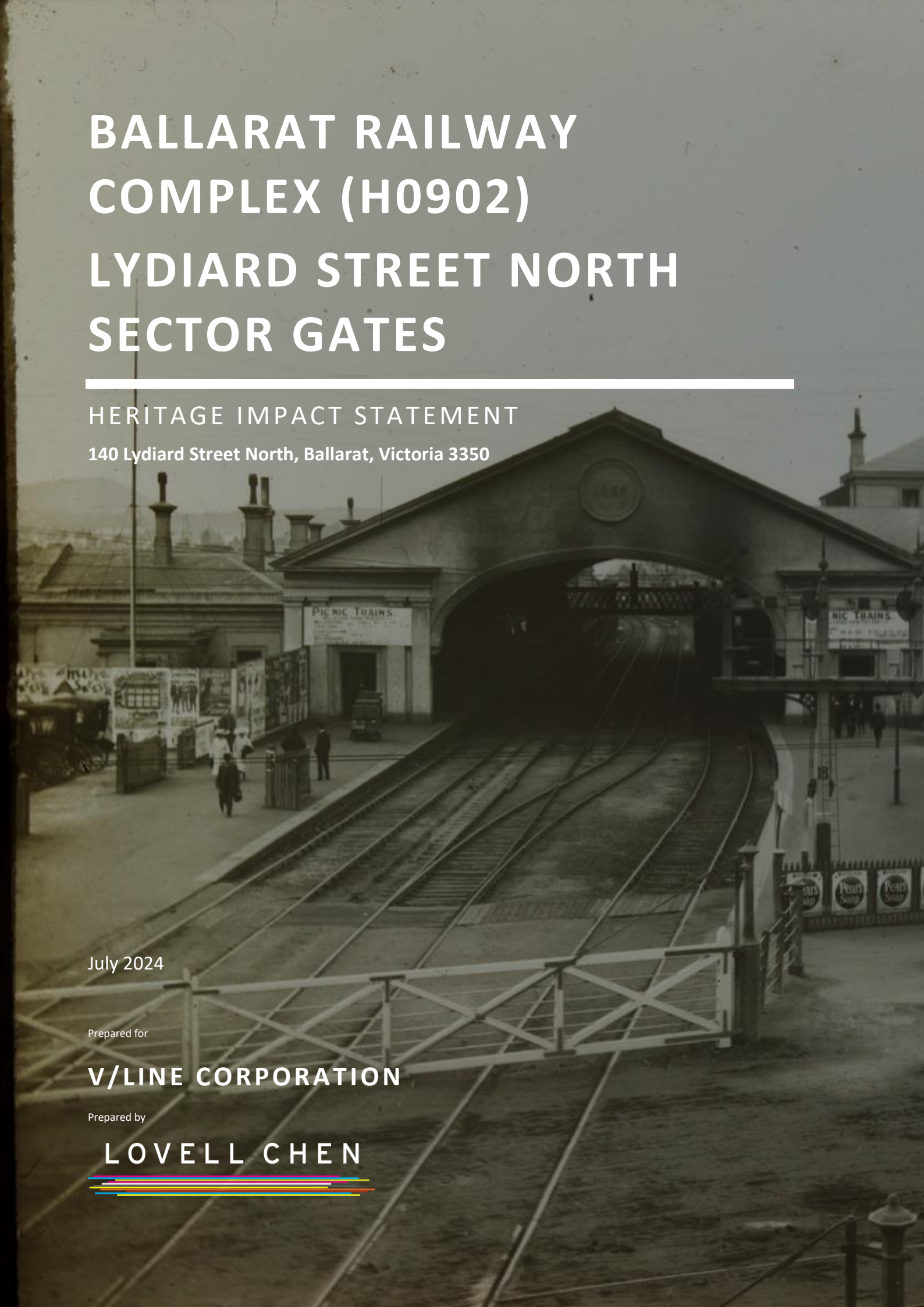
BALLARAT RAILWAY COMPLEX (H0902)

LYDIARD STREET NORTH SECTOR GATES

HERITAGE IMPACT STATEMENT

140 Lydiard Street North, Ballarat, Victoria 3350



July 2024

Prepared for

V/LINE CORPORATION

Prepared by

LOVELL CHEN

ACKNOWLEDGEMENT OF COUNTRY

This report was prepared on the lands of the Wurundjeri people who have been custodians of this land for thousands of years. We acknowledge their stories, connection to land, water and culture which is embedded in Country. We pay our respects to their Elders past and present and acknowledge that this report includes a post-contact history that forms only a small part of the ongoing story.

Ballarat Railway Complex is located on the lands of the Wadawurrung people, who are, and have always been the custodians of this land. We pay our respects to the Elders past and present, and acknowledge the stories, traditions and cultures of all Aboriginal and Torres Strait Islander people.

Quality Assurance Register

The following quality assurance register documents the development and issue of this report prepared by Lovell Chen Pty Ltd in accordance with our quality management system.

Project no.	Issue no.	Description	Issue date	Approval
9381.01	DRAFT	Heritage Impact Statement	10/05/2024	SZ
9381.01	FINAL	Heritage Impact Statement	5/7/2024	SZ

Referencing

Historical sources and reference material used in the preparation of this report are acknowledged and referenced as endnotes or footnotes and/or in figure captions. Reasonable effort has been made to identify and acknowledge material from the relevant copyright owners.

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Limitation

Cover image: Elevated perspective looking east to the Train Hall and level crossing from Lydiard Street, undated (c. 1890s)

Source: State Library Victoria, H41033/24

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1.0 INTRODUCTION

We respectfully acknowledge that the Ballarat Railway Complex is located on Wadawurrung Country.

This Heritage Impact Statement (HIS) has been prepared by Lovell Chen for the V/Line Corporation to accompany a Heritage Permit application for works at the Ballarat Railway Complex, specifically the interlocking sector gates at the Lydiard Street North level crossing. The Ballarat Railway Complex is included on the Victorian Heritage Register (VHR) and designated as Registered Place H0902. The Heritage Permit application fulfills Condition 12 of Heritage Permit P34664 (Amended), see 1.1.

1.1 Background

With the destruction of the sector gates because of an accident in May 2020, and the resulting inability to safely operate the rail/road interchange, the Lydiard Street level crossing was temporarily closed. Heritage Permit P34664 was issued on 7 October 2021 and subsequently amended on 19 December 2022 to allow for:

> The temporary removal to storage at the V/Line Wendouree Depot for a period not exceeding ~~eighteen (18) months~~ *7 October 2024* of the following elements from the Lydiard Street North level crossing: the pair of timber sector gates (Gates 2 and 3), Gate Post 3 including the two gate braces, square rotating shaft and rear stay, the two gate braces to Gate Post 2 and the rear stay to Gate Post 1 and the rear stay and any remnant elements of the swing mechanism still extant and loose at the base of Gate Post 4.

The numbering of these elements is shown in Figure 1.

In accordance with P34664 (Amended), the remnant gate fabric and associated salvaged elements were inventoried and moved to a secure storage location, where they have been subject to regular assessments by a heritage architect.

In order to enable the re-opening of the level crossing to vehicles, mechanical boom gates were temporarily installed in the level crossing.

Condition 11 of P34664 (Amended) required the preparation of an options paper to identify options and issues in relation to the investigation of the feasibility for the reinstatement of the sector gates. The Options Paper was submitted to the Executive Director, Heritage Victoria, on 7 July 2023.

On 27 July 2023 the Executive Director, Heritage Victoria issued correspondence to V/Line, requesting resubmission of the Options Paper with a further and 'thorough assessment' of the option of reinstating the sector gates to working order in the level crossing.

The Options Paper set out the legislative framework governing the operation of the rail network and the implications for the reinstatement of the sector gates in working order. It was determined that the return to the pre-collision condition of the level crossing was not possible due to the regulatory environment within which Australian rail operators must work, especially in regard to safety. This outcome was discussed with Heritage Victoria in engagement in late 2023.

An addendum to the Options Paper was submitted to the Executive Director, Heritage Victoria on 21 December 2023. This outlined further investigations of, and detail on, possible options and the associated legislative context. Options were developed as a result of consultation with Heritage Victoria and the operator's preferred option was included in this report.

The Options Paper was endorsed under Condition 11 of P34664 on 12 January 2024, with the Addendum to Options Paper endorsed under the same condition on 9 January 2024. Accordingly, the Executive Director, Heritage Victoria has indicated a preference for the option that retains and conserves some significant heritage fabric in the level crossing and provides for the relocation and decommissioning of other elements of heritage fabric, as well as the introduction of new elements.

The subject Heritage Permit application relates to Condition 12 of P34664 (Amended), which is as follows:

> 12. Within ~~three (3)~~ *six (6)* months of the receipt of the endorsed copy of the options paper required under Condition 11, a permit application is to be lodged with Heritage Victoria requesting approval for the return of the removed fabric to their substantive locations at the Lydiard Street North level crossing, or in an arrangement to the satisfaction of the Executive Director, Heritage Victoria.

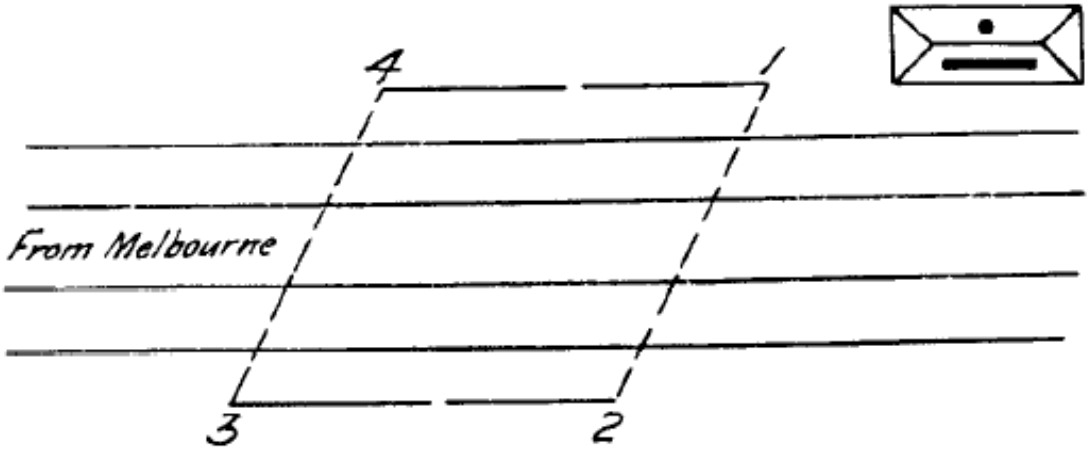

Figure 1 The configuration of the sector gates at the Lydiard Street North level crossing, with north to the bottom of the image, from 'Interlocked gates – identification plan for gates & sectors', 30 December 1943, F3793
Source: V/Line

1.2 Relevant documentation

This report references the following documents:

- *Ballarat Railway Complex (H0902) Lydiard Street North Sector Gates, Options Paper*, prepared for V/Line Corporation by Lovell Chen, July 2023.
- *Ballarat Railway Complex (H0902) Lydiard Street North Sector Gates, Addendum to Options Paper*, prepared for V/Line Corporation by Lovell Chen, December 2023.
- *Ballarat Railway Station: Conservation Management Plan*, prepared for Vic Track Access by Allom Lovell & Associates, 2002.
- *Ballarat Railway Station Precinct Conservation Management Plan*, prepared by Lovell Chen for the Victorian Department of Transport and Planning (in preparation).

1.3 Documentation submitted with this Heritage Impact Statement

- Locality plan and drawing index, 1731_C0001, Rev C, 2 July 2024
- General notes and specifications, 1731_C0002, Rev C, 2 July 2024
- General arrangement plan, 1731_C0011, Rev C, 2 July 2024
- Heritage Overlay arrangement plan, 1731_C0012, Rev B, 2 July 2024
- Typical Cross Sections – Sheet 1, 1731_C0015, Rev C, 2 July 2024
- Typical Cross Sections – Sheet 2, 1731_C0016, Rev C, 2 July 2024
- Typical Cross Sections – Sheet 3, 1731_C0017, Rev C, 2 July 2024
- Typical Details – Sheets 1 and 2, 1731_C0021-22, Rev C, 2 July 2024

1.4 List of abbreviations

Abbreviation	**Title**
CMP	Conservation Management Plan
DTP	Department of Transport and Planning
HV	Heritage Victoria
ONRSR	Office of the National Rail Safety Regulator
RSNL	Rail Safety National Law
SFAIRP	So Far As Is Reasonably Practicable
VHD	Victorian Heritage Database
VHR	Victorian Heritage Register

2.0 STATUTORY HERITAGE CONTROLS

2.1 Heritage Act 2017

The Lydiard Street interlocking sector gates are part of the Ballarat Railway Complex, which is included in the Victorian Heritage Register (VHR) as Registered place number H0902.

