



Transport Accident  
Investigation  
Commission

# **Final Report**

***Rail inquiry RO-2019-108  
Level crossing collision  
Piako Road, Morrinsville  
7 December 2019***

**November 2021**



## About the Transport Accident Investigation Commission

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The Transport Accident Investigation Commission (Commission) is a standing commission of inquiry and an independent Crown entity responsible for inquiring into maritime, aviation and rail accidents and incidents for New Zealand, and co-ordinating and co-operating with other accident investigation organisations overseas.

The principal purpose of its inquiries is to determine the circumstances and causes of occurrences with a view to avoiding similar occurrences in the future. It is not the Commission's purpose to ascribe blame to any person or agency or to pursue (or to assist an agency to pursue) criminal, civil or regulatory action against a person or agency. However, the Commission will not refrain from fully reporting on the circumstances and factors contributing to an accident because fault or liability may be inferred from the findings.

# Notes about Commission reports

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## **Commissioners**

Chief Commissioner	Jane Meares
Deputy Chief Commissioner	Stephen Davies Howard
Commissioner	Richard Marchant
Commissioner	Paula Rose, QSO

## **Key Commission personnel**

Chief Executive	Martin Sawyers
Chief Investigator of Accidents	Harald Hendel
Investigator in Charge	David Manuel
General Counsel	Cathryn Bridge

## **Citations and referencing**

This report does not cite information derived from interviews during the Commission's inquiry into the occurrence. Documents normally accessible to industry participants only and not discoverable under the Official Information Act 1982 are referenced as footnotes only. Publicly available documents referred to during the Commission's inquiry are cited.

## **Photographs, diagrams, pictures**

The Commission has provided, and owns, the photographs, diagrams and pictures in this report unless otherwise specified.

## **Verbal probability expressions**

Where possible, the Commission uses standardised terminology in its reports. This is for the benefit of investigation participants, readers of its reports, and recipients of its recommendations. One example of this standardisation is the terminology used to describe the degree of probability (or likelihood) that an event happened or a condition existed in support of a hypothesis.

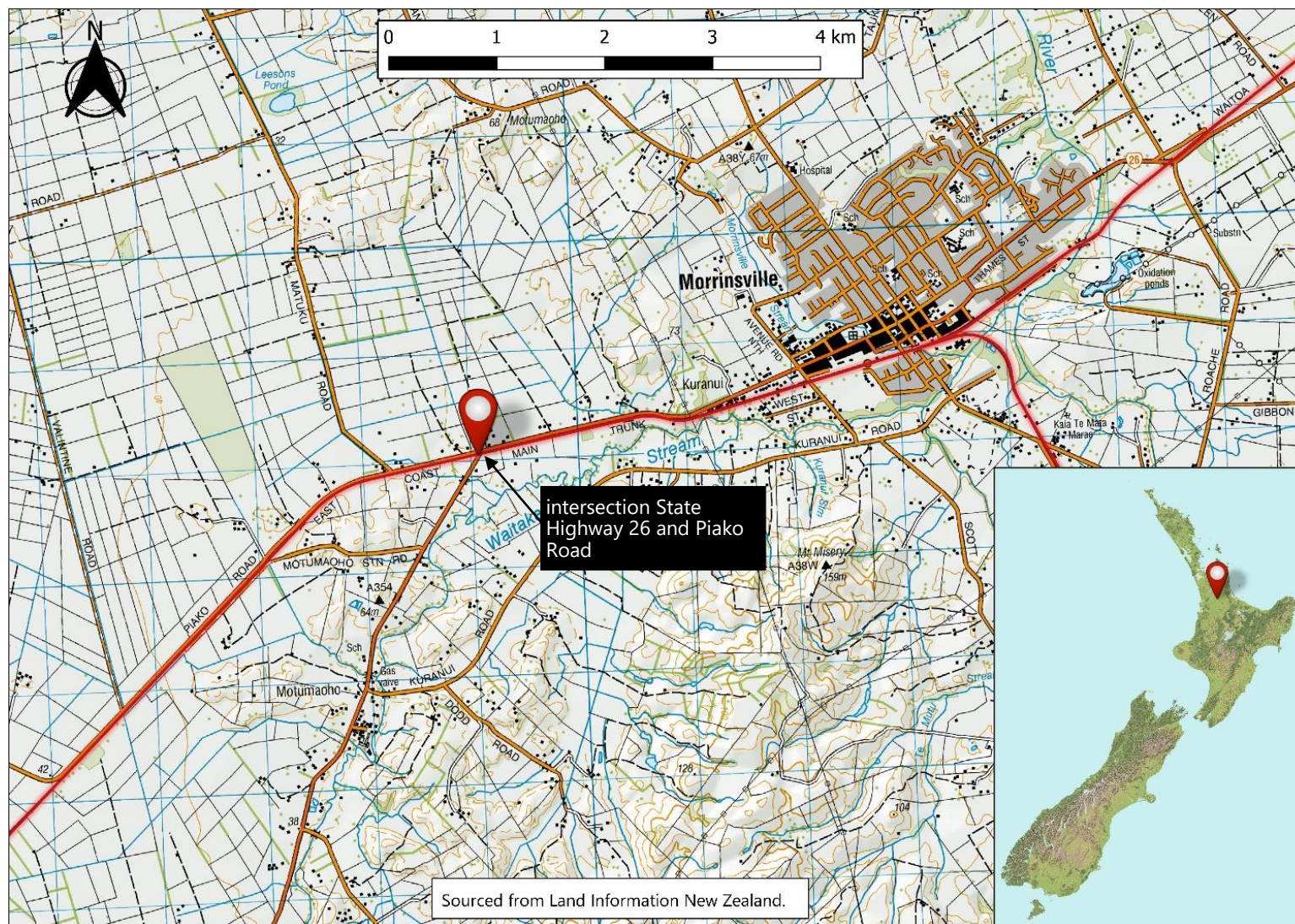
This terminology, set out in the table below, has been adopted by the Commission based on the Intergovernmental Panel on Climate Change and Australian Transport Safety Bureau models. The Commission chose these models due their simplicity, usability and international use. The Commission considers the suitability of these models as being reflective of the Commission's functions, which include the making of findings and recommendations based on a wide range of evidence received, whether or not that evidence would be admissible in a court of law.

