



**Report 96-106**

**Train 903**

**Collision with Motor Vehicle**

**Templeton, Canterbury**

**17 May 1996**

### **Abstract**

On Friday, 17 May 1996, at about 0845 hours, a truck and semi-trailer travelling east on Kirk Road, Templeton moved over the level crossing and stopped to gain entry to State Highway 1 with the semi-trailer foul of the railway line. The *Southerner* passenger express collided with the rear of the semi-trailer unit. There were no injuries. The cause was insufficient stacking room between the level crossing and the adjacent parallel State Highway. Safety deficiencies identified were the absence of any controls or advice for legal road vehicles with a length exceeding the stacking room available.

# **Transport Accident Investigation Commission**

## **Rail Incident Report 96-106**

<b>Train type and number:</b>	Express Passenger, 903
<b>Locomotive:</b>	DF 6041
<b>Date and time:</b>	17 May 1996, 0845 hours
<b>Location:</b>	Main South Line, 24.36 km, Kirk Road, Templeton
<b>Type of occurrence:</b>	Collision with motor vehicle (truck and semi-trailer)
<b>Persons on board:</b>	Crew: 3 Passengers: 24
<b>Injuries:</b>	Nil
<b>Nature of damage:</b>	Locomotive: Minor Train: Nil Semi-trailer unit: Substantial
<b>Investigator in Charge:</b>	R E Howe

## 1. Factual Information

- 1.1 On Friday, 17 May 1996, Train 903 was the scheduled *Southerner* passenger express operated by Tranz Rail Limited (Tranz Rail) from Christchurch to Invercargill. The service comprised DF 6041, passenger cars ASO 14 and AO 54, and power/baggage van AG 124, for an overall length of 68 m and weight of 175 t. On board at the time of the incident were a locomotive engineer (LE), the train crew of Train Manager and a train attendant, and 24 passengers.
- 1.2 At about 0845 hours Train 903 was south of Islington and travelling at approximately 100 km/h, the appropriate maximum line speed, when the LE saw a truck and semi-trailer unit approximately 1000 m away turn from a parallel road (Waterloo Road) to cross the railway from west to east. The level crossing involved was Kirk Road at 24.36 km Main South Line.
- 1.3 The weather was fine and clear, and in accordance with normal practice the locomotive headlight was set at maximum. The LE observed the vehicle cross the railway and come to rest with the rear of the semi-trailer over the track.
- 1.4 Kirk Road was protected by half-arm barriers. These were activated by the train when 711 m from the crossing, the appropriate distance for 25 seconds warning at 100 km/h, and were seen to operate normally as the *Southerner* approached the obstructed crossing.
- 1.5 The LE realised that the vehicle was not moving, and when about 600 m from the crossing he sounded the train whistle continuously. As he saw no sign of the semi-trailer moving off the crossing he then made an emergency brake application.
- 1.6 As the train slowed and approached the crossing the LE saw the truck and semi-trailer edging forward. At the time of impact he estimated “less than a metre was still over the track and that’s what I hit”.
- 1.7 The impact swung the semi-trailer through approximately 150°, leaving it straddling the opposite lane of Kirk Road (Figure 1 and Figure 2). Fortunately there was no vehicle waiting at the barriers in this lane. The driver remained in the cab and although he was buffeted by the impact the only injury he sustained was a cut hand.
- 1.8 Damage to the locomotive was minimal. There was no damage to the passenger cars or van and the impact was reported as barely noticeable in the passenger cars.
- 1.9 The locomotive event recorder was removed and data extracted. This showed that the train was travelling at 100 km/h prior to an emergency brake application 370 m before the point of impact, and slowed to 75 km/h at impact. The train came to a halt with the locomotive approximately 210 m beyond the point of impact. The braking distance of 580 m was that expected of such a train from 100 km/h.
- 1.10 For approximately four months the refrigerated semi-trailer had been on a daily run with a regular driver from the operator’s McLeans Island Road depot to Fairton (near Ashburton) to pick up a load of lambs for return to Harewood. At the time of the incident it was on the journey to Fairton and therefore empty.
- 1.11 The normal timing of the run meant that the truck departed from the depot at 0400 hours and at that time of day the driver always took the State Highway (SH) (Figure 3, Route A).