The gates are defined in the Extent of Registration for the heritage place as part of B21 as:

> …Ballarat B signal box, including signal lever frame and all fittings, one set of associated sector gates at Lydiard Street and all gate and signal control rodding within the area adjoining the signal box shown hatched…[1]

It is noted that that VHR Extent of Registration includes the component elements related to Ballarat B signal box as noted above. The hatched area, shown in the mapped extent, west of the level crossing includes Signal Box B, as well as signal control rodding (Figure 2). The level crossing (road/rail interchange) and operating corridor are explicitly excluded from the Extent of Registration.

The VicPlan mapping for the heritage place indicates the mapped extent of registration overlaid on an aerial image (Figure 3).

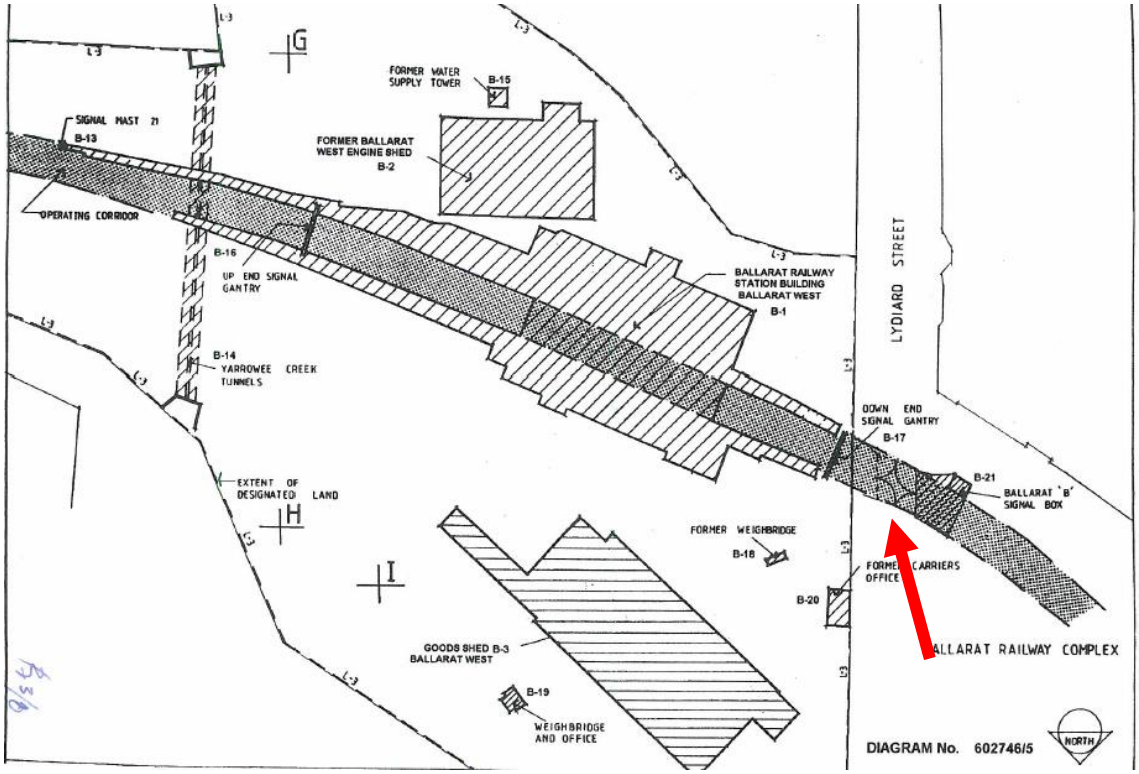

Figure 2 Extent of registration diagram, plan 5, location of Lydiard Street gates is identified by the arrow; north to the bottom of the image
Source: Victorian Heritage Database

1 VHR Extent of Registration for the Ballarat Railway Complex, source: https://vhd.heritagecouncil.vic.gov.au/places/68, accessed 5 June 2023.

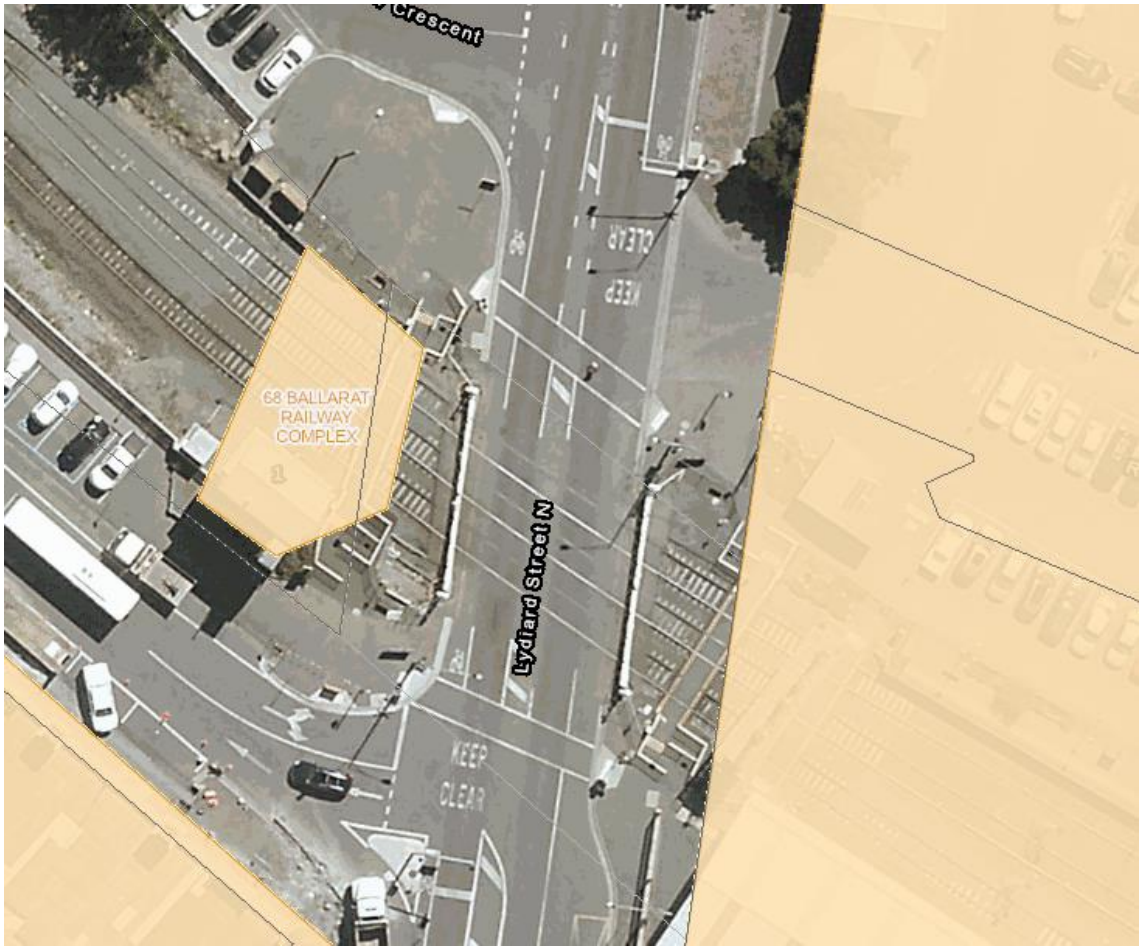

Figure 3 VicPlan mapping of the VHR extent of registration for Ballarat Railway Complex (yellow overlay); north to the top of image
Source: VicPlan, accessed 4 April 2024

The Statement of Significance for the Ballarat Railway Complex is partially reproduced here (see Appendix A for full version), noting the parts relevant to the discussion of the sector gates (bolded emphasis, Lovell Chen):

What is Significant?

The Ballarat Station Complex is of historical, architectural, social and technological significance at State level.

How is it significant?

Its historical significance arises from considerations of the following factors:

- Together with the Sandhurst (Bendigo) line, the Geelong-Ballarat railway was the first of the colonial government's main trunk lines, opened in 1862, and built to the best British standards of construction. These standards were never to be repeated. Most of the present complex dates from this period. Ballarat is the largest complex to have been built at this time.
- The Government's decision to build one of its first trunk lines to Ballarat recalls the great importance of a Ballarat and East Ballarat as an economic centre in the colony

and the largest mining centre of the world famous Victorian central goldfields. The entire complex is expressive of this decision arising from Ballarat's economic importance.

- The railway acted as a catalyst for the development and redevelopment of Lydiard Street North throughout the nineteenth century. Given Lydiard Street North's national importance as a thoroughfare founded on wealth produced through gold mining activity, as indeed the important economic social and political role Ballarat played in the State's development because of this gold-based wealth the station complex plays a crucial role in the interpretation of the fabric of this street.
- Ballarat Station was the colony's busiest non-metropolitan station for a period during the nineteenth century, its pre-eminence only being surpassed at different times by Echuca and Geelong. The entire complex is expressive of this fact.
- The construction and development of the Ballarat station site recalls the roles of the following senior offices [sic] of the Victorian Railways Department:

  …

Why is it significant?

The architectural significance of the complex is borne out by the following:

…

- The train hall and clock tower symbolise Ballarat's importance as a provincial city and simultaneously recalls the status of rail travel in the Victorian age.
- In Victoria, Ballarat compares in size with Geelong and Bendigo and in layout to the extent that it has an approach road surrounded by passenger and freight handling buildings. Given the destruction of Bendigo by fire and the pending demolition of the Geelong goods shed, Ballarat's intact state will be unique in this respect, recalling the planning principles of early British terminal stations.

  …

The social significance of the complex arises not only from its use as a point of arrival and departure on journeys undertaken prior to and following the advent of the motor car but also from the nature of the trips...

…

The technological significance of the complex hinges on the survival of bull head rail in the former carriage shed, the evidence of the removed locomotive traversers in the engine shed, and the signal boxes. The bull head rail, secured to the sleepers with wooden keys, was superseded by 1873 and recalls traditional British railway practice and the comparatively small locomotives, in use at that time.

The signal boxes recall late nineteenth century safe working practices. **Today, Ballarat retains the largest surviving interlocked installation in the state. The Winters block telegraph instruments are now rare and the sector gates similarly depleted, comparing only with Ballarat East, Ballarat C & D, Kyneton in country areas.** The modified type 6 frame in Ballarat "B" Box is unique at the State level and compares with type 6 frames elsewhere. They were once commonplace.

> The Signal Gantries postdate construction of the 1888 additions. They compare with the gantries which existed at Bendigo and Flinders Street Station, now demolished, and have significance as the largest surviving installations of its type to be fitted exclusively with somersault signals. They form an essential component in the interpretation of the role of "B" Box, but they did not exist for the first fifty years in the life of the early station buildings.

In relation to the permit exemptions, the site is subject to General Exemptions, although no Specific Exemptions are identified in the VHR Registration for the place. It is noted that the General Exemptions do not apply in this instance.

2.2 Planning and Environment Act (Ballarat Planning Scheme)

The Ballarat Railway Complex is included in the Ballarat Planning Scheme and identified as HO59 in the Schedule to the Heritage Overlay, largely reflecting the inclusion of the place on the VHR and mapped as shown in Figure 4. The Lydiard Street North level crossing is also included in HO171 Lydiard Street Precinct (see Appendix A for citation).

Neither the Ballarat Railway Complex nor the sector gates are identified in the statement of significance for HO171, but reference is made to the influence of the railway station on the development of the area:

> Around 1862, the northern end of Lydiard Street became the focus of a specific type of buildings which addressed the needs of the new railway station and the grand neoclassical styled Railway Hall… Between 1865 and 1890 the sites were developed into a '*series of distinctive two-storey commercial and civic buildings*'.

The statement of significance identifies the following in relation to the social and scientific significance of the Lydiard Street Precinct.

> The Lydiard Street Precinct is **scientifically** significant at the LOCAL level (AHC criterion C.2 and F).
>
> *(c) the place's potential to yield information that will contribute to an understanding of Australia's natural or cultural history*
>
> *(f) the place's importance in demonstrating a high degree of creative or technical achievement at a particular period.*
>
> The Precinct is of importance for contributing to the history of infrastructure development in Ballarat West, identified by intact bluestone kerbs and gutters.
>
> The Lydiard Street Precinct is **socially** significant at a LOCAL level (AHC criterion G.1).
>
> *(g) the place's strong or special association with a particular community or cultural group for social, cultural or spiritual reasons.*
>
> The Precinct is recognized and highly valued by the wider community for civic, commercial and religious reasons. The Precinct is culturally important as it demonstrates the particular social structure of Ballarat during the 19th century which was conducive to a universally admired aesthetic.

