Australian Government
Australian Transport Safety Bureau

Collision between a motor vehicle and freight train 9261

Brown Street level crossing, Allansford, Victoria | 19 March 2013

Investigation

ATSB Transport Safety Report
Rail Occurrence Investigation
RO-2013-011
Final – 29 October 2013

Released in accordance with section 25 of the *Transport Safety Investigation Act 2003*

This investigation was conducted under the *Transport Safety Investigation Act 2003* by the Chief Investigator, Transport Safety (Victoria) on behalf of the Australian Transport Safety Bureau in accordance with the Collaboration Agreement entered into on 18 January 2013.

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Addendum

Page	Change	Date

Safety summary

What happened

On 19 March 2013, EL Zorro freight train 9261 travelling to Warrnambool, Victoria collided with a northbound motor vehicle at the Brown Street level crossing in Allansford (21 km east of Warrnambool) at about 0730. Vehicular traffic across the Brown Street level crossing was controlled by warning and stop signs (passive controls).

The motor vehicle driver sustained fatal injuries. The train crew were not injured in the accident. The motor vehicle was severely damaged while the train sustained minor damage.

What the ATSB found

The ATSB found that the driver of the motor vehicle did not come to a stop at the railway crossing Stop line and proceeded into the level crossing and the path of the freight train. The ATSB concluded that the driver's familiarity with this crossing, combined with the expectation that a train would not be present due to the low frequency of rail traffic on this line, probably influenced the motorist's behaviour.

When at the Stop line south of the crossing – the direction the motor vehicle driver approached the crossing – there was adequate sighting to the east, the direction from which the train approached.

For approaches other than the occurrence scenario, the level crossing did not meet the requirements of *Australian Standard AS 1742.7-2007, Manual of uniform traffic control devices, Part 7: Railway crossings*. This issue was not found to be contributory to this accident.

Prior to this accident, this level crossing was identified as having sighting issues by the infrastructure manager V/Line and was included in the *2013/14 Fix Country Level Crossings Program*, a Victorian Government funded program to upgrade rural level crossings by equipping them with active controls including lights, bells and boom barriers.

What's been done as a result

Warrnambool City Council has temporarily closed the Brown Street Level Crossing until it is equipped with active traffic controls.

A minor deficiency with respect to the signage north of the level crossing on Brown Street has been rectified by the Warrnambool City Council.

Safety message

This occurrence highlights the need for motor vehicle drivers using railway level crossings to be vigilant, observe road warning signs, obey road rules and look out for trains.