**Figure 1**  
View looking south down SH1 (Kirk Road to the right)



**Figure 2**  
View looking east on Kirk Road, towards SH1

- 1.12 On the day of the incident there was no requirement for the truck to be at Fairton until 1045 hours so the driver left the depot at 0800 hours. Due to traffic on Johns Road he elected to go around McLeans Island Road and follow Pound Road south (Figure 3, Route C). In doing this he linked up with the posted Hornby by-pass (Figure 3, Route B). This was the first time the driver had taken Route C during his four months on the Fairton shuttle.
- 1.13 On reaching Barters Road where Route B was signposted to cross the railway to join the SH the driver elected to cross Barters Road and proceed south down Waterloo Road to turn left and cross the railway at Kirk Road. The stated reason for this was his recollection of roadworks on SH1 between Barters and Kirk Road, which may have delayed him (roadworks were in hand on SH1 at the time but south of Kirk Road).
- 1.14 The crossing was clear and there was no sign of rail traffic when he crossed the rail track and stopped at the double white line prior to entering the SH to turn right. The double white line was approximately 14.2 m clear of passing railway traffic. The overall length of the truck and semi-trailer was 16.7 m which left the rear 2.5 m of the semi-trailer foul of any passing rail traffic.
- 1.15 The SH traffic was a continuous flow as the driver waited for an opportunity to turn right. He estimated one to two minutes passed before the barriers started to come down and, as he stated, "I started to panic a bit". He edged his vehicle out beyond the double white line until a passing truck "just about swiped the front off me". He looked in his rear-vision mirror and saw that the barriers were down and hoped he was clear of the track. He stayed in the cab and continued to edge forward and look for a gap in the traffic until impact.
- 1.16 The driver stated that although there was no vehicle on his left blocking him from making a left turn to clear the crossing any such turn would have required him to arc out into the occupied north-bound lane of SH1.

#### **Road vehicle details**

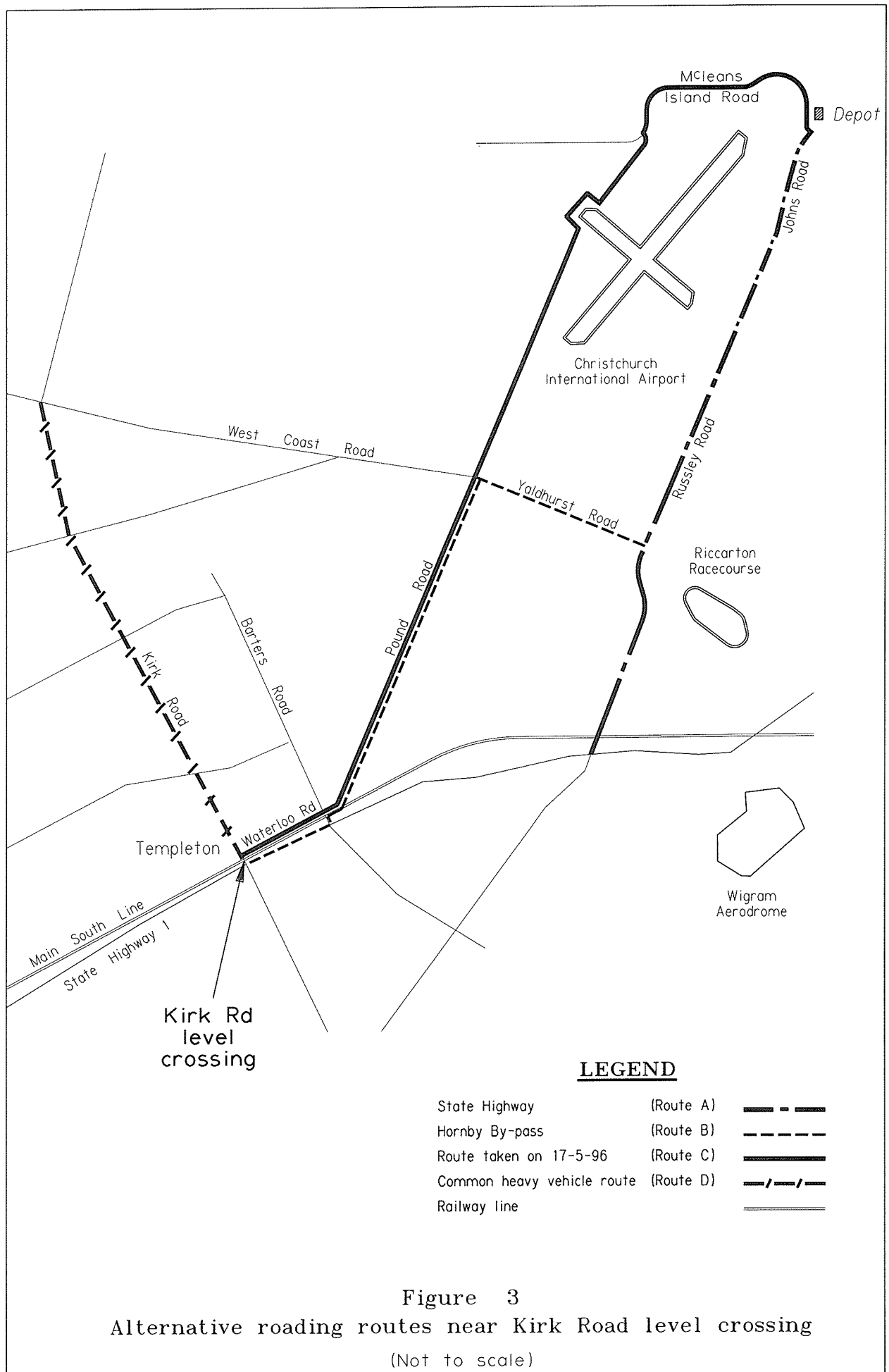
- 1.17 The overall length of the truck and semi-trailer (16.7 m) complied with the relevant maximum permitted vehicle dimensions laid down by the Land Transport Safety Authority (LTSA).
- 1.18 The semi-trailer had a Certificate of Fitness which expired on 30 October 1996. The truck unit had a Certificate of Fitness which expired on 30 March 1996.
- 1.19 The body of the semi-trailer was moved laterally and twisted over the rear two metres causing substantial damage to the unit.