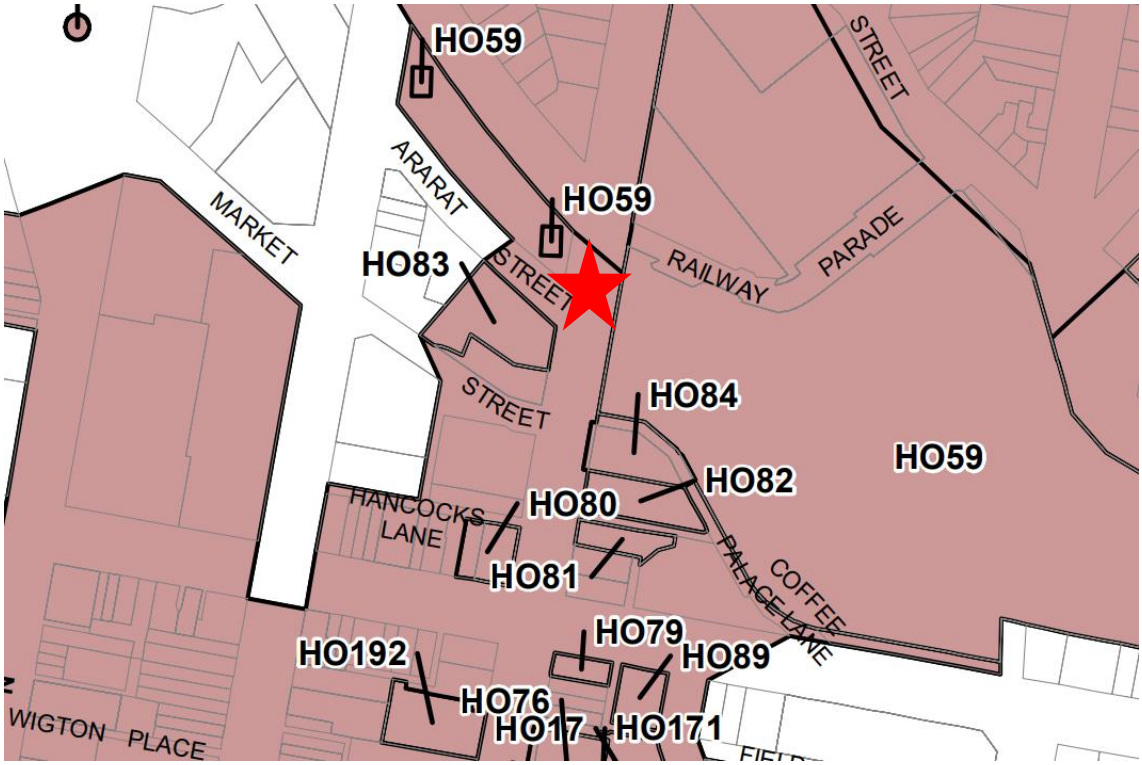

Figure 4 [Detail] Map no. 23HO showing Ballarat Railway Complex (HO59) and the Lydiard Street Heritage Precinct (HO171); subject site indicated
Source: Ballarat Planning Scheme Online (accessed 14 June 2023)

3.0 BALLARAT RAILWAY COMPLEX

3.1 Lydiard Street North level crossing

The sector gates and associated infrastructure were located at the Lydiard Street North level crossing, to the east (downside) of the Ballarat Railway Complex. The level crossing is part of a complex intersection of rail, car and pedestrian traffic (Figure 5).

With the exception of the damaged Gate Post 1 and Gate Post 2, the balance of salvaged fabric was relocated to secure storage. The current configuration of the level crossing incorporates temporary boom masts located in the south-west and north-east.

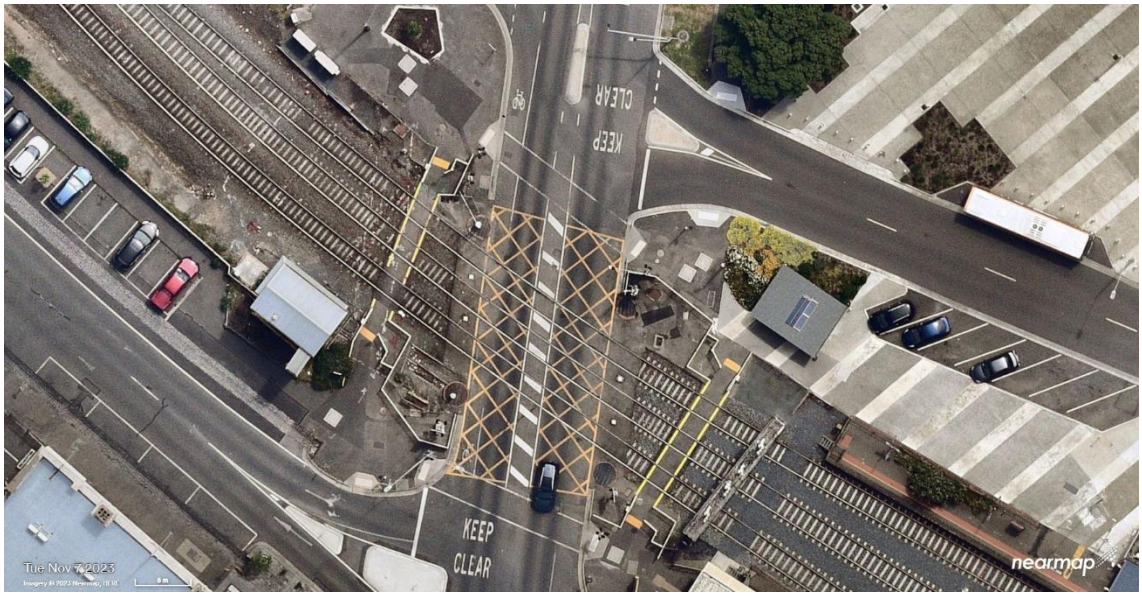

Figure 5 Aerial image of the Lydiard Street North level crossing (hatched pattern), north to the top of image, captured 7 November 2023
Source: Nearmap (accessed 30 November 2023)

3.2 Regulatory constraints

V/Line is a public authority responsible for the delivery of the regional transport network, and its duties as a rail operator are defined by the Rail Safety National Law (RSNL).[2]

The RSNL is governed by the office of the National Rail Safety Regulator (ONRSR), which was established in 2012 to oversee consistency of rail safety across Australia's jurisdictions (see Appendix B). The *Rail Safety National Law (South Australia) Act 2012* is the main schedule for this law and was adopted in Victoria through the *Rail Safety National Law Application Act 2013*.

Pursuant to sections 52 to 54 of the RSNL, rail transport operators have an obligation to ensure the safety of railway operations, so far as is reasonably practicable (SFAIRP) (see Appendix C).

2 Legislation – Rail Safety National Law & related legislation, https://www.onrsr.com.au/publications/rail-safety-national-law-related-legislation, accessed 7 June 2024.

The ONRSR administers a national scheme of accreditation, including monitoring, investigating and enforcing compliance with the RSNL. This includes registration and exemption and provides confidence to the industry and community that those organisations permitted to conduct railway activities are the appropriate parties responsible for the control and management of rail safety and have the competence and capacity to ensure the safety of their operations.

The *ONRSR Way* document, page 12, states:

> [Rail Transport Operators are] accountable for ensuring, SFAIRP, the safety of their specific railway operations, including impacts on interfacing railway and road operations. Accountable for the establishment and implementation of the standards, rules, and procedures for the safe operation of their railway, in the form of a documented and implemented safety management system.[3]

Where required by the RSNL, V/Line must also systematically identify and assess the risks to safety relating to their railway operations and demonstrate an ability to manage or mitigate these risks prior to operating.

As assets age and newer versions are introduced that more effectively manage the associated risk, V/Line, as the Rail Transport Operator, is obliged to implement modern practices where it is reasonably practicable to do so. *ONRSR's Guideline* document, s. 6, states:

> Existing practices and assets should be compared against relevant modern standards, including those that were not in force when they were first introduced and commissioned. This should be done across the lifecycle of the practice or asset.[4]

These regulatory obligations frame the decision-making process in relation to the potential for reinstatement of the retained sector gates in an operational capacity in the level crossing (see 4.1 below).

3.3 Conservation Management Plans

Two conservation management plans (CMPs) have been prepared for the Ballarat Railway Complex:

- *Ballarat Railway Station Conservation Management Plan* (2002)
- *Ballarat Railway Station Precinct Conservation Management Plan* (in preparation).

For the purposes of this HIS, greater consideration has been given to the CMP (in preparation) as this has been prepared with consideration to current values assessment methodologies. Where 'CMP' is included in the text, this refers to the document currently in preparation.

3.3.1 Conservation Management Plan (2002)

The *Ballarat Railway Station Conservation Management Plan* was prepared by Allom Lovell & Associates for Victrack Access in 2002. It provided an assessment of the significance of the various railway station structures, and the site and complex as a whole and provided conservation policies and strategies for

3 Office of the National Rail Safety Regulator, *The ONRSR Way: Regulating Rail Safety Across Australia*, 2020, available at https://www.onrsr.com.au/operator-essentials/the-onrsr-way, accessed 4 December 2023.

4 ONRSR guideline: Meaning of duty to ensure safety so far as is reasonably applicable, 2021, https://nraspricms01.blob.core.windows.net/assets/documents/Guideline/Guideline-Meaning-of-Duty-to-Ensure-Safety-SFAIRP-May-2021.pdf, accessed 1 December 2023.

the future management of the site. The 2002 CMP is an important foundational document for the CMP, and it is referenced here for the historical information that it provides.

3.3.2 Conservation Management Plan (in preparation)

The *Ballarat Railway Station Precinct Conservation Management Plan* (CMP), prepared by Lovell Chen for the Department of Transport and Planning, (in preparation), applied the *Victorian Heritage Register Criteria and Threshold Guidelines* to assess the significance of the railway station complex.

In summary, the statement of significance identified the following:

> *How is it significant?*
>
> The Ballarat Railway Station precinct:
>
> - is of historical significance to Victoria (HCV criterion 'a')
> - demonstrates the principal characteristics of a major regional rail complex of the nineteenth century at a level indicative of State significance (HCV criterion 'd'); and
> - includes buildings and attributes of aesthetic/architectural significance to Victoria (HCV criterion 'e').
>
> Based on the limited research and consultation undertaken for this CMP, it is considered that the BRSP is a place of social value at the local level (and possibly more broadly).

It is noted that the reassessment of the VHR statement of significance found that the complex does not meet the threshold for Criterion F: 'Creative or technical achievement' – as the identified innovations featured elsewhere and were not 'beyond the ordinary' - and Criterion H: 'Special association with the life or works of a person of importance in Victoria's history'. It was found that the special associations with particular figures were better addressed under Criterion A. Conversely, the assessment found that the social significance of the place (Criterion G) arose from demonstrated relationships to place other than historical connections.

The interlocking sector gates

The CMP considered that the interlocking sector gates contributed to the satisfaction of Criterion D.[5] However, it identified the sector gates as among those elements performing a 'supporting role' at the heritage place, rather than those elements that are 'necessary' for the place to demonstrate its significance.[6] The CMP found that the gates and other elements supported the 'operation of the principal buildings'.[7]

The CMP highlighted the historical significance of the gates and associated fabric as a highly modified remnant of late-nineteenth century operation of Victorian Railways and also stressed their rarity.[8]

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5 *Ballarat Railway Station Precinct: Conservation Management Plan*, prepared by Lovell Chen (in preparation), p. 30.

6 *Ballarat Railway Station Precinct: Conservation Management Plan*, prepared by Lovell Chen (in preparation), pp. 17–18.

7 *Ballarat Railway Station Precinct: Conservation Management Plan*, prepared by Lovell Chen (in preparation), pp. 17-18.

8 *Ballarat Railway Station Precinct: Conservation Management Plan*, prepared by Lovell Chen (in preparation), Volume 2: Datasheets, '3.7: Railway Sector Gates'.

Among the analytical tools applied for assessing significance, the CMP used a methodology outlined in *The Conservation Plan* by James Kerr to assess the site in relation to three criteria: ability to demonstrate; formal and aesthetic qualities; and associations.[9]

In considering the Ballarat Railway Complex's 'ability to demonstrate' its evidence, the CMP noted 'scale and completeness' as a significant attribute of the station complex.

> …. several previous assessments – and the VHR entry – identify the 'completeness' or 'comprehensiveness' of the BRSP as a significant attribute. The concept of completeness, from a heritage perspective, has generally been seen to relate to the BRSP's ability to demonstrate the trappings of a major rail centre of the mid-nineteenth century. In this regard, the 1860s-1900s period is privileged...[10]

The report cited UNESCO's *Operational Guidelines for the Implementation of the World Heritage Convention*, which specify that 'a significant proportion of the elements necessary to convey the totality of the value conveyed by the property should be included'.[11] However, the CMP also argued that this concept should be understood as also tied to continuity of use.[12]

When considering the gates, this analysis invited a balancing of objectives for the station from the perspective of completeness: in one sense, the gates and their late-nineteenth century design play a supporting role in demonstrating the completeness of the site; in another, the ongoing functioning of the site for rail purposes is essential to its significance, and this informs the question of how conservation efforts should relate to modern-day functionality.

The policies for management of the Ballarat Railway Complex outlined in the CMP include recommendations that 'Where there is a need to renew existing fabric, the replacement should match the original in design, materials and construction unless there are strong reasons for altering original design or materials. Generally, repairs would address only the extent of decayed fabric'.[13] The policies also advise that 'New buildings, structures and additions should be designed and sited to minimise (or avoid) detrimental impacts on the heritage values of the place'.[14]

3.4 History of the place

3.4.1 Lydiard Street Precinct and the railway line

The streetscape of Lydiard Street stems from the economic boom of the city between the 1850s and the 1880s as it grew from the riches of the goldfields. The precinct was home to the Gold Commissioner's

9 James Kerr, *The Conservation Plan* (7th edn), Australia ICOMOS, 2013, cited in *Ballarat Railway Station Precinct: Conservation Management Plan*, prepared by Lovell Chen (in preparation), pp. 14.

