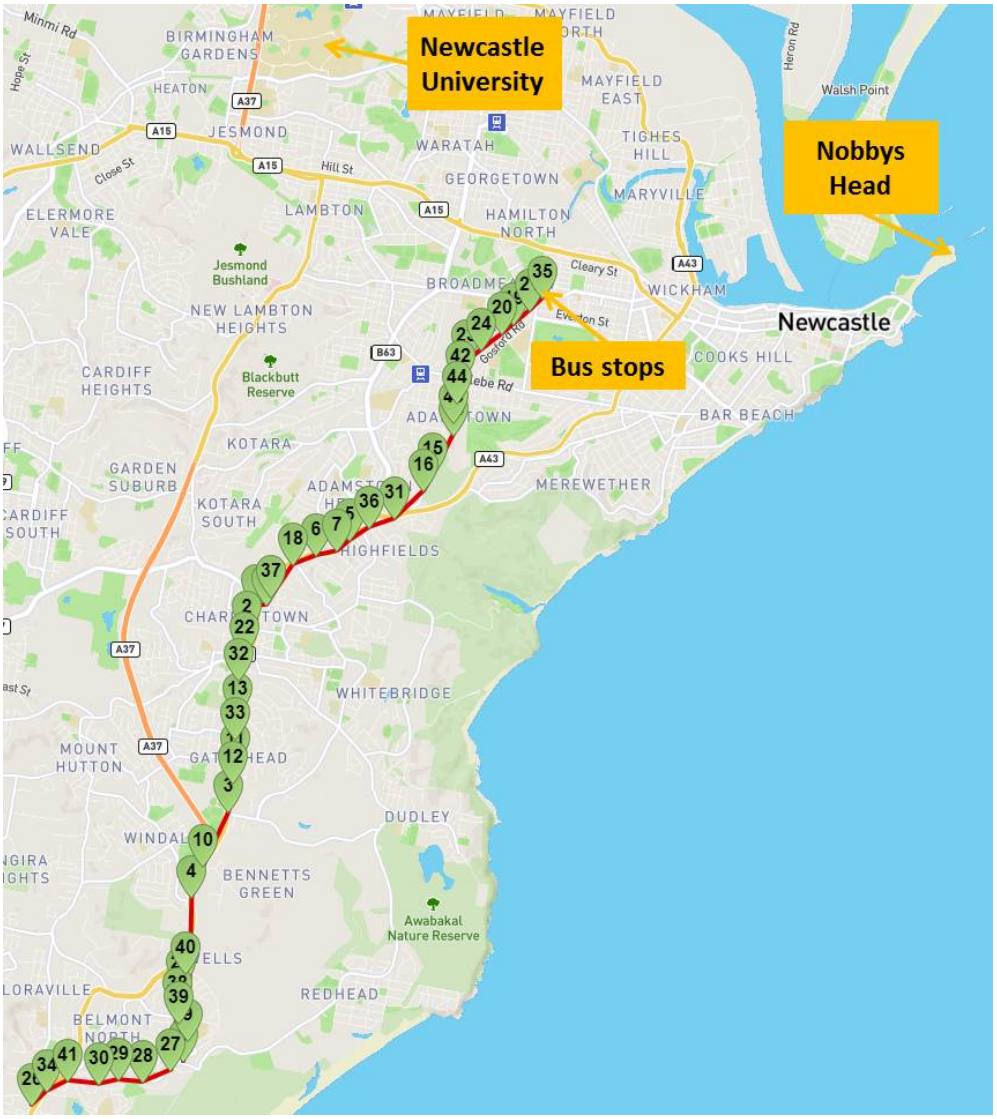
Bus m/o1591

1.18 The bus was a Volvo B12BLE fitted with a Custom Coaches CB60 body. The bus was previously owned by the STA and was leased by TfNSW to KDH on 1 July 2017. The bus was authorised to carry 62 passengers: 44 seated and 18 standing. The bus was carrying 44 school children at the time of the accident.

[8] KDH under contract to Transport for NSW took operational control of Newcastle Transport on 1 July 2017.

[9] The classic mechanism of ST elevation myocardial infarction (STEMI) is complete occlusion (typically thrombosis or embolism) of a coronary artery. In contrast, non-ST elevation myocardial infarction (NSTEMI) is usually a result of a transient or near-complete occlusion of a coronary artery or acute factor that deprives the myocardium of oxygen.

1.19 The bus was on route 551, which commenced at Broadmeadow Nineways[10] and terminated at Belmont North, travelling via the suburbs of Adamstown and Jewells (Figure 2). The intended path of travel for the bus at the time of the accident was in the southbound lane along Brunker Road.



Source: transitfeeds.com, annotated by OTSI

Figure 2: Route 551

The occurrence

1.20 The bus driver started work at 0650 on shift D416. The latter part of the shift required the bus driver to drive route 551.