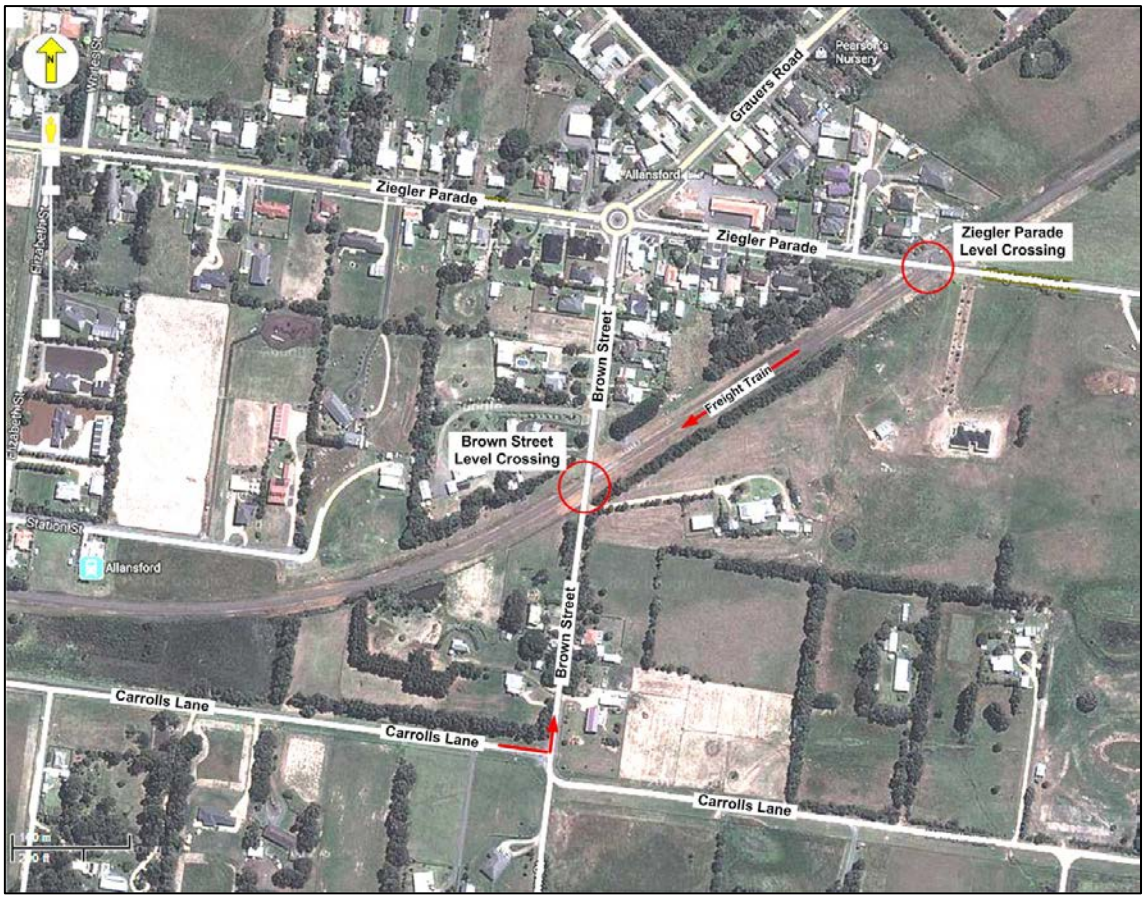
Contents

The occurrence

On 19 March 2013, an El Zorro freight train was operating the scheduled 0235 service 9261 from the North Dynon Yard to Warrnambool, Victoria. Two train drivers were rostered to operate the service and prepared the train after signing on at about 0100. Both drivers reported that all safety checks were conducted prior to departing the North Dynon Yard at about 0240. One driver operated the train to Colac and the second driver took over the controls from there.

At about 0726, as train 9261 approached the Brown Street level crossing from the northeast, a resident of Allansford departed his home by motor vehicle. He was required to start work at 0730 and had planned to pick up a passenger who lived to the north of the Brown Street level crossing. The driver intended to drop the passenger en route and then continue to his regular workplace, which was approximately a 20 minute drive from his residence. The day before the occurrence, the driver had forewarned the passenger that he intended to get to work on time and required the passenger to be ready to leave on time the following morning. The motor vehicle was observed to proceed at a relatively high speed down Carrolls Lane, brake sharply and then continue down Brown Street at speed towards the level crossing (Figure 1).

Figure 1: Overview of motor vehicle and train 9621 approach path to the Brown Street level crossing



Source: Image courtesy of Google maps

Train 9261 continued to approach the Brown Street level crossing. The locomotive data recorders[1] indicate that the train was travelling at about 76 km/h, which was within the permissible line speed of 80 km/h. The co-driver seated in the left hand side of the cab reported noticing the

[1] Hasler Bern Speed Recorders on Locomotives T378 and T320.

approaching motor vehicle just before impact and called-out to the driver, who was on the opposite side of the cab, to make an emergency brake application.

The locomotive data loggers recorded the emergency brake application occurred at about 0730, which was about the same time that the motor vehicle entered into the path of the freight train which collided with it. The severely damaged motor vehicle came to rest to the southwest of the level crossing approximately 33 m from the point of impact (Figure 2). Train 9261 continued braking, coming to a stop about 434 m from the level crossing.

The driver of the motor vehicle was fatally injured. Minor damage was sustained by the lead locomotive (Figure 2). There were no injuries to the train crew.

Figure 2: Damage to lead locomotive T378 and the motor vehicle

Source: Chief Investigator, Transport Safety (Victoria)

Context

Location

Allansford is located about 21 km east of Warrnambool, Western Victoria. The Brown Street level crossing is on the section of the V/Line broad-gauge regional network connecting Geelong and Warrnambool (Figure 3).

Figure 3: Location of Allansford, Victoria

Source: Copyright Melway Publishing 2013. Reproduced from Melway Edition 41 with permission

Level crossing control

The Brown Street level crossing was equipped with passive controls.[2] The movement of vehicular traffic across the crossing was controlled by approach warning signage, road markings and Stop signs for each road approach. Road users were required to stop at the Stop sign/line and detect the approach of a train by direct observation.

Signage at level crossing

Australian Standard, Manual of uniform traffic control devices, Part 7: Railway crossings (*AS 1742.7 – 2007),* specifies the signage and sighting requirements for level crossings with passive controls.

[2] Passive controls are where the control of the movement of vehicular traffic across a railway crossing is by signs and devices, none of which are activated during the passage of a train and rely on the road user detecting the approach of a train by direct observation.