Terminology	Likelihood	Equivalent terms
Virtually certain	> 99% probability of occurrence	Almost certain
Very likely	> 90% probability	Highly likely, very probable
Likely	> 66% probability	Probable
About as likely as not	33% to 66% probability	More or less likely
Unlikely	< 33% probability	Improbable
Very unlikely	< 10% probability	Highly unlikely
Exceptionally unlikely	< 1% probability	



**Figure 1: Piako Road level crossing during upgrade  
(Credit: Transport Accident Investigation Commission)**





**Figure 2: Location of accident**  
(Credit: Land Information New Zealand)

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# 1 Executive summary

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## ***What happened***

- 1.1 At about 0340 on Saturday 7 December 2019, two family members left their home in Hamilton by car to begin a rostered shift at their place of employment in Morrinsville.
- 1.2 The car journey to Morrinsville took them through an area of roadworks near the intersection of State Highway 26 and Piako Road, four kilometres southwest of their destination.
- 1.3 The vehicle the two people were in was stopped briefly by a traffic controller holding a stop/go sign at the southern end of the roadworks while opposing traffic cleared the area. Their car was the first in a queue of cars waiting for the go signal. Once the opposing traffic was clear, the traffic controller moved the stop sign to the go position and the cars began moving through the work area towards Morrinsville.
- 1.4 A short time after the queue of cars had proceeded past the traffic controller, a train travelling from Tauranga towards Hamilton entered the section of track that automatically activated the level crossing warning alarms.
- 1.5 The driver of the car did not stop before the level crossing and proceeded on to the railway line directly in front of the approaching train.
- 1.6 The train and car collided, resulting in the two car occupants suffering fatal injuries.

## ***Why it happened***

- 1.7 The approved traffic management plan under which the roadworks were being conducted did not identify the risks to road and rail vehicles of the level crossing situated within the proposed work area. Safety briefings and risk-mitigation actions taken by the road crew focused on their own safety and did not adequately mitigate the risks for other users approaching the level crossing.
- 1.8 The road was partially coned off to provide protection for the contractors who were painting the road markings approaching the level crossing. There was distracting activity being conducted and a vehicle with flashing amber beacons was parked next to the level crossing warning signals.
- 1.9 The proximity of the vehicle with flashing amber beacons next to the level crossing alarms likely created confusion, hindering the effectiveness of the warning devices to alert road users that a train was approaching.
- 1.10 The confusing scene created by the roadwork activity likely led the driver of the car to perceive, on being given a go signal by the traffic controller, that they had clearance to drive through the entire roadworks area including the level crossing.
- 1.11 Safety for pedestrians and vehicles using level crossings is on the Transport Accident Investigation Commission's (Commission's) watchlist of serious transport safety concerns.

- 1.12 The Commission **recommended** that **Waka Kotahi NZ Transport Agency** review its current auditing of agencies delegated to approve traffic management plans, to ensure that applicants developing traffic management plans near rail crossings have identified any rail crossings within the vicinity of proposed work areas and have consulted the rail access providers to ensure that any additional safety requirements in relation to the road/rail interface have been met.
- 1.13 The Commission **recommended** that the **Secretary for Local Government** provide leadership to, and work with local authorities to ensure all traffic management plans near rail crossings are developed in consultation with the rail access providers and any additional safety requirements in relation to the road/rail interface are met.

### ***What we can learn***

- 1.14 Roadwork activity in the vicinity of a level crossing has the potential to distract road users from the level crossing warning devices. In planning for such activity, consideration must be given to the increased risks for road users.

### ***Who may benefit***

- 1.15 Road users, road controlling authorities, roading contractors and people involved with the planning and approval of work around road/rail interfaces may all benefit from the findings and recommendations in this report.

## 2 Factual information

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### *Narrative*

- 2.1 On 17 June 2018 a traffic management plan (TMP)<sup>1</sup> titled Level Crossing Programme: SH26 Piako Road was prepared by an employee of HEB Construction Limited (HEB) as part of a level crossing improvement project that HEB was contracted to complete on behalf of KiwiRail and Waka Kotahi NZ Transport Agency (Waka Kotahi).
- 2.2 On 10 September 2019 the TMP was approved as Corridor Access Request R616904 by an employee of Higgins Contractors Limited (Higgins), acting on delegated authority to approve TMPs from Waka Kotahi.
- 2.3 On 23 September 2019 HEB contacted KiwiRail to request that a Permit to Enter (PTE)<sup>2</sup> be issued for the State Highway 26/Piako Road level crossing (the crossing) to carry out work in the rail corridor.
- 2.4 Correspondence between HEB and KiwiRail on this matter continued intermittently until 1 November 2019.
- 2.5 On 1 November 2019 there was a final communication from the KiwiRail National Corridor Permit Manager to HEB, seeking clarification of the status of the PTE.
- 2.6 There was no response to this request from HEB, and a PTE was not issued for the crossing before the accident occurred.
- 2.7 At about 1700 on 6 December 2019, road contractors commenced work near the crossing. The work involved setting up road cones and signage to provide protection for vehicles and personnel involved in painting markings on the road as part of a crossing upgrade.
- 2.8 At about 1830 a rail protection officer (RPO)<sup>3</sup>, who had been contracted by the road marking company, arrived on site to carry out duties related to marking the road within the confines of the rail corridor.
- 2.9 At about 2030 the RPO reported to the site traffic management supervisor that they had witnessed an incident where a driver of a car had become confused with the road layout and driven on the incorrect side of the coned-off area.
- 2.10 At about 2230 there was reportedly a second incident at the crossing that involved a near miss between a train and a car.
- 2.11 At about 0130 on 7 December 2019, the RPO was no longer required for rail protection duties and departed the site. The traffic management equipment, including the road cones and vehicles, remained in place while further work was conducted outside the rail corridor.
- 2.12 At about 0150 Train 320 departed Tauranga travelling towards Hamilton.