[10] Colloquially known as the Nineways, it is a road intersection of several roads, primarily Lambton Road, Broadmeadow Road, Brunker Road and Belford Street.

1.21 Bus m/o1591 commenced route 551 at 1521, as per schedule. The route took the bus south on Brunker Road.

1.22 At 1523, the bus driver stopped at the Koree Road bus stop and picked up nine passengers. As he drove between Koree Road bus stop and the next stop at Awaba Road, onboard CCTV footage showed he adjusted his cap, lifted his shoulders, turned his head side to side and yawned before closing the bus driver side window.

1.23 At 1524, the bus driver stopped at Awaba Road bus stop to pick up more passengers. While they were boarding, the bus driver yawned again tilted his head back and placed his hands on his hips. As the bus driver departed Awaba Road bus stop and continued south on Brunker Road, he lifted and lowered his shoulders another two times.

1.24 Just before 1526, the bus was travelling at 32 km/h and the bus driver lifted his shoulders again before dropping them and asssuming a driving position of both hands on the steering wheel and sitting slightly forward.

1.25 At 1526:04, the bus slowed to 19 km/h and the bus driver looked to his left before turning back to centre and resuming his driving postion (Figure 3).

Source: nearmap, annotated by OTSI

Figure 3: Path of the Bus

1.26 At 1526:11, the bus veered to the right from the southbound lane towards the northbound lane. The bus driver remained motionless, making no response to correct the change in direction of travel.

1.27 At 1526:13, the bus moved across and over the centre broken white lines and into the northbound lane. The bus driver remained motionless and unresponsive to the change in direction of the bus.

1.28 At 1526:15, the bus was travelling across the northbound lane.

1.29 At 1526:17, the bus had moved further across the northbound lane and approached the kerb extensions of the pedestrian crossing. The bus driver remained motionless, although his body shifted slightly forward off the seat. The bus driver's right hand then slipped from the steering wheel.

1.30 At 1526:18, the bus reached the pedestrian crossing near Mandalong Road. The bus had moved across the northbound lane. A person was standing on the kerb next to the pedestrian crossing sign and looking to the south for oncoming traffic (away from the approaching bus).

1.31 At 1526:19, the bus travelled up onto the kerb and struck and fatally injured the person.

1.32 The bus then struck the pedestrian crossing sign and dismounted the kerb and continued along the parking lane of the northbound carriageway. CCTV showed the bus driver was still slightly forward in his seat with his right hand off the steering wheel grasping in the air momentarily before locating the steering wheel.

1.33 At 1526:24, as the bus reached Evans Road, the bus began to track back towards the southbound lane. The bus driver's right hand was back on the steering wheel and the bus driver's left hand, while resting on the steering wheel, was seen grasping at air.

1.34 The bus continued left across Brunker Road and collided with the side of a parked car, then collided into the rear of another parked car in the southbound side street parking lane. At this time, the bus driver responded to the collisions, and, shortly after, corrected and steered the bus to the side of the road, approximately 150 m beyond the pedestrian crossing.

Post occurrence

1.35 Shortly after, the bus driver called the KDH Operation Control Centre (OCC) to report he had an accident and that his bus had hit multiple parked cars on Brunker Road, Adamstown.

1.36 While the bus driver was still on the phone to the OCC, a bystander came to the front doors of the bus and knocked, the bus driver opened the doors. The bystander addressed the school children and they began to alight from the bus.

1.37 At 1534, the bus driver notified the OCC that a bystander advised him that a person had been injured but could not confirm if it was a result of the accident.

1.37 At 1538, a police officer boarded the bus and spoke with the bus driver. A short time after, other police officers, staff from KDH and ambulance officers had arrived at the scene.

1.38 The bus driver was drug and alcohol tested and checked by ambulance officers before being taken to hospital.

1.39 Police closed Brunker Road to traffic in both directions until initial investigations and the road clear up could be completed.

Environmental information

1.40 A recorded temperature of 16.2°C was observed by the Bureau of Meteorology at 1500 at Nobbys Head, Newcastle, approximately 6.5 km to the east of Adamstown. The maximum temperature recorded at Nobbys Head on the day was 17.9°C.

1.41 The Bureau of Meteorology's weather station at Newcastle University, approximately 4.5 km to the west of Adamstown, recorded a maximum temperature of 20.4°C. It recorded a temperature of 18.2°C at 0900. There was no 1500 reading available.

1.42 On the day of the accident, it was partly cloudy but dry. The sun was high and to the right of the driver's field vision. The environmental conditions did not contribute to the accident.

Fatigue

1.43 The bus driver had worked the two consecutive days prior to the date of the accident. His last day off was on Saturday 2 November 2019. KDH reviewed his roster and confirmed that his work hours had not breached their fatigue management standards.