10 *Ballarat Railway Station Precinct: Conservation Management Plan*, prepared by Lovell Chen (in preparation), p. 17.

11 UNESCO, *Operational Guidelines for the Implementation of the World Heritage Convention*, 2019, paragraph 89, in Lovell Chen, *Ballarat Railway Station Precinct: Conservation Management Plan* (in preparation), p. 17.

12 *Ballarat Railway Station Precinct: Conservation Management Plan*, prepared by Lovell Chen (in preparation), p. 17–18.

13 *Ballarat Railway Station Precinct: Conservation Management Plan*, prepared by Lovell Chen (in preparation), p. 60.

14 *Ballarat Railway Station Precinct: Conservation Management Plan*, prepared by Lovell Chen (in preparation), pp. 77.

Camp, and came to represent the unified nature of streetscape design in Ballarat.[15] The opening of the Bendigo to Geelong railway line and its key buildings in 1862 prompted the construction of particular types of buildings at the northern end of Lydiard Street.[16] As detailed in the citation for the Lydiard Street Heritage Precinct (HO171), these included 'Two two-storey bluestone warehouses… built close to the railway and hotels … established at the precinct's north.'[17] As such, the Lydiard Street precinct has been vital to the city's core social and economic interests, underpinning administrative, legal and commercial activities in the town.[18]

3.4.2 Ballarat Railway Station

Ballarat Railway Station began life through the Ballarat to Geelong railway line, constructed between 1858 and 1862, with the terminus at Soldiers Hill. It indirectly connected Ballarat to Melbourne.[19] The station was subsequently constructed over several years through three distinct phases, with the interlocking sector gates a prominent element of the railway complex by the early twentieth century (Figure 6).

Inception (1860s–1870s)

Following the completion of the railway embankment, construction of the station began. This period involved significance input from members of the Victorian Railways Department including Engineer-in-Chief George Darbyshire (1856–1860), and his successor Thomas Higginbotham (1860–1878). The imposing site came to include the following buildings and infrastructure: the north station, water tower, engine shed, goods and platform sheds, roads, kerbing, channelling, gates, footways, a pedestrian tunnel and drainage channel.[20] Minor alterations were made to the Railway Buildings in 1877.[21] The line was extended towards various localities during the 1870s and 1880s.[22]

Second Phase: Buildings of the 1880s

The surging wealth of Ballarat, its burgeoning rail load and the growing popularity of rail travel prompted redevelopment of the station complex. This saw the demolition of the earlier south buildings and the construction of the main south station and clock tower during the late 1880s.[23]

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15 'HO171 – Lydiard Street Heritage Precinct', Victorian Heritage Register, Statement of Significance, City of Ballarat, Victorian Heritage Database, https://vhd.heritagecouncil.vic.gov.au/places/156830, accessed 5 June 2023.

16 *Ballarat Star*, 15 March 1862, p. 5; 'HO171 – Lydiard Street Heritage Precinct', Victorian Heritage Register, Statement of Significance, City of Ballarat, Victorian Heritage Database, https://vhd.heritagecouncil.vic.gov.au/places/156830, accessed 5 June 2023.

17 'HO171 – Lydiard Street Heritage Precinct', Victorian Heritage Register, Statement of Significance, City of Ballarat, Victorian Heritage Database, https://vhd.heritagecouncil.vic.gov.au/places/156830, accessed 5 June 2023.

18 'HO171 – Lydiard Street Heritage Precinct', Victorian Heritage Register, Statement of Significance, City of Ballarat, Victorian Heritage Database, https://vhd.heritagecouncil.vic.gov.au/places/156830, accessed 5 June 2023.

19 *Ballarat Railway Station: Conservation Management Plan*, prepared by Allom Lovell & Associates, June 2002, p. 8.

20 *Ballarat Railway Station: Conservation Management Plan*, prepared by Allom Lovell & Associates, June 2002, pp. 8–9.

21 *Ballarat Railway Station: Conservation Management Plan*, prepared by Allom Lovell & Associates, June 2002, p. 10.

22 *Ballarat Railway Station: Conservation Management Plan*, prepared by Allom Lovell & Associates, June 2002, p. 9.

23 *Ballarat Railway Station: Conservation Management Plan*, prepared by Allom Lovell & Associates, June 2002, pp. 10–11.

Signal box 'A' was built in 1885 and signal box 'B' in 1886, as well as a red-brick carrier's office. Extensions and workrooms were added to the engine shed.[24] The sector gates were replaced at this time, with the installation of the McKenzie and Holland interlocking system constructed at Newport (Figure 6).[25]

Figure 6 Photograph showing the sector gates (gates 3 & 4) at Lydiard Street North, looking south-east towards the station, c. 1890s
Source: State Library of Victoria, H41033/24

Third Phase: Twentieth and twenty-first centuries

Following a limited number of additions and alterations during the 1890s, alterations in the twentieth century included the re-equipping and extension of Signal Box 'A' in 1910, and the construction of the Victorian Railways Institute to the north of the site in 1926. Branch lines were closed from the 1940s until the 1970s. A tramline crossing at the site was removed in 1971. Ballarat Station was added to the Register of the National Estate in 1980, just a year before a fire damaged parts of the site.[26]

24 *Ballarat Railway Station: Conservation Management Plan*, prepared by Allom Lovell & Associates, June 2002, pp. 10–11.

25 *Ballarat Railway Station Conservation Management Plan*, prepared by Allom Lovell & Associates, June 2002, p. 66.

26 *Ballarat Railway Station Precinct: Conservation Management Plan*, prepared by Lovell Chen (in preparation), pp. A12–A25.

In 1993, the timber interlocking gates were replaced as a result of damage in a traffic accident. In 2020, the gates and posts were damaged following a train accident, and the salvaged gates (one pair) were removed in accordance with Heritage Permit P34664, and temporary boom gates installed to enable the level crossing to reopen.[27]

3.4.3 Interlocking sector gates

The gates, built at Newport by the Victorian Railways Signals Department using the McKenzie and Holland interlocking system, were installed at the site in the mid-1880s, and it is assumed that the iron posts were installed at the same time. While the posts date to the 1880s, new replica gates were installed in 1993 following a traffic accident.[28] These were constructed in a four-panel design.

The gates are described in the 2002 Conservation Management Plan as follows:

> Two sets of double timber boom gates are located on either side of the railway line at the western side of the site, along Lydiard Street. These consist of cast iron gateposts, with cross-braced gates featuring chamfered timberwork.[29]

There is a key difference between the original design and that of the replica gates – the original gates featured three cross-braced panels while the replica gates featured four cross-braced panels.[30] The four-panel design was in place by the time of a photograph of the station in 1967, and additional tie rods supporting the gates were also evident (Figure 7).

From their original installation, the gates were operated by gate wheel controls in Signal Box B. This was replaced by a motorised system in 2001.[31]

Following the 2020 train accident, the salvaged gates and other components were removed to a secure storage location in 2021. Some elements, including posts and associated rodding, remain in place.

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27 *Ballarat Railway Station Precinct: Conservation Management Plan*, prepared by Lovell Chen (in preparation), Datasheet 3.7: Railway Sector Gates, p. 45.

28 *Ballarat Railway Station: Conservation Management Plan*, prepared by Allom Lovell & Associates, June 2002, p. 66; Lovell Chen, *Ballarat Railway Station Precinct: Conservation Management Plan* (in preparation), Datasheet 3.7: Railway Sector Gates, p. 45–46.

29 *Ballarat Railway Station: Conservation Management Plan*, prepared by Allom Lovell & Associates, June 2002, p. 66.

30 *Ballarat Railway Complex Lydiard Street Gates (H0902): Heritage Impact Statement for Temporary Removal of Sector Gates*, prepared by Lovell Chen July 2021, p. 7.

31 *Ballarat Railway Station: Conservation Management Plan*, prepared by Allom Lovell & Associates, June 2002, p. 66; *Ballarat Railway Station Precinct: Conservation Management Plan*, prepared by Lovell Chen (in preparation), Datasheet 3.7: Railway Sector Gates, p. 45.

Figure 7 1967 view of the Lydiard Street crossing, note the addition of a second tie rod attached to the gate and supporting rod (red arrow)
Source: State Library of Victoria, H83.156/195

3.5 Significance

In summary, the VHR Statement of Significance for the Ballarat Railway Complex identifies the place as being of historical, architectural, social and technological significance to the State of Victoria. The following values relate to the interlocking sector gates:

- The station was the first trunk line in the state (1862) and built according to British best practice, and most of the complex dates from this period; these standards were not repeated and Ballarat was the largest railway station of its kind in the state
- The scale and intactness of Ballarat as a mid-to-late nineteenth century station makes it unique in Victoria
- The gates contributed to the technological significance of the station as they are the 'largest surviving interlocked installation in the state'.

Refer to section 2.1 for the VHR Statement of Significance.

4.0 PROPOSED WORKS

4.1 Options considered

Under Heritage Permit P34664, V/Line was required to assess the permanent options for the level crossing and the future of the salvaged heritage elements, which would assess the feasibility of the reinstatement of the timber sector gates in an operational capacity in the level crossing. Five options were developed by V/Line and assessed in relation to practical operational and regulatory requirements, and these were also put to community consultation as required by P34664. This assessment was presented in The *Ballarat Railway Complex (H0902) Lydiard Street North Sector Gates, Options Paper* (prepared for V/Line Corporation by Lovell Chen, July 2023).

The five options considered in the analysis were identified in the relevant consultation materials as follows:

- **Supported Option 1:** The mechanical gates at the level crossing will be retained and the replica heritage gates will be displayed elsewhere within the Ballarat Station precinct.
- **Supported Option 2:** The mechanical gates at the level crossing should be retained and the replica heritage gates should be placed in a static position at the crossing, running parallel to the train line.
- **Unviable Option 1:** The replica heritage gates should be reinstated in a functional capacity.
- **Unviable Option 2:** Lydiard Street should be closed with the replica heritage gates returned to the crossing and placed permanently across the road.
- **Unviable Option 3:** The mechanical gates at the level crossing should be retained and the replica heritage gates should be placed in a static position at the level crossing, at varying angles, roughly perpendicular to the train line.

The document noted V/Line and DTP's preference for Supported Option 1.

Option 2 would require major changes to the level crossing to accommodate the stationary gates and was found not to be feasible following investigation by V/Line. Due to the length of the gates and the complexity of the level crossing arrangement, the pedestrian crossings would require repositioning and realignment to provide sufficient space for the sector gates to be installed as proposed. This option would also 'foul' safe maintenance access to the mast to the north-east boom gate and impede visibility of the level crossing flashing lights. Any relocation of this pedestrian crossing is also likely to impede on existing underground signalling assets.

The repositioning and realignment of the pedestrian crossings required by Option 2 would also require a derogation from V/Line Design Standards NIST-2687, NIST-003.2 and Australian Standard AS1742.7 for the downtrack pedestrian crossing. The likelihood of this being approved was low, especially in the context of the existing pedestrian crossing location being fully compliant to current standards.

V/Line and DTP also observed that the relocation of pedestrian crossings and the increased travel distance from the connecting footpaths on Lydiard Street was likely to result in an increased number of pedestrians violating the pedestrian crossing controls by crossing the tracks on the roadway. This would compromise safety, a view expressed in the V/Line *Human Factors Report* (Appendix D) and the *Railway Crossing Risk Report* (Appendix E, pages 20 and 27).

Unviable Option 1 (full reinstatement) was deemed not possible by V/Line and DTP in terms of obligations to maintain safety and operational efficacy in line with modern infrastructure standards.

Unviable Option 2 (closure of the intersection) was not considered a desirable outcome and was not supported by the City of Ballarat. Unviable Option 3 (retention of the gates in a static position at varying angles, with some truncation) was deemed to be a poor heritage outcome because the site limitations would lead to an outcome that would limit visual interpretation.

The *Ballarat Railway Complex (H0902) Lydiard Street North Sector Gates, Addendum to Options Paper* (prepared for V/Line Corporation by Lovell Chen, December 2023) – outlined the logistical and regulatory obligations that made the reinstatement of the gates in a functional capacity unfeasible (see 3.2 above).

A variation of Option 1 for the retention and display of the gates and associated gate posts is proposed and outlined in the following section.

4.2 Proposed works

The overall proposed outcome for the salvaged gates has been developed in discussion with Heritage Victoria. It includes a combination of retention and/or relocation of significant heritage fabric (with associated conservation works), the decommissioning of salvaged heritage fabric, and the introduction of new elements. This permit application for works is anticipated under Heritage Permit P34664 (Amended) via Condition 12. The intent is for the salvaged gates to be relocated to positions proximate to but outside of the level crossing.