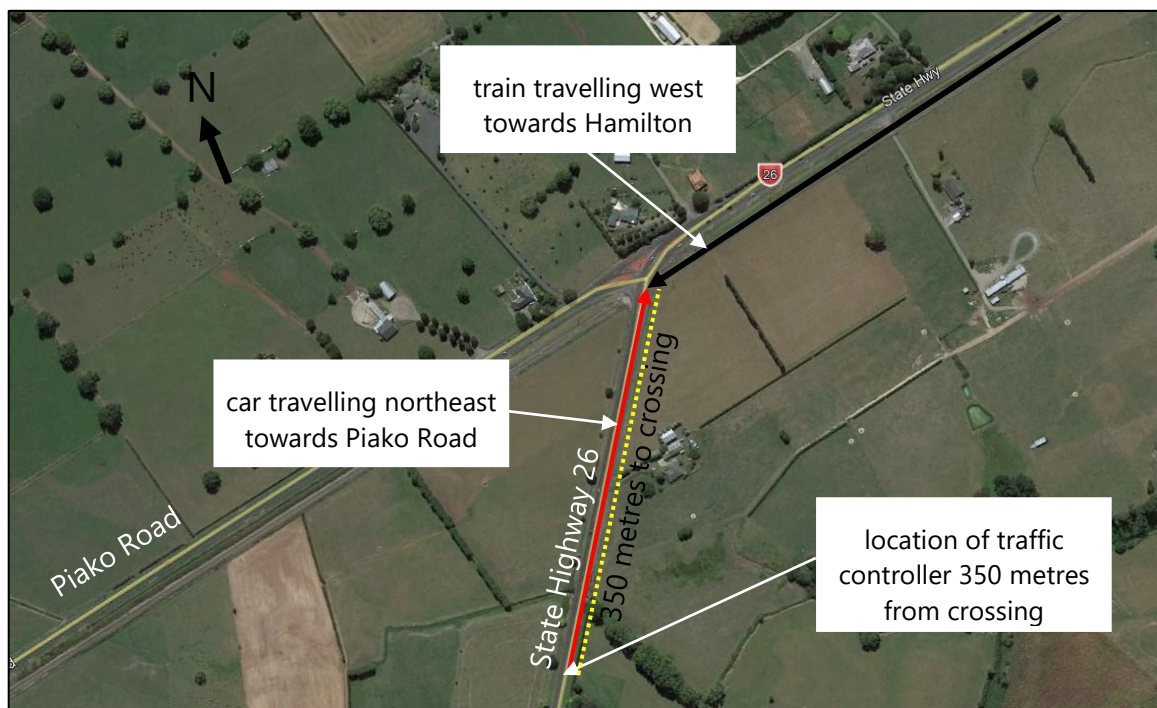
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<sup>1</sup> A document outlining the position of roadworks and the various protection methods employed to carry out roadwork safely. It must be approved by a qualified person.

<sup>2</sup> A document provided by KiwiRail allowing work to be conducted within five metres of the rail corridor once certain conditions have been met.

<sup>3</sup> A person responsible for protected work areas. They control entry to and exits from the work areas and communicate with train control to provide protection from rail traffic entering the work areas.

- 2.13 At about 0340 the occupants of the car involved in the collision (the car) departed their home in Hamilton and travelled towards Morrinsville on their way to work.
- 2.14 At about 0402 the car was stopped by a traffic controller holding a stop/go sign. The traffic controller was located within the roadworks, approximately 350 metres (m) from the crossing.
- 2.15 The traffic controller's duty was to stop cars approaching from the south end of the roadworks while cars were travelling through the single lane from the opposing direction.
- 2.16 At about 0406 the car was given clearance by the traffic controller to proceed and began moving towards the crossing at an estimated speed of no more than 30 kilometres per hour (km/h).
- 2.17 About 15 seconds before the car reached the crossing, the crossing alarm warning bells and alternating flashing red lights were activated by the approach of Train 320. Train 320 was travelling at 70 km/h, within the 80 km/h speed limit for the line.
- 2.18 At 0407 the car entered the crossing directly in front of Train 320. The car was struck in the middle of the driver's side by the locomotive (see Figure 3).
- 2.19 The train driver immediately activated the train's emergency braking system. The train came to a stop 500m west of the point of collision.
- 2.20 Emergency services were called and the train driver disembarked from the locomotive to assess the situation. The right-hand side of the car was wedged into the front of the locomotive. Both car occupants had suffered fatal injuries.



**Figure 3: Satellite view of accident site**  
(Credit: Google Maps modified by Transport Accident Investigation Commission)



### ***Personnel information***

- 2.21 The train driver had received full certification in 2013. They had all current relevant qualifications for the role.
- 2.22 The car driver held a learner's licence.

### ***Train/Vehicle information***

- 2.23 The train was carrying freight. It was 704 metres long and weighed 679 tonnes.
- 2.24 The car was a small four-door saloon. No mechanical issues that may have contributed to the accident were found during an independent post-accident examination.

### ***Meteorological information***

- 2.25 The accident occurred in the early hours of the morning. The weather conditions were still and clear. The area in which the accident occurred was lit by numerous artificial sources due to the roadwork activity.

### ***Site and wreckage information***

- 2.26 The car was removed by New Zealand Police to a secure storage facility, where it underwent a mechanical examination. No mechanical faults were found with the vehicle.

### ***Medical and pathological information***

- 2.27 The train driver voluntarily supplied an alcohol breath-screening test to New Zealand Police at the scene. The test indicated a negative/clear result.
- 2.28 Toxicology tests on the car driver also indicated a negative/clear result.

### ***Previous occurrences***

- 2.29 There had been numerous reported near misses and several collisions at the crossing since 2005, including fatal collisions in 2012 and 2017.

### ***Organisational information***

- 2.30 Level Crossing Programme: SH26/Piako Road was a venture between Waka Kotahi, KiwiRail and third parties contracted by Waka Kotahi. See Appendix 1 for an organisational chart.

## 3 Analysis

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### Introduction

- 3.1 The upgrade to the crossing at State Highway 26/Piako Road was commissioned by Waka Kotahi to improve the safety features of the road/rail interface. The intersection itself was challenging to road users, as three separate 100 km/h roads joined in the vicinity of the rail crossing. This encouraged road users to concentrate on being prepared to follow give-way rules to avoid road accidents, rather than focus on the crossing, which was also a potential danger.
- 3.2 The roadwork activity at the time of the accident included the crossing. Receiving a go signal from the traffic controller likely led the car driver to believe that they had clearance through the entire area of activity, whereas the traffic controllers on duty reported that they had the expectation that road users would stop if required for any level crossing alarms.
- 3.3 The car driver held a learner's licence but was described by family members as a confident and competent driver. The Transport Accident Investigation Commission (Commission) found no evidence that the driver's level of experience contributed to the safety factors identified in this report.
- 3.4 The following section analyses the circumstances surrounding the event to identify those factors that increased the likelihood of the event occurring or increased the severity of its outcome. It also examines any safety issues that have the potential to adversely affect future operations.