Figure 4: Brown Street level crossing (approach from the south)

Source - Chief Investigator, Transport Safety (Victoria)

Brown Street has a sign-posted speed limit of 50km/h. Other traffic controls installed on the approach from the south of the Brown Street level crossing (Figure 4) included a *Railway Crossing Ahead (W7-7)* sign located 136 m before the Stop line. A *Stop Sign Ahead (W3-1)* sign was located as the second warning sign about 88 m in advance of the Stop line. Just beyond the Stop line, a *Railway Crossing Stop Assembly (RX-2)* and *Railway Crossing Width Marker Assembly (RX-9)* were located as required. The Stop line was marked 9.6 m from the nearest rail.

The 'RAIL X' road markings were located on the middle of the road (Figure 5). The positioning of the road markings was inconsistent with the requirements of *AS 1742.7-2007*, but this is not unusual for narrow roads.

Figure 5: Signage and road markings on approach to Brown Street level crossing from south

Source: PASS Assets – Public Transport Victoria

An inspection of the traffic controls installed on the approach from the north of the Brown Street level crossing found that the *Stop Sign Ahead (W3-1)* was missing, but all the other signage required by the *AS 1742.7-2007* was in position at the recommended distances.

Sighting at level crossing

When approaching the level crossing from the south, the sighting of the rail track in both the easterly and westerly directions was obscured by vegetation and the surrounding landscape, until the road vehicle was stopped at the Stop line. Once at the Stop line there is clear sighting available to the driver of the rail track in the easterly direction (Figure 6).

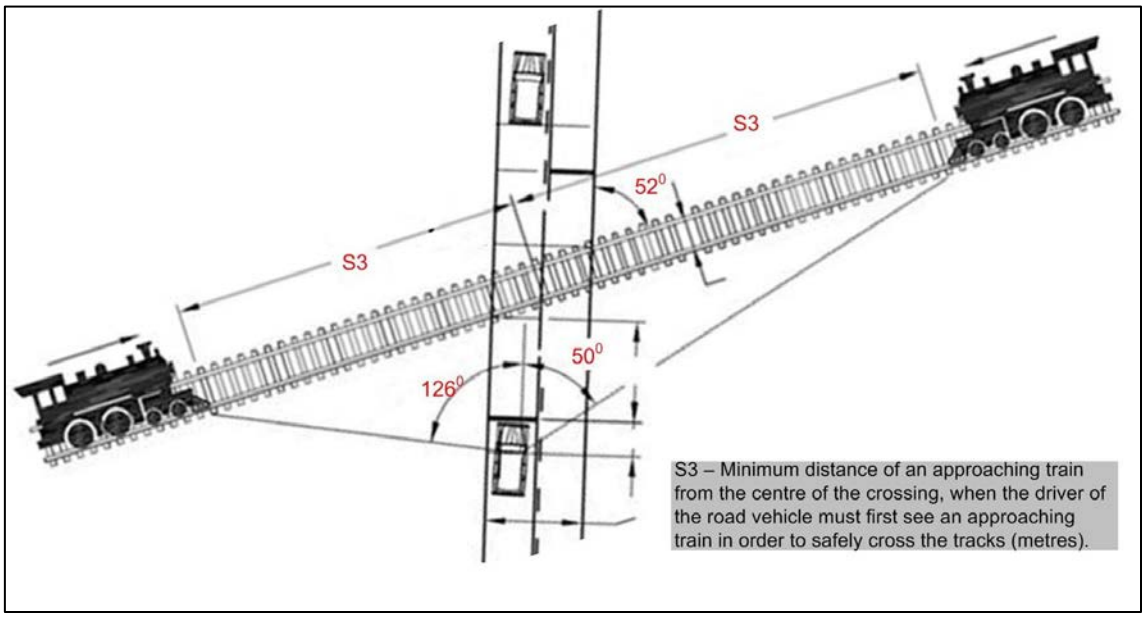
Figure 6: Sighting from Brown Street level crossing Stop line to the east

Source: Chief Investigator, Transport Safety (Victoria)

The directional alignment of Brown Street is approximately 8° east of north and forms an angle of 52° with the rail tracks. The *AS 1742.7-2007* specifies maximum sighting angles to the left and right measured at the stop line to ensure that an approaching train can be sighted without excessive head movement by a vehicle driver or sight obstructed by parts of the vehicle itself. An assessment of the Brown Street level crossing's geometry revealed a viewing angle of 50° to the right which is well within the maximum angle of 140° specified by the standard. However, the viewing angle to the left of the crossing was calculated at 126°, which is above the maximum allowable angle of 110° (Figure 7).