It is noted that this Heritage Permit application relates only to those items identified in the VHR Extent of Registration for the Ballarat Railway Complex. It is recognised that a component of the proposed works scope is outside of the VHR Extent of Registration, being the relocation of the salvaged gates and introduced gate posts proximate to the level crossing and interpretation. Accordingly, it is proposed that the VHR registration be amended to include additional land to ensure that relocated registered elements are maintained on registered land. This would reasonably occur as a consequence of a Heritage Permit for the works and could be managed by way of a condition on permit.

The configuration is illustrated below (Figure 8). The design includes the following notable elements:

- Gate Post 1 to remain in current location and subject to conservation and repair works, including the capping of the broken upper section
- Gate Post 2 to remain in current location and subject to conservation and repair works
- Gate Post 3 to be relocated to Gate Well 4 to replace Gate Post 4 (destroyed by the accident), and subject to conservation and repair works (this relocation enables safe maintenance access to the boom gate positioned at Gate Post 3)
- One surviving replica timber gate to be positioned south of Signal Box B on new supports
- One surviving replica timber gate to be positioned on new supports, north-west of the level crossing and north of the retaining wall parallel to the rail line
- Gate stops to be relocated within the level crossing (in preparation for planned track re-alignment)
- Works to gate wells to ensure conservation of significant fabric and to facilitate ongoing maintenance (new gate- well lids)
- Installation of two cast iron gate posts (provided by V/Line, though not from Ballarat Railway Complex) to support the two salvaged replica gates in their proposed display locations

- Installation of an interpretive panel south-east of Signal Box B to interpret the history of the interlocking sector gates (replacing existing interpretation)
- Installation of a signpost with two signs - 'DO NOT CLIMB' and 'SURVEILLANCE CAMERAS IN USE' - between Signal Box B and the displayed sector gate by Ararat Street
- The decommissioning of salvaged fabric not included in the final design (refer 4.3.1)
- The permanent retention of mechanical boom gates at the level crossing.

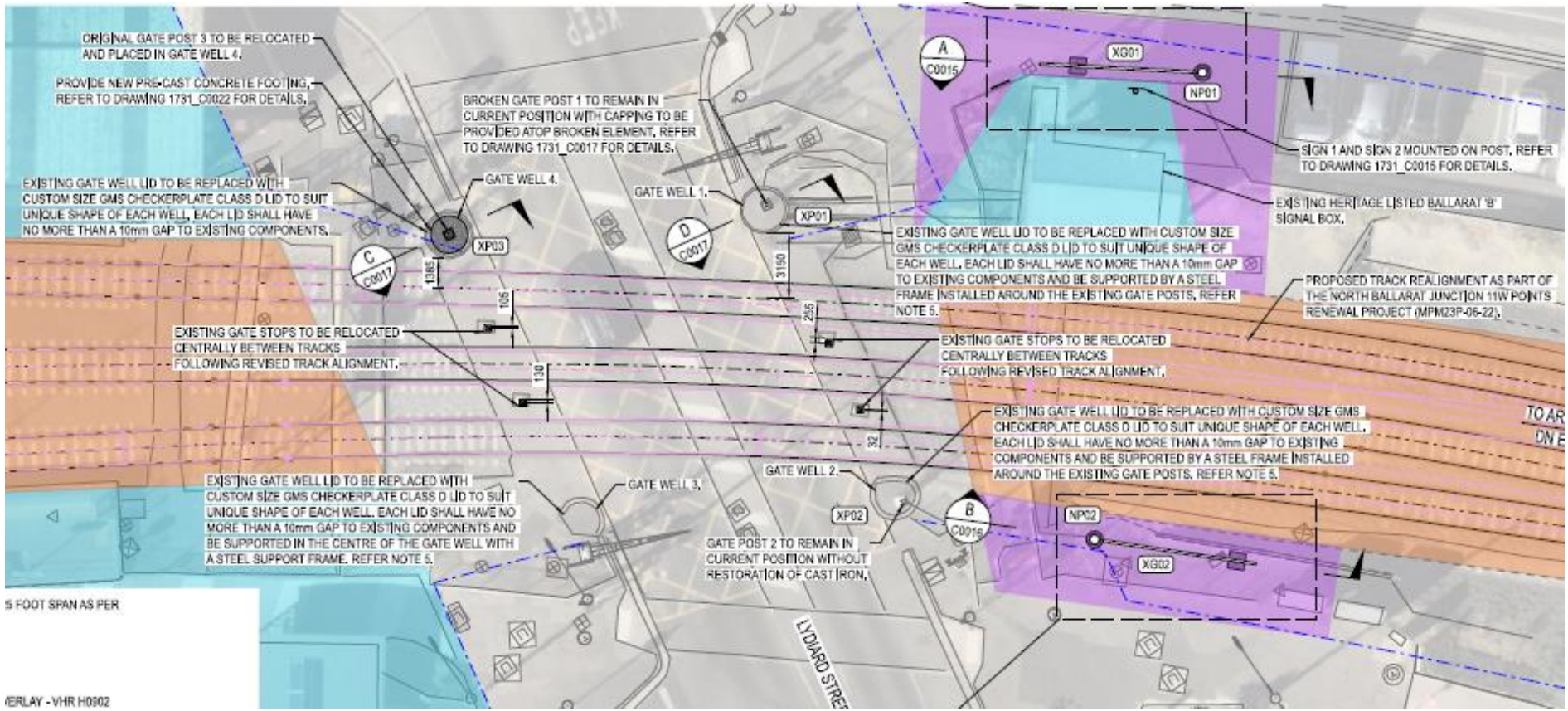


Figure 8 Detail from General Arrangement Plan showing proposed works to Lydiard Street North level crossing
Source: 1731_C0011, Revision C, 2 July 2024

4.3 Works requiring a heritage permit

The works subject to permit approval include the retention and conservation of Gate Posts 1 and 2 in the level crossing, the relocation of Gate Post 3 to Gate Well 4, and the relocation of the replica gates outside of the level crossing. Some salvaged fabric currently in storage at the Wendouree depot will not be included in the proposed approach and will be decommissioned.

For the purposes of this application, the gate wells are considered as registered elements as they are integral to the operation of the gates and posts and contain associated mechanisms and equipment.

It is not proposed to cast a replacement for Gate Post 4 (destroyed in 2020), and it is understood that the proposed retention of three gate posts in the level crossing is an acceptable approach.

The works subject to this Heritage Permit application are as follows:

- Modification of Gate Post 1 to remove the section of the broken shaft, creating a flush surface and for the installation of a protective cap to be welded to the flush surface; repainting and other minor conservation and repair works to stabilise cast iron fabric
- Gate Post 2 (no change to current position), undertake minor conservation works as needed and repainting to stabilise cast iron fabric
- Gate Post 3 to be returned to the level crossing, though repositioned on Gate Well 4; undertake minor conservation works as needed and repainting to post to stabilise cast iron fabric
- Installation of new bespoke lids to gates wells
- Removal of the components in Gate Well 4 and infilling
- Repair and repainting works to the replica timber gates 2 and 3; repositioning outside of the level crossing
- Minor repositioning of Gate Stops within the level crossing
- Installation of tie rods and other salvaged materials, as noted, in the composition of replica gates and non-original posts (this latter component is not subject to permit approval).
- Decommissioning and disposal of items not able to be reused (see 4.3.1).

4.3.1 Decommissioned elements

The decommissioned elements described below are to be disposed of as they are not required as part of the proposal (identified by numbers in Figure 9 and Figure 10 below).

- 3 x Rear stays (2)
- 1 x Mud guard (5)
- 1 x Electrical box (9)
- 1 x Gate post base plate (10)
- 1 x Pulley (12)
- 3 x Left-hand sectors (13) and 3 x Right-hand sectors (14)
- 1 x Gate shaft guard (15)

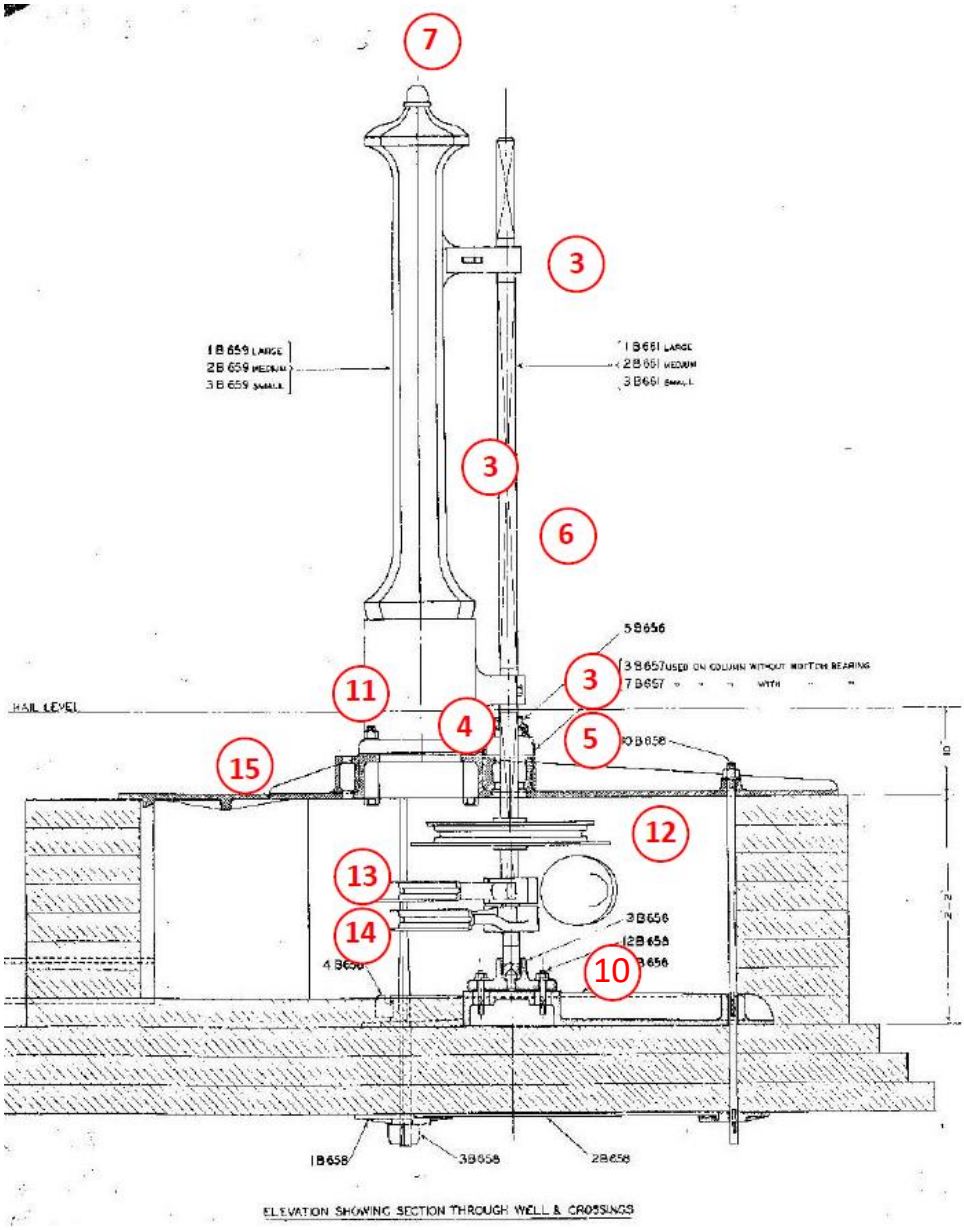


Figure 9 Detail of designs for Victorian Railways Level Crossing Gates (interlocked), Column & Well apparatus assembly, N239
Source: V/Line; Lovell Chen annotations

