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ATSB TRANSPORT SAFETY REPORT
Rail Investigation RO-2009-005
Final

Level crossing collision between a school bus and train 7GP1 near Moorine Rock, Western Australia 23 March 2009

Figure 1: Nulla Nulla South Road level crossing collision site

Abstract

At about 1540[1] on 23 March 2009, freight train 7GP1 collided with a school bus after the bus drove onto, and became stuck on, an excavated section of railway track at the Nulla Nulla South Road level crossing near Moorine Rock, Western Australia. There were no injuries as a result of the collision but there was significant damage to the school bus.

The investigation determined that the collision occurred as a result of the bus being driven around road closure signs and onto a level crossing worksite which was closed for the purpose of replacing rail that was embedded in the road surface. A minor safety issue, unrelated to the development of the accident sequence, was identified during the investigation and has been brought to the attention of the train operator. That safety issue relates to overdue safe working qualifications of train staff. The ATSB is satisfied that the action taken and proposed by the train owner, including the introduction of more robust procedures for checking the currency of operator competencies, will adequately address the safety issue.

1 The 24-hour clock is used in this report. Western Daylight Time (WDT) was Coordinated Universal Time (UTC) + 9 hours. Unless shown otherwise, all times are WDT.

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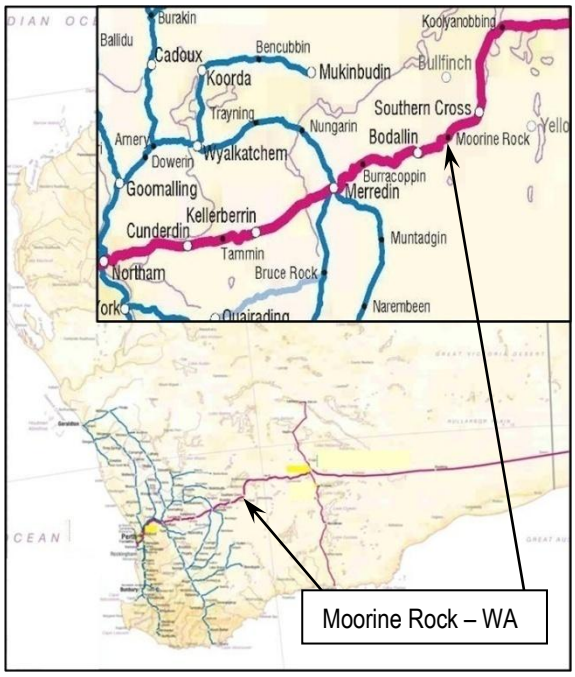
FACTUAL INFORMATION

Location

The collision occurred on the Defined Interstate Rail Network (DIRN) at the Nulla Nulla South Road level crossing located 372.109 rail km from the East Perth Rail terminal [2] and about 9.5 road km west of the township of Moorine Rock, located between Kalgoorlie and Perth, Western Australia (Figure 2).

Figure 2: Location of Moorine Rock



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The Nulla Nulla South Road crosses the railway track on a near level gradient with both road approaches having active flashing light level crossing equipment installed to warn road vehicle drivers of approaching trains. (Figure 3)

The weather on the day of the collision was fine and clear with a maximum temperature of 25 degrees Celsius recorded at the Southern Cross Airport weather station, located about 30 km east of Moorine Rock.

Train and crew Information

Freight train 7GP1 was owned by SCT Logistics (SCT) and operated by Genesee & Wyoming Australia Pty Ltd (GWA). It consisted of two locomotives (SCT015 leading and SCT010) hauling 73 wagons. The train was 1721 m long and weighed a total of 6260 t.

The GWA crew of 7GP1 comprised two sets of two drivers. The two crews worked rotating shifts with one crew driving and one crew resting. The resting crew was accommodated in a fully equipped crew van marshalled behind the locomotives. The driver operating train 7GP1 at the time of the collision had more than 28 years driving experience, was appropriately qualified, and was assessed as competent and medically fit for duty. The second driver was assessed as medically fit for duty. All his remaining qualifications were current except for a reassessment of competency to maintain the WestNet Rail Track Access Permit.

Bus and driver Information

The Moorine Rock school bus is one of three school bus services operated by a private company that works under contract from the Public Transport Authority of Western Australia (PTA). The service is operated in the morning and afternoon to transport children from the Moorine Rock Dulyalbin district to, and from, the Moorine Rock Primary School. The bus involved in the level crossing collision was a Toyota Coaster manufactured in the year 2000 and licensed to seat 21 adults. The bus driver, whose normal occupation is a school assistant at the Moorine Rock Primary School, was relieving the regular driver. The relief bus driver was appropriately licensed but was not a frequent driver of the school bus. Before the day of the collision, the relief bus driver had not driven the Nulla Nulla South Road bus route.

