



No 93-117

Train No. 36

Collision with Motor Vehicle

Mt. Maunganui

18 October 1993

ABSTRACT

A shunting locomotive struck a car on the Matapihi Road level crossing, Mt Maunganui, on 18 October 1993, fatally injuring the motorist. The safety issues identified in this report are the location and substance of the passive signs prior to the crossing, and the number and location of the active warning devices at the crossing.

TRANSPORT ACCIDENT INVESTIGATION COMMISSION

RAIL ACCIDENT REPORT NO. 93-117

Train Type and Number:	Mt. Maunganui Local Shunting Service, No. 36
Locomotive:	DC4398
Date and Time:	18 October 1993, 0750 hours*
Location:	Matapihi Road level crossing, 0.97 km Mt Maunganui Branch
Type of Occurrence:	Collision with motor vehicle
Persons on Board:	Crew: 2 Passengers: Nil
Injuries:	Crew: Nil Passengers: Nil Others: 1 Fatal#
Nature of Damage:	Car destroyed by impact
Information Sources:	Transport Accident Investigation Commission field investigation
Investigator in Charge:	Mr W J D Guest

*All times in this report are NZDT (UTC + 13 hours)

#Driver of motor vehicle

1. NARRATIVE

1.1 Mt. Maunganui Local Shunting Service No. 36 was returning to Mt. Maunganui Yard from Te Maunga shortly after 0740 hours on 18 October 1993. It was not hauling any wagons, and was travelling "long hood leading" i.e. in reverse to the usual direction of travel.

1.2 The locomotive had two crew on board: a Locomotive Engineer (the driver), and a Train Operator.

1.3 The weather was fine and the visibility excellent.

1.4 The locomotive was travelling at a steady 57 km/h as it approached the Matapihi Road level crossing. The headlights were illuminated, and the Locomotive Engineer sounded the horn as the locomotive neared the crossing.

1.5 The Train Operator was sitting on the right hand side of the locomotive in the direction of travel. He observed a small motor car commence to turn from Maunganui Road into Matapihi Road at a speed which suggested that it might not stop before the crossing. He called to the Locomotive Engineer to stop.

1.6 The Locomotive Engineer immediately applied the brakes, but did not have enough distance remaining to the crossing to stop the locomotive.

1.7 The car moved on to the track and was struck on its left hand side by the locomotive.

1.8 The Locomotive Engineer sent a radio message to Train Control, and the Controller notified emergency services which responded promptly.

1.9 The motorist was a 66 year old retired man who was travelling to the golf course situated along Matapihi Road. His route was via Maunganui Road from Te Maunga and thence into Matapihi Road.

1.10 Maunganui Road runs parallel to the railway between Te Maunga and the Matapihi Road intersection, but the railway is screened from view for much of the distance by trees and shrubs which have been planted to beautify the road and rail reserves.

1.11 Maunganui Road in this area is also State Highway 29, and connects State Highway 2 to the central business district of Mt. Maunganui and the new Tauranga Harbour bridge. It is a busy four lane road.

1.12 The Matapihi Road intersection with Maunganui Road is in the form of a roundabout. In addition to Maunganui Road and Matapihi Road, Girven Road also joins the roundabout approximately opposite Matapihi Road. Close to the roundabout, between Maunganui Road and Girven Road there is a shopping centre with a large carpark which has exits on to both Maunganui and Girven Roads.

1.13 The roundabout is approximately 20 m in diameter, so that the curvature on the road around it enables vehicles which are not required to stop or slow down to give way to proceed round it at 50 km/h, the speed limit for the road, if they are proceeding straight ahead. Vehicles turning left from Maunganui Road into Matapihi Road can also turn the sweeping corner at 50 km/h.

1.14 As he approached the intersection from the direction of Te Maunga, the motorist was faced with a number of signs to observe in addition to being alert for traffic conditions which may have required his attention. On the left hand side of the road were seven signs at approximately 20 m intervals prior to the intersection and roundabout. Two of these signs were commercial advertising signs, which were not authorised to be in this location. The other five were:

(a) An advisory sign showing a "T" intersection ahead, with a railway crossing depicted on the side road. This is a statutorily defined W13 sign, but in this instance it bore little resemblance to the actual road layout.

(b) An information sign with white lettering on a black background, showing the road layout at the intersection as a roundabout, and the continuation of the main road (Maunganui Road) as State Highway 29. No indication was given of the presence of the railway crossing on this sign.