1.44 Information was gathered about the bus driver's sleep patterns, exercise, food and liquid consumption outside of rostered working hours for the week prior to 5 November 2019. Based on the information collected, it is unlikely fatigue contributed to this accident.

Drug and alcohol

1.45 The bus driver was drug and alcohol tested after the accident. The bus driver returned a negative result for both tests. The influence of drugs and alcohol were not a contributing factor to the accident.

Post-accident medical examination

1.46 The results of the post-accident medical examination were requested to help the investigation team determine the contributors to the bus driver's incapacitation. However, results of the post-accident medical examination were not made available to OTSI.

Heavy vehicle mechanical inspection

1.47 Technical inspections conducted by RMS heavy vehicle inspectors did not detect a mechanical malfunction, component failure or a design feature of the bus that contributed to this accident.

Roads and Maritime Services

1.48 *The Passenger Transport Act 2014 (PTA 2014)* required RMS accreditation and/or authorisation of operators and drivers involved in public bus passenger services. RMS acted as the Driver Licencing Authority (DLA)[11] for commercial bus drivers in NSW.

[11] The Driver licencing authority referred to in 'Assessing Fitness to Drive 2016' AUSTROADS, makes all decisions regarding the licensing of drivers.

1.49 RMS issued Bus Driver Authorities under the guidance of its 'Public Passenger Operators and Drivers Fit and Proper Policy'[12] and in accordance with the requirements under the PTA 2014 and associated Regulations.

1.50 During the conduct of this investigation, the *Transport Administration Amendment (RMS Dissolution) Bill 2019* was passed by both Houses of the NSW Parliament. This Act amended the *Transport Administration Act 1988* to dissolve RMS and to transfer its assets, rights, liabilities and functions to TfNSW.

Bus driver authorities and medical fitness

1.51 The *Passenger Transport (General) Regulation 2017,* Clause 29 sets the criteria for authorisation to drive public passenger vehicles[13].

1.52 Amongst other requirements specified in Clause 29, applicants for a driver authority must have passed a medical fitness examination or assessment.

1.53 Clause 47 of the Regulation required the driver of a public passenger vehicle to provide RMS with a certificate from a medical practitioner containing the medical practitioner's assessment, in accordance with any requirements of RMS, of the driver's medical condition. Drivers were required to do this on initial application for a Driver's Authority, every three years up to the age of 60 years and every 12 months thereafter.

1.54 Clarification of the RMS requirements for medical assessments was in the RMS developed *Medical Assessment Form for Public Passenger Vehicle Drivers*[14]. Where a general practitioner identifies a driver may require a conditional authority, drivers were required to complete the *Medical Specialist Assessment Form for Commercial/Public Passenger Vehicle Drivers* with a relevant medical specialist.

1.55 Medical Practitioners were provided a reference to 'Assessing Fitness to Drive for commercial and private vehicle drivers 2016 Guidelines' (AFTD Guidelines) on the *Medical Assessment Form for Public Passenger Vehicle*

[12] The *Fit and Proper Policy* is available on RMS website (see References)

[13] Clause 29 of the Regulation is available on Legislation NSW website (see References)

[14] The *Medical Assessment Form for Public Passenger Vehicle Drivers* is available on RMS website (see References)

Drivers. They are encouraged to apply the standards in the Guidelines when assessing applicants.

Assessing fitness to drive guidelines

1.56 The AFTD Guidelines was a joint publication by Austroads and the National Transport Commission Australia (NTC) and details medical standards for driver licensing purposes for use by health professionals and driver licencing authorities.

1.57 The purpose of the document is to provide information to health professionals about medical conditions that may impair and adversely affect driving ability, possibly resulting in a crash causing death or injury. TfNSW adopted the guidelines as a health assessment standard for public passenger drivers, as have all the Australian licencing authorities.

1.58 To ensure medical assessments were conducted in a consistent manner, the AFTD Guidelines were developed to provide medical professionals with information on known crash risks and how to effectively manage particular medical conditions or impairment.

Transport for New South Wales

1.59 Transport for New South Wales (TfNSW) is a State Government corporation constituted under the *Transport Administration Act 1988 (NSW)* on behalf of the State of New South Wales.

1.60 Under provisions in the PTA 2014, TfNSW may enter into a passenger service contract with an Operator[15] for the provision of a Public Passenger Service.

1.61 TfNSW entered into a passenger service contract with Keolis Downer Hunter Pty Limited for the provision of Contract Bus Services (including Bus Services, Dedicated School Services and On Demand Services).

Keolis Downer Hunter

1.62 KDH commenced service delivery for bus operations of the Newcastle Integrated Services (NIS) Contract[16] on 1 July 2017.

[15] An operator is an accredited operator of a Public Passenger Service or the operator of a Public Passenger Service who is not required to be accredited under the PTA 2014.

