



Australian Government

Australian Transport Safety Bureau

Collision between V/Line train 8280 and MTM train 6502

Altona, Victoria, 22 August 2014

ATSB Transport Safety Report
Rail Occurrence Investigation
RO-2014-016
Preliminary – 13 November 2014

Cover photo - Chief Investigator, Transport Safety (Victoria)

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

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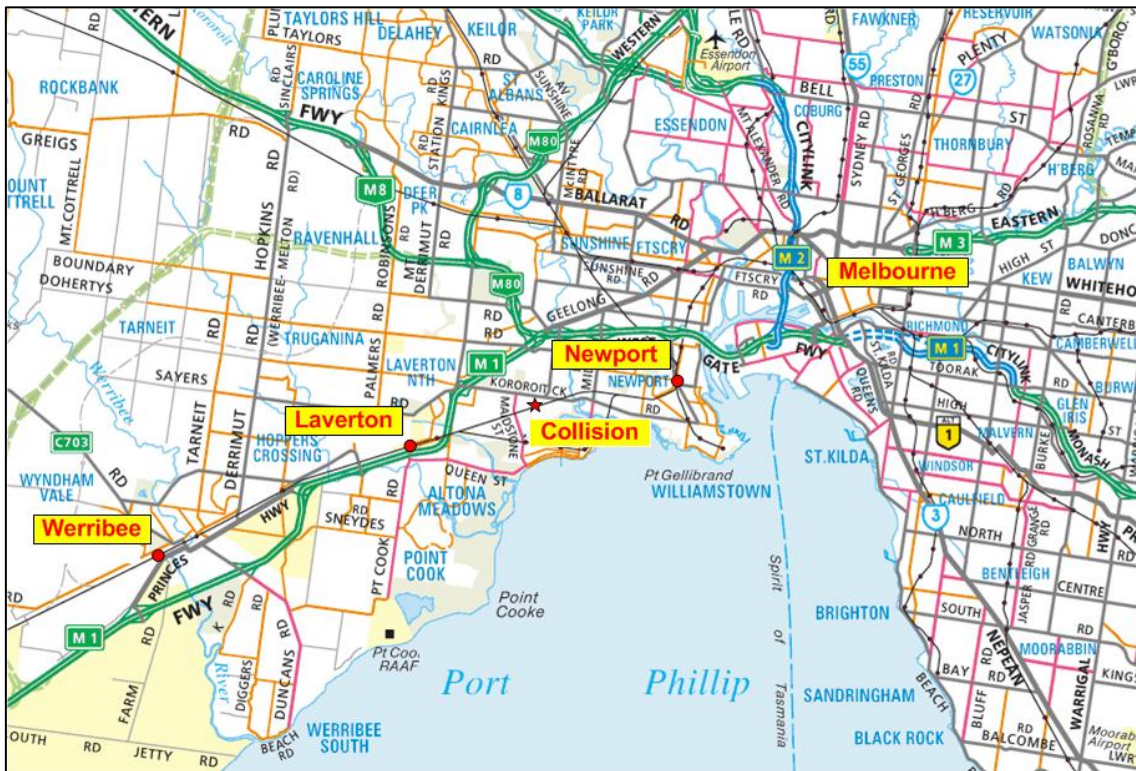
The occurrence

The information contained in this Preliminary report is released in accordance with section 25 of the Transport Safety Investigation Act 2003 and is derived from the initial investigation of the occurrence. Readers are cautioned that new evidence will become available as the investigation progresses that will enhance the ATSB's understanding of the accident as outlined in this Preliminary report. As such, no analysis or findings are included in this report.

MTM Service 6502

At about 1840¹ on 22 August 2014, Metro Trains Melbourne (MTM) passenger train 6502 departed Werribee Railway Station on its scheduled service to Flinders Street Station. The train arrived at Laverton Railway Station at about 1852 without incident.