(c) An information sign with white letters on a black background saying "Girven Road Right Lane".

(d) An information sign giving destinations from the intersection with arrows pointing in the directions to be taken. The destinations shown were "Mt Maunganui", "Girven Road", and "Matapihi". This sign was 2 m x 1.5 m in size.



FIG. 1

Approaching the Matapihi Road intersection along Maunganui Road. The number of signs can be seen, but the crossing and the alarms are not visible.



FIG. 2

This photograph was taken closer to the crossing than Fig. 1. The roundabout is visible, but the crossing and the alarms are still out of sight, obscured by the largest bushes and two of the road signs. The inconsistency of the information given by the nearest two road signs is also apparent.

(e) An sign with an arrow giving a piece of information about the route.

1.15 At the intersection was a standard regulatory "Give Way" sign, and three metres to the left of this a standard St Andrew's Cross sign reading "Railway Crossing".

1.16 The number of signs and the nature of the information on them made it unlikely that the motorist, who was familiar with the route, would read all of them and react to each of them every time he drove along this road.

1.17 The requirement to give way to traffic on the right at the roundabout made it essential for the motorist to look to the right as he approached the intersection. He would have had to turn his head at least 90 degrees from the general direction of traffic in the roundabout in order to observe the St Andrew's sign on the left side of the road.

1.18 The railway crossing was also protected by flashing lights and bells. There were two masts each carrying a pair of flashing lights directed towards the Maunganui Road side of the crossing. One was directed across the roundabout towards Girven Road, and could not be seen clearly from Maunganui Road while approaching the intersection. The other was directed at the outside edge of the roundabout where the two left hand lanes of Maunganui Road joined it. This pair of flashing lights was the only active warning given to traffic in Maunganui Road that a train was approaching.

1.19 The flashing lights at railway crossings are designed with low voltage 18 watt bulbs focused through the coloured lenses. The lenses focus the light in a cone of 15 degrees from their central axes. The visibility of the flashing lights is noticeably less for observers outside the cone because of the reduced intensity of light. The lights cannot be seen at all from the side because of a protective hood which is intended to reduce the extent to which sunlight can reflect from the lens and cause a false illusion of illumination.

1.20 The flashing lights would only have been clearly visible to the driver of the car for about 20 m to 30 m along Maunganui Road from the roundabout. At 50 km/h,

he would have covered this distance in 1.5 seconds. This would be a vital time for him to have been observing the traffic on or approaching the roundabout, as he would be required to give way to such traffic. Thus at the critical time for the motorist to see the flashing lights of the crossing alarm, he was probably watching the roundabout on his right. (See paragraph 1.25 for the report of eyewitnesses).

1.21 Even if the motorist did glance to the left he may not have seen the flashing lights. At two key points the flashing lights were obscured from his view by passive signs.

1.22 The first point was at a distance of 40 m from the roundabout, when the view of the flashing lights was completely obscured by the large information sign referred to in paragraph 1.14 (d). The zone of obstructed vision lasted for several metres. Although this zone was outside the cone of focus of the light beam, it was still an area in which the driver of the car might have looked towards the level crossing and noticed the flashing lights prior to concentrating on the roundabout and the traffic on the right.

1.23 The second point at which the view of the flashing lights was obstructed was much closer to the roundabout, approximately five metres along Maunganui Road. The driver had his view of the flashing lights obstructed over a short zone by the St Andrew's cross sign and a closely adjacent lamppost.

1.24 Despite the problems with both passive and active warning signs described above, had the motorist looked ahead again once he had seen that the roundabout was clear for him to proceed, he would have seen the flashing lights.

1.25 Two eye witnesses to the accident stated to the Police that the motorist did not slow down, but looked to his right at the roundabout and then proceeded to the left into Matapihi Road and on to the level crossing. The witnesses observed the flashing lights operating normally, and one clearly recalled the bells and the sound of the locomotive's horn.



FIG. 3

Closer still to the roundabout, the crossing alarms are completely obscured by the large destination sign. (The car on the right of the photograph is making an unusual (but not illegal) U-turn.)



FIG. 4

Close to the crossing, but still in Maunganui Road at the edge of the roundabout. The photographer was standing up. The motorist in his car would have had a lower viewing height, and the St Andrews Cross would have blocked his view of the alarms.