Safety information was released to the Warrnambool City Council and V/Line (Appendix A) advising of the non-compliances with the *AS 1742.2-2007,* and that a significant risk of a collision existed at this level crossing. In response, the Warrnambool City Council advised that this level crossing would be closed to road traffic until fitted with active traffic controls.

Figure 7: Sighting angles calculated as per 1742.7



Source: AS1742.7 - 2007

Environmental conditions

The accident occurred at about 0730, just before sunrise (0731). At the time, the sun's azimuth[3] was 91.7° at an altitude[4] of -1.1°. The ATSB considered whether the sun glare, which is at its most intense at sunrise, could have affected the sighting of the train. Practical observation carried out at the site indicated that the sun glare was unlikely to have been a factor as the angle of sighting down the track and the topography of the cutting would have obscured the sun, which would have been just below the horizon at the time of the accident.

Level crossing sighting/clearing distance

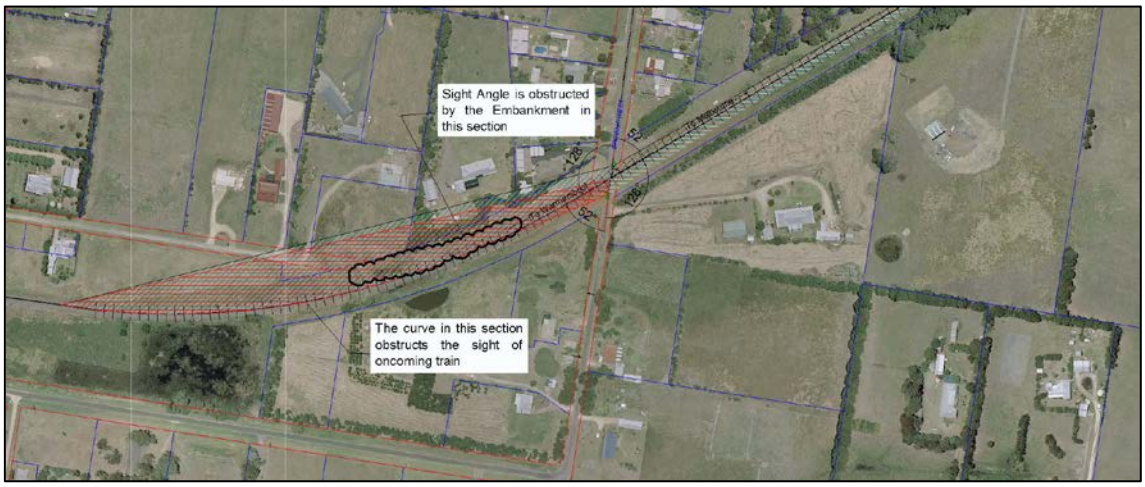
With respect to sighting distances, the *AS 1742.7-2007* requires that the distance is sufficient for the road vehicle driver stopped at the Stop line to be able to start off and clear the crossing before the arrival of a previously unseen train. The Standard has a formula for calculating the minimum sighting distance for a vehicle of maximum length allowed for this road (design vehicle)[5]. Using the formula and measurements obtained on site, the design vehicle when stopped at the Stop line on the southern side of the Brown Street level crossing requires 414 m sighting distance to safely clear the track with a train approaching at 80 km/h (normal track speed). When the formula was applied to a vehicle with similar specifications to the accident vehicle, the sighting distance requirement was about 356 m.

From the Stop line south of the Brown Street level crossing, and looking east, the Ziegler parade level crossing which is located 360 m from Brown Street level crossing could be clearly seen (Figure 6) and the Princes Highway overhead bridge located approximately 950 m from the Brown Street level crossing could also be sighted by a diligent observer. Therefore, the available sighting exceeded the minimum sighting requirements specified in the *AS 1742.7-2007*.

[3] Azimuth is the clockwise horizontal angle from true north to the sun.
[4] Altitude is the vertical angle from an ideal horizon to the sun.
[5] The minimum sighting distance calculation was based on a loaded semi-trailer, 19 m in length (maximum allowable for this road) and having an acceleration of 0.36 m/s².

When at the Stop lines south of the Brown Street level crossing and looking west, the minimum sighting distances specified by the Standard were not met due to track curvature and the embankment (Figure 8).

Figure 8: Sighting to west from Stop line south of Brown Street



Source: Warrnambool City Council

Rail crossing interface coordination

The *Rail Safety Act 2006 (Vic)* requires that rail infrastructure managers and other relevant stakeholders, such as road managers, seek to enter into safety interface agreements (SIA) to enable cooperative management of risk at railway level crossings. For this location, the SIA was between the rail infrastructure manager, V/Line and the Warrnambool City Council as the road manager. SIAs require that the parties identify and assess risks and determine measures to manage those risks, so far as is reasonably practicable.

