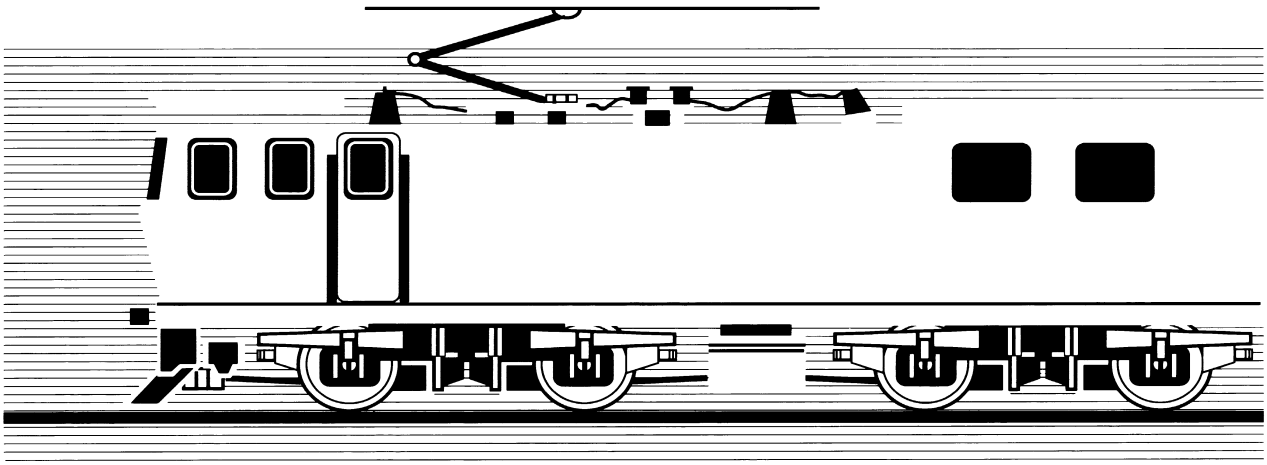
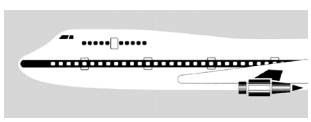
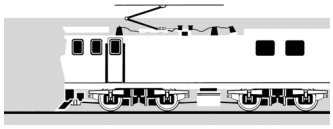


RAILWAY OCCURRENCE REPORT

05-121 **express freight Train 354, near collision with school bus, Caverhill Road level crossing, Awakaponga** **2 September 2005**


TRANSPORT ACCIDENT INVESTIGATION COMMISSION
NEW ZEALAND

The Transport Accident Investigation Commission is an independent Crown entity established to determine the circumstances and causes of accidents and incidents with a view to avoiding similar occurrences in the future. Accordingly it is inappropriate that reports should be used to assign fault or blame or determine liability, since neither the investigation nor the reporting process has been undertaken for that purpose.

The Commission may make recommendations to improve transport safety. The cost of implementing any recommendation must always be balanced against its benefits. Such analysis is a matter for the regulator and the industry.

Report 05-121

express freight Train 354

near collision with school bus

Caverhill Road level crossing

Awakaponga

2 September 2005

Abstract

On Friday 2 September 2005 at about 1600, the locomotive engineer of express freight Train 354 reported to train control that a school bus had passed over Caverhill Road level crossing, Awakaponga, immediately in front of his train. The level crossing had passive protection that included limit line road markings and compulsory stop signs on both sides of the crossing.

The incident was caused by the bus driver not stopping at the level crossing.

No safety deficiencies were identified in the level crossing layout or in the rail system.

One safety recommendation was made to the Chief Executive of ONTRACK regarding the storing of rail vehicles on the north end backshunt at Awakaponga.

Contents

Figures

Abbreviations

km/h	kilometres per hour
m	metre(s)
MTMV	mobile track maintenance vehicle
t	tonne(s)
Toll Rail	Toll NZ Consolidated Limited
UTC	coordinated universal time

Data Summary

Train type and number:	express freight Train 354
Date and time:	2 September 2005 at about 1600[1]
Location:	Awakaponga
Persons on board:	train: 1 bus: 26
Injuries:	nil
Damage:	nil
Operator:	train: Toll NZ Consolidated Limited (Toll Rail) bus: Kawerau Coaches
Investigator-in-charge:	D L Bevin

[1] Times are New Zealand Standard Time (UTC + 12 hours) and are expressed in the 24-hour mode.