2. FINDINGS

2.1 The train was being operated correctly prior to the accident.

2.2 The level crossing alarms operated normally.

2.3 The Locomotive Engineer and the Train Operator were keeping a lookout as required, and took prompt action when they realised that the motorist was not going to stop.

2.4 The Locomotive Engineer was unable to stop the train in the space available before reaching the crossing.

2.5 There was an excessive number of passive signs along the roadside leading up to the intersection. Two of the signs were commercial advertising, and were unauthorised.

2.6 The authorised road signs were inconsistent in the information they gave about the intersection ahead and the location of the level crossing.

2.7 The crossing alarms were only visible for a short distance along Maunganui Road.

2.8 There were two short zones through which the motorist could not have seen the crossing alarms because of the location of the road signs which obstructed the view.

2.9 The motorist was looking away from the level crossing as he approached and entered the roundabout, because he was required to give way to traffic on his right at the roundabout.

2.10 The layout of the roundabout, particularly the easy curvature for vehicles turning left into Matapihi Road, enabled the motorist to maintain a fairly high speed when there was no traffic on the roundabout for which he had to slow down or stop.

2.11 The flashing lights of the crossing alarms would have been clearly visible if the motorist had looked towards Matapihi Road and the crossing as he entered the roundabout.

2.12 The contributing factors to this accident were:

The limited effectiveness of the passive road signs because of their number and the inconsistency of the information they contain;

The limited view of the flashing lights from Maunganui Road because of the roading geometry, and the location and direction of the lights;

The obstruction of the view of the flashing lights caused by two of the road signs;

The location of the busy roundabout so close to the level crossing, causing the motorist to give priority attention to traffic events on his right, when the alarm lights were flashing on his left.

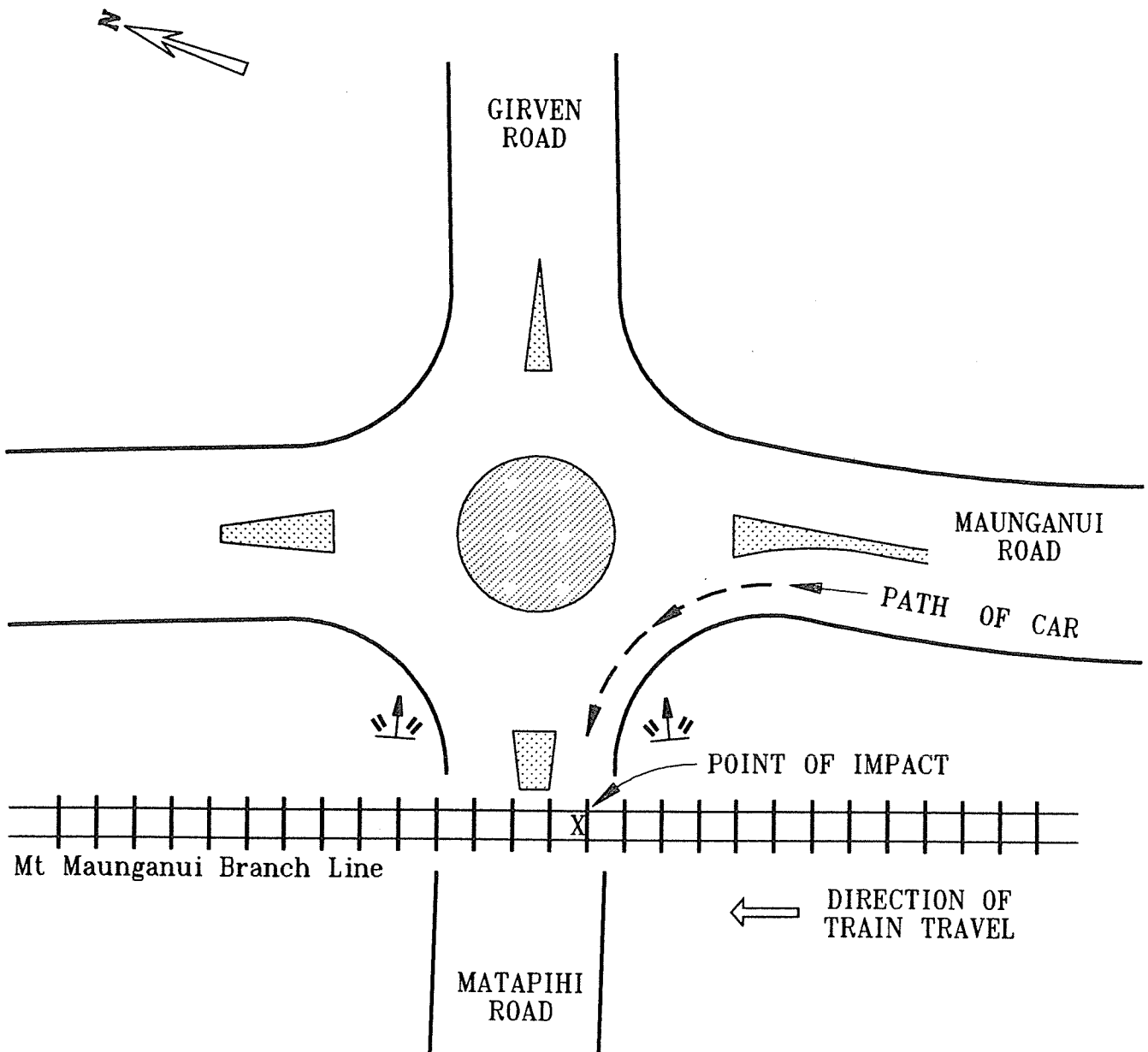
The layout of the roundabout, which enabled the motorist to proceed quickly to the left without slowing down appreciably, and giving himself time to observe the flashing lights and stop.