Figure 1: Location map – Greater Melbourne



Source: Copyright Melway Publishing 2013, Edition 41 with annotations by the Chief Investigator, Transport Safety (Victoria)

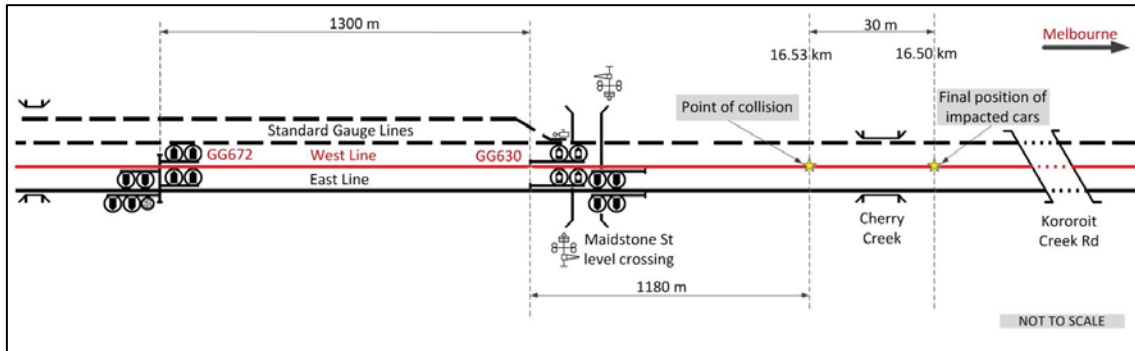
The train departed Laverton Railway Station and all signal aspects from Laverton were at clear normal speed (Green over Red). At about 1855, the train achieved a maximum speed of 115 km/h — the maximum authorised line speed for this section of track. The train then passed signal GG630 (Figure 2) that was also indicating a clear normal speed aspect, and had just crossed over Cherry Creek, when the driver heard a ‘loud bang’ from under the train. He noted that the brake pipe pressure had decreased and the brake cylinder pressure had increased. There was an immediate reduction in speed and the driver placed the brake handle to the full service braking position. When the train came to a stop, he placed the Reverser to the off position, which

¹ The 24-hour clock is used in this report and is referenced from Eastern Standard Time (EST).

automatically applied the spring park brake. The train came to a stop at 1855, with the rearmost car, 427M, at about the 16.53 rail km mark².

The driver looked back and concluded that the train had not derailed and that it was not fouling the adjacent running lines. He called Metrol³ to advise them of the location of the train and that the train had lost brake pipe pressure. He then made an announcement on the public address system to the passengers to advise them that the train would be delayed due to a defect. The driver then called Metrol for authority to go on the track.

Figure 2 – Collision location and signals



Source: Metro Trains Melbourne with annotations by the Chief Investigator, Transport Safety (Victoria)

V/Line Service 8280

At about 1802 on the same evening, V/Line train 8280 departed Geelong for Southern Cross Railway Station. The train was returning to Southern Cross Station in preparation for a scheduled passenger service, and it was crewed by a driver and a conductor but carried no passengers. At about 1832 the train came to a stand at Automatic signal GG1178 (between Little River and Werribee) which was at Stop and resumed its journey about 19 seconds later. After passing through Laverton Station, it proceeded at about 90 km/h past Automatic signal GG672 which was indicating a normal speed warning⁴ (Yellow over Red). The train then arrived at Automatic⁵ signal GG630 which was indicating a Stop aspect (Red over Red) and stopped for about eight seconds before resuming its journey. Trains are allowed to proceed past an Automatic signal at Stop under conditions specified by a rule in *The Book of Rules and Operating Procedures 1994*.

The collision and post collision events

After passing signal GG630 the V/Line train reached a speed of 43 km/h and collided at this speed with the rear of the stationary MTM service 6502 at about 1901. The MTM train was shunted about 30 metres due to the impact and the impacted cars stopped at about the 16.5 rail km mark, approximately 1210 m from signal GG630. The driver of the MTM train was thrown onto the cab floor by the impact. The V/Line driver was trapped between the train control console and the seat but managed to extricate himself by lowering the seat. He got out of his cab, walked towards the MTM train and spoke to passengers to inquire as to their wellbeing and then spoke to the MTM driver who was still in the cab of his train.