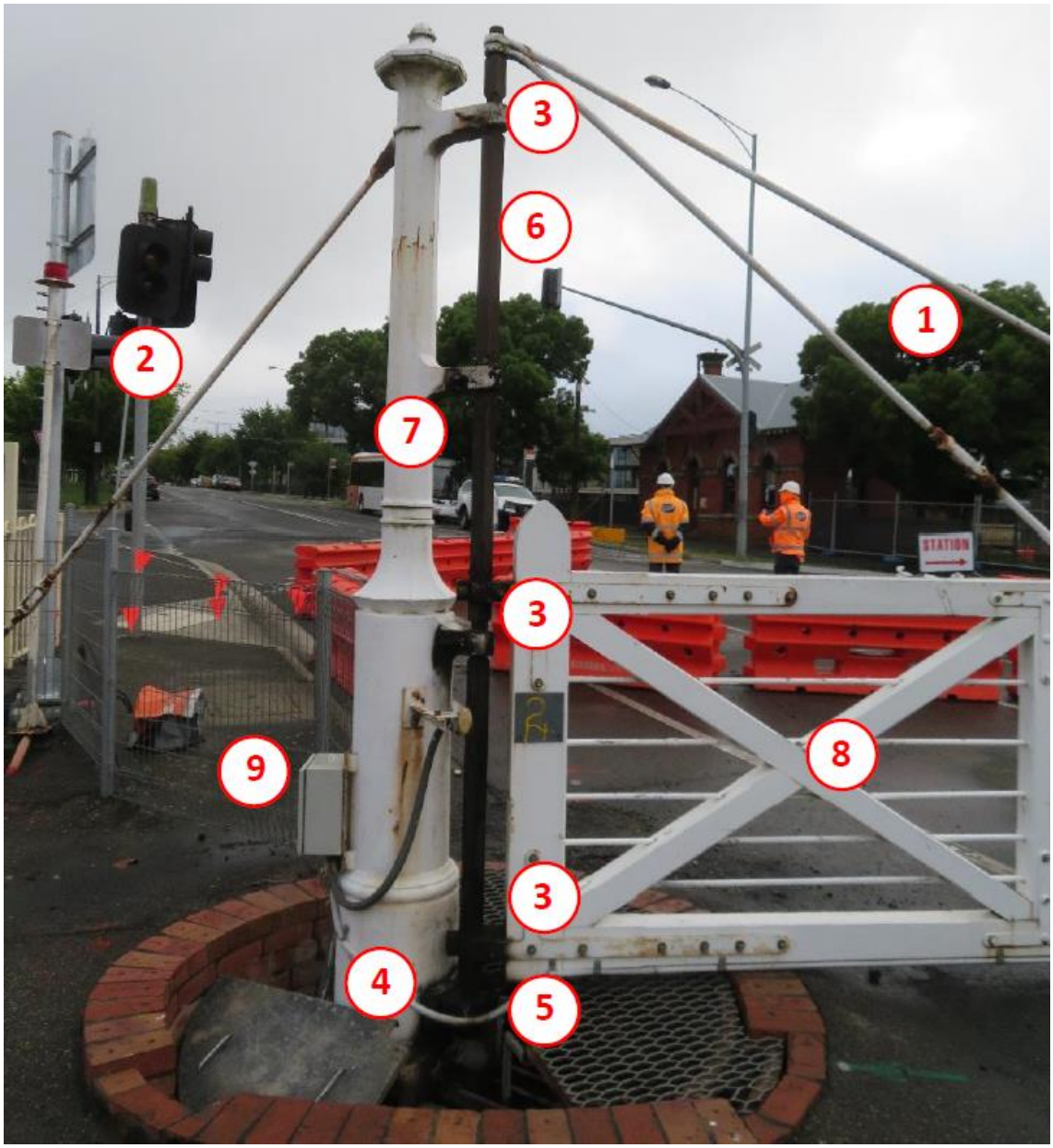


Figure 10 Photograph of Lydiard Street Gate Post 2 and Gate 2, prior to removal from the level crossing, with elements marked
Source: Lovell Chen

5.0 ASSESSMENT OF HERITAGE IMPACTS

5.1 Heritage Act considerations

Relevant considerations that must be considered by the Executive Director under Section 101(2) of the Heritage Act and addressed in this HIS are:

- Impact on the cultural heritage significance of the registered place – s. 101(2)(a);
- Performance of a statutory duty by a public authority (what would the effect of refusal be on the ability of the public authority to perform a statutory duty at the registered place) – s. 101(2)(d).

In assessing impact on the cultural heritage significance of the Ballarat Railway Complex, reference is made to the VHR Statement of Significance and the CMP (in preparation).

5.2 Impact on the cultural significance of the registered place – s. 101(2)(a)

The VHR Statement of Significance for Ballarat Railway Complex (H0902) and the CMP both recognise the historical significance of the railway station, as well as the rarity of the interlocking sector gates. The CMP applies a more nuanced view in relation to the significance of the gates and their contribution to the heritage values of the station complex overall. It posits that the Ballarat Railway Complex satisfies Criterion D, noting that it demonstrates 'the principal characteristics of a major regional rail complex of the nineteenth century' and that it is significant for its scale and completeness.[32] The CMP identifies the sector gates as 'supporting' fabric that contributes to the legibility of the history and operation of the place. Specifically, the levels and nature of significance are described as follows:

- The interlocking gates are historically significant as a remnant – albeit highly modified – of the late nineteenth century operation of the Victorian Railways.
- The gates are also of some interest as an example of a standard 'sector' design for level crossing gates (manufactured by the Victorian Railways Signal Department, Newport). They are of a type that is now rare.
- They are a valued feature of the Lydiard Street streetscape.[33]

Overall, the proposed approach is to reuse the heritage fabric salvaged subsequent to the accident where feasible. Due to regulatory constraints, it is not proposed to reinstate the pre-collision arrangement of the level crossing with the replica gates within the crossing in an operational capacity. This approach includes the retention of some elements in the level crossing (three gate posts and all gate wells, relocated gate stops) and relocation of the replica gates and selected retained fabric elsewhere, though proximate to the level crossing. This is intended to provide for the legibility of the gate posts in the level crossing while recognising (through the changed arrangement that incorporates the retained boom masts) the evolution of the level crossing in response to modern operating standards and requirements and as a result of the 2020 collision.

When considered in relation to the whole of place values for the Ballarat Railway Complex, the approach is one which maintains the ability for the station, and particularly the level crossing, to operate in a manner consistent with the identified historical significance. There will be no adverse impact on this value in relation to the ability to appreciate the history of the place as a major mid-nineteenth century rail centre, and its contemporary influence on the development of Lydiard Street North. With a view to the supporting role the sector gates play in demonstrating completeness in terms of nineteenth-century elements, the overall adverse effect would be balanced by the continued operation of the place for rail purposes, which is essential to the expression of its significance.

The key point of departure relates to the technological significance described in the VHR Statement of Significance which states, at the time of inclusion on the VHR, that 'Ballarat retains the largest surviving interlocked system in the state'. Three gate posts will remain in the level crossing, with Gate Post 1 repaired and conserved in a manner that assists in the interpretation of the modification of the crossing

32 *Ballarat Railway Station Precinct: Conservation Management Plan*, prepared by Lovell Chen (in preparation), pp. 29-31.

33 *Ballarat Railway Station Precinct: Conservation Management Plan*, prepared by Lovell Chen (in preparation), Datasheet 3.7: Railway Sector Gates, p. 46.

and appreciation of the position of these elements. The gate posts are to be managed as a 'ruin' or remnant, a legitimate heritage approach. It is with removal of the remaining replica gates from the level crossing that the technological aspect of significance will be somewhat diminished. On balance, the area retains key elements to illustrate the historical technical operation of the level crossing, being the three gate posts, and elements related to rail signalling, being Signal Box B and the signal gantry, control rodding and the like. With the proposed interpretation, the opportunity to appreciate the function of the level crossing and the historical functional relationships of these co-located elements will remain evident and this will maintain the appreciation of the technical significance of the place overall.

While not providing a heritage outcome in relation to the significance of the place, the relocation of the replica gates can be seen as one way of managing and conserving this fabric. The replica gates will be visually detached and separate from the level crossing and will be understood as a reconstruction accompanied by the introduced gate posts and some of the retained fabric. The introduced gate posts could have the effect of confusing the understanding of authenticity in relation to original or early fabric associated with the place, and clear interpretation of the intent of the display would ameliorate this outcome.

In relation to managing the relocated registered elements, it is recommended that the registration for the Ballarat Railway Complex be amended to include additional land, thereby enabling these elements and the land they are positioned on to be managed under the provisions of the Heritage Act. This would reasonably occur as a consequence of a Heritage Permit for the works, and could be managed by way of a condition on permit.

The identified architectural and social values in the VHR Statement of Significance will not be affected as a result of the proposed works.

5.2.1 Impact on significant fabric

The approach to the proposed works is to retain and reinstate, where feasible, the material salvaged from the 2020 accident. It does accept that the retained replica gates will not be returned to their original or alternative positions in the level crossing and that Gate Post 3 will be relocated to Gate Well 4. While not reinstating the pre- or post-collision condition of the level crossing or arrangement of posts and gates, it does allow for the retention of the early post fabric in a manner which connects them to the crossing. This approach has precedent in other VHR-listed railway stations and serves to retain the fabric close to the level crossing, with posts retained and gates relocated elsewhere or removed entirely. The retained gate posts are to be repaired and conserved, with Gate Post 1 subject to works that will secure the open, broken part of the shaft and cap it. The conservation and repair of the gate posts is a positive outcome and ensures their longevity.

The retained and relocated replica gates will be repaired and installed in a new arrangement that includes introduced posts and supports and is outside of the VHR Extent of Registration. The conservation and repair of these elements is consistent with good heritage practice. The gate will be supported on stirrup footings, which will be packed with timber to ensure that the gates are secure. Connection to the introduced posts will be as per the historical approach, utilising tie rods and other salvaged material as needed.

The four gate stops, which are roughly central to the rail tracks, will be relocated slightly within the level crossing to accommodate a future track realignment project. There will be no impact on this fabric arising from relocation.

The four gate wells will be retained, with Gate Well 4 modified for the introduction of Gate Post 3. The works will include the infilling of the well to provide a footing for the relocated post. In order to ensure reversibility, the gate well will be lined with polyurethane film to the inner side of the brickwork well-wall, and the base poured over a polystyrene base. The well design incorporates drainage to ensure any captured stormwater can drain away, protecting the retained fabric.

Salvaged gate mechanism components (pulleys, sectors and the like) will not be utilised in the reconstructed arrangement, and these are not proposed to be retained. V/Line will decommission and dispose of these elements. Mechanical elements such as these are typically replaced and renewed over the life of operation. They are standard equipment of no intrinsic significance, and their disposal will not adversely impact on the significance of the railway complex.

5.2.2 Visual impact

The visual impact of the proposal on the heritage fabric in this permit application can be considered in relation to the change to the presentation of the level crossing. The level crossing will present as it does currently, as a hybrid of historic elements within a broadly modernised context. The level crossing and immediate surrounds have been modified over time to introduce modern and compliant pedestrian crossings, including modern fences and gates, signalling and the like. These have primarily been introduced to ensure the safety of pedestrians and vehicles in the rail environment.

The relocation of the gates outside of the level crossing will introduce a level of visual change, though the key change, and one that is not subject to approval under the Heritage Act, is the retention of the modern boom gates that were installed as a temporary solution after the 2020 collision. The retained gate posts will be understood in this evolved context and, as noted, in a manner not dissimilar to the approach implemented at other suburban and regional railway stations. While there will be a change to the crossing presentation, it would not be of a level that would substantially diminish the appreciation of the broader historical context of the station in the Lydiard Street North streetscape.

5.3 Performance of a statutory duty by a public authority – s. 101 (2)(d)

With regard to s. 101 (2)(d), V/Line is a public authority responsible for the delivery of the regional transport network. In managing the Ballarat Railway Complex as an operational heritage place, V/Line and the Department of Transport and Planning must therefore balance their obligations under the *Heritage Act 2017* with their duties to maintain safety in line with the Rail Safety National Law (see 3.2).

The proposed works to, and outcome for, the Lydiard Street North level crossing and registered fabric represents a balanced solution that accounts for the contemporary operating environment in which rail operators are obligated to function. It has been achieved through extensive consultation with the relevant authorities and community, including through discussions with Heritage Victoria. The refusal of this permit application would accordingly unreasonably and detrimentally affect the ability of V/Line to effectively undertake its duties as defined by the Rail Safety National Law (RSNL).

6.0 CONCLUSION

Overall, the proposed approach to the management of heritage values and fabric at the Lydiard Street North level crossing is one which strives to balance the limited adverse impact on the significance of Ballarat Railway Complex as a whole and ensure that the station is able to operate within the constraints of the rail operator's regulatory environment. As a public authority, V/Line and the Department of Transport and Planning are required to maintain line safety consistent with Rail Safety National Law.

Refusal of this permit application would therefore unreasonably and detrimentally affect the ability of V/Line and the Department of Transport and Planning to effectively undertake their duties.

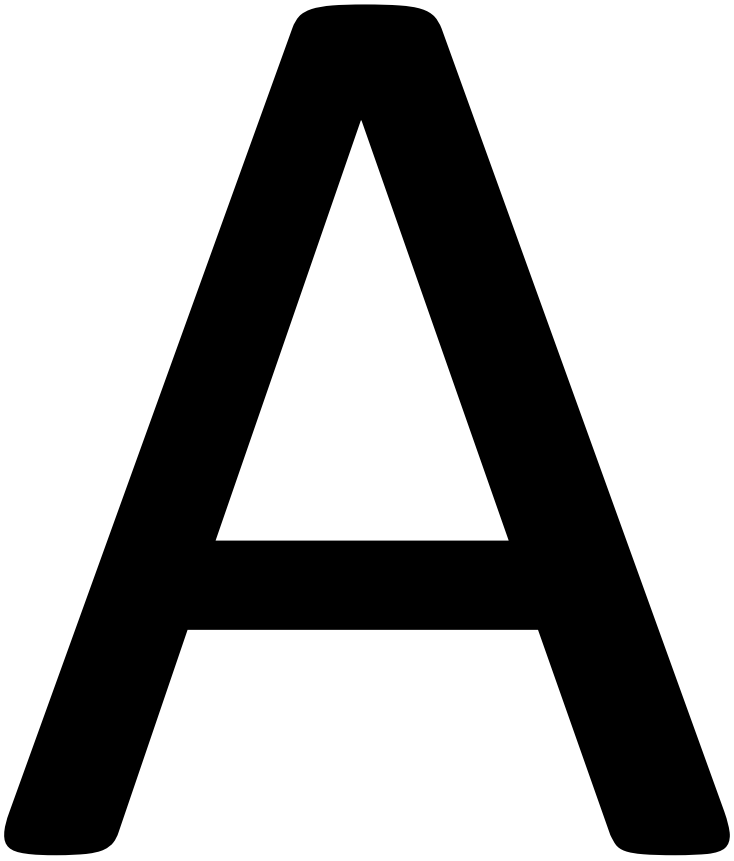
The approach is one that allows for retention of the salvaged gate posts in the level crossing and enables them to continue to contribute to the understanding of this as an evolving component of the railway complex. It is accepted that the proposed works will alter the way in which the level crossing is presented and do introduce an alternative way of presenting the replica gates in the wider context, noting that this approach is understood to be supported by Heritage Victoria.