1 Factual Information

1.1 Narrative

1.1.1 On Friday 2 September 2005, Train 354 was a Kawerau to Mt Maunganui express freight train and consisted of 2 DC class locomotives in multiple and 47 wagons for a gross tonnage of 1994 t and an overall length of 780 m. It was crewed by a locomotive engineer.

1.1.2 At about 1600, as the train was accelerating towards Caverhill Road level crossing, the locomotive engineer saw a bus approaching. He sounded the locomotive horn to warn the bus driver, but the bus did not stop.

1.1.3 The bus passed close enough in front of the train that the locomotive engineer was able to read the rear registration number plate as his train crossed over the level crossing.

1.1.4 There were no injuries.

1.2 Site information

General

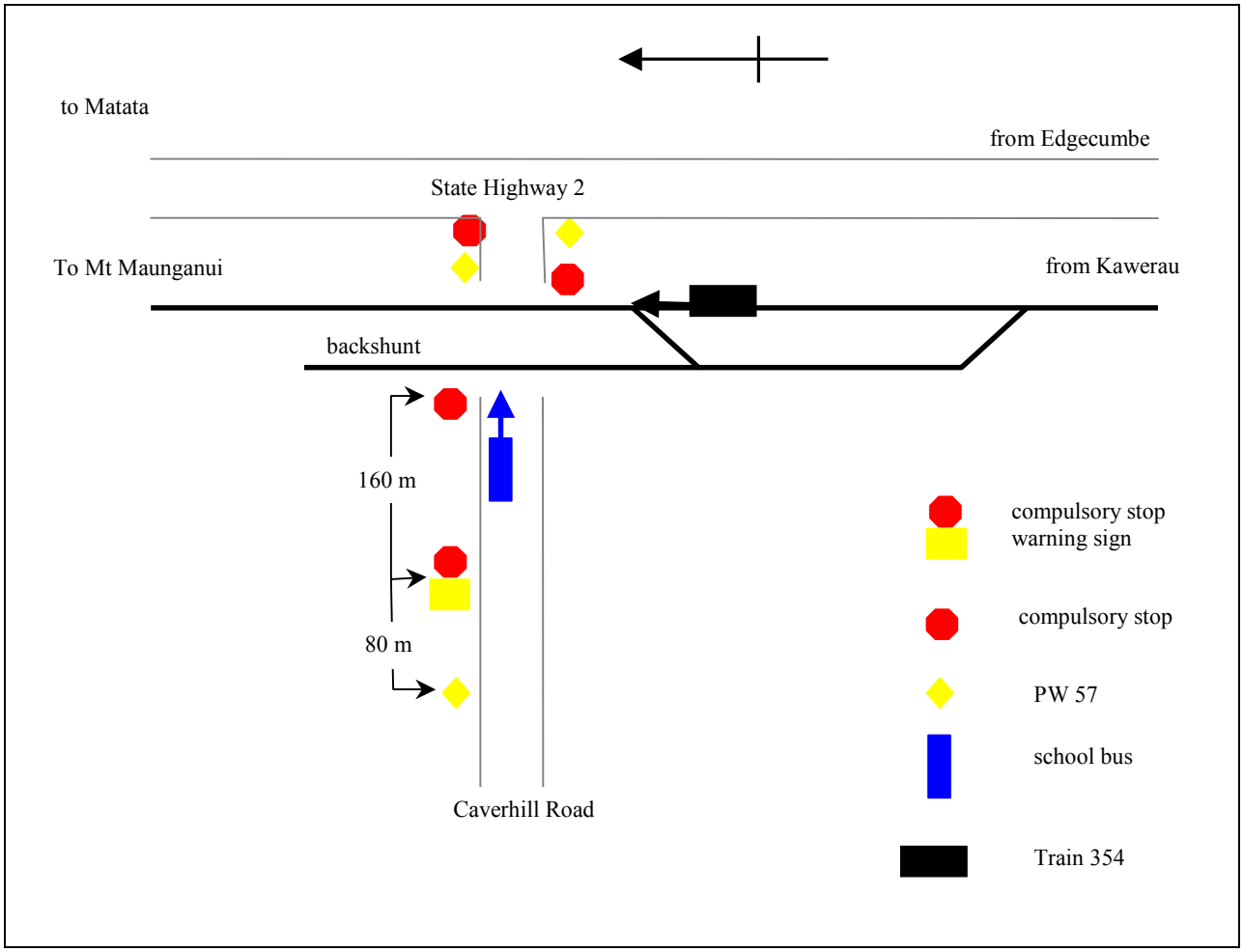


Figure 1
Site diagram of Caverhill Road level crossing (not to scale)