The driver and conductor on the V/Line train, the driver of the MTM train and four passengers from the MTM train sustained minor injuries in the incident. Both trains sustained significant damage (Figure 3 & 4).

² Distance in track kilometres from a reference point near Melbourne's Southern Cross Station.

³ Metropolitan Train Control Centre.

⁴ A normal speed warning indicates to a driver that he/she must be prepared to stop at the next signal.

⁵ See signalling arrangements section.

Figure 3 – Impacted trains



Source: Chief Investigator, Transport Safety (Victoria)

Figure 4 - Train damage



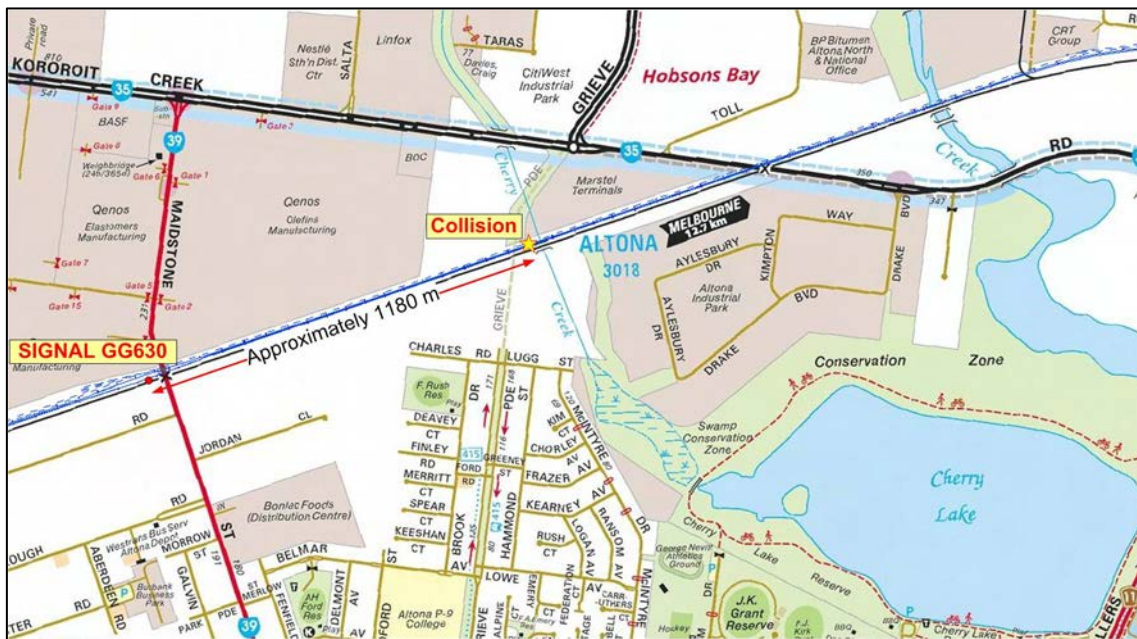
Source: Chief Investigator, Transport Safety (Victoria)

Context

Location

The collision occurred on the MTM rail network between the Maidstone Street and Kororoit Creek Road level crossings in Altona.

Figure 5 - Location of collision



Source: PASS Assets (Public Transport Victoria) with annotations by Chief Investigator, Transport Safety

Track and environmental conditions

The track infrastructure in this section consisted of a Broad Gauge East Line, a West Line and an independent parallel Standard Gauge line (Figure 2). Both trains were operating on the West Line. From the Maidstone Street level crossing the track is tangent with a slight downhill gradient towards Cherry Creek and Kororoit Creek level crossing. Clear sighting is available up to and beyond Cherry Creek from the Maidstone Street level crossing. The weather conditions were fine and it was a clear night with light winds.