In November 2010, the Victorian Government announced a boom barrier program to upgrade 75 level crossings in regional Victoria, the *2013/14 Fix Country Level Crossing Program*. The Australian Level Crossing Assessment Model (ALCAM)[6] was used to compile the initial list of level crossings that required upgrading.

In January 2013, V/Line proposed that the Brown Street level crossing be added to the list on the program. The rationale for adding this level crossing to the program was that the crossing had poor sighting and that there had been two recorded incidents at this location. Road volumes were also considered relatively high for a passive crossing on a passenger line (200 vehicles per day).

The Warrnambool City Council advised the ATSB that the council had also identified sighting issues with this level crossing and had considered options of closing off the crossing or re-aligning the crossing to improve sighting angles. However, they had not progressed with either of the options because the crossing was placed on the *2013/14 Fix Country Level Crossing Program*.

Train & crew

Train

The train consisted of two locomotives hauling 19 freight wagons. The total length of the train-consist was 352.4 m with a trailing load of 440.1 t. The train headlights and horn were tested and found to operate satisfactorily. Neither the train handling nor the train's mechanical systems were considered factors in the collision.

[6] ALCAM is the Australian and New Zealand standard for assessing level crossings.

Train Horn

It was reported that the train horn was sounded at the whistle board prior to, and then again at the Zeigler Parade level crossing. There is conflicting information from witnesses whether the locomotive horn was sounded between Zeigler Parade and the Brown Street level crossing.[7] When the train horn was sounded at the Zeigler Parade level crossing, the motor vehicle was about 270 m from the Brown Street level crossing (assuming the motor vehicle was travelling at a speed of 60 km/h). This locates the motor vehicle on Carrolls Lane when the train horn was sounded.

Considering the topography of the terrain and the vegetation between the Zeigler Parade crossing and the Brown Street crossing it is unlikely that the motor vehicle driver would have been alerted to the approaching train by its horn.

An NTSB study[8] reported that the sound of a train horn is effective as a warning only if the road vehicle driver recognises it as a train horn, and that this recognition is affected by the vehicle interior noise levels, exterior traffic noise, the sound characteristics of the train horn, vehicle driver expectations, and 'insertion loss'.[9] Other environmental characteristics that affect the audibility of a locomotive warning horn include surrounding or nearby terrain, buildings and landscape elements as well as sound attenuation materials included within vehicle body shells. Due to the severely damaged condition of the motor vehicle the investigation could not ascertain if the vehicle's sound system was operating at the time of the accident.

The NTSB report concludes that '…it is difficult for a [road vehicle] driver to detect the presence of a train by its audible warning only and still have sufficient time to react to its presence'. The vehicle was observed being driven at speed before the accident. In the above context it is questionable whether, even if the locomotive horn had been sounded before the Brown Street level crossing, it would have alerted the motor vehicle driver, such as to create awareness of the train and provide him sufficient time to react to it.

Crew

The two drivers that were operating the freight train at the time of the accident were appropriately trained, qualified and certified as competent. Both drivers were assessed as competent to drive the Melbourne to Warrnambool corridor. Medical certification of the crew was valid and current at the time of the accident. No alcohol was detected during post-incident preliminary breath tests conducted on the drivers.

Road vehicle and driver

The motor vehicle was inspected post incident and no mechanical defects that may have contributed to the accident were identified during the inspection.

Driver

The motor vehicle driver had held a driver's licence for approximately three and a half years. There was no evidence to indicate that the driver was fatigued or had a medical condition that may have contributed to this accident.

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[7] The Hassler-Bern data logger fitted on this train does not record instances of train horn soundings.

[8] National Transportation Safety Board (1998), *Safety at passive grade crossing; Volume1: Analysis*. Safety Study NTSB/SS-98/02.

[9] *Insertion loss* is the difference between the measured values of a sound from an exterior sound source taken outside the highway vehicle and from inside the vehicle.

Other occurrences

For this level crossing, two near miss incidents (August 2008 and November 2009) had been reported by train drivers. On average, of the 100 level crossing incidents that take place annually in Australia; 37 result in fatalities. In 2002, the ATSB reviewed information on 87 fatal level crossing accidents and has found that in 66 per cent of these accidents the road vehicle was impacted by the front of the train and over 80 per cent occurred in daylight during fine weather conditions. The review also found that unintended road user error accounted for 46 per cent of these fatal events.[10]

[10] Australian Transport Council, *National Railway Level Crossing Safety Strategy 2010-2020*.