Rail track management

The DIRN at this location is managed by WestNet Rail. The level crossing is actively[3] controlled by flashing lights that require road users to stop and give way to trains when approaching the level crossing. WestNet Rail is responsible for the

2 Rail track distance taken from a zero point located at the East Perth Rail Terminal.

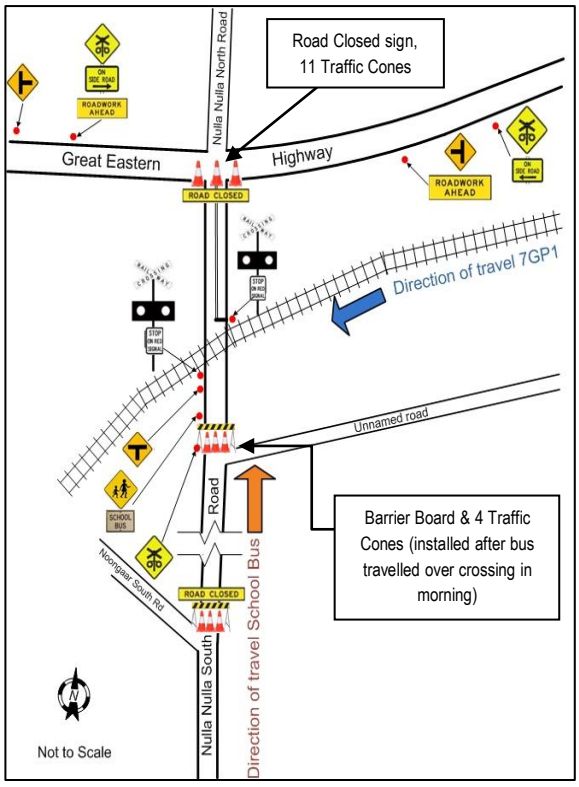
3 Active control - Control of the movement of vehicular or pedestrian traffic across a railway crossing by devices such as flashing signals, gates or barriers, or a combination of these, where the device is activated prior to and during the passage of a train through the crossing. (Source: AS1742.7-2007)

management of the pavement over the track, level crossing lights and associated track-side equipment. Maintenance works carried out at the Nulla Nulla South Road level crossing were being undertaken by John Holland Rail (JHR), a railway contractor to WestNet Rail.

Nulla Nulla South Road and level crossing

Nulla Nulla South Road generally runs in a north-south direction and has a maximum speed limit of 110 km/h. Roadside advance warning signs for the Nulla Nulla South Road level crossing are managed by the Shire of Yilgarn (Shire). Nulla Nulla South Road has an unsealed gravel surface and when travelling from the south, the road crosses the rail line at an angle close to 60 degrees (Figure 3).

Figure 3: Diagram showing road layout, road signs and direction of travel for school bus and train



On approach to the level crossing, the road has a down-grade of about 2 per cent before it levels out over the crossing. Signs to warn road vehicle drivers approaching the level crossing were unobstructed and visible when travelling in a northerly direction. Level crossing equipment and flashing lights adjacent to the railway track are maintained by WestNet Rail.

The short section of Nulla Nulla South Road between the Great Eastern Highway and the level crossing is a spray sealed, near level surface painted with two unbroken centre barrier lines that extend continuously from the level crossing to the edge of the highway.

Great Eastern Highway

The Great Eastern Highway is a major arterial road connecting Perth and Kalgoorlie. All permanent and temporary road signs positioned on the Great Eastern Highway each side of the Nulla Nulla South Road were clearly visible and unobstructed by vegetation in both directions (Figure 3). The highway is the responsibility of Main Roads Western Australia (MRWA). All road signs on both approaches to the level crossing were appropriately positioned.

Planning and preparation for works

About 2 weeks prior to work commencing on the level crossing at Nulla Nulla South Road, the JHR superintendent contacted the Shire works manager and discussed the proposed work that would take place at the level crossing.

On Friday 20 March 2009, the JHR superintendent made four attempts to contact the Shire works manager via his mobile telephone and on the fourth attempt a detailed message was left on the answering service which described the proposed level crossing work. The JHR superintendent made a further attempt to contact the Shire works manager by telephoning the Shire offices, to advise him of the impending road closure for railway track maintenance at the Nulla Nulla South Road level crossing that was expected to commence on Monday 23 March. As the works manager was not available on the day, a Shire employee who believed Nulla Nulla South Road was not a school route, indicated that a message would be relayed to the Shire works manager about the proposed work.

On the morning of 23 March, the Shire works manager telephoned the JHR superintendent but was not able to speak directly to him so a message was left on his mobile telephone. The message was not received by the JHR superintendent and preparations for work

commenced to exclude road users either side of the level crossing.

By 0730 that day, a contractor to JHR specialising in road traffic management (Altus Traffic), had placed road signs in both directions on the Great Eastern Highway to indicate that there was roadwork ahead and the Nulla Nulla South Road was closed to road traffic at the next intersection. On the southern approaches to Nulla Nulla South Road and the intersection of Noongar South Road, a 'Road Closed' sign, barrier board and six traffic cones were placed across the road to indicate the road beyond the signs was closed to public traffic and that all traffic should divert onto Noongar South Road (Figure 3). However, no road detour signs had been erected. Subsequently, a form acknowledging that all traffic management signs had been installed was signed by JHR and the Altus Traffic contractors departed the worksite.