Train and crew information

MTM Train and Crew

The MTM train 6502 was of the Comeng type and consisted of two, 3-car sets, 338M - 1092T - 484M and 487M - 1052T - 427M.

The MTM driver at the time of the incident had about 2½ years train driving experience. He held the required qualifications to operate the train, was route certified and assessed as medically fit for duty.

Following the collision the MTM train driver underwent mandatory drug and alcohol testing, the results of which were negative.

Post incident inspection and testing revealed that the train’s rear tail lights were operational.

V/Line Train and Crew

The V/Line train 8280 was a VLocity Diesel Multiple Unit consisting of VL05 (units 1105 and 1205), VL12 (units 1112 and 1212) and VL39 (units 1139, 1339 and 1239).

The V/Line train had two crew members, a driver and a conductor. The driver had been driving trains since qualifying in 1989 and was employed as a train driver by V/Line for the last 11 years. He held the required qualifications to operate the train, was route certified and assessed as medically fit for duty.

Post incident testing indicated that the trains head lights were operational and the train's data logger indicated that the train's headlights were on at the time of the incident.

Signalling system and rules

A three position colour light signalling system is in place between Laverton and Newport. Three position signals provide information to drivers regarding the compliance speed for the block⁶ and information on the the aspect of the signal ahead. Multiple aspect signalling allows closer spacing of signals such that braking distances are spread over two signal blocks, allowing higher line speeds for the sector and can consist of Home (Absolute) and Automatic signals (Permissive).

Home signals are usually directly controlled by a signaller or train controller as well as by track circuits. Home signals are Absolute signals and are not to be passed when displaying a Stop aspect unless written or verbal authority is provided as specified in the *Book of Rules and Operating Procedures 1994*.

Automatic signals are not directly controlled by a signaller or train controller but by the passage of trains (track circuits) and their function is to provide separation between trains travelling in the same direction on the same track in accordance with the line speed and headway requirements of that section of track.

A Permissive signal is an Automatic signal that is able to be passed at Stop under conditions specified by a rule in The *Book of Rules and Operating Procedures 1994*.⁷

⁶ A block is a section of track between two signals.

⁷ *Book of Rules and Operating Procedures 1994* - Section 3 Rule 1 – Detention at Automatic Signals.

Ongoing investigation activities

The ATSB investigation is continuing and will focus on the:

- Operation of the signalling system.
- Operating rules pertaining to Permissive signalling systems and compliance.
- Use of Permissive signalling systems in other jurisdictions.
- Previous incidents associated with Permissive signalling systems.
- Performance of train external lighting systems.
- Use of safety technologies to maintain train separation.
- Crashworthiness performance of the trains.
- Mechanical condition of the trains, actions of the train crew and situational factors.

General details

Occurrence details

Date and time:	22 August 2014 – 1901 EST	
Occurrence category:	Serious incident	
Primary occurrence type:	Collision - Running Line	
Location:	Melbourne Metropolitan Rail Network - Altona	
	Latitude: 37° 51' 04.6" S	Longitude: 144° 49' 19.9" E

Train 1 details

Train operator:	Metro Trains Melbourne	
Registration:	6502	
Type of operation:	Passenger	
Persons on board:	Crew – 1	Passengers – Unknown
Injuries:	Crew – 1	Passengers – 4
Damage:	Substantial	

Train 2 details

Train operator:	V/Line Pty Ltd	
Registration:	8280	
Type of operation:	Passenger (Out of service - empty cars)	
Persons on board:	Crew – 2	Passengers – Nil
Injuries:	Crew – 2	Passengers – Nil
Damage:	Substantial	

Sources and submissions

Sources of information

The sources of information during the investigation included:

- V/Line Pty Ltd
- Metro Trains Melbourne
- Data loggers from VLocity and MTM passenger trains
- Train crew.

References

Bureau of Meteorology

RISSB Glossary of Railway Terminology - Guideline

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 factors related to the transport safety matter being investigated.

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.