Safety analysis

The occurrence

The motor vehicle driver approached the crossing from the south and drove into the path of the freight train. For this approach all warning signage was clear and visible and consistent with the Australian Standard requirements. The weather conditions at the time of the accident were fine and no medical or fatigue-related condition with respect to the driver's behaviour became evident in this investigation.

Driver behaviour and situational factors

Expectancy and familiarity

A National Transportation Safety Board (NTSB) study[11] of drivers involved in accidents at passive level crossings discovered that a significant factor that influenced a road user to look for trains was their expectation of encountering one. An individual's perception of the probability of a particular event occurring is strongly influenced by past experience.[12] The perception of road users, that a train is unlikely to be there, is reinforced every time they traverse the crossing and do not encounter a train. The NTSB study concludes that the frequency with which they encounter a train at a crossing will influence the likelihood of that road user stopping at the crossing.

Another factor that has been found to influence a road user's behaviour at a level crossing is their level of familiarity with it.[13] A study involving passive level crossings[14], determined that crossing familiarity combined with the expectation that a train won't be present has the potential to lull motorists into becoming complacent or developing poor looking habits.

In the context of acquiring and processing task-related information a motor vehicle driver is required to identify and interpret salient cues that exist within the operational environment. Part of this process involves the driver being able to recognise situations that are inconsistent with expectations. The motor vehicle driver resided about 1.2 km from the Brown Street level crossing. On a weekday six scheduled passenger train movements and two freight train movements pass through this level crossing. Being a local roadway, he had used the crossing frequently, but may have rarely encountered trains due to the limited frequency of train movements on this line. Under these circumstances the driver may have become desensitised to the warning signage and, as the research[15] indicates, become complacent or developed poor looking habits at this crossing.

The above factors and the driver's preoccupation with getting to work on time may have contributed to the driver not stopping at the level crossing.

Sighting

Due to roadside and private property vegetation, motorists travelling along Brown Street have no prior sighting of approaching trains until they are close to the tracks. Consistent with *AS 1742.7-2007* this crossing was therefore controlled by Stop signs, rather than Give Way signs.

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[11] Ibid 8.

[12] Schoppert, D.W and Hoyt, D.W. (1968). Factors influencing safety at highway- rail grade crossings, Highway Research Board, National Research Council, Washington, - Cited in NTSB 1998.

[13] Yeh, M. & Multzer, J. (2008) Driver Behaviour at Highway-Railroad Grade Crossings: A Literature Review from 1990-2006. *Human Factors in Railroad Operations* United States Department of Transportation, Federal Railroad Administration: Washington DC.

[14] Caird, J.K., Creaser, J.I., Edwards, C.J. and Dewar, R.E. (2002) Highway-Railway grade crossing research; A human factors analysis of highway-railway grade crossing accidents in Canada; TP 13938E.

[15] Ibid.

In this occurrence, the sighting from a road vehicle at the Stop line looking towards the approaching train met the requirements of the *AS 1742.7–2007*. However, for other road and rail approach scenarios sighting was affected by track curvature and topography to the west and the angle of the road-rail intersection. This crossing had therefore, and appropriately, been identified as a crossing that had sighting issues. Where sighting distances are inadequate for crossings with passive controls, *AS1742.7-2007* states that if the crossing is to remain open, alternative measures such as restoration of sight distance by sight benching in cuttings, clearing, geometric alteration of the crossing or active control should be considered.

In this instance, the crossing had been identified for upgrade to active crossing protection to address the sighting issues; however no action had been taken to manage the risk until the implementation of the upgrade. During the investigation, the Chief Investigator, Transport Safety (Vic) released safety information (Appendix A) to the Warrnambool City Council and V/Line, advising them of the existing risk of collision at the Brown Street level crossing. In response, the Warrnambool City Council advised that they had closed the Brown Street level crossing to road traffic until it is equipped with active traffic controls.

Level crossing signage

The *Stop Sign Ahead (W3-1)* was missing on the north side of the level crossing. All signage on the roadway approaching the Brown Street level crossing from the south was clear, visible and positioned as required by *AS 1742.7-2007*.

Findings

From the evidence available, the following findings are made with respect to the collision between a motor vehicle and El Zorro freight train 9261 at the Brown Street level crossing, Allansford on 19 March 2013. These findings should not be read as apportioning blame or liability to any particular organisation or individual.

Safety issues, or system problems, are highlighted in bold to emphasise their importance.