1.63 All previously employed bus drivers of STA continued service with KDH at the commencement of the NIS contract.

1.64 KDH were required under the contract to ensure, 'with respect to Bus Driver Authorities required to be held by Drivers under the PT Act 1990[17], all Drivers of Buses hold such Bus Driver Authorities and will comply at all times with such Bus Driver Authorities…'

1.65 KDH checked that all drivers previously employed by STA and transferred over to KDH held a current Driver Authority through the use of *MyRecords*[18]. This included the bus driver of 1591.

1.66 KDH has a safety management system that has been accepted under the requirements of the Bus Operator Accreditation Scheme (BOAS). As part of the safety management system, KDH has in place a Fit for Work Policy and have recognised the risk of when a worker presents unfit for duty.

1.67 KDH identified the potential risks to worker fitness for duty, such as fatigue and under the influence of drugs or alcohol.

Related occurrences

1.68 In November 2005, the driver of an STA bus became incapacitated while in control of a bus descending Spit Road, Mosman, Sydney (see References, Spit Road, Mosman - Collision 14 November 2005). The bus crossed the median strip and collided with four vehicles. Ten people and the bus driver were injured and conveyed to hospital. At the time, the OTSI investigation made recommendations to the Ministry of Transport (MoT) (now TfNSW) to review its system of monitoring adherence to the health assessment regime and its system of monitoring compliance with any special conditions attached to a driver's authorisation.

1.69 In July 2016, the driver of an STA bus became incapacitated while in control of a bus on Miller Street, Cammeray, Sydney (see References, Cammeray – Bus Collision 1 July 2016). The bus was on route between Sydney CBD and

[16] The NIS Contract was for transport services in Newcastle, including Bus, Ferry and Light Rail operations.

[17] PT Act 1990 is the *Passenger Transport Act 1990*. The PTA 2014 has succeeded the PT Act 1990, however the PT Act 1990 continues to be in force for certain sections.

[18] *MyRecords* was an RMS owned and maintained system for monitoring Bus Driver Authorities

East Lindfield with 12 passengers on board when the bus mounted a footpath, subsequently colliding with three parked cars and striking three pedestrians before coming to a halt. OTSI recommended RMS ensure that incapacitated drivers of heavy vehicles, public passenger vehicles and bulk dangerous goods vehicles are assessed in accordance with the AFTD guidelines before resuming normal driving duties. Additionally, OTSI discussed the management of medical cases in other transport modes such as rail and aviation during commercial operations.

1.70 OTSI received 50 notifications of driver ill health and incapacitation between the period 1st December 2005 and 31st January 2020. A table and summary of these notifications is in Appendix 2.

PART 2 ANALYSIS

Introduction

2.1 The investigation focused on identifying the contributing factors which led to the accident, determining whether the accident might have been anticipated and the effectiveness of any controls that were in place to manage the related risks. Any matters arising from the investigation that would enhance the safety of bus operations would be advised during the course of the investigation.

Contributing factors to the accident

2.2 Review of the onboard CCTV footage of the bus driver found he made a number of additional body movements while driving in the lead up to the accident, compared with his driving style observed on the days previous and on the morning of the day of the accident.

2.3 The additional body movements that were observed shortly after he commenced route 551 included, yawning, shrugging shoulders, and head movements sideways and back.

2.4 These additional body movements were likely an indication of the bus driver feeling a level of discomfort.

2.5 At interview, the bus driver described he “felt dizzy and looked for a place to pull over before everything went black.”

2.6 The review of the onboard CCTV footage revealed a moment when the bus driver moved his head briefly to the left before returning to centre. This occurred seven seconds before the bus veered to the right across the road centre line and into potential oncoming traffic. When this occurred, the bus driver remained unresponsive to the change in the bus’s direction of travel. At this time the bus driver appeared incapacitated and had lost control of the bus.

2.7 The bus driver appeared motionless for the next six seconds until his body moved slightly forward on the seat and his right hand slipped from the steering wheel. The bus driver did not appear to lose complete postural tone[19].

2.8 Over the next ten seconds the bus driver's movements consisted of very minor hand grasping responses, likely involuntary. Following the collisions with parked cars, the bus driver appeared to recover and was observed responding to the bus's movement and was able to bring the bus back under control.

2.9 With consideration of the following items, in the 16 seconds prior to the bus driver making a recovery, it is likely the bus driver suffered a transient loss of consciousness (TLoC):

a. comparison observations of onboard CCTV on the day before the accident and on the day indicate a distinct change in the bus driver's driving behaviour;
b. the bus driver was on prescribed medication;
c. the bus driver was not under the influence of other illicit drugs or alcohol;
d. the bus driver was not fatigued.

2.10 TLoC can be defined as a loss of consciousness with complete recovery. It is usually spontaneous in onset and may be described by the person as a 'blackout'.