#### **Personnel**

- 1.20 The LE held an Operating Certificate for the duties being carried out with an expiry date of December 1997.
- 1.21 The truck and semi-trailer driver held a class B F G H I J and L licence with an expiry date of 30 September 2038.

#### **Roading**

- 1.22 The by-pass from Pound Road via Waterloo Road had a central island at the entry to Barters Road.



- 1.23 The entry into SH1 at Barters Road was controlled by a STOP sign; the entry into SH1 at Kirk Road was controlled by a GIVE WAY sign.
- 1.24 During the course of interviews carried out as part of the investigation it became apparent that Kirk Road was a common route for long and heavy vehicles to and from the West Coast Road (Figure 3, Route D).
- 1.25 An assessment of level crossings in the Templeton area showed four level crossings over a four kilometre length (Barters, Kirk, Dawsons, Curraghs) equipped with half-arm barriers. The only crossing without a suitable stacking distance between the railway and SH1 was Kirk Road.
- 1.26 It is relevant that TAIC Occurrence Report 93-105 covering a fatal level crossing accident at Kimberly Road, near Levin, in May 1993, included the following recommendations to Transit New Zealand:

“They develop a code of practice for the design of intersections with closely adjacent railway crossings, taking into account the combined risks of accident that the two hazards present (056/93), and

They develop a programme to review the adequacy of warnings to motorists at all intersections on State highways which have railway crossings in close proximity. (057/93)”

Transit New Zealand responded, inter alia, as follows, in 1993:

Recommendation 057/93 is being actioned through a working party involving Transit New Zealand, Land Transport Safety Authority, New Zealand Rail and local authority representatives considering revisions to signing and road markings at rail crossings. This activity is also a first stage towards developing a code of practice as in recommendation 056/93.

## **2. Analysis**

- 2.1 The incident involved an authorised road vehicle using a permitted road route where insufficient clear distance was available to ensure safe crossing of the rail and entry to the SH. The crossing was a common route for vehicles up to 20 m in length.
- 2.2 Assuming that the vehicle driver waited one minute at the SH for an entry before the barriers started to lower, the *Southerner* was approximately 1700 m away when he crossed Kirk Road. The LE's estimate was 1000 m. In either case the vehicle driver would have had difficulty in seeing the approaching train.
- 2.3 The presence of the central island at the entry to Barters Road from Waterloo Road, and the give-way at Kirk Road to SH1 as compared to the compulsory stop at Barters Road to SH1, had the potential to influence the drivers of vehicles, and particularly long vehicles, to use Kirk Road crossing in preference to Barters Road crossing.
- 2.4 Once the driver of the semi-trailer had crossed the railway and stopped to turn right into SH1, he had no alternative action open to him when he became aware of the approaching train. Any left turn, with the vehicle involved, would have involved a wide arc onto SH1 in conflict with the continuous traffic in the northbound lane.
- 2.5 Damage to the rear of the refrigerated semi-trailer and witness reports indicated approximately 1.5 m of the unit was obstructing the passage of Train 903 at impact.

- 2.6 The number and location of level crossings in the area indicate that a critical review of level crossing needs, with a view to the closure or relocation of Kirk Road crossing, could offer long-term safety benefits.
- 2.7 The problem of appropriate warnings to road users highlighted by this incident is not restricted to Kirk Road level crossing. Paragraph 1.26 refers to recommendations arising from a 1993 accident. While the particular circumstances of the Kirk Road incident are not similar there is a common factor of road and rail parallel and in close proximity, and a common problem of adequate warning. Although much work has been done with regard to signage and road markings, the lack of adequate warnings or controls to prevent the incident which occurred at Kirk Road indicates that the general problem of long vehicles with no safe exit after crossing the railway has not been adequately addressed. Risks also exist for road traffic where long vehicles are required to stop at level crossings in situations where they are unable to clear the adjacent parallel public road.