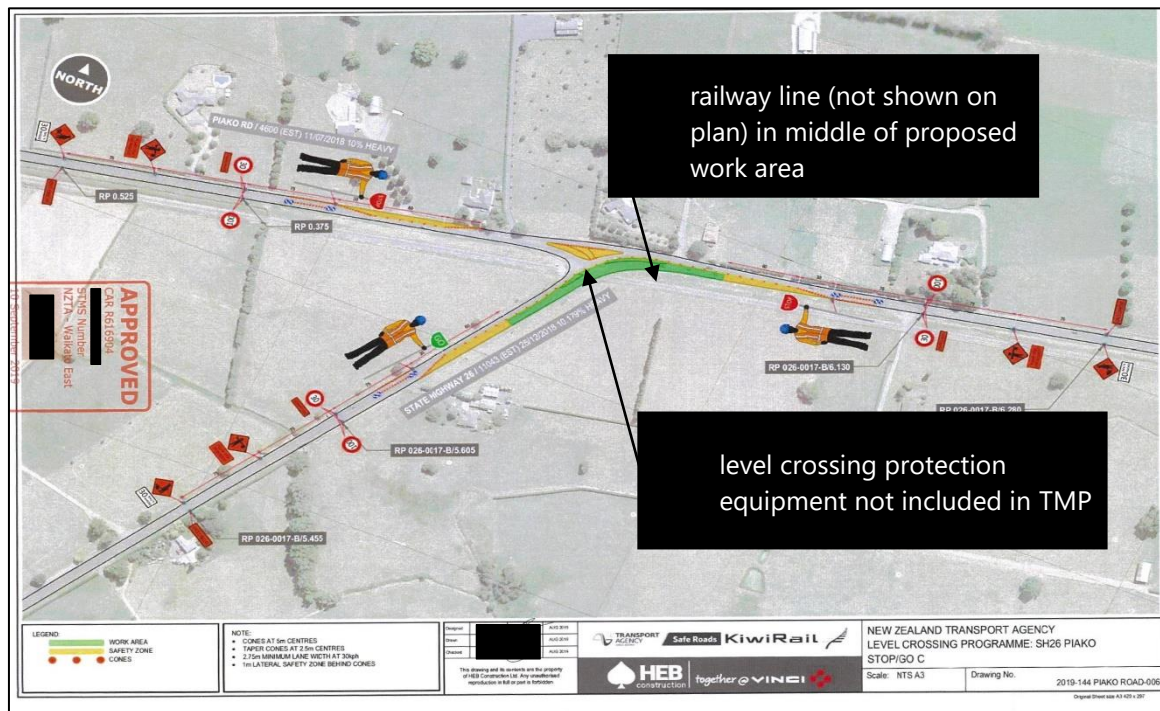
***Safety issue: The TMP did not fully identify the risks to road and rail vehicles approaching the crossing.***

- 3.5 The roadworks being conducted were part of an upgrade to the crossing at that location and were being controlled by traffic controllers with stop/go signs.
- 3.6 Road traffic was diverted into a single lane to provide a safe working area for road marking contractors, and the traffic controllers were present to ensure there were no conflicting movements of cars in the single lane. There was a temporary speed limit of 30 km/h in place within the area of the roadwork activity.
- 3.7 The work had been approved by means of a TMP, which had been signed off by Higgins on behalf of Waka Kotahi in September 2019 (see Figure 4).
- 3.8 The TMP included information regarding the positioning of warning signs, road cones and traffic controllers in relation to the proposed work.
- 3.9 The TMP approved by the contractor under delegated authority from Waka Kotahi did not identify the rail corridor and crossing within the work area. This was contrary to the advice in Waka Kotahi's own publication, Traffic Control Devices Manual Part 9 (NZ Transport Agency, 2012), which stated in part:

Whenever both rail and road corridors are within a work site, any traffic management plan must consider implications of the work and associated controls on the safe operation of each corridor.

It is essential that critical features such as railway lines and traffic control devices (such as flashing light assemblies) are included on plans. This will ensure those involved in the

design and approval of the plans fully consider the implications of the work on all traffic (including road and rail vehicles) through the site as required by CoPTTM [the Code of Practice for Temporary Traffic Management]<sup>4</sup>.



**Figure 4: Approved TMP**  
(Credit: Higgins, modified by Transport Accident Investigation Commission)

- 3.10 Although required by the TMP approving authority, the absence of any reference to the rail corridor meant that the planning of the proposed work did not consider the danger to road and rail vehicles approaching the crossing, and subsequently no added protection was required to be put in place while the work was being carried out.
- 3.11 Vehicles were signalled through the roadworks area towards the crossing. Specific protection had not been put in place to ensure that road users would comply with crossing alarm warning devices as they normally would in the absence of any roadwork activity.
- 3.12 A lack of specific protection for the crossing within the work area increased the risk to road and rail vehicles.
- 3.13 The Commission has made a recommendation to address this issue in section 6.

**Safety issue: Work within the rail corridor was undertaken without a permit to do so being obtained. As a result, potential risk-mitigation actions that were required prior to the issue of the permit were not completed. Not obtaining a permit increased the risk to road and rail users approaching the crossing.**

- 3.14 PTEs were granted by the National Corridor Permit Manager, who was the KiwiRail official responsible for reviewing requests by outside agencies needing to work within five metres of the railway corridor.

<sup>4</sup> Waka Kotahi is responsible for setting the requirements for the safe and efficient management and operation of temporary traffic management on all roads in New Zealand. CoPTTM is the best-practice guideline for temporary traffic management in New Zealand.

- 3.15 Before a PTE was granted, a series of checks was to be made to ensure there was no unacceptable risk to KiwiRail assets and users of the rail corridor.
- 3.16 On this occasion, the contractor requested that an existing PTE granted for a different location be extended to cover the State Highway 26/Piako Road crossing.
- 3.17 The National Corridor Permit Manager questioned the request, as it did not follow the correct protocol. After a period of correspondence on the matter, communication ceased. The request was not followed through and a PTE was not issued for the crossing.
- 3.18 The work requiring a PTE was the painting of yellow road markings (hatching) that denoted the danger area for road users close to the crossing. This work went ahead despite a PTE not having been issued (see Figure 5).



**Figure 5: Painted hatching at the crossing**  
(Credit: KiwiRail, modified by Transport Accident Investigation Commission)

- 3.19 The RPO contracted by the road markers contacted train control<sup>5</sup> to request blocking<sup>6</sup> for the area for the duration of the work. Due to the time of the evening there was little rail activity and therefore, although the work was not on a plan, it was treated as a routine ad hoc request for blocking and was granted by train control.
- 3.20 Once the work had been completed, the RPO contacted train control to remove the blocking. At this point they were no longer required for protection duties so they departed the site hours before the accident occurred.
- 3.21 The work taking place within five metres of the railway corridor without a permit had already been completed at the time of, and therefore did not contribute to, the accident. However, it is of concern to the Commission that an opportunity was lost for KiwiRail to have oversight of the planned work, had the contractor obtained a PTE.

<sup>5</sup> Train control is situated in Wellington Railway Station and is responsible for track authorisations and the safe movement of rail traffic.

<sup>6</sup> A method of preventing signals being cleared into an area, which is applied by a train controller on a train control system.