1.2.1 Caverhill Road level crossing was located at 165.300 km on the East Coast Main Trunk and crossed 2 tracks, the main line and a backshunt, or loop extension (see Figure 1). The backshunt was not used, except for the occasional stabling of mobile track maintenance vehicles (MTMV) when working in the area.

1.2.2 The level crossing was traversed by trains travelling in either direction between Kawerau and Mt Maunganui, and by motor vehicle traffic using Caverhill Road to or from State Highway 2. There were 8 scheduled daily train services over the crossing, 3 of those between the hours of 0800 and 1600.

1.2.3 The crossing offered excellent visibility for road traffic approaching the tracks from either direction. On the western side, Caverhill Road was straight for about 400 m as it approached the crossing at a right angle. Trains approaching the crossing from Kawerau, the right-hand side, were visible across flat farm paddocks while trains approaching from Mt Maunganui, the left-hand side, came into view about 240 m from the crossing as they rounded a curve towards the crossing.

1.2.4 The level crossing offered excellent visibility for locomotive engineers approaching from Kawerau (south) as the line approached the crossing on a straight of at least 1200 m. (see Figure 2).

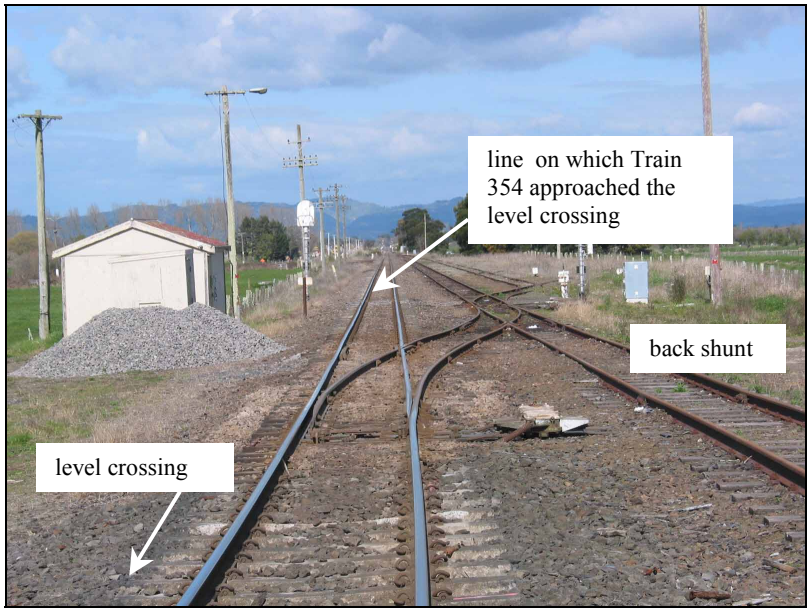


Figure 2
Looking south from the level crossing

1.2.5 The line approached the crossing from the north around a 420 m radius left-hand curve (see Figure 3). Because a locomotive engineer sat on the right-hand side of the locomotive in the direction of travel his view line of the level crossing was reduced.

Figure 3
Looking north from the level crossing

1.2.6 A vehicle count, taken several days after the incident, showed that between 0730 and 0800, 36 motor vehicles, including cars, heavy trucks and buses, used the crossing. Of that number, 20 vehicles, or 55%, had stopped at the compulsory stops on either side of the crossing. Of those that didn't stop, some reduced speed as they approached the crossing, but the majority continued across without slowing down.

1.2.7 On the eastern side of the railway, Caverhill Road connected to State Highway 2 by means of an intersection controlled by a compulsory stop. The intersection was about 50 m beyond the crossing (see Figure 4). The same traffic count showed that of those vehicles that did not stop at the compulsory stop at the western side of the level crossing, a significant number also did not stop at the compulsory stop before entering State Highway 2.