Site works

At about 0940 on 23 March, shortly after the passage of train 2484, railway workers commenced excavation works on the road surface at the Nulla Nulla South Road level crossing. Works in the rail corridor continued throughout the day and were interrupted twice to allow the passage of freight and passenger trains to and from Perth. Work on the level crossing ceased and the track was reopened for rail traffic at 1512. All track maintenance employees had vacated the site before 1530 with all 'Road Closed' signs, barrier boards and traffic cones remaining in place.

OccurrenceSchool bus movements and road traffic management

At about 0810 on 23 March, a JHR railway workman observed a school bus carrying about six children travelling west on the Great Eastern Highway turn left onto Nulla Nulla South Road. To accomplish the left turn onto Nulla Nulla South Road, the relief bus driver veered off the bitumen road surface, went around the eastern end of 11 traffic cones and a 'Road Closed' sign, and proceeded towards the level crossing located about 60 m from the intersection. The relief bus driver approached the railway crossing, looked both ways and drove over the crossing without incident.

When the JHR supervisor arrived at about 0830, he increased road traffic protection to the worksite by moving four traffic cones from the intersection of the Great Eastern Highway and Nulla Nulla South Road and repositioning them with a barrier board across Nulla Nulla South Road on the southern approach to the level crossing. Those signs were erected about 200 m from the level crossing near the intersection of an unnamed road that branches off to the eastern side of Nulla Nulla South Road (Figure 3). Before maintenance work commenced on the level crossing at about 0940, the Nulla Nulla South Road approaches had been appropriately signed as closed to use by road and pedestrian traffic in both directions.

Early in the afternoon, the relief school bus driver informed the Moorine Rock School principal, who is also the coordinating principal[4], that in the morning she had to drive around cones and through road works that were blocking the entrance to Nulla Nulla South Road. The relief school bus driver asked what she should do for the afternoon bus service and was advised by the principal that she would make enquiries with the Shire and then get back to the driver to provide advice.

The school principal contacted the shire and was told by the works manager that he: 'was unaware of any road closures or road works at that location', and advised her 'to inform the bus driver to stop at the location and speak to road workers of any detour that can be taken'.

At about 1505, the school principal advised the relief school bus driver that 'the shire was not aware of the road closure and to make a decision when you get there' (at the level crossing).

The relief school bus driver departed the school at about 1510, drove south along Moorine South Road, turned right onto Gethin Road and then right onto Nulla Nulla South Road. At the intersection of Noongaar South Road, the relief bus driver saw that the road was obstructed so she drove onto the right side of the road, and around the 'Road Closed' sign, barrier board and

4 The coordinating principal is a person approved by the PTA School Bus Services for the purposes of coordinating and facilitating the provision of transport assistance to eligible students within a district or region.

traffic cones. The relief bus driver said she was unsure which way she should proceed as there was no detour sign, so she decided to continue to drive along Nulla Nulla South Road for another 7.7 km. She then observed another barrier board and four traffic cones positioned across the road. Once again the relief bus driver drove onto the right side of the road and around the traffic management devices. At this point the school bus was about 200 m away from the level crossing.

The relief bus driver said she cautiously approached the level crossing and continued at a low speed of about 5–10 km/h. About 1 m from the railway track, the front wheels of the bus dropped off the road's 'normal' surface into a 200 mm deep excavation that ran parallel to the track. The front of the bus rode over the rail head and this was the first indication to the driver that the road surface had been completely removed. It is not known whether one or both front wheels rode over the rail.

The relief driver attempted to reverse the bus off the track but the rear wheels spun before the engine stalled about 10 seconds later. When the driver couldn't move the bus backwards, she immediately evacuated the nine children from the bus and moved them away from the level crossing. She then used a mobile telephone to call a nearby landholder who she thought may be able to tow the school bus off the level crossing.

About 2 minutes after the call for assistance was made to the landholder, the level crossing warning equipment activated as train 7GP1 approached from the east. About 40 seconds later, lead locomotive SCT015 collided with the school bus.

There were no injuries to the school children, driver of the school bus or the train crew.

Train 7GP1

At 1029 on 23 March, freight train 7GP1 departed West Kalgoorlie and travelled towards Perth. At 1244, the train was diverted into the Jaurdi crossing loop to allow the Kalgoorlie bound 'Prospector' passenger train to be crossed. At 1402, train 7GP1 was diverted into the Darrine loop where another cross was made with a loaded iron ore train.

At about 1538, when train 7GP1 rounded a left curve on approach to the Nulla Nulla South Road level crossing, the train drivers observed a vehicle close to the track. When the train was about 250 m from the crossing, the drivers saw that the vehicle was a bus which was obstructing the track. The driver immediately made an emergency brake application[5].