Recognising that the proposed works will relocate the salvaged items outside of the current Extent of Registration for the Ballarat Railway Complex, it is proposed that registration be amended to include sufficient land for the relocated elements to be managed under the provisions of the Heritage Act. This would appropriately occur as a consequence of the approval of a Heritage Permit for the works and it is suggested that this can be effectively managed by way of a Heritage Permit condition.

The following identifies the intent of potential Heritage Permit conditions for the Executive Director's consideration:

- A permit condition requiring V/Line and the Department of Transport and Planning to make an application to amend the registration for Ballarat Railway Complex by nominating to add additional land under s. 27B of the *Heritage Act 2017*.
- A permit condition requiring the development of interpretation with content designed by a suitably qualified heritage consultant and installation of interpretation proximate to the relocated gates and Signal Box B.
- General conditions allowing for the approval of minor changes to the design, once endorsed, in accordance with the intent and approach of the endorsed drawings, by way of correspondence for assessment by the Executive Director, Heritage Victoria.

APPENDIX A:
STATEMENTS OF SIGNIFICANCE



BALLARAT RAILWAY COMPLEX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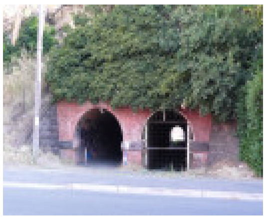

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1 ballarat railway complex front view with tower feb1984

ballarat railway complex interior of station building

ballarat railway complex signal box & gates

ballarat railway complex site view

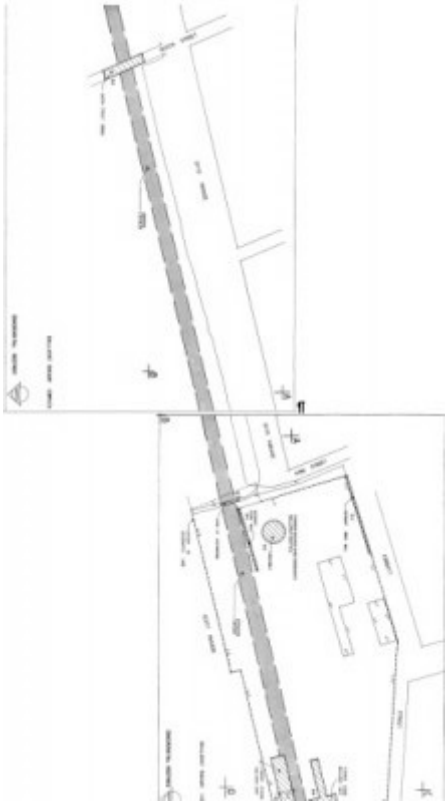
Reconstructed entry porch to the north side station building refer P20705

Reconstructed bay to the west end of the north side of station building refer P20705

Reconstructed pedimented entry to north side station building refer P20705

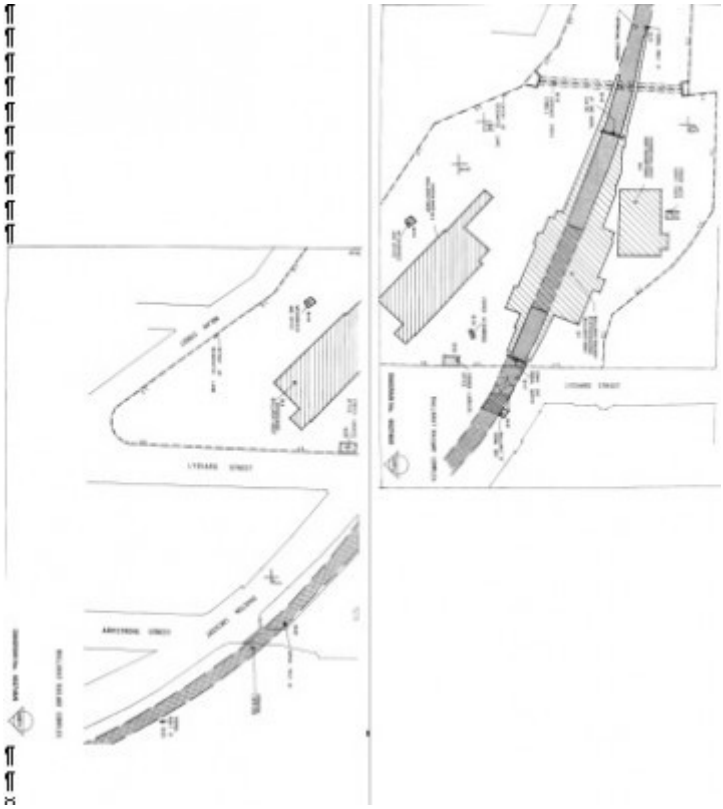
Reconstructed entry porch, north side station building refer P20705

Modern and highly intrusive entry door to the north side station building



ballarat railway station registration plans1and2

ballarat railway station registration plans3and4



ballarat railway station registration plans5and6

Location

140 LYDIARD STREET NORTH BALLARAT CENTRAL AND 202 LYDIARD STREET NORTH AND NOLAN STREET SOLDIERS HILL AND SCOTT PARADE AND 60 CORBETT STREET BALLARAT EAST AND 75 HUMFFRAY STREET NORTH BAKERY HILL, BALLARAT CITY

Municipality

BALLARAT CITY

Level of significance

Registered

Victorian Heritage Register (VHR) Number

H0902

Heritage Overlay Numbers

HO59

VHR Registration

August 20, 1982

Amendment to Registration

November 26, 1998

Heritage Listing

Victorian Heritage Register

Statement of Significance

Last updated on - August 30, 1999

What is significant?
The Ballarat Station Complex is of historical, architectural, social and technological significance at State level.

How is it significant?
Its historical significance arises from considerations of the following factors:

- Together with the Sandhurst (Bendigo) line, the Geelong-Ballarat railway was the first of the colonial government's main trunk lines, opened in 1862, and built to the best British standards of construction. These standards were never to be repeated. Most of the present complex dates from this period. Ballarat is the largest complex to have been built at this time.
- The Government's decision to built one of its first trunk lines to Ballarat recalls the great importance of a Ballarat and East Ballarat as an economic centre in the colony and the largest mining centre of the world famous Victorian central goldfields. The entire complex is expressive of this decision arising from Ballarat's economic importance.
- The railway acted as a catalyst for the development and redevelopment of Lydiard Street North throughout the nineteenth century. Given Lydiard Street North's national importance as a thoroughfare founded on wealth produced through gold mining activity, as indeed the important economic social and political role Ballarat played in the State's development because of this gold-based wealth the station complex plays a

crucial role in the interpretation of the fabric of this street.
- Ballarat Station was the colony's busiest non-metropolitan station for a period during the nineteenth century, its pre-eminence only being surpassed at different times by Echuca and Geelong. The entire complex is expressive of this fact.
- The construction and development of the Ballarat station site recalls the roles of the following senior offices of the Victorian Railways Department:

George Darbyshire, Engineer-in-Chief (1856-1860).
Thomas Higginbotham, Engineer-in-Chief (1860-1878).
Patrick Brady, Senior Architectural and Mechanical Draughtsman (1857-1867 and possibly later).
These men are likely to have had responsibility for the development of the complex during the first decade.
George W Sims, Chief Draughtsman (c. 1878- ?) had responsibility for the 1888 additions as well as the signal boxes (buildings only).
JW Hardy, Chief Architect of the Way and Works Branch (1908-1918) had responsibility for the additions to "A" Box, based closely on a design developed under Sims.
With the exception of Hardy, whose involvement was minor, the Ballarat complex was a major example of the work of these senior officers.

Why is it significant?
The architectural significance of the complex is borne out by the following information:

- Together with Maryborough, Albury (NSW), Port Pirie (SA) and Brisbane Central (Qld), Ballarat is the only nineteenth century station built at the national level to have a prominent clock tower.
- Together with Geelong and Normanton (Qld), Ballarat is the only surviving nineteenth century station building now retaining a substantial and imposing train hall. It is representative of others, now demolished including Adelaide, Port Adelaide and Brisbane Central.
- The train hall and clock tower symbolise Ballarat's importance as a provincial city and simultaneously recalls the status of rail travel in the Victorian age.
- In Victoria, Ballarat compares in size with Geelong and Bendigo and in layout to the extent that it has an approach road surrounded by passenger and freight handling buildings. Given the destruction of Bendigo by fire and the pending demolition of the Geelong goods shed, Ballarat's intact state will be unique in this respect, recalling the planning principles of early British terminal stations.
- The Goods Shed compares closely with Ballarat East and to a lesser extent with Little River, Riddells Creek, Malmsbury and Kyneton. It is the largest bluestone goods shed in Victoria.
- The former Engine Shed compares with Bendigo and Echuca but is the only example of this 1860s design to be erected in bluestone.
- The Carrier's Office recalls other timber offices in Ballarat, now demolished, and offers insights into nineteenth century freight handing methods. It is unique at the State level at least for its flamboyant design.

The social significance of the complex arises not only from its use as a point of arrival and departure on journeys undertaken prior to and following the advent of the motor car but also from the nature of the trips. Ballarat Station was used by race patrons for five racecourses in the district and special trains were run at holiday times to Burrumbeet Park and to the Lal Lal Falls. Special timetables applied during recognised holiday periods and the station was for a period the focus for local passenger services to Skipton, Waubra, Buninyong and Daylesford. Its existence gave rise to the construction for the "Provincial" Hotel, Reids Coffee Palace and "Victoria House," and it was approximately three quarters of a century a transfer point for rail and tramway passengers.

The technological significance of the complex hinges on the survival of bull head rail in the former carriage shed, the evidence of the removed locomotive traversers in the engine shed, and the signal boxes. The bull head rail, secured to the sleepers with wooden keys, was superseded by 1873 and recalls traditional British railway practice and the comparatively small locomotives, in use at that time.
The signal boxes recall late nineteenth century safe working practices. Today, Ballarat retains the largest surviving interlocked installation in the state. The Winters block telegraph instruments are now rare and the sector gates similarly depleted, comparing only with Ballarat East, Ballarat C & D, Kyneton in country areas. The modified type 6 frame in Ballarat "B" Box is unique at the State level and compares with type 6 frames elsewhere. They were once commonplace.
The Signal Gantries postdate construction of the 1888 additions. They compare with the gantries which existed at Bendigo and Flinders Street Station, now demolished, and have significance as the largest surviving installations of its type to be fitted exclusively with somersault signals. They form an essential component in the interpretation

of the role of "B" Box, but they did not exist for the first fifty years in the life of the early station buildings.

Permit Exemptions

General Exemptions:

General exemptions apply to all places and objects included in the Victorian Heritage Register (VHR). General exemptions have been designed to allow everyday activities, maintenance and changes to your property, which don't harm its cultural heritage significance, to proceed without the need to obtain approvals under the Heritage Act 2017.

Places of worship: In some circumstances, you can alter a place of worship to accommodate religious practices without a permit, but you must notify the Executive Director of Heritage Victoria before you start the works or activities at least 20 business days before the works or activities are to commence.

Subdivision/consolidation: Permit exemptions exist for some subdivisions and consolidations. If the subdivision or consolidation is in accordance with a planning permit granted under Part 4 of the *Planning and Environment Act 1987* and the application for the planning permit was referred to the Executive Director of Heritage Victoria as a determining referral authority, a permit is not required.

Specific exemptions may also apply to your registered place or object. If applicable, these are listed below. Specific exemptions are tailored to the conservation and management needs of an individual registered place or object and set out works and activities that are exempt from the requirements of a permit. Specific exemptions prevail if they conflict with general exemptions.

Find out more about heritage permit exemptions here.

Specific Exemptions:

Nil

Construction dates	1862,
Heritage Act Categories	Registered place,
Other Names	RAILWAY BRIDGE AND EMBANKMENT, RAILWAY CARRIAGE SHED, RAILWAY GOODS SHED, BALLARAT RAILWAY STATION, EAST ENGINE SHED,
Hermes Number	68
Property Number	

History

Associated People:

Extent of Registration

NOTICE OF REGISTRATION

As Executive Director for the purpose of the Heritage Act, I give notice under section 46 that the Victorian Heritage Register is amended in that the Heritage Register Number 902 in the category described as a Heritage place is now described as:

Ballarat Railway Station Complex, Ballarat, Ballarat City Council.