A safety issue is an event or condition that increases safety risk and (a) can reasonably be regarded as having the potential to adversely affect the safety of future operations, and (b) is a characteristic of an organisation or a system, rather than a characteristic of a specific individual, or characteristic of an operating environment at a specific point in time.

Contributing factors

- The driver of the motor vehicle did not stop at the Stop line of the level crossing and entered the crossing into the path of the approaching freight train.

Other factors that increase risk

- **For approaches other than the one taken by this motor vehicle driver, this level crossing did not meet the requirements of *Australian Standard AS1742.7-2007, Manual of uniform traffic control devices, Part 7: Railway crossings* [Safety Issue].**

- **A review of the signage requirements for compliance with *Australian Standard AS1742.7-2007, Manual of uniform traffic control devices, Part 7: Railway crossings* indicated that the *Stop Sign Ahead (W3-1)* was missing on the northern side of the Brown Street level crossing [Safety Issue].**

Other findings

- When approaching the crossing from the south there is adequate sighting to the east from the Stop line.

- There were no deficiencies identified with the mechanical condition of the motor vehicle that may have contributed to the collision.

- There were no deficiencies identified with the mechanical condition of the freight train that may have contributed to the collision.

- There was little effective action that the train crew could have taken to prevent or minimise the impact of the collision.

Safety issues and actions

The safety issues identified during this investigation are listed in the Findings and Safety issues and 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.

Level crossing sighting

Number:	RO-2013-011-SI-01
Issue owner:	Warrnambool City Council
Operation affected:	Rail - Other
Who it affects:	Users of Brown Street level crossing

Safety issue description:

For approaches other than the one taken by this motor vehicle driver, this level crossing did not meet the requirements of *Australian Standard AS1742.7-2007, Manual of uniform traffic control devices, Part 7: Railway crossings*.

Response to safety issue: Warrnambool City Council.

The Warrnambool City Council has advised that the Brown Street level crossing has been closed until it is equipped with active traffic controls.

Action number: RO-2013-011-NSA-007

ATSB comment:

The ATSB is satisfied that appropriate action has been taken by Warrnambool City Council.

Level crossing signage

Number:	RO-2013-011-SI-02
Issue owner:	Warrnambool City Council
Operation affected:	Rail - Other
Who it affects:	Users of Brown Street level crossing

Safety issue description:

A review of the signage requirements for compliance with *Australian Standard AS1742.7-2007, Manual of uniform traffic control devices, Part 7: Railway crossings* indicated that the *Stop Sign Ahead (W3-1)* was missing on the northern side of the Brown Street level crossing.

Proactive safety action taken by: Warrnambool City Council

The Warrnambool City Council has advised that the missing signage at Brown Street level crossing has been reinstated.

Action number: RO-2013-011-NSA-008

ATSB response:

The ATSB is satisfied that appropriate action has been taken by Warrnambool City Council.

General details

Occurrence details

Date and time:	19 March 2013 – 0730 EST	
Occurrence category:	Accident	
Primary occurrence type:	Level crossing collision	
Location:	Brown Street, Allansford, Victoria	
	Latitude: 38° 23' S	Longitude: 142° 36' E

Train details

Train operator:	El Zorro	
Service:	9261	
Type of operation:	Freight train	
Persons on board:	Crew – 02	Passengers – 0
Injuries:	Crew – 0	Passengers – 0
Damage:	Minor	

Motor vehicle details

Vehicle type:	Holden Combo Van	
Registration:	Private	
Persons on board:	Driver - 1	
Injuries:	Driver – Fatal	Passengers – 0
Damage:	Significant	

Sources and submissions

Sources of information

The sources of information during the investigation included:

- El Zorro Transport Pty Ltd
- V/Line Corporation
- VicTrack
- Victoria Police
- Warrnambool City Council.

References

Australian Government, Geoscience Australia.

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Australian Transport Council, *National Railway Level Crossing Safety Strategy, 2010-2020*.

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Yeh, M. & Multzer, J. (2008). Driver Behaviour at Highway-Railroad Grade Crossings: A Literature Review from 1990-2006. *Human Factors in Railroad Operations*. United States Department of Transportation, Federal Railroad Administration: Washington DC.

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.

Any submissions from those parties will be reviewed and where considered appropriate, the text of the draft report will be amended accordingly.

Appendices

Appendix A – Release of safety information

During this investigation, the Chief Investigator, Transport Safety (Vic) released the following safety information to the Warrnambool City Council and V/Line, advising of the existing risk of collision at the Brown Street level crossing.