3. SAFETY RECOMMENDATIONS

3.1 It was recommended to the Land Transport Safety Authority that:

3.1.1 In view of the presence of several level crossings close to busy main roads in the Borough, they establish a working party with the Tauranga

District Council, New Zealand Rail Limited, and Transit New Zealand to review the adequacy of the road and rail layout, the warning devices, and the passive signs on all level crossings in Mount Maunganui as soon as practicable (070/93).



NOT TO SCALE

LEVEL CROSSING LAYOUT
MAUNGANUI RD / MATAPIHI RD INTERSECTION

The Land Transport Safety Authority responded:

That they would comply with the recommendation and that they were preparing a new Code of Practice for Road Signs and Markings at Railway Level Crossings. Further they planned a safety survey of every level crossing early in 1994.

3.2 It was recommended to Transit New Zealand that:

3.2.1 They reduce the number of road signs in the vicinity of the Maunganui Road/Matapihi Road intersection to the minimum necessary to convey information to drivers effectively. (071/93).

3.2.2 They alter the location of road signs at the Maunganui Road/Matapihi Road intersection to reduce or eliminate obstruction of the view of the level crossing alarms from Maunganui Road. (072/93).

3.2.3 They cooperate with the Land Transport Safety Authority, the Tauranga District Council, and New Zealand Rail Limited in a review of all level crossings in Mt. Maunganui. (073/93).

Transit New Zealand responded that:

This was another case of an accident occurring just after a driver had negotiated an intersection immediately prior to a railway crossing. They were studying the pattern of such accidents in association with the Land Transport Safety Authority to determine whether there was a need for specific design considerations in such situations. They were extremely conscious of the randomness of such railway crossing accidents and the need to be consistent in their approach to investing in remedies. Nevertheless they would be involved in the study of this particular stretch of state highway.

3.3 It was recommended to New Zealand Rail Limited that:

3.3.1 They examine the possibility of incorporating a further pair of flashing lights into the crossing alarms directed to be visible as far along Maunganui Road towards Te Maunga as is practicable with a view to attracting the attention of drivers before they become occupied by traffic in the roundabout. (074/93)

3.3.2 They cooperate with Transit New Zealand, the Tauranga District Council, and the Land Transport Safety Authority in a review of all level crossings in Mt Maunganui. (075/93)

New Zealand Rail Limited replied:

“3.3.1 Provision of an extra set of lights will be evaluated as part of the proposal for upgrading the intersection as a whole.

3.3.2 NZ Rail will co-operate in the review of all level crossings in Mt. Maunganui.”

3.4 It was recommended to the Tauranga District Council that:

3.4.1 They cooperate with Transit New Zealand, New Zealand Rail Limited, and the Land Transport Safety Authority in a review of all level crossings in Mt. Maunganui. (076/93)

Tauranga District Council agreed with the safety recommendation and advised they had no problem in complying with the recommendation.

9 February 1994

M F Dunphy
Chief Commissioner