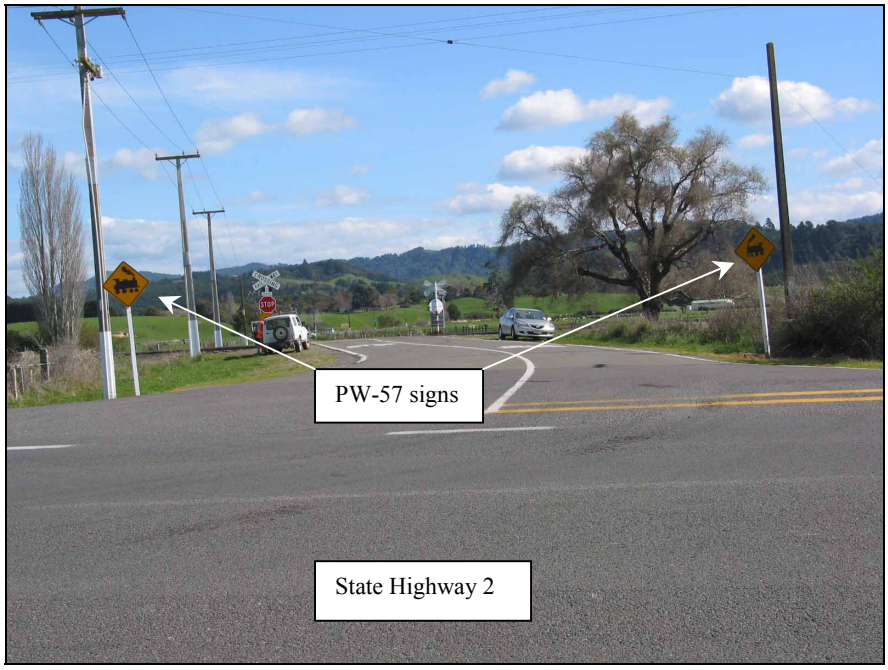


Figure 4
Looking west to the Caverhill Road intersection with State Highway 2

Level crossing protection

1.2.8 A PW-57 sign warning motorists of the level crossing was located about 240 m from the level crossing on the western side. This was in accordance with the "Manual of Traffic Signs and Markings"[2] (the manual), which specified that such signs should be located on the left-hand side of the road at least 60 m from the crossing. The PW-57 signs on the eastern side were about 50 m from the crossing, but physical constraints prevented them being positioned further away. Figure 4 shows the positions of the PW-57 signs on the eastern side of the crossing, and Figure 5 shows the PW-57 sign on the western side.