- 3.22 Not having oversight of the planned work meant that any risk-mitigation actions KiwiRail deemed necessary (for example, temporarily lowering the speed of trains through the crossing or promulgating the worksite on the daily information bulletin) could not be considered.
- 3.23 A further opportunity was lost in that by reviewing the planned work KiwiRail may have deduced from the TMP that there had been an insufficient consideration of the risks posed by the crossing.
- 3.24 KiwiRail has provided the Commission with documentation on actions it has taken since the incident. The documentation includes alerts to industry of the obligations for appropriate TMPs and the need for PTEs, and for updated checklists to be completed before PTEs are granted (see Appendix 2).
- 3.25 KiwiRail has also instituted a new requirement for an RPO to be in place where a TMP or work activity impacts any of the warning devices on a crossing, or as otherwise determined necessary in the circumstances. The RPO will communicate directly with the traffic controllers.
- 3.26 The Commission welcomes these actions. However, rail access providers are only able to provide additional protections if they are aware in advance of the work taking place. The current process, which places the onus on contractors to apply for PTEs after TMPs have been approved, increases the risk of work going ahead without rail access providers' knowledge or approval.
- 3.27 The Commission has made a recommendation to address this issue in section 6.

## 4 Findings

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- 4.1 The complexity of the scene created by the roadwork activity was confusing and likely led the driver of the car to perceive, on being given a go signal by the traffic controller, that they had clearance to drive through the entire roadworks area, including the level crossing.
- 4.2 The traffic management plan presented to the approving authority by HEB Construction made no mention of the rail level crossing within the proposed worksite. This was contrary to the requirements given in Appendix C of the Traffic Control Devices Manual, Part 9, Level crossings (New Zealand Transport Agency, 2012).
- 4.3 No added protection for road and rail vehicles approaching the level crossing was considered during the traffic management plan approval process.
- 4.4 The activity conducted around the level crossing had not been issued with a permit by KiwiRail.

## 5 Safety issues and remedial action

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### General

- 5.1 Safety issues are an output from the Commission's analysis. They typically describe a system problem that has the potential to adversely affect future operations on a wide scale.
- 5.2 Safety issues may be addressed by safety actions taken by a participant, otherwise the Commission may issue a recommendation to address the issue.
- 5.3 The Commission identified two safety issues during the investigation.

### *The TMP did not fully identify the risks to road and rail vehicles approaching the crossing*

- 5.4 The TMP presented to the Waka Kotahi delegated authority for approval did not identify the crossing within the worksite. Waka Kotahi's own instructions for working on or near level crossings gave clear directions to road controlling authorities<sup>7</sup> and rail access providers to consider the possible implications arising from rail and road vehicle interactions.
- 5.5 On 1 June 2021 Waka Kotahi advised the Commission:

CoPTTM uses a risk-based approach that relates the task to the specific location at which the work will be carried out. All of the requirements outlined in the CoPTTM (TCD [Traffic Control Devices] Manual part 8) also apply to TMPs with or near rail crossings. In addition to the guidance provided through CoPTTM, providers developing TMPs with or near rail crossing are also required to consult with railway authorities, who are best placed to confirm their additional TMP requirements have been met. Other than TCD part 8 section A7.4.2. requesting TMP providers to consult with railway authorities, there are no further specific reference to rail crossings within the current TCD. Given feedback through the CoPTTM Review and the number of incidents around rail crossings a guidance document (which would sit in Section I-10: Railway crossings) is currently being developed.
- 5.6 The Commission welcomes the safety actions taken to date. However, it believes more action needs to be taken to ensure the safety of future operations. Therefore, the Commission has made a recommendation in section 6 to address this issue.

### *Work within the rail corridor was undertaken without obtaining a permit to do so. As a result potential risk-mitigation actions that were required prior to the issue of the permit were not completed. Not obtaining a permit increased the risk to road and rail users.*

- 5.7 The work taking place within five metres of the railway corridor without a permit had already been completed at the time of, and therefore did not contribute to, the accident. However, it is of concern to the Commission that, through the contractor not obtaining a PTE, an opportunity was lost for KiwiRail to have oversight of the planned work.
- 5.8 KiwiRail has taken the following safety action to address this issue:
  - updated internal checklists to prompt the requirement for a temporary TMP

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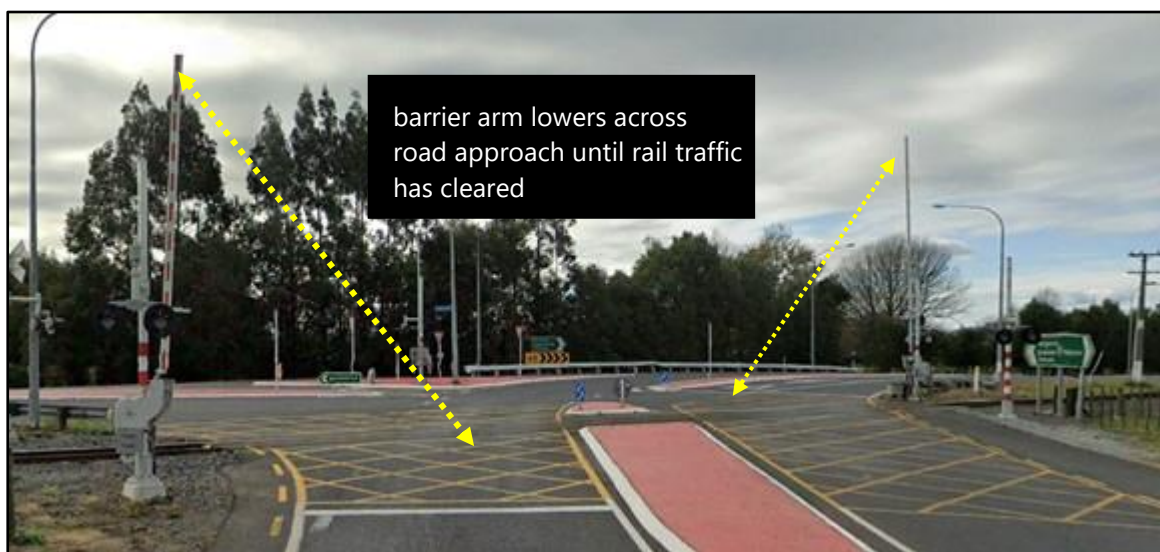
<sup>7</sup> A body responsible for the care, control or management of roads within a given jurisdiction. Waka Kotahi is the road controlling authority for state highways; other roads are the responsibility of the local or regional councils.

- drafted an alert to industry, to be presented to road controlling authorities and contractors, emphasising the need for PTEs
- instituted a requirement for an RPO to be present when work could potentially affect level crossing protection equipment.

5.9 The Commission welcomes the safety actions taken to date. However, it believes more action needs to be taken to ensure the safety of future operations. Therefore, the Commission has made a recommendation in section 6 to address this issue.

### ***Other safety action***

5.10 The State Highway 26/Piako Road crossing was fitted with a half-arm barrier on completion of the upgrade for enhanced protection of road traffic. When activated by an approaching train, a half-arm barrier lowers across the road to provide a physical intervention for vehicles approaching the crossing (see Figure 6).