### **3. Findings**

- 3.1 The train was being operated correctly.
- 3.2 The half-arm barriers were operating as intended.
- 3.3 The truck with semi-trailer was being driven by a suitably licensed driver, complied with the relevant length restrictions covering such vehicles and was being used in an authorised location.
- 3.4 The expired Certificate of Fitness on the truck unit was not a factor in the incident.
- 3.5 There was insufficient room between the railway and SH1 for any vehicle exceeding approximately 12 m in length to cross the railway and await entry onto SH1 without encroaching on the rail track.
- 3.6 There were no signs or any other warnings to the drivers of legal road vehicles exceeding 12 m in length of the hazards involved in crossing the railway without a clear exit.
- 3.7 The driver of the truck and semi-trailer observed the requirements for crossing the railway at Kirk Road and reacted correctly to the “give way” entry to SH1.
- 3.8 The circumstances which existed at Kirk Road level crossing probably exist at other level crossings throughout New Zealand.
- 3.9 The recommendation made by the Commission in 1993 has not yet resulted in adequate warnings for drivers of long vehicles.



## 4. Safety Recommendations

### 4.1 It was recommended to Transit New Zealand that it:

Liaise with the Christchurch City Council to review the integrated use of Barters Road and Kirk Road level crossings and take such steps as are necessary to encourage long vehicles to use Barters Road level crossing and to prohibit any uncontrolled crossing of Kirk Road level crossing by vehicles exceeding 11 m in length. (023/96)

### 4.2 It was recommended to the Christchurch City Council that it:

Liaise with Transit New Zealand to review the integrated use of Barters Road and Kirk Road level crossings and take such steps as are necessary to encourage long vehicles to use Barters Road level crossing and to prohibit any uncontrolled crossing of Kirk Road level crossing by vehicles exceeding 11 m in length. (024/96)

### 4.3 Both parties responded that they accepted the recommendation and are liaising to achieve integrated action. The Council advised, inter alia:

The following immediate improvements are proposed at the Kirk Road rail crossing:

- i) A ban of vehicles exceeding 9 m in length from travelling on Kirk Road between Waterloo Road and the Main South Road.
- ii) Additional sign posting to encourage long vehicles on Pound Road to use Barters Road.
- iii) The marking of a cross-hatched clear zone at the Kirk Road rail crossing.

Longer term measures will include; the relocation of the bypass route from Pound Road to the State Highway network and an investigation into improvements or changes to the junctions with the State Highways and the road-rail crossing in this locality. This study would be jointly funded by Transit New Zealand and the City Council.

### 4.4 The General Manager, Transit New Zealand, responded, inter alia:

The immediate actions rest with Christchurch City Council and are already underway. I understand that the Council has already recommended a by-law restricting the length of vehicles exiting at Kirk Road to 9 m, and that this process will be complete by the end of July. This will allow other signposting to be implemented.

The medium term options are also underway but to ensure acceptance of transport operators their implementation should await the completion of the traffic signal changes at the SH1 : SH73 intersection at Carmen/Shands/Main South roads.

You will note our intention to assess a longer term relocation of access to SH1. This will be investigated in the next 12 months.

I fully support your recommendation with the change in the length restriction from 11 m to 9 m.

### 4.5 The Council has passed the relevant by-law and vehicles exceeding 9 m in length are now prohibited from travelling on Kirk Road between the limits specified. Additional signs encouraging long vehicles to use Barters Road have been erected.

4.6 It was recommended to the Director, Land Transport Safety Authority, that he:

Liaise with Transit New Zealand, Tranz Rail Limited and the appropriate local authorities to initiate a review to define all public level crossings where the stacking distance for long road vehicles is insufficient to ensure safe entry to or exit from the crossing, and to ensure that appropriate action is taken, consistent with the frequency of use and the potential consequences of collision. (064/96)

4.7 The Director, Land Transport Safety Authority, responded, inter alia:

The Land Transport Safety Authority (LTSA) acknowledges the TAIC recommendation regarding the safety of railway level crossings for long vehicles and will liaise with Transit New Zealand, Tranz Rail Ltd and other road controlling authorities appropriately. The LTSA will request road controlling authorities to identify all level crossings within their districts where stacking distances for long road vehicles are insufficient to ensure safe entry or exit from the crossings, and develop and implement appropriate road or rail strategies to minimise risk of collision.

For the information of the Commission, the LTSA has received a copy of a Ministry of Transport document entitled "Road Management, Options for Reform", submissions on which close on 31 July 1997. The LTSA plans to address the issue of responsibilities and accountabilities for road safety actions in our submission on the paper to the Ministry of Transport.

19 February 1997

M F Dunphy  
Chief Commissioner