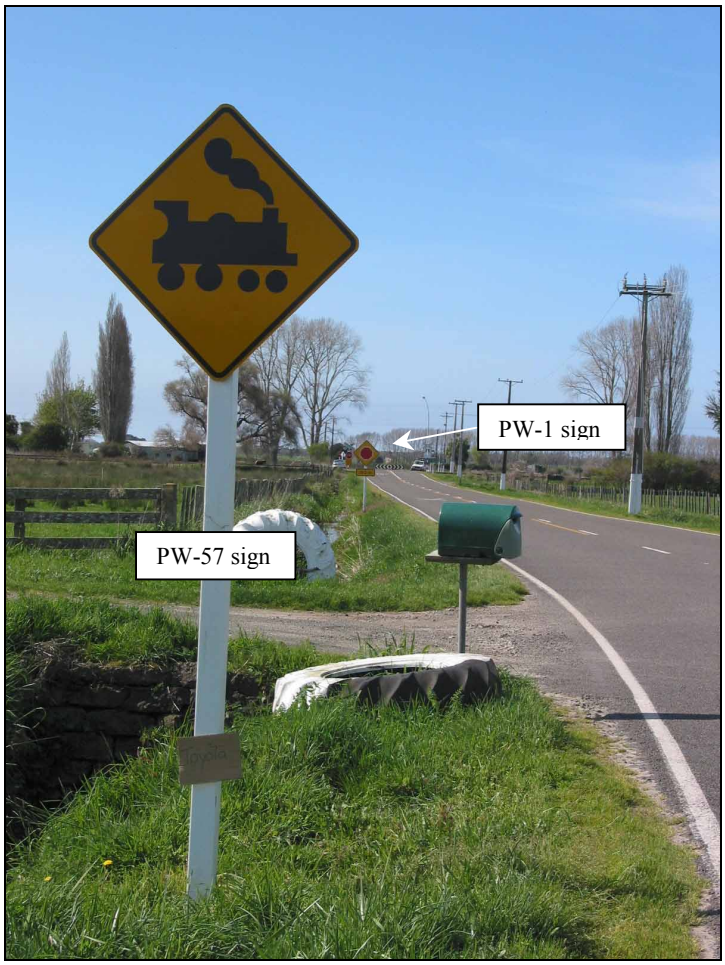


Figure 5
The PW-57 and PW-1 signs on the western approach to the crossing

1.2.9 A PW-1 sign, warning motorists of the impending compulsory stop, was positioned 160 m from the level crossing on the western side of the crossing (see Figure 5). PW-1signs were erected in advance of an RG-32 Railway Level Crossing Stop sign combination[3] (see Figure 6) where the sign was not clearly visible to approaching drivers over a distance of at least 120 m in a rural area. There was no PW-1 sign on the eastern side because of physical constraints. The manual required that in areas with 100 km/h speed restrictions such signs should be positioned 160 m before the RG-32 sign.

[2] A manual jointly prepared and distributed by Transit New Zealand and the Land Transport Safety Authority (now Land Transport New Zealand) that set out the policy and requirements for traffic signs and included guidance for the location and positioning of signs.
[3] An RG-32 Railway Level Crossing Stop sign combination consisted of a PW-14 sign and an RG-5 Stop sign mounted on the same support. A supplementary PW-15 "_" TRACKS was added at crossings with multiple railway tracks. A PW-59 LOOK FOR TRAINS sign was optional.

1.2.10 RG-32 signs were positioned on both sides of the level crossing in accordance with the manual.

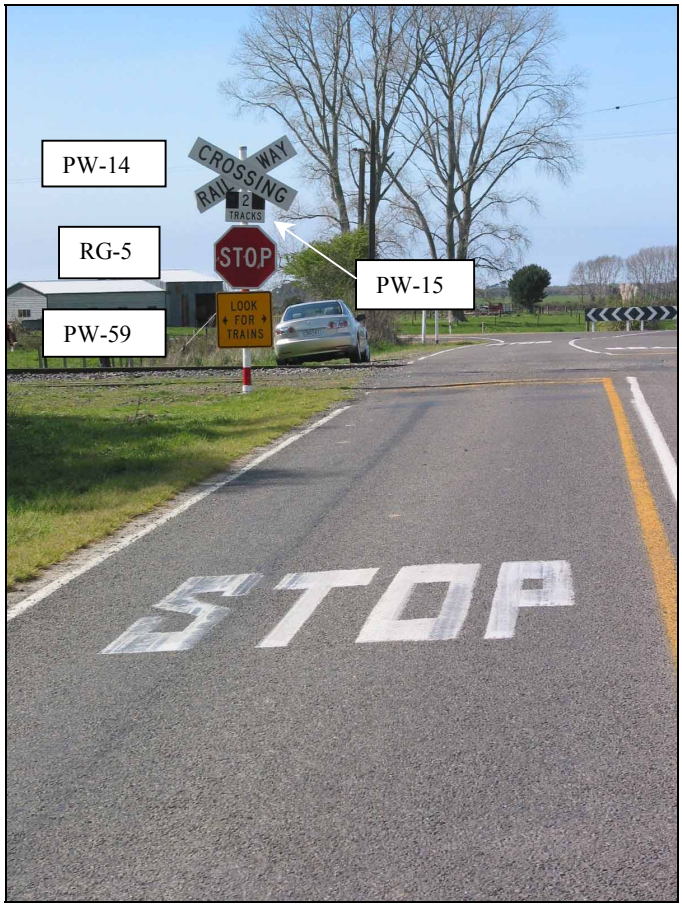


Figure 6
The RG-32 Railway Level Crossing Stop sign combination

1.2.11 The manual required that a PW-13, Railway Crossing on side road sign[4], be erected on the main road approach to a side road intersection where a railway level crossing was located on the side road immediately adjacent to the main road intersection. PW-13 signs were to be erected where they were clearly visible to approaching drivers for a distance of at least 160 m on rural roads. There were no PW-13 signs on State Highway 2 warning traffic turning into Caverhill Road.