**Figure 6: Half-arm barriers in place at completion of crossing upgrade**  
**(Credit: Google Earth, modified by Transport Accident Investigation Commission)**



## 6 Recommendations

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### General

- 6.1 The Commission may issue, or give notice of, recommendations to any person or organisation that it considers the most appropriate to address the identified safety issues, depending on whether these safety issues are applicable to a single operator only or to the wider transport sector.
- 6.2 In the interests of transport safety, it is important that recommendations are implemented without delay to help prevent similar accidents or incidents occurring in the future.
- 6.3 This accident revealed that there were existing guidelines for road controlling authorities to consider for rail level crossings in the planning of roadwork activity, with respect to the safety of road users. Not considering these guidelines may compromise the effectiveness of level crossing protection.
- 6.4 Waka Kotahi is the road controlling authority for work on state highways. Local and regional councils are the road controlling authorities for other roads. The safety issues regarding the approval processes are the same. Waka Kotahi has no jurisdiction to implement CoPTTM for local road controlling authorities, therefore a recommendation has been made to the Secretary for Local Government.

### New recommendations

- 6.5 **On 27 October 2021 the Commission recommended that Waka Kotahi review its current auditing of agencies delegated to approve traffic management plans, to ensure that applicants developing traffic management plans identify any rail crossings within the vicinity of proposed work and that the rail access providers have been consulted to ensure that any additional safety requirements in relation to the road/rail interface are met. (006/21)**

On 15 November 2021, Waka Kotahi NZ Transport Agency Senior Manager – Safer Rail replied in part:

I can confirm that Waka Kotahi is currently in the process of replacing the current Code of Practice for Temporary Traffic Management (CoPTTM), which is the document that guides temporary traffic management practice across Aotearoa's road controlling authorities and their supply chains. CoPTTM will be replaced by the NZ Guide to TTM (NZGTTM) which will take a different approach to how temporary traffic management is governed, planned for and operationalised. This includes leading culture change to ensure relevant persons conducting or undertaking a business (PCBU) understand their obligations under the Health and Safety at Work Act 2015 and consultation requirements with other affected PCBU. Concurrently, WorkSafe NZ is developing the Good Practice Guide to Road Worker Safety. These two documents will be closely aligned. There is currently a large amount of work underway to develop NZGTTM, which includes consultation with KiwiRail, amongst others, in order to understand their needs. The timeframe for implementing the new model includes having a draft for consultation by January 2022, and a target release in the second quarter of 2022. There will be on-going adoption and culture change programmes beyond this.

- 6.6 **On 27 October 2021 the Commission recommended that the Secretary for Local Government provide leadership to, and work with local authorities to ensure that traffic management plans identify any rail crossings within the vicinity of the proposed work and that the rail access providers have been consulted to ensure that any additional safety requirements in relation to the road/rail interface are met. (007/21)**

*Notice given to Chief Executive of KiwiRail*

- 6.7 On 27 October 2021 the Commission recommended that Waka Kotahi review its current auditing of agencies delegated to approve traffic management plans, to ensure that applicants developing traffic management plans identify any rail crossings within the vicinity of proposed work and that the rail access providers have been consulted to ensure that any additional safety requirements in relation to the road/rail interface are met.
- 6.8 On 27 October 2021 the Commission recommended that the Secretary for Local Government provide leadership to, and work with local authorities to ensure that traffic management plans identify any rail crossings within the vicinity of the proposed work and that the rail access providers have been consulted to ensure that any additional safety requirements in relation to the road/rail interface are met.

## 7 Key lesson

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- 7.1 Roadwork activity in the vicinity of a level crossing has the potential to distract road users from the level crossing warning devices. In planning for such activity, consideration must be given to the increased risk to road users.

## 8 Data summary

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### Vehicle particulars

Train number: service number 320

Classification: freight

Operator: KiwiRail

**Date and time** 7 December 2019, 0407

**Location** State Highway 26/Piako Road, Morrinsville

**Operating crew** one train driver, two car occupants

**Injuries** two fatalities



## 9 Conduct of the inquiry

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- 9.1 On 7 December 2019 KiwiRail notified the Commission of the occurrence. The Commission subsequently opened an inquiry under section 13(1) of the *Transport Accident Investigation Commission Act 1990* and appointed an investigator in charge.
- 9.2 Commission investigators conducted a scene examination and interviewed:
- the train driver
  - two witnesses to the incident
  - the RPO
  - the contractor who approved the TMP
  - the approving authority manager.
- 9.3 The Commission obtained the following documents and records for analysis:
- Tranzlog data from the freight train locomotive
  - radio communications between the train driver and train control at the time of the incident
  - train control diagrams relevant to the incident
  - records from New Zealand Police, including photographs and witness statements
  - toxicology reports
  - the warrant of fitness and registration details of the car
  - a copy of an independent vehicle examination conducted on the car
  - the driver licence details of the car driver
  - copies of incident reports produced by KiwiRail and HEB
  - a copy of the TMP.
- 9.4 The Commission also spoke to members of the family of the car occupants.
- 9.5 On 23 June 2021 the Commission approved a draft report for circulation to four interested persons for their comment.
- 9.6 The Commission received submissions from four interested persons. Any changes resulting from those submissions have been included in this final report.
- 9.7 On 27 October 2021 the Commission approved the final report for publication.

## 10 Report information

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### Abbreviations

CoPTTM	Code of Practice for Temporary Traffic Management
HEB	HEB Construction Limited
Higgins	Higgins Contractors Limited
km/h	kilometre(s) per hour
PTE	Permit to Enter
RPO	rail protection officer
TMP	traffic management plan
Waka Kotahi	Waka Kotahi NZ Transport Agency

### Glossary

blocking	a method of preventing signals being cleared into an area, which is applied by a train controller on a train control system
Code of Practice for Temporary Traffic Management	the best-practice guideline for temporary traffic management in New Zealand
Permit to Enter	a document provided by KiwiRail allowing work to be conducted within five metres of a rail corridor once certain conditions have been met
rail protection officer	a person responsible for protected work areas. They control entry to and exits from work areas and communicate with train control to provide protection from rail traffic entering the work areas
road controlling authority	a body responsible for the care, control or management of roads within a given jurisdiction. Waka Kotahi is the road controlling authority for state highways; other roads are the responsibility of the local or regional councils
traffic management plan	a document outlining the positions of roadworks and the various protection methods employed to carry out roadworks safely. It must be approved by a qualified person