2.11 Rogers and O'Flynn (2011) stated:

> TLoC is commonly described by the person as a blackout. TLoC is very common and there are a number of potential causes including; situational syncope, orthostatic hypotension, epilepsy, cardiovascular dysfunction or dysfunction of the psyche. The diagnosis of the underlying cause is often inaccurate, inefficient and delayed and misdiagnosis is common[20].

2.12 The bus driver had suffered a NSTEMI (heart attack) six months prior to this accident. The bus driver was cleared to resume regular driving duties (consistent with requirements in the AFTD Guidelines).

[19] Postural tone can be defined as the steady contraction of muscles that are necessary to hold body posture. A loss of postural tone is a loss of the steady muscle contraction and hence body posture.

[20] NICE guideline: *transient loss of consciousness (blackouts) in adults and young people* (see References).

2.13 While cardiovascular dysfunction is a potential cause of TLoC, there was no evidence to support the bus driver's likely TLoC was due to cardiovascular dysfunction. Based on the evidence available, determining the underlying cause of the likely TLoC was not possible.

Anticipating ill health and incapacitation

2.14 The importance of anticipating when a driver is feeling the onset of ill health and potential for incapacitation is paramount for the safety of the driver and the travelling public.

2.15 The AFTD Guidelines recognise a key input in terms of evidence for the licensing criteria to be the Monash University Accident Research Centre (MUARC) report; *Influence of Chronic Illness on crash involvement of motor vehicle drivers, 2nd edition, Charlton et al, Nov 2010*.

2.16 A recommendation from the MUARC Report was –

> Promote public awareness, particularly amongst the driving population, about the known crash risks and effective management for particular medical conditions or impairment - this is important particularly because most jurisdictions are reliant on self-referral or voluntary reporting of medical conditions and hence, the onus is on the driver to determine whether they have a condition that affects their driving.

2.17 It follows, the safety of the driver and that of the travelling public is reliant on the driver being aware of the known crash risks and how to effectively manage any particular medical condition or impairment they may have.

2.18 The AFTD Guidelines was developed as a resource for understanding crash risks and effectively managing medical conditions. It was primarily developed for use by health professionals and driver licencing authorities. However, it would be reasonable for bus operators and bus drivers to learn, share and make others aware of the information in the guidelines. This may help control the risk of crash due to ill health and incapacitation.

2.19 The greater knowledge bus operators and bus drivers have about the known crash risks for particular medical conditions, the better equipped they may be to effectively manage the risk of incapacitation while driving.

2.20 While a loss of consciousness can happen quickly, most people experience some common signs and symptoms in the moments before they lose consciousness. Some of these symptoms include, an inability to respond, slurred speech, a rapid heart rate, confusion, and/or feeling light headed or dizzy[21].

2.21 There is a potential opportunity, albeit a last line of defence, for bus drivers to act and stop the bus when they experience symptoms of a particular medical condition that could lead to incapacitation.

Effectiveness of existing controls

Medical assessment

2.22 As detailed in Part 1 of this report – Bus driver authorities and medical fitness and the criteria for authorisation to drive public passenger vehicles was set out in the *Passenger Transport (General) Regulation 2017*.

2.23 RMS was the Driver Licencing Authority for commercial bus drivers at the time of this accident and was responsible for ensuring all requirements specified in the Regulations were adhered to.

2.24 The key mechanism of control against driver incapacitation was the medical assessment that needed to be conducted on initial application, every three years until the age of 60 years and annually thereafter.

2.25 Additionally, where a medical practitioner identified an applicant that did not meet the medical assessment requirements, or presented with a specific medical condition, they were required to send the applicant to a relevant medical specialist.

2.26 It was then the responsibility of the medical specialist to determine whether they provided a medical clearance for the applicant to drive a public passenger vehicle.

2.27 The effectiveness of this mechanism of control against driver incapacitation is potentially eroded if full disclosure of medical history is not provided.

[21] First Aid for Unconsciousness (see References)

2.28 There is also an opportunity for the effectiveness of the control to be compromised if specific knowledge of the driver's work activities is not supplied by the patient. This may leave the medical professional unaware of the known crash risks associated with the work and how particular medical conditions could increase that risk.

2.29 The existing mechanism of informing medical professionals of this is the AFTD Guidelines. Without any other prompt, the onus was on the medical professional conducting the medical assessment to ensure they consulted the AFTD Guidelines.

2.30 The bus driver had medical assessments completed for his initial application for a Driver's Authority, then every three years up to the age of 60 years and annually thereafter. There were no issues identified by the medical professionals, in these medical assessments that would preclude the driver from holding a Driver Authority.

2.31 Following the bus driver's heart attack on 2nd May 2019, the driver was managed in accordance with the requirements in the AFTD Guidelines.

2.32 The bus driver remained off work for a minimum of four weeks. He was provided a clearance from his medical specialist on the 30 May 2019 and did not return to work until 3 June 2019.

2.33 The bus driver had been managed in accordance with the standards in the AFTD Guidelines; however, the driver became incapacitated and lost control of the bus he was driving on the day of this accident.