Eleven seconds later, the train collided with the bus which, on impact, rotated about 90 degrees to the left, coming to rest near an excavation over a culvert near the track. The rear of the bus remained on the road. The train came to a stop 173 m past the crossing. The second driver alighted from the locomotive and walked back to check for injuries and damage. The other driver remained on the train and contacted WestNet Rail transport control requesting emergency assistance.

Post occurrence

The WA Police from Southern Cross arrived at the scene at about 1550 followed by two ambulances and fire and rescue services. The police carried out alcohol breath tests on the school bus driver and the train driver who both returned negative results.

The school bus was extensively damaged in the collision and was recovered by a heavy lift crane at about 1800.

There was minor damage to the front of the locomotive and train 7GP1 departed Nulla Nulla South Road at 1732 after a delay of about 3 hours.

Critical incident counselling services were made available by WestNet Rail and the PTA to the school children and their parents, school staff and the relief bus driver.

ANALYSIS

Sequence of events

Early on the afternoon on 24 March 2009, investigators from the Australian Transport Safety Bureau arrived at the collision site. Layouts of roads with permanent and temporary traffic signs, tyre witness marks and damaged equipment were examined and photographed on site.

5 The type of brake application made when a train must be stopped in the minimum distance possible (Glossary for the National Codes of Practice - 2004).

Other evidence was provided to investigators from WestNet Rail, Specialized Container Transport, WA Police, Public Transport Authority WA, the Shire of Yilgarn and Altus Traffic Pty Ltd. The evidence included train control graphs, locomotive data logs, train consist and inspection information, level crossing data, train driver/co-driver statements, medical fitness, fatigue and training records, and individual statements.

Examination of the accident site and other relevant evidence determined that the school bus had been driven onto the excavated track but it was unclear what factors may have influenced and contributed to the collision. The following analysis documents the sequence of events and examines the elements that may have contributed to the level crossing collision between train 7GP1 and the school bus.

Locomotive information

Locomotive data-log information shows that at about 1538:50 and when 600 m before the Nulla Nulla South Road level crossing, the train slowed to 57 km/h as it entered a shallow cutting. At about 1539:11 and 265 m from the level crossing, both drivers observed a school bus stopped near the level crossing. Almost immediately, they realised the school bus was obstructing the track so the driver made an emergency brake application.

At about 1539:29 and at a speed of 48 km/h, locomotive SCT015 collided with the driver's side of the school bus, pushing the bus to the left of the railway track into an excavation and drain. The bus came to a rest suspended over a concrete culvert, parallel to the track and remained upright. Still under emergency braking, lead locomotive SCT015 came to a stop 173 m and 26 seconds after passing through the level crossing.

The locomotive data-log also showed that the headlight was illuminated throughout the accident sequence.

Level crossing

At both Nulla Nulla South Road approaches to the railway, active level crossing traffic control equipment was installed to warn road users of approaching trains. The equipment, located each side of the railway crossing, consists of a railway flashing signal assembly fitted with twin red circle aspect lights arranged horizontally and equipped to flash alternately. In addition, 'Railway Crossing' cross-bucks and 'Stop on Red Signal' signs had been installed on the mast assembly (Figure 3). The level crossing equipment, approach signs and painted road markings had been installed in accordance with Australian Standard – *Manual of uniform traffic control devices Part 7 Railway crossings* AS 1742.7-2007.

Data extracted and analysed from the level crossing control system following the collision, shows that all equipment operated as designed and the flashing lights commenced operating 40.1 seconds before the train collided with the school bus.

School bus operations

Relief school bus driver

The relief bus driver had held a bus operator's license for about 20 years and had driven the Bodallin school bus for about 15 years. She had also driven for a different contractor on another bus route in the final school term of 2008 and had maintained appropriate qualifications and training as a school bus driver.

Before driving the bus on 23 March 2009, the relief school bus driver was briefed about the school route by the regular school bus driver. She was given a student contact list and told where each of the children were to be picked up and set down along with a PTA bus route map for reference as she was unfamiliar with the route and some of the roads in the area. In addition, it was the first time the driver had driven on the Moorine Rock Dulyalbin school bus route and it was also the first time she had driven the school bus for the local school bus contractor.

On the afternoon trip, the relief bus driver said she had not been distracted by personal issues, external influences or the children's behaviour on the bus prior to driving onto the excavated crossing. The driver stated that she was not fatigued and had about 8 hours of nightly sleep on each of the previous 2 days.

As the relief bus driver was not familiar with the bus route, when she reached the 'Road Closed' signs and traffic cones, she stated that she expected there would have been detour signs that would have provided guidance for an alternative route around the road works she had encountered

in the morning. The combination of being unfamiliar with the roads in the area, the absence of detour signs in advance of and at road junctions to redirect traffic flow, and being uncertain of what she may encounter near the level crossing ahead, resulted in the relief bus driver choosing to drive around the traffic control devices that had been placed primarily to stop the passage of road traffic.