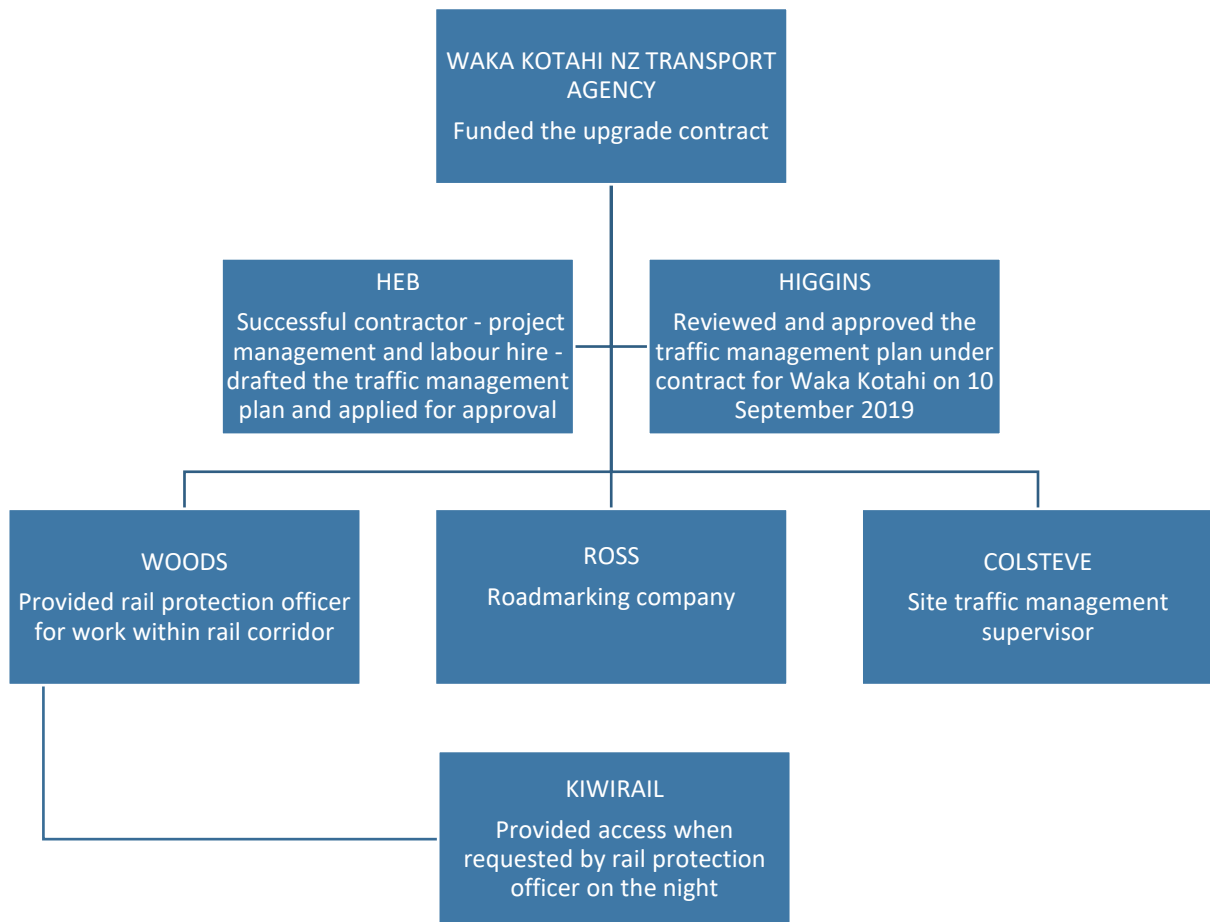
train control	train control is situated in Wellington Railway Station and is responsible for track authorisations and the safe movement of rail traffic
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### **Citation**

NZ Transport Agency. (2012, December). Traffic control devices manual. *Part 9, Level Crossings*. Waka Kotahi NZ Transport Agency.

## Appendix 1 Involved parties organisational chart

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## Appendix 2 KiwiRail alert to industry

# SAFETY, HEALTH AND ENVIRONMENT ALERT



### UPDATED ALERT

### Temporary Traffic Management and Level Crossing Interface



Example of confusing signage as approaching a level crossing.



Example of driver view lines where fencing is used in proximity to the rail corridor



View of signalling when crossing is activated on the correct side of the road



View of signalling when crossing is activated on the wrong side of the road (half-arm barrier has very low visibility and flashing lights are not observable)

Issue No.	11	Issue date:	3/05/2021	Originator:	Zero Harm
IRIS No.	EVT2001083EVT2001083			BU reference:	ZH CPAD 008
Content endorsed by:				Related docs:	Code of Practice for Temporary Traffic Management
Content authorised by:				Job title:	Zero Harm Lead



## What happened?

There have been 4 high potential near miss incidents relating to temporary traffic management interfacing with railway level crossings. The works undertaken requiring the use of temporary traffic management were 3<sup>rd</sup> party road works unrelated to requiring access to the rail corridor.

### Incident 1: Piako Road Level Crossing, Waikato

Stop/Go operating prior to approach to level crossing. A vehicle driven by a member of public was signalled 'go' by the traffic controller, the road user continued to approach the crossing once alarms activated resulting in workers taking emergency measures to stop the vehicle as a train approached the crossing.

### Incident 2: Portage Road Level Crossing, Auckland

A temporary traffic management system had been established for a work site on Portage Road, New Lynn. South travelling vehicles were directed over the crossing on the wrong side of the road. A vehicle was signalled 'go' and approached the crossing as the barrier arms activated. The vehicle continued to access the crossing and was blocked by the southern side barrier arm. The left side of the crossing was blocked by traffic cones causing a momentary delay of the vehicle leaving the crossing while they waited on instruction to drive over the cones.

### Incident 3: Renall Street Level Crossing, Masterton

A temporary traffic management system had been established for excavation work being undertaken on Renall Street. The system diverted road users through side roads away from the crossing. A passenger bus service was granted special permission supported by the local council to travel through the worksite and over the wrong side of the crossing. A passenger bus approached the crossing as the half-arm barrier activated blocking the bus from exiting the crossing. The driver stopped the bus and reversed clear of the tracks. Less than 10 seconds later a freight train proceeded over the crossing. As the train is proceeding over the crossing the STMS placed themselves between the front of the bus and the passing train wagons shown in figure 10 below.

Rail protection and bulletins are required to protect people from rail movements where activity is underway within 5m of the track centre line.



Figure 10: STMS person positioned near the front of the bus.

### Incident 4: Glenview Road Level Crossing, Auckland

A temporary traffic management system had been established for construction of a tall building neighbouring our rail corridor. Our Permit to Enter approved a traffic management plan that allowed traffic to flow normally across the level crossing. The contractor used an amended traffic management plan (that was not approved by KiwiRail) to send traffic on the wrong side of the road across the level crossing. A barrier arm came down on a water truck.