2.34 A review of the incident notifications to OTSI over the period between 1 December 2005 to 31 January 2020, revealed a notification of driver ill health and incapacitation was received every 3-4 months.

2.35 While improvements have been made with managing the health assessment standards for bus drivers since the accident on Spit Road, Mosman, 14 November 2005, it is apparent bus driver ill health and incapacitation events are still occurring.

Fitness for work

2.36 KDH has in place systems for ensuring fitness for work.

2.37 KDH identified that effects of fatigue and drug and alcohol on a driver can lead to adverse outcomes. Appropriately, KDH implemented controls to minimise the risk of an adverse outcome due to fatigue and drugs and alcohol, through education and promotions to raise awareness of the effects of fatigue and drugs and alcohol.

2.38 Such programs help to raise the bus driver's self-awareness. This then enables the bus driver to identify and disclose when they are feeling fatigued or under the effects of drugs and/or alcohol.

2.39 Such a system is an appropriate mechanism for educating and promoting the effects of ill health and incapacitation of a bus driver.

2.40 Information on ill health and incapacitation is readily available (such as in the AFTD Guidelines and the MUARC Report) and could be used to raise a bus driver's self-awareness in this area.

2.41 This would likely enable the bus driver to identify and disclose when they are feeling symptoms of particular medical conditions that could lead to incapacitation.

Health standards in other transport industries

2.42 OTSI highlighted, in its 2016 Cammeray investigation, the different approaches other transport industries have taken to manage the risk of ill health and incapacitation of safety critical workers.

2.43 In the aviation industry, pilots and air traffic controllers are subjected to rigorous medical examination (including physical tests and samples) on a regular basis to ensure the associated risks of ill health and incapacitation are not realised. An incapacitation of the worker in these positions would result in potentially significant safety impacts on the workers and passengers.

2.44 The medical examinations of other flight crew, such as cabin crew, is less stringent based on the level of impact ill health of the person in these positions would have on the safety of the worker and passengers.

2.45 In the rail industry, the type of medical examination that must be passed by the rail worker is determined by the type of work the rail worker is involved in and the impact their ill health could have on their safety and that of others.

2.46 The medical examinations of safety critical workers such as train drivers and train controllers are the most rigorous due to the potential impact ill health and incapacitation could have on the safety of themselves and others.

2.47 In both the aviation industry and rail industry, workers in safety critical roles require a physical medical examination that is relevant to the safety criticality of their role, in addition to a medical assessment. In both cases, the medical examination provides the medical professional a greater opportunity to identify any potential health precursors in an individual that might make them a greater risk for incapacitation.

2.48 The medical assessment for bus drivers is heavily reliant on the bus driver openly disclosing any medical conditions that could affect their ability to drive safely.

2.49 Although the bus driver is in a role that is as equally safety critical to that of a commercial pilot or train driver, the bus driver is not always subjected to a physical medical examination as a prerequisite for approval of their Driver's Authority. A bus driver may have to undertake a physical medical examination but only if the information that has been disclosed on the medical assessment leads the medical professional to conduct one.

Context of bus operations

2.50 The bus driver is the only person in control of the bus. The bus driver operates the bus on public roads, alongside other motorists and pedestrians on public pathways. When a bus driver suffers a medical episode that renders them incapacitated, there is little anyone can do to stop the bus from colliding with other vehicles, objects and people.

2.51 In contrast to a commercial passenger pilot who becomes incapacitated, there is a second person at the controls of the plane who can take control of the plane and avoid any adverse outcome.

2.52 In contrast to a train driver who suffers a medical episode that renders them incapacitated, the passenger train will continue in a direction determined by the rail tracks and will travel in a relatively controlled environment known as the rail corridor. There are engineering controls in place to intervene should a

passenger train driver suffer incapacitation, such as vigilance control and automatic train stop[22]. Additionally, there is a second person, the guard, on most trains who has the ability to stop the train when they perceive there is a problem.

2.53 The bus driver is the last line of defence. Any effects of ill health and incapacitation of the bus driver can and will directly affect the safety of people on and around the bus.

[22] Automatic Train Stop (ATS) is a system that automatically stops a train, usually by activating the train's braking system, when an unwanted event occurs, such as driver incapacitation or train passing a stop signal.

PART 3 FINDINGS

From the evidence available, the following findings are made with respect to the bus on pedestrian accident and collision with several parked cars on Brunker Road, Adamstown.

3.1 The roadway and pedestrian crossing were designed and built to meet Austroads and Newcastle City Council's road geometry standards.

3.2 It is unlikely the driver was affected by fatigue and was not under the influence of illicit drugs and/or alcohol.

3.3 The environmental conditions were not considered a contributing factor.

3.4 Post-accident inspections of the bus did not detect a mechanical malfunction, component failure or design feature of the bus that contributed to the accident.