EXTENT:

1. All of the buildings and structures known as the Ballarat Railway Complex: Ballarat Railway Station Building, Ballarat West B1; former Railway Engine Shed, Ballarat West B2; Goods Shed, Ballarat West B3; former Engine Shed Remnants, Ballarat East, including remnant stone wall, brick wall and turntable B4; Peel Street Railway Bridge and Embarkment B5; Queen Street Bridge B6; King Street footbridge B7; former goods shed, Ballarat East, including external island platform at east end and stone wing wall at West end, but excluding roof over platform at east end B8; former station site, Ballarat East, including platform walls, station building foundation walls to threshold level and roadside kerb B9; signal box, Ballarat East, including the signal level frame and all fittings, two sets of associated sector gates at Humffray Street and all gate and signal control rodding within the area adjoining the signal box shown hatched B10; Davies Street subways B11; Ballarat A signal box, including the signal level frame and all fittings, all signal control rodding within the area adjoining the signal box shown hatched B12; signal mast No. 21, complete with all fittings and signal control rodding extending to a point 2 metres from the base of the mast B13; Yarrowee Creek tunnels B14; former water supply tower B15; up-end signal gantry, complete with all fittings and including signal control rodding extending to a point 2 metres from the base of the gantry B16; down-end signal gantry, complete with all fittings and including signal control rodding extending to a point 2 metres from the base of the gantry B17; former weighbridge B18; weighbridge and associated office B19; former carriers office B20; Ballarat B signal box, including signal lever frame and all fittings, one set of associated sector gates at Lydiard Street and all gate and signal control rodding within the area adjoining the signal box shown hatched B21; signal mast No. 33, complete with all fittings and signal control extending to a point 2 metres from the base of the mast B22; signal mast No. 31, complete with all fittings and signal control rodding extending to a point 2 metres from the base of the mast B23; and shown on Plans 602746/1-602746/6 inclusive, held by the Executive Director, Heritage Victoria.

2. The land marked L1, L2, L3 and L4 on Plan Nos. 602746/1-602746/6 inclusive, endorsed by the Chairperson, HBC and held by the Director, Historic Buildings Council, being all of the land described in Certificate of Title Volume 1882 Folio 376320, Volume 386 Folio 77069 and Volume 2863 Folio 572428 and Alotment 2C Section B3 in the Township of Ballarat East, but excluding an 'operating corridor' as shown on Plan Nos. 602746/1-602746/6 inclusive, held by the Executive Director, Heritage Victoria.

Dated 5 November 1998.

RAY TONKIN

Executive Director

[*Victoria Government Gazette* G 47 26 November 1998 pp.2890-2891]

Lydiard Street Heritage Precinct

LYDIARD STREET
HERITAGE PRECINCT

Location

LYDIARD STREET, ALBERT STREET, ARMSTRONG STREET, BATH LANE, CAMP STREET, CHANCERY LANE, DANA STREET, DAWSON STREET, DOVETON STREET, GRENVILLE STREET, LEWIS STREET, MAIR STREET, AND STURT STREET, BALLARAT CENTRAL, BALLARAT CITY

Municipality

BALLARAT CITY

Level of significance

Included in Heritage Overlay

Heritage Overlay Numbers

HO171

Heritage Listing

Ballarat City

Statement of Significance

Last updated on - March 28, 2024

What is significant?
How is it significant?
Why is it significant?
The Lydiard Street Heritage Precinct is **architecturally and aesthetically** significant at a **STATE** level (AHC criteria D.2, E.1 and F).
(d) the place's importance in demonstrating the principal characteristics of: (i) a class of Australia's natural or cultural places; or (ii) a class of Australia's natural or cultural environments; (e) the place's importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;
(f) the place's importance in demonstrating a high degree of creative or technical achievement at a particular period.

The Precinct is aesthetically and architecturally significant as an outstanding example of 19th century provincial city centre representing the development of modern urbanism, initiated by the 1850s gold rush in rural Victoria. As a model of a mid 19th century classical European city it is an excellent testament of European colony planning where urban design and perspective views were adapted to the local context and can be appreciated in all its magnitude. The natural physical framework along with the built is used as a theatrical backdrop with rectilinear streets lined by buildings of similar neo-classical facades and similar heights that define the sociopolitical functions and cultural centre of Ballarat.

The historic urban development and character of the Precinct is architecturally important to Ballarat, as the first large goldfields town surveyed by W.S. Urquhart, which is regarded as his most successful in Victoria. The primary focus of the British Colonial Office was the design and layout of streets as well as provision of law and order on the goldfields, with local private capital generated by the gold fields financing the buildings.

The Precinct is aesthetically and architecturally significant as an excellent model representing 19th century neo-classical town planning based on a new order, hygiene and services that sharply distinguishes it from East Ballarat. The absolute regularity of the grid street pattern gives way dramatically in the east to a basalt escarpment, which overlooks the former chaotic gold mining area along Yarrowee Creek and East Ballarat. The juxtaposition between order and chaos is further reinforced by the street names which were all named after Police Commissioners and Officers of the Native Police controlling the goldfields and comprise the following, Sturt (Commandant of the Melbourne City Police), Lydiard (Officer Lydiard of the Native Police from Goulburn area, later full Commissioner), Dana (Captain Dana of the Native Police), Mair (Melbourne Police Magistrate and Inspector of Police), Doveton (Commissioner Doveton), Armstrong (Assistant to Commissioner Doveton).

The creation of the Precinct between 1850 and 1880s is particularly significant as it coincided with the early boom of the gold fields and because the legacy of mid 19th century historic street pattern, urban fabric and buildings have retained their authenticity and integrity to a high degree, in terms of the historic architecture and types of function. The historic area is one of a few examples of this type in Australia where the early collection of grand buildings and infrastructure are well protected and well managed. Although the Precinct has been subject to urban growth which still continues, the urban fabric has been extended on the same pattern as the first plan and the historic core has not been subject to drastic transformations.

Ballarat architecture in Lydiard and Sturt Streets represented its *eclat*, its style. The architecture best symbolized the *belle epoque* of the gold mining boom, it was initiated by the wealth generated from the alluvial and deep leads and sustained by the growth of quartz gold mining from the late 1850s. This was emphasized by major landmark buildings that defined the focal point of the major intersections of the grids.

The economic success of the town allowed for the development of a city that responded to the social aspirations of a rising middle class and serviced the needs of the mining industry. The success of a unifying aesthetic ideal derived from overseas 19th century and early 20th century architectural and planning ideas adapted to a provincial Australian model is evidenced by the remarkable collection of landmark neo-classical building styles in the precinct which collectively contribute to a visually unified streetscape of great classical beauty.

The early construction of opulent buildings in Lydiard Street was due to the specific characteristics of the Ballarat gold fields. It was the discovery of gold at Ballarat in 1851 that resulted in Victoria's gold boom. Ballarat was recognized as probably the richest alluvial goldfields in the world at its peak between 1852 and 53. Unlike the great alluvial goldfield at Mt Alexander, Castlemaine, Ballarat was a unique field. It had both surface alluvial, deep lead and quartz mining that led to a more permanent stable population than most other mining areas, where the rise of syndicates and companies became common. It also led to increased tension between government authorities and miners which after the Eureka Rebellion in 1854, provided for the development of new courts of mines and mining legislation that underpins mining activities throughout Australia today. It also paved the way for rapid and orderly growth of capitalist mining and accumulation of vast wealth.

The Precinct is also architecturally and historically significant for its associational links with the development of mining law related to underground mining practices. The many disputed claims in the area gave rise to a substantial growth in legal chambers and fine architectural buildings that lined Lydiard Street by 1860s. A gaol (1857) and Supreme Court (1868) were built in Lydiard Street South and the area became the centre of legal and business offices and many buildings still house these functions today. A Church Precinct at the corner of Lydiard and Dana Streets contributed to the importance of this area of Lydiard Street and creates a spectacular backdrop to the centre city.
The Precinct is also architecturally and historically significant for its group of six outstanding neo-classical banks in Lydiard Street designed by notable Melbourne architect Leonard Terry in the 1860s, clustered around the corner of Lydiard and Sturt Streets. These include from the northern corner the former Bank of Australasia, the National Bank, former Colonial Bank of Australasia and the Bank of New South Wales which were all built in a row. On the southern corner, the London Chartered Bank and the nearby Union Bank buildings continued the theme. It is also the site of the Mining Exchange (1887-89) which replaced an earlier exchange located near the south-west corner of Sturt and Lydiard Streets. The earlier exchange building (now the library of the Ballarat Mechanic's Institute) had been the scene for broker's offices, major transactions, and where the disclosure of important gold discoveries were made.

In the early 1860s the Government Camp (the site of the former Gold Commissioners Police Camp in Camp Street) was subdivided and other uses were located there. These include, the Market Reserve, Ballarat Free Library and Reading Rooms Reserve and Benevolent Asylum Reserve. Between 1891 and 1925 these Reserves were redeveloped along Sturt and Camp Streets with shops dating 1895 - 1901 on the corner of the streets, and a Library (1895- 1901). However the former function of area was reinstated when the Police Court (1903-4) and new State Government Offices and Courthouse were erected in Camp Street in1941. The Chief Government Architect, Percy Everett, designed a building which became a "*dramatic new element in the street.*" The Police Station (1961) was the only new building built in the Camp Street area in the post World War II period.
Further subdivision of the Government Camp site in the mid to late 1880s was followed by the construction of five boom-style buildings including the Ballarat Commercial Club (later the Alexandra Tearooms, 26-34 Lydiard Street), Bones Building, the Ballarat Fine Art Gallery, Old Colonists' Hall and the Mining Exchange, all with frontages along Lydiard Street. These buildings along with the Post Office (begun 1864) on the corner of Sturt and Lydiard Streets and the Victorian buildings on the west side of Lydiard Street, formed a distinctive 'boom style' streetscape**.** Imposing buildings such as the Chamber of Commerce (1859), the Ballarat Mechanic's institute (commenced 1860) and Post Office (commenced 1864) were early additions to Sturt Street. By the 1870s timber shops had been replaced by brick shops. By the 1860s the boulevard character of Sturt Street was being defined with the development of a dual carriageway.

Around 1862, the northern end of Lydiard Street became the focus of a specific type of buildings which addressed the needs of the new railway station and the grand neoclassical styled Railway Hall. Two two-storey bluestone warehouses were built on the corner sites for Lister and Angel and McDowall and Gray close to the railway and at the north end of Lydiard Street other warehouses concentrated with premises such as Holmes, White & Co and merchant Robert Dunn both built in 1862. Hotels already established in the area included the George in 1852 and William Irwin's Provincial Hotel in 1863, later relocated and rebuilt nearby others include the Alexandra Tea Rooms and Reid's Coffee Palace. The Craig's Hotel was established in 1852 in Lydiard Street South. Between 1865 and 1890 the sites were developed into a "*series of distinctive two-storey commercial and civic buildings*."

The Precinct is architecturally significant for the outstanding collection of 19th century civic and commercial buildings associated with the commercial life of Ballarat. These include, the City of Ballarat Town Hall, the Myer Building and the Golden City Hotel in Sturt Street, the William Booth Citadel in Albert Street, South British Insurance Company on the corner of Dana and Armstrong Streets, The Ballarat Club, the former Ballarat Brewery building in Dana Street, Electra Hall, the Trades Hall and the YMCA building in Camp Street, The former Gas Company building, Ballarat Water Board Office, Manchester Unity Hall and Protestant Hall in Grenville Street. A late development to the Lydiard Street and Sturt Street corner was the 1905 National Mutual Building designed by J.J. and E.J. Clarke Architects of Melbourne. The most notable buildings in the block between Sturt and Dana Street are Her Majesty's Theatre, which is the oldest operating theatre in mainland Australia and Craig's Royal Hotel. The office buildings in this block include Counsel Chambers, Booths Buildings, Chancery house, and buildings located at 50, 54 and 56 Lydiard Street South.

The lower part of Sturt Street includes the former Union and Unicorn Hotels, the Camp Hotel, Edinburgh Buildings, the blue tile faced commercial premises at 23 Sturt Street and the Australian Natives Association building which has a parapet decorated with a Kangaroo and Emu. The Precinct is architecturally significant for its high quality of substantially intact buildings with examples by notable contemporary architects from all periods ranging from 1860s-1950s. It demonstrates many original and early architectural design qualities associated with the civic and commercial development of the area from the 1850s. The main building characteristics include a solid masonry form of usually stone or ashlar render, similar heights and scale, Italianate detailing and other strongly related elements which constituted a single "composition." This together with a commonly held aesthetic ideal, where the hierarchy of decoration and ornaments, columns, cornices, framing of windows and sculpted motifs delineated spatial composition, contributed to the unity of a monumental streetscape. The predominantly symmetrical design of Renaissance Revival Victorian and Beaux Arts Edwardian architecture with elaborately ornate street verandahs, tree lined avenues, asphalt footpaths and 19th century engineering infrastructure have created an historic centre of great unity and visual coherence.
The Precinct has aesthetic significance for its outstanding visual qualities of its setting, urban