1.3 Locomotive event recorder

1.3.1 Train handling was not considered to have contributed to this incident so the locomotive event recorder data was not requested for analysis.

1.4 Personnel

The locomotive engineer

1.4.1 The locomotive engineer said that he was accelerating his train and was travelling between 35 and 40 km/h as it approached the level crossing. As he did so, he saw a bus approaching the crossing from his left, the off side of the cab to which he was sitting.

1.4.2 He sounded the locomotive horn to warn the bus driver of his approach, but the bus did not stop and passed over the crossing, close enough to the locomotive that he was able to read the registration number plate on the bus as he crossed the level crossing behind the bus.

[4] A side road junction symbol (arrow version with railway crossing on side road).

1.4.3 The locomotive engineer sounded the horn a second time as the bus cleared the crossing, which brought gestures from the passengers on the bus. He saw a car stopped on the opposite side of the crossing waiting for the train to pass.

1.4.4 The locomotive engineer said he was sure that at the speed his train was travelling there was no chance of him colliding with the bus on this particular occasion, but was concerned at the closeness of the train to the level crossing when the bus passed over in front of him.

The school bus driver

1.4.5 The bus driver said he was an experienced heavy transport driver and had been driving school buses for about 2 years. The bus was a 46-seater, with a maximum capacity of 64 passengers.

1.4.6 His route took him from Edgecumbe College to Matata with a detour from State Highway 2 along Caverhill Road into Braemar Road to pick up or drop off passengers. At the last drop-off point in Braemar Road, about 4 km from the Caverhill Road intersection, he did a U-turn and returned to State Highway 2 to continue his run. He did the run twice every day, which meant he crossed the level crossing 4 times daily.

1.4.7 He recalled that on leaving the college on the day of the incident he had about 50 passengers on board and by the time he reached the crossing on his return to State Highway 2 there were about 26 still on board.

1.4.8 The bus driver said that he had first seen the train from across farm paddocks when he did his U-turn in Braemar Road. This was about 5 km by road from the level crossing. He said that when he arrived at the level crossing, he had not stopped at the yellow road limit line markings, but had stopped instead on the "old track", which he knew was not used. He said he had stopped there to change gear.

1.4.9 He said he thought the line of sight for road vehicles at the level crossing was excellent and identified a post beside the track, about 200 m away from the crossing, as about where he thought the train was when he arrived. He said that, based on that distance, he made a judgement to cross ahead of the train, which in his opinion he did safely.

1.4.10 The driver said that he had seen trains around the area during his runs, but had never had to wait at Caverhill Road level crossing for one to pass. He thought the locomotive engineer had probably got the registration number of the bus afterwards, when State Highway 2 and the railway line ran adjacent to each other.

1.4.11 Student behaviour was an ongoing problem on the bus and this often distracted the driver. However, he said there had been no such distractions as he approached and crossed the level crossing on the day of the incident. He considered distractions to be a safety issue, as they prevented him from giving his full attention to his driving duties.

1.4.12 The bus company manager confirmed the driver's comments, and said that most of his other drivers would not drive the route. The issue of student behaviour on the bus had been addressed, with actions taken by teaching staff at the college in an attempt to improve it.

Witnesses 1 and 2

1.4.13 Witnesses 1 and 2 were passengers on the school bus at the time of the incident. Witness 1 thought that the driver had seen the train as the bus slowed down but did not stop at the yellow limit lines. The witness estimated that the train was about 35 m away when the bus crossed over.

1.4.14 Both witnesses had seen the train across the farm paddocks as the bus had completed its U-turn in Braemar Road.

1.4.15 When the bus got to the level crossing, they both felt the train was too close for the bus to get across. Witness 1 thought that the train had sounded its horn twice, once as it approached the crossing and again as it passed behind the bus. Witness 1 said that the bus driver had laughed after the bus had cleared the crossing, and that the passengers showed a range of emotions from scared to excited, and some had sworn at the driver.

1.4.16 The witnesses said that student behaviour on the bus often distracted the driver but they were not aware of any behaviour that could have distracted him on the day of the incident, although Witness 2 had heard some of the passengers chanting encouragement to the driver to cross the limit line as the bus approached the crossing.

Witness 3

1.4.17 Witness 3 was the driver of a car stopped on the eastern side of the crossing waiting for the train to approach and pass. The witness had turned from State Highway 2 into Caverhill Road and seen the train coming and had stopped at the level crossing.