Although there were no children to pick up or set down along Nulla Nulla South Road, the relief bus driver also believed she was not permitted to deviate from the designated bus route shown on the bus route map. This belief may have been reinforced when she was given no clear direction in her discussions with the Coordinating Principal about what to do if the route was obstructed before the afternoon school run and this may also have influenced her action to drive around the 'Road Closed' signs and barrier boards.

Coordinating Principal

The Moorine Rock School Principal was the designated Coordinating Principal for school bus services operated from the Moorine Rock Primary School. Responsibilities of the position included the planning of temporary alternative routes when the safety of the service may be affected and to seek the advice of appropriate local authorities, shires or councils if necessary.

After the Coordinating Principal had been advised by the Shire that they were not aware of any roadworks on Nulla Nulla South Road, she suggested to the bus driver that she stop and ask the workers at the level crossing which way to go. As the workers had left the worksite for the day, this option was not available to the bus driver.

Notwithstanding the Coordinating Principal's advice, the relief bus driver was required to make an independent decision as to whether or not she should proceed along the closed section of road towards the level crossing, or drive on a road that was not part of the designated bus route.

It is likely that the Coordinating Principal did not fully understand the level of authority she had to plan an alternative temporary bus route in accordance with the *Transport Assistance for Students Operational Policy Manual*[6] and then discuss other route options with the relief bus driver before she commenced the afternoon service.

School bus contractor

The PTA issues contracts to suitably qualified private bus organisations for the operation of regional and country school bus services. To gain accreditation to operate a school bus service, contractors are required to develop and maintain a safety management plan that is periodically audited by the PTA for compliance.

A PTA School Bus Services audit of documentation for the Moorine Rock Dulyalbin school bus service contract following the accident showed that:

- The job specification for the duties and responsibilities of a school bus driver were adequate.
- The training provided to bus drivers was mostly verbal and there was minimal documentation to support that training had been carried out.
- There was no formal induction provided to the relief school bus driver by the school bus contractor.
- The school bus contractor relied on the designated bus driver to provide induction training to the relief school driver.
- An induction training form had not been acknowledged or signed by the relief school bus driver.

Maintenance work processes

Notification of works and sign compliance

For consistency in notification and requests for work that affect shire roads, the Shire of Yilgarn uses the *Main Roads Western Australia - Traffic Management for Works on Roads Code of Practice* as a reference document. Standard practice for non-urgent works is for the proposer of works to complete a traffic management plan and a *MRWA Notification of Roadworks* form and submit these documents to the shire via email or facsimile for assessment at least 1 week prior to

6 Policy manual published by the Public Transport Authority of Western Australia – School Bus Services.

works commencing (except in an emergency). In this instance, the works planned by WestNet Rail at the Nulla Nulla South Road level crossing were not urgent and were being carried out as part of a railway maintenance program. A distribution list on the *MRWA Notification of Roadworks* form includes a footnote stating 'the relevant public transport/school bus services shall be notified' of the proposed works.

During the approval period, the shire assesses the management plan to determine how the proposed works may affect adjoining landholders, the general public, emergency services and road users (including public transport services). Thereafter, the shire advises the proposer what action is required to be taken before work is authorised to commence.

In the lead-up to works being carried out on 23 March 2009, communications between WestNet Rail/JHR and the Shire of Yilgarn were carried out by telephone conversations either directly with the responsible personnel, by messages relayed via administration staff, and by voice mail left on mobile telephones. There were no formal written communications made between the parties to confirm the proposed arrangements before works commenced in accordance with the Shire's standing procedures. Previous applications to the Shire of Yilgarn by WestNet Rail/JHR to close roads for level crossing works had followed those procedures. Written advice in respect of the proposed works had been provided by the shire stating JHR was to advertise in the local newspaper showing a map of the road closure with detours and to supply council with a traffic management plan 2 weeks before commencement of work.

In this instance, a number of important communications between the parties for the notification of proposed works and the approval process did not occur or were not complete, including:

- WestNet Rail/JHR did not lodge a completed *MRWA Notification of Roadworks* form with the Shire of Yilgarn for assessment.
- Some telephone messages between WestNet Rail/JHR and the Shire of Yilgarn may not have been received, clearly understood or responded to.
- The last attempt by WestNet Rail/JHR to make contact with the Shire of Yilgarn about the works was 3 days before work commenced.
- Although the Shire of Yilgarn was aware that a proposal for works by WestNet Rail/JHR was imminent, no written application had been received for assessment.
- As there was no written or verbal confirmation provided by the Shire of Yilgarn to WestNet Rail/JHR before the commencement of works, the Moorine Rock Primary School Principal was not advised of the proposed temporary road closure.
- Affected organisations and adjoining land owners along Nulla Nulla South Road were not advised in advance of the road closure.