## Why did it happen?

Key risk areas in temporary traffic management and level crossing interfaces:

- Road users do not have visibility of barrier arms activating, warning lights and signage when crossing on the wrong side of a level crossing.
- Stop/Go instructions create confusion for road users when the worksite incorporates part of the crossing.
- Sign clutter can cause confusion and comprehension overload for road users.
- Site traffic management supervisors (STMS) and Traffic Controllers (TCs) generally do not have rail experience to appropriately control the road/rail interface.
- View lines where plant or equipment is used in close proximity to the rail corridor can prevent road users observing either signage or approaching trains.
- Where Temporary Traffic Management (TTM) is operating after a level crossing, there is the potential for road users to inadvertently queue over a level crossing i.e. short stacking distances.
- Vehicles becoming 'trapped' in the crossing as half arm barriers activate in front of them while crossing on the wrong side.

## Important information or action to be taken

**This alert supercedes ZH CPAD 003 Temporary Traffic Management and Level Crossing Interface**

The following actions must be taken effective 1<sup>st</sup> September 2021:

### Working within 100m of a Railway Level Crossing:

- All traffic management plans to be notified to KiwiRail for approval to ensure it does not impact the level crossing.
- All traffic management plans that encroach within 5m of the crossing will require a KiwiRail Permit to Enter
- To reduce risk where there is direct impact to a railway level crossing traffic management designs must consider:
  1. Closure of the road to avoid a change in road user interaction with the crossing
  2. That road workers are able to maintain a safe distance from the rail corridor
  3. That road users and pedestrians are able to use the crossing as designed – i.e. avoiding crossing the wrong side, or diverting pedestrians

### Working Adjacent to the Rail Corridor

- All traffic management plans where the traffic management or work activity is within 10m of the track must be notified to KiwiRail
- All work within 5m of track requires a KiwiRail Permit to Enter.

KiwiRail may require that a permit to enter and rail protection is in place to control the interface between road and rail where higher level controls cannot be applied. Details and lead times of the Permit to Enter process can be found here: <https://www.kiwirail.co.nz/how-can-we-help/access-the-rail-corridor/>.

This alert is subject to 6 monthly review and updates will be made as required.

For more information contact: [nationalpermits@kiwirail.co.nz](mailto:nationalpermits@kiwirail.co.nz)





# TAIC Kōwhaiwhai - Māori scroll designs

TAIC commissioned its kōwhaiwhai, Māori scroll designs, from artist Sandy Rodgers (Ngati Raukawa, Tuwharetoa, MacDougal). Sandy began from thinking of the Commission as a vehicle or vessel for seeking knowledge to understand transport accident tragedies and how to prevent them. A 'waka whai mārama (i te ara haumarū) is 'a vessel/vehicle in pursuit of understanding'. Waka is metaphor for the Commission. Mārama (from 'te ao mārama' – the world of light) is for the separation of Rangitāne (Sky Father) and Papatūānuku (Earth Mother) by their son Tāne Māhuta (god of man, forests and everything dwelling within), which brought light and thus awareness to the world. 'Te ara' is 'the path' and 'haumarū' is 'safe or risk free'.

## Corporate: Te Ara Haumarū - The safe and risk free path



The eye motif looks to the future, watching the path for obstructions. The encased double koru is the mother and child, symbolising protection, safety and guidance. The triple koru represents the three kete of knowledge that Tāne Māhuta collected from the highest of the heavens to pass their wisdom to humanity. The continual wave is the perpetual line of influence. The succession of humps represent the individual inquiries.

Sandy acknowledges Tāne Māhuta in the creation of this Kōwhaiwhai.

## Aviation: ngā hau e whā - the four winds



To Sandy, 'Ngā hau e whā' (the four winds), commonly used in Te Reo Māori to refer to people coming together from across Aotearoa, was also redolent of the aviation environment. The design represents the sky, cloud, and wind. There is a manu (bird) form representing the aircraft that move through Aotearoa's 'long white cloud'. The letter 'A' is present, standing for aviation.

Sandy acknowledges Ranginui (Sky father) and Tāwhirimātea (God of wind) in the creation of this Kōwhaiwhai.

## Marine: ara wai - waterways



The sections of waves flowing across the design represent the many different 'ara wai' (waterways) that ships sail across. The 'V' shape is a ship's prow and its wake. The letter 'M' is present, standing for 'Marine'.

Sandy acknowledges Tangaroa (God of the sea) in the creation of this Kōwhaiwhai.

## Rail: rerewhenua - flowing across the land



The design represents the fluid movement of trains across Aotearoa. 'Rere' is to flow or fly. 'Whenua' is the land. The koru forms represent the earth, land and flora that trains pass over and through. The letter 'R' is present, standing for 'Rail'.

Sandy acknowledges Papatūānuku (Earth Mother) and Tāne Mahuta (God of man and forests and everything that dwells within) in the creation of this Kōwhaiwhai.





## Transport Accident Investigation Commission

**Recent railway occurrence reports published by  
the Transport Accident Investigation Commission  
(most recent at top of list)**

RO-2020-102	Express freight Train 932, strikes hi-rail vehicle, Limeworks Road, 24 April 2020
RO-2019-105	Express freight Train 268, derailment, Wellington, 2 July 2019
RO-2019-107	Passenger service SPAD and near collision, Wellington, 6 November 2019
RO-2019-106	Passenger train 804, Irregular disembarkation of passengers, Rolleston, Canterbury, 3 September 2019
RO-2019-104	Unsafe entry into worksite, Taimate, 5 June 2019
RO-2019-103	Derailment of Train 626, Palmerston North, 4 April 2019
RO-2019-101	Safe-working occurrence, Westfield yard, Ōtāhuhu, Auckland, 24 March 2019
RO-2019-102	Clinton derailment, 29 March 2019
RO-2018-102	Freight train SPAD and wrong-routing, Taimate, 1 October 2018
RO-2018-101	Metropolitan passenger train, derailment, Britomart Transport Centre, Auckland, 9 May 2018
RO-2017-106	Mainline locomotives, Wrong-routing and collision with work vehicle, Invercargill, 16 November 2017
RO-2017-105	Collision between freight Train 353 and heavy motor vehicle, Lambert Road, level crossing, near Kawerau, 6 October 2017
RO-2017-104	Unauthorised immobilisation of passenger train, at Baldwin Avenue Station, Avondale, 17 September 2017
RO-2017-101	Signal Passed at Danger 'A' at compulsory stop boards protected worksite, Pongakawa, Bay of Plenty, 7 February 2017
RO-2017-103	Potential collision between passenger trains, Wellington Railway Station, 15 May 2017

Price \$14.50

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