1.4.18 The witness saw the bus approaching from the opposite side of the crossing. The bus slowed then sped up, and witness 3 realised it was going to cross in front of the train, which it did. The witness noticed a look of fear on the faces of some of the students on the bus as it went past.

1.4.19 Witness 3 confirmed that the bus had not slowed significantly as it approached the crossing, and estimated there was about one locomotive length between the front of the train and the bus after it crossed.

1.4.20 The witness had not heard the locomotive horn sounding but had a radio on in the car, which could have blocked out the sound.

1.4.21 Coincidentally, the witness had followed the same bus several days later and again it had not stopped at the level crossing.

1.4.22 Witness 3 also expressed concerns about the practice of stabling MTMVs on the back shunt at the level crossing as this significantly reduced visibility to the north for motor vehicles stopped at the compulsory stop at the level crossing. while moving towards State Highway 2. This was because the track curved away behind the stabled vehicles and motorists had to edge on to the crossing to be able to see around the vehicles to see if a train was approaching from that direction (see Figure 7).

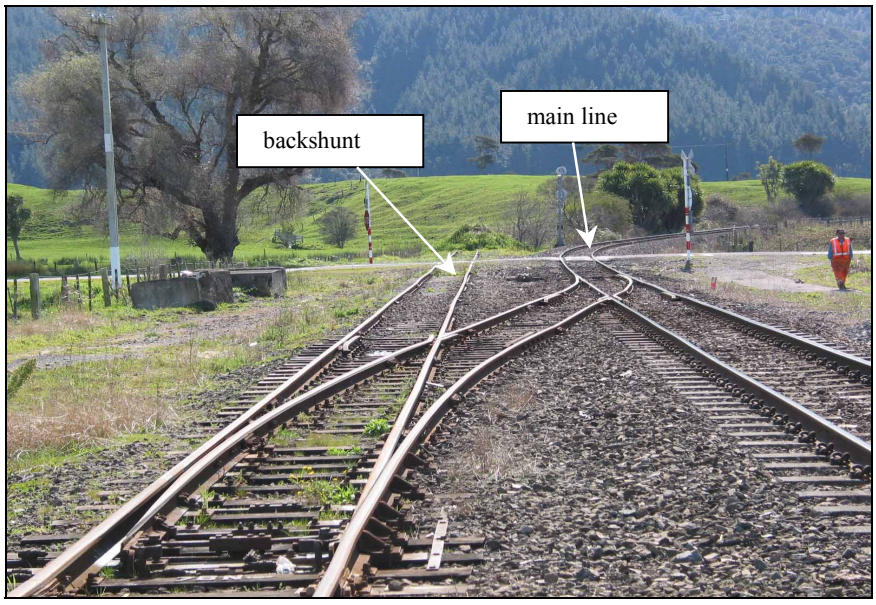


Figure 7
Looking north of the level crossing

2 Analysis

2.1 Caverhill Road was a principal route from State Highway 2 to inland communities. The excellent view lines for motor traffic approaching the crossing from either side was well known to locals and was probably the reason for the high number of vehicles not complying with the compulsory signs protecting the crossing. This behaviour was probably further encouraged by the infrequency of train services on the line, which meant that motorists did not often see or get held up by a passing train. The excellent visibility at the intersection with State Highway 2, particularly to the south, also probably encouraged motorists not to stop at the compulsory stop before turning on to the highway.

2.2 The road signage and markings that were in place, both approaching and at the level crossing, were clearly visible and in good condition and met the signage guidelines in the manual, except for the absence of PW-13 signs on State Highway 2 and the closeness of the PW-57 signs on the eastern side. However, the main defences, namely the RG-32 Railway Level Crossing Stop sign combinations on either side of the crossing, together with the advance warning signs, met the guidelines and the absence of the PW-13 signs did not contribute to the incident. The bus had approached from the western side of the level crossing anyway.

2.3 The high level of non-compliance by motorists with the level crossing signage was cause for concern. However, the Commission's investigation, of necessity, was focussed on the interface between the road and the rail, specifically the physical attributes of the level crossing. The crossing met the critical signage and line-of-sight requirements and these did not contribute to the incident, and the non-compliance by motorists fell outside the scope of the investigation. Had the driver of the bus complied with the signage the incident would not have happened. Compliance with road signs and markings at level crossings does not come within the powers of the Commission.