As a result, the notification process was not formally completed and users of Nulla Nulla South Road were not advised of the proposed works to close the level crossing on 23 March 2009.

Road closure notifications to advise affected parties are the responsibility of the proposer of works. This occurs after the Shire receives an application by the proposer who in turn is provided with a list of parties who will be affected by the closure/s.

As a consequence, regular road users and emergency services organisations were unable to make advance alternative arrangements to bypass the worksite.

For these works, local worksite road traffic management was carried out by JHR's contractor, Altus Traffic Pty Ltd. Altus Traffic is an 'Authorised Body' permitted to erect traffic signs in accordance with the provisions of the WA Road Traffic Code. WestNet Rail and their agents are also authorised bodies permitted by Main Roads WA to place road signs for the purposes of road traffic management near railway worksites.

During the investigation, a revised version of the *Main Roads Western Australia - Traffic Management for Works on Roads Code of Practice* - April 2009 (CoP) was published. It was noted that the *Notification of Roadworks* form (Appendix 3 of the CoP) contained in the revised code of practice, is now Perth metropolitan specific and has deleted a footnote that in the previous version included a requirement that non-

metropolitan public transport/school bus services shall be notified before commencement of works.

However, Appendix 3 notes that the *Notification of Roadworks* form needs to be appropriately modified for use in regions outside the metropolitan area. Following the release of the revised MRWA CoP, the Shire of Yilgarn have formally included the CoP in their policies and procedures manual with amendments to the *Notification of Roadworks* form that includes notification to schools that may be affected by proposed works.

The Australian Standard *AS 1742.3-2009 Manual of uniform traffic control devices - Traffic control for works on roads*, specifies traffic control measures for organisations about to carry out work to warn, instruct and guide road users in the safe negotiation of their work sites.

Although signs and other traffic control devices erected across the intersection of Nulla Nulla South and Noongar South Roads were placed in accordance with AS 1742.3-2009, no 'Detour Ahead' signs had been erected on approach to the intersection and at the intersection to guide road users on an alternative route.

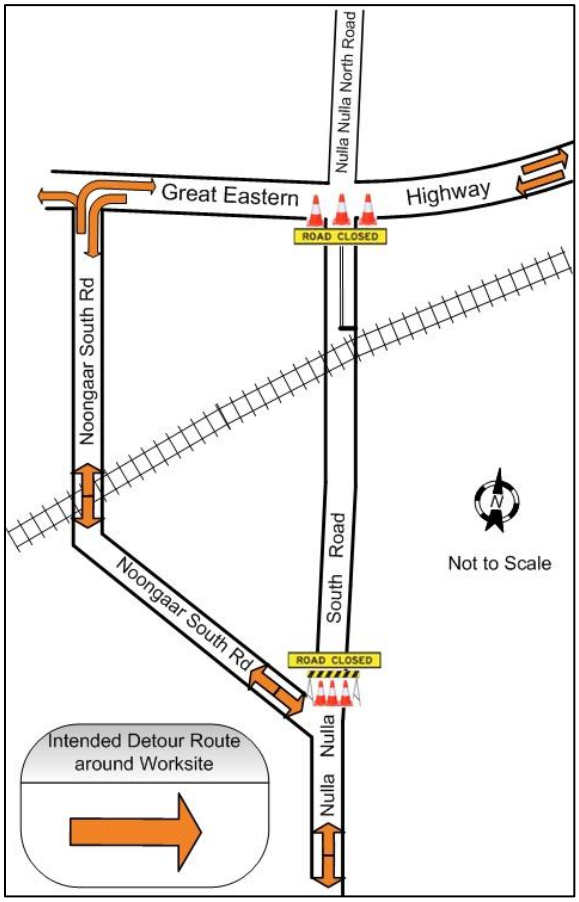
AS 1742.3-2009 states:

> **3.6.4** The DETOUR sign (T5-1B(L or R))shall be used to indicate the direction and location for traffic to leave the normal roadway to detour via existing roads or streets or via a side track bypassing an obstruction (see Clause 4.14). It will usually be necessary to use the advance sign DETOUR AHEAD (T1-6) in conjunction with this sign. DETOUR signs (T5-1A(L or R)) should be used, if necessary, to reassure and guide traffic along the route of the detour.

Although the Nulla Nulla South Road had been signed as closed and largely obstructed for the full width of the carriageway with a barrier board and traffic cones (Figure 3), the absence of detour signs left the bus driver in doubt as to how she would navigate to her next destination on the Great Eastern Highway to set down more school children.

The detour route intended by Altus Traffic staff to bypass the works at the Nulla Nulla South Road level crossing is shown in Figure 4. The failure to place detour signs to assist road users around the closed section of Nulla Nulla South Road was an oversight.

Figure 4: Worksite bypass route for traffic on Nulla Nulla South Road



Interface agreements

During the investigation, it was noted that WestNet Rail and the Shire of Yilgarn did not have an Interface Agreement covering their respective maintenance responsibilities for the level crossing and intersecting road. While there is currently no obligation for rail and road authorities (in this case the Shire of Yilgarn) to enter into such an agreement[7], maintenance responsibilities for level crossings need to be clearly defined.