3.5 The bus driver had a current Driver Authority, issued by RMS.

Contributory factors

3.6 The bus driver became incapacitated while driving a bus. As a result, the driver did not have control of the bus and fatally struck a pedestrian and collided with several parked cars.

3.7 The driver's incapacitation and loss of control was likely due to a TLoC..

3.8 The driver was aware he was not feeling well but did not anticipate becoming incapacitated and was unable to stop the bus.

3.9 There was no other mechanism for controlling the bus once the driver became incapacitated.

Other safety factors

3.10 The medical assessment for bus drivers relies on open and honest disclosure by the bus driver of any medical condition that may affect their ability to drive safely.

3.11 Other transport industries have more stringent and robust medical assessment requirements for safety critical workers.

3.12 The bus driver had been treated in accordance with standards in the AFTD guideline however he became incapacitated whilst driving a bus.

3.13 There are continued reports of bus drivers suffering ill health and incapacitation whilst driving a bus after enforcement of the AFTD Guidelines.

Key issues

3.14 This accident highlights bus drivers are the last line of defence when things go wrong.

3.15 Only the bus driver is aware when they are not feeling well and can act to stop the bus.

3.16 There are a range of health issues that can affect the bus driver whilst driving. The bus driver needs to be aware of how to manage these particular medical conditions.

3.17 The bus driver, as a safety worker, is required to drive the bus safely but also deploy risk control measures on behalf of the organisation, in lieu of secondary or engineering defences.

3.18 Bus operators should educate bus drivers to stop a bus in the event of illness.

PART 4 RECOMMENDATIONS

It is recommended that the following additional safety actions be undertaken by the specified responsible entities.

Bus operators

4.1 Implement programs using supporting information from TfNSW and/or the bus industry that provide bus drivers with the capacity to manage known crash risks associated with particular medical conditions.

4.2 Implement systems (policies and procedures) to enable bus drivers stop the bus and report to the Operations Control Centre (or equivalent) when they are experiencing symptoms of particular medical conditions.

4.3 Promote prompt driver reporting of adverse particular medical conditions as an operational priority.

Bus drivers

4.4 Be aware of their health base line and be vigilant to identify adverse changes during the operation of the bus.

4.5 Stop the bus in a safe place and promptly report to the Operations Control Centre (or equivalent) when experiencing symptoms of particular medical conditions.

Transport for NSW

4.6 Assist bus operators to implement programs to provide bus drivers with the information of known crash risks associated with particular medical conditions and how to effectively manage them.

4.7 Assess existing health assessment standards and evaluate the effectiveness of these controls to adequately mitigate the risks of incapacitation.

4.8 Assess the health assessment standards with consideration of those in other transport modes.

4.9 Ensure any improvements to health assessment standards are implemented throughout the bus industry in NSW.

PART 5 APPENDICES

Appendix 1: Sources, Submissions and Acknowledgements

Sources of information

- Keolis Downer Hunter
- Driver of bus 1591
- NSW Police
- TfNSW

References

- National Transport Commission and Austroads *Assessing Fitness to Drive* guidelines
- Austroads *Guide to Road Design Part 4: Intersections and Crossings – General*
- Design of kerb and guttering in accordance with Newcastle City Council - *A1200 Standard Extruded Kerb and Gutter Profiles*
- RMS Public Passenger Driver *Fit and Proper Policy*: https://www.rms.nsw.gov.au/documents/business-industry/buses/public-passenger-operators-and-drivers-fit-and-proper-policy-pn302.pdf
- *Passenger Transport (General) Regulation 2017*, Clause 29: https://legislation.nsw.gov.au/#/view/regulation/2007/421/part3/sec29
- *Medical Assessment Form for Public Passenger Vehicle Drivers*: https://www.rms.nsw.gov.au/documents/about/forms/45071751-public-passenger-vehicle-driver-medical-assessment-form.pdf
- NICE guideline: *transient loss of consciousness (blackouts) in adults and young people*, Greg Rogers, Norma O'Flynn, British Journal of General Practice, Jan 1; 61(582):40-42(2011)
- First Aid for Unconsciousness: https://www.healthline.com/health/unconsciousness-first-aid#signs
- Spit Road, Mosman – Collision 14 November 2005: https://www.otsi.nsw.gov.au/bus/investigations/spit-road-mosman-collision
- Cammeray – Bus Collision 1 July 2016: https://www.otsi.nsw.gov.au/bus/investigations/cammeray-bus-collision

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:

- Keolis Downer Hunter
- Driver of bus 1591
- NSW Police
- TfNSW
- Next of Kin

Appendix 2: Notifications of driver ill health and incapacitation

Table: Period - 1st December 2005 to 31st January 2020

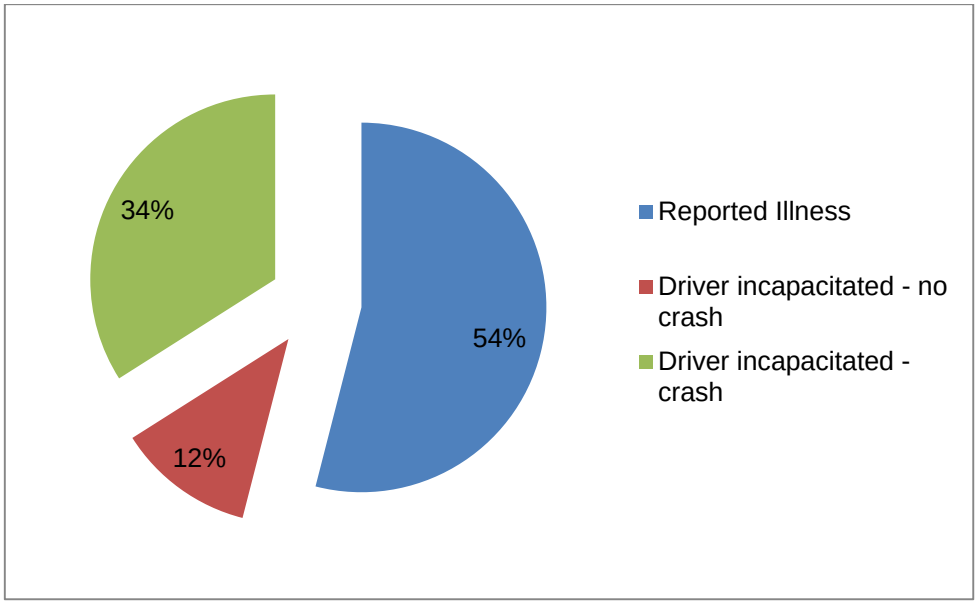
Reported illness	
11954 Jun 2007 – chest pains	17817 Dec 2014 – heart attack
12328 Nov 2007 – chest pains	17856 Jan 2015 – faint and short of breath
12484 Feb 2008 – chest pains	17969 Mar 2015 – chest pain
14850 Oct 2010 – chest pains	18224 Jul 2015 – chest pains and short of breath
14869 Oct 2010 – chest pains	18579 Jan 2016 – feeling unwell
15776 Nov 2011 – symptoms suggesting heart attack	18953 Aug 2016 – suspected heart attack
16189 May 2012 – chest pains	18994 Sep 2016 – medical episode
16494 Nov 2012 – chest pains	19293 Feb 2017 – medical episode
16868 Jun 2013 – chest pains	19579 Aug 2017 – chest pains
16987 Aug 2013 – chest pains	20871 Mar 2019 – medical episode
17017 Sep 2013 – chest pains	21179 Jul 2019 – chest pains
17087 Oct 2013 – feeling faint	21582 Nov 2019 – medical episode
17503 Jul 2014 – chest pains	21740 Dec 2019 – medical episode
17653 Sep 2014 – chest pains	

Driver incapacitated – no collision	
17628 Sep 2014 – heart attack, bus stationary	18040 Apr 2015 – heart attack, bus stationary
17815 Dec 2014 – heart attack, bus stationary	18371 Sept 2015 – black out and pain to left side, bus stationary
17927 Feb 2015 – heart attack, bus stationary	21834 Jan 2020 – incapacitated

Driver incapacitated - collision	
13643 Jun 2009 – black out, collision with pole	18419 Nov 2015 – medical episode, crossed wrong side of road and collided with a parked car
14954 Dec 2010 – black out, collision with fence	18641 Mar 2016 – black out, collision with tree
15096 Feb 2011 – heart attack, collision with signs, barriers and other vehicles	18857 Jul 2016 – seizure, collision with roadside infrastructure
16410 Sep 2012 – black out, collision with parked cars	19411 Apr 2017 – unconscious state, passenger took over driving
17250 Feb 2014 – black out, collision with power pole	19556 July 2017 – incapacitated, collision with several vehicles
17469 Jun 2014 – black out, collision with fence and side of house	20670 Dec 2018 – medical episode, crossed into oncoming traffic
17723 Nov 2014 – heart attack, collision with tree	21352 Aug 2019 – medical episode, collision with front yard fence
17875 Jan 2015 – heart attack, ran off road	21571 Nov 2019 – medical episode, collision with pedestrian and cars
17994 Mar 2015 – black out, collision with power pole	

Summary:

Reported Illness	27
Driver incapacitated - no crash	6
Driver incapacitated - crash	17



50 notifications received of a bus driver suffering ill health or incapacitation whilst operating a bus.

23 (46%) of notified incidents resulted in the driver becoming incapacitated, of these 17 (34%) resulted in the bus crashing.

27 (54%) of notifications were reported ill health where the driver detected and reported their health problem before their condition became potentially worse.

50 reports in 170 months = average 1 report every 3.4 months