2.4 The bus driver was familiar with the level crossing and crossed it 4 times per week day during the running of his route. He was aware of the lines of sight available in both directions and considered them to be excellent. The track was infrequently used by rail traffic during daylight hours so the chance of him having to stop at the crossing for a train to pass was remote. As a result, his normal expectation when approaching the crossing was likely that there was not going to be a train approaching. However, on this occasion he had seen the train when he was doing his U-turn in Braemar Road, so he was aware of its presence and should have been expecting to encounter the train in the vicinity of the crossing.

2.5 If the bus had already stopped at the level crossing when the driver saw the train, it would have been unlikely that he would have attempted to cross in front of it at that point. However, if the bus was still moving at normal speed when he saw the approaching train and slowed only slightly, there was time for him to accelerate again and clear the crossing ahead of the train. It was therefore likely that the only way the bus could have cleared the crossing ahead of the train would have been for the driver to have either maintained his speed, or slowed slightly then accelerated and kept going, as witness statements suggested.

2.6 The bus slowed down as it approached the crossing and it was likely that the driver was planning to stop. However, possibly encouraged by the chanting of the passengers, he decided that the bus could clear the crossing ahead of the train and kept going. In doing so he misjudged the distance between the train and the crossing and his bus probably only cleared the crossing 2 or 3 seconds before the train arrived. The estimate by a witness that the train was about 35 m away when the bus entered the crossing was probably accurate. Even if the train had been 200 m distant, to cross ahead of it was not a prudent course of action possibly putting both him and the students in danger.

2.7 The closeness of the train to the bus was reflected in the look of fear on the faces of the passengers, the mix of emotions within the bus, the swearing at the driver and the locomotive engineer being able to read the rear registration number plate of the bus as he passed over the

crossing behind it. The bus driver's laugh and the gestures of the passengers to the locomotive engineer, when he sounded the locomotive horn as the bus cleared the crossing, could have been interpreted as nervous responses to the incident.

2.8 Although not a contributing factor to this incident, the stabling of MTMVs on the backshunt at the north end of the Awakaponga crossing loop was raised during the investigation. This only happens when work is being undertaken in the area, but the presence of these, or any rail vehicles stored on the backshunt, restricts the north view for motorists on the western side of the crossing. Motorists were then forced to edge out onto the crossing to be able to see around the vehicles when looking for trains approaching from that direction. Any degradation in lines of sight at level crossings is viewed with concern and a safety recommendation covering this issue is made to the Chief Executive of ONTRACK.

3 Findings

Findings are listed in order of development and not in order of priority.

3.1 Train 354 was operated correctly and the actions of the locomotive engineer did not contribute to the incident.

3.2 Except for the closeness of the PW-57 signs and the absence of the PW-13 signs on State Highway 2, the existing level crossing signage and road markings were in accordance with guidelines published in the "Manual of Traffic Signs and Markings", Part 1.

3.3 All signage and road markings were clearly visible and in good condition.

3.4 The standard of protection at the level crossing was appropriate for its geography and use.

3.5 The level crossing signage was ignored by a significant percentage of motorists, as was the compulsory stop sign at the intersection of Caverhill Road and State Highway 2.

3.6 View lines for motor vehicle drivers when approaching, and at, the level crossing were adequate.

3.7 The incident was caused by the bus driver not responding to the compulsory stop protection at the level crossing.

4 Safety Recommendation

4.1 On 30 November 2005 it was recommended to the Chief Executive of ONTRACK that he:

> ensure that the northern view lines from the western side of Caverhill Road level crossing for traffic heading east are preserved by prohibiting the storage of rail vehicles on the backshunt at the north end of the crossing loop at Awakaponga (107/05).

4.2 On 8 December 2005 the Chief Executive of ONTRACK responded in part:

> ONTRACK intend to implement this recommendation.
>
> We expect completion of this by 31 January 2006.

Approved on 16 December 2005 for Publication

Hon W P Jeffries
Chief Commissioner

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Transport Accident Investigation Commission
P O Box 10-323, Wellington, New Zealand
Phone +64 4 473 3112 Fax +64 4 499 1510
E-mail: reports@taic.org.nz Website: www.taic.org.nz

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