The establishment of consistent standards and practices is necessary to ensure that all parties are aware of their responsibilities and

7 A national model for rail safety legislation will introduce a requirement for road and rail authorities to have an Interface Agreement defining organisational responsibilities. The Government of Western Australia have sought comments and submissions on model legislation through drafting of the Western Australia Rail Safety Bill 2009 that specifies responsibilities for rail transport operators and road managers. (WA Department for Planning and Infrastructure – 18 May 2009).

accountabilities, particularly with regard to matters affecting the safety of operations at level crossings. For example, where approach warning signs for public road level crossings are necessary, these are generally provided by road authorities. However, it has not always been clear who should provide and maintain these signs. Therefore, the lack of a formal agreement potentially exposes organisations to risk, particularly where items are not provided or maintained in accordance with industry standards because the responsibilities between the parties are unknown or ill-defined.

In this instance, the process for notification of works to the Shire of Yilgarn should have been arranged through the requirements of the MRWA *Traffic Management for Works on Roads Code of Practice* which JHR was expected to comply with.

Had JHR used the *MRWA Notification of Roadworks* form contained within the MRWA *Traffic Management for Works on Roads Code of Practice,* the completion of this action would have largely met the intent of an interface agreement.

Although written approval for the works at the level crossing was not obtained, JHR was still required to contact the shire and confirm their requirements.

During the investigation WestNet Rail advised that:

> John Holland Rail has revised the *Project Procedure - Road Traffic Management at Worksites* which now requires written permission from any relevant road authority. John Holland Rail has also filled a previously vacant project engineer position to increase the engineering support provided to superintendents at their Northam office.
>
> With the imminent introduction of new legislation in WA (based on the model bill) WestNet Rail will develop Interface Coordination Plans with relevant shires as part of meeting the requirements of the new legislation.

Locomotive Horn

Historically, the locomotive horn (audible warning device) was considered an important aid in warning motorists and the public of an approaching train. 'Whistle' signs are placed beside the track in advance of a level crossing to indicate to the train driver where the locomotive horn should be sounded, thereby providing advance warning of an approaching train. A Whistle sign was located 370 m in advance of the Nulla Nulla South Road level crossing. An examination of the locomotive data log records shows that the train horn was not sounded at or near this location as required by the WestNet Rail Network Rules. However, the Nulla Nulla South Road level crossing is fitted with flashing lights and this provides advance warning of an approaching train to road users. Although the train driver did not sound the horn, the flashing lights began operating well in advance of where the train driver would normally have sounded the horn. On this occasion, the operation of the level crossing flashing lights gave adequate pre-warning to the relief bus driver, allowing her to effect the safe and orderly movement of the school children, who were already off the bus, to a position of safety behind a mound of earth about 20 m away from the track. However, neither the operation of the level crossing nor the failure to sound the train horn were factors in the collision as the bus was foul of the crossing well before the train arrived at the crossing.

Train crew safe working qualifications

The maintenance and currency of driver safe working qualifications is the responsibility of the train owner (SCT). In this instance, requalification of the track access permit for the second driver was about 13 months overdue. Although an internal sample audit of train driver training records was carried out on 24 February 2009, this overdue component of the second driver's training was not discovered at this time. However, the overdue qualification was not considered contributory to this accident or the seriousness of its consequences.

Nevertheless, and notwithstanding other risk controls in place including the presence of another train crew member with current qualifications providing opportunities to cross check and monitor operations, an overdue safe working qualification may increase the possibility of an individual acting or making decisions that increase the risk of harm to themselves and others. It is apparent that the train operator's arrangements for ensuring that all relevant staff retain current safe working qualifications are not sufficiently robust.

FINDINGS

Context

At about 1540 on 23 March 2009, SCT Logistics freight train 7GP1 collided with a Moorine Rock Primary School bus at the Nulla Nulla South Road level crossing near Moorine Rock, Western Australia. There were no injuries as a result of the collision but there was significant damage to the school bus.

From the evidence available, the following findings are made with respect to the level crossing collision and should not be read as apportioning blame or liability to any particular organisation or individual.