The Chief Investigator, Transport Safety (Vic) is investigating a collision between a motor vehicle and a freight train at the Brown Street level crossing, Allansford that occurred on 19 March 2013. The investigation is being undertaken under the *Transport Safety Investigation Act 2003* and in accordance with a collaboration agreement with the Australian Transport Safety Bureau (ATSB).

In the interests of improving transport safety at this location, the following information obtained during this investigation is released under Section 61 of the *Transport Safety Investigation Act 2003.*

The investigation has been provided with the ALCAM assessment data for this level crossing and the Victorian Railway Crossing Safety Steering Committee (VRCSSC) report. The report states that the Brown Street level crossing has been identified by V/Line as a crossing with poor sighting and has been added to the *2013-14 Fix Country Crossing Program*.

Initial assessment of the crossing by the investigation confirms that the sighting distances and sighting angles of the crossing do not meet the *AS 1742.7 – 2007* requirements. This level crossing is a passive crossing with Stop signs and the line speed for this passenger line is 80 km/h. Warrnambool City Council has estimated that vehicular traffic on Brown Street is approximately 200 vehicles per day and may include small passenger coaches and semi-trailers. There have been two incidents prior to this collision at this crossing. The Council further advised the investigation that they had considered re-alignment or closing the crossing, but had deferred progressing either of these options as the crossing was placed on the list for upgrading with active protection devices.

Based on our review of the above information, the investigation considers that a significant risk of collision exists at this level crossing until it is fitted with active protection and accordingly, the Chief Investigator, Transport Safety (Vic) encourages Warrnambool City Council / V/Line to take effective safety action on this matter in the interim.

As part of the investigation process, safety actions taken during the course of an investigation are detailed within the final report and considered by the Chief Investigator when assessing residual risk at the conclusion of the investigation.

Australian Transport Safety Bureau

The Australian Transport Safety Bureau (ATSB) is an independent Commonwealth Government statutory agency. The ATSB is governed by a Commission and is entirely separate from transport regulators, policy makers and service providers. The ATSB's function is to improve safety and public confidence in the aviation, marine and rail modes of transport through excellence in: independent investigation of transport accidents and other safety occurrences; safety data recording, analysis and research; fostering safety awareness, knowledge and action.

The ATSB is responsible for investigating accidents and other transport safety matters involving civil aviation, marine and rail operations in Australia that fall within Commonwealth jurisdiction, as well as participating in overseas investigations involving Australian registered aircraft and ships. A primary concern is the safety of commercial transport, with particular regard to fare-paying passenger operations.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and Regulations and, where applicable, relevant international agreements.

Purpose of safety investigations

The object of a safety investigation is to identify and reduce safety-related risk. ATSB investigations determine and communicate the safety factors related to the transport safety matter being investigated. The terms the ATSB uses to refer to key safety and risk concepts are set out in the next section: Terminology Used in this Report.

It is not a function of the ATSB to apportion blame or determine liability. At the same time, an investigation report must include factual material of sufficient weight to support the analysis and findings. At all times the ATSB endeavours to balance the use of material that could imply adverse comment with the need to properly explain what happened, and why, in a fair and unbiased manner.

Developing safety action

Central to the ATSB's investigation of transport safety matters is the early identification of safety issues in the transport environment. The ATSB prefers to encourage the relevant organisation(s) to initiate proactive safety action that addresses safety issues. Nevertheless, the ATSB may use its power to make a formal safety recommendation either during or at the end of an investigation, depending on the level of risk associated with a safety issue and the extent of corrective action undertaken by the relevant organisation.

When safety recommendations are issued, they focus on clearly describing the safety issue of concern, rather than providing instructions or opinions on a preferred method of corrective action. As with equivalent overseas organisations, the ATSB has no power to enforce the implementation of its recommendations. It is a matter for the body to which an ATSB recommendation is directed to assess the costs and benefits of any particular means of addressing a safety issue.

When the ATSB issues a safety recommendation to a person, organisation or agency, they must provide a written response within 90 days. That response must indicate whether they accept the recommendation, any reasons for not accepting part or all of the recommendation, and details of any proposed safety action to give effect to the recommendation.

The ATSB can also issue safety advisory notices suggesting that an organisation or an industry sector consider a safety issue and take action where it believes it appropriate. There is no requirement for a formal response to an advisory notice, although the ATSB will publish any response it receives.

Australian Transport Safety Bureau

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Investigation

ATSB Transport Safety Report
Rail Occurrence Investigation
Collision between a motor vehicle and freight train 9261
Brown Street level crossing, Allansford, Victoria, 19 March 2013

RO-2013-011
Final – 29 October 2013