Contributing safety factors

- The WestNet Rail contractor (JHR) did not follow a previously established interface process outlined in the *Main Roads Western Australia - Traffic Management for Works on Roads Code of Practice.* As a result, JHR did not effectively communicate information about the intended work at the level crossing with the affected parties. In addition, JHR did not receive written approval from the Shire of Yilgarn for the closure of the Nulla Nulla South Road level crossing before commencing work.
- Detour signs were not placed in advance of and at the road closure points on Nulla Nulla South Road to redirect and guide road users around the closed level crossing in accordance with Australian Standard *AS 1742.3-2009*.
- It is likely that the Coordinating Principal did not fully understand the level of authority she had to plan an alternative temporary bus route in accordance with the *Transport Assistance for Students Operational Policy Manual* and then discuss other route options with the relief bus driver before the driver commenced the afternoon bus service.
- The relief school bus driver was reluctant to deviate from the designated school bus route as she was unfamiliar with the route and branch roads off Nulla Nulla South Road.
- The combination of being unfamiliar with the roads in the area, the absence of detour signs in advance of and at road junctions to redirect traffic flow, and being uncertain of what she may encounter near the level crossing ahead, resulted in the bus driver choosing to drive around the traffic control devices that had been placed primarily to stop the passage of road traffic.
- The school bus driver failed to observe that the road structure had been completely removed before driving the school bus into the excavation area close to the railway track.

Other safety factors

- Induction & training of the relief school bus driver had not been carried out in accordance with the Public Transport Authority school bus contractor's safety management plan.
- The locomotive horn was not activated near the whistle sign located about 370 m before the Nulla Nulla South Road level crossing, contrary to WestNet Rail Network Rule 27.
- An overdue safe working qualification may increase the possibility of an individual acting or making decisions that increase the risk of harm to themselves and others. It is apparent that the train operator's arrangements for ensuring that all relevant staff retain current safe working qualifications are not sufficiently robust. *[Minor safety issue]*

Other key findings

- After the school bus became stranded on the track, the school bus driver quickly evacuated the bus and moved the children to a place of safety thereby avoiding a more serious outcome.
- Tests for the presence of alcohol carried out on the school bus driver and locomotive driver by the WA Police from Southern Cross returned negative results.

SAFETY ACTION

The safety issues identified during this investigation are listed in the Findings and Safety Actions sections of this report. The Australian Transport Safety Bureau (ATSB) expects that all safety issues identified by the investigation should be addressed by the relevant organisation(s). In addressing those issues, the ATSB prefers to encourage relevant organisation(s) to proactively initiate safety action, rather than to issue formal

safety recommendations or safety advisory notices.

Depending on the level of risk of the safety issue, the extent of corrective action taken by the relevant organisation, or the desirability of directing a broad safety message to the rail industry, the ATSB may issue safety recommendations or safety advisory notices as part of the final report.

SCT Logistics

Overdue training and assessment

Minor safety issue

An overdue safe working qualification may increase the possibility of an individual acting or making decisions that increase the risk of harm to themselves and others. It is apparent that the train operator's arrangements for ensuring that all relevant staff retain current safe working qualifications are not sufficiently robust.

Action taken by SCT Logistics

Refresher training and a formal reassessment of network rules knowledge was completed by the second driver on 27 March 2009 and a WestNet Rail Track Access Permit was issued to the driver for a further three years. SCT has reviewed the competencies required by GWA drivers and developed a training matrix. The matrix of competencies has been forwarded to GWA management for updating on the SCT Operator Qualification Register (OQR). SCT has further developed the OQR to link to the train consist program for automatic checking of the currency of driver competencies. This function has been trialled and is ready to be put into practice; however, until GWA update all route competencies on the SCT OQR, daily manual checking of operator's competencies will be carried out by SCT.

ATSB assessment of action taken

The ATSB is satisfied that the action taken and proposed by SCT Logistics will adequately address the safety issue.

SOURCES AND SUBMISSIONS

Sources of information

Information for this report was obtained from:

- Altus Traffic Pty Ltd
- Main Roads Western Australia
- SCT Logistics
- The relief school bus driver
- The train drivers
- The Shire of Yilgarn
- WA Department for Planning and Infrastructure
- WA Police
- WA Public Transport Authority
- WestNet Rail

References

Australian Standard *AS 1742.3-2009 Manual of uniform traffic control devices - Traffic control for works on roads.*

Australian Standard *AS* 1742.7-2007 *Manual of uniform traffic control devices Part 7 Railway crossings*.

Glossary for the National Codes of Practice – 2004.

Main Roads Western Australia - *Traffic Management for Works on Roads Code of Practice.*

Public Transport Authority of Western Australia – School Bus Services *Transport Assistance for Students Operational Policy Manual.*

WestNet Rail Network Rules.

Submissions

Under Part 4, Division 2 (Investigation Reports), Section 26 of the *Transport Safety Investigation Act 2003*, the ATSB may provide a draft report, on a confidential basis, to any person whom the ATSB considers appropriate. Section 26 (1) (a) of the Act allows a person receiving a draft report to make submissions to the ATSB about the draft report.

A draft of this report was provided to:

- Altus Traffic Pty Ltd
- SCT Logistics
- The Office of Rail Safety WA
- The relief school bus driver
- The Shire of Yilgarn
- The train drivers
- The school principal
- WA Public Transport Authority.
- WestNet Rail

Submissions were received from SCT Logistics, The Office of Rail Safety WA and WestNet Rail. Those submissions were reviewed and where considered appropriate, the text of the report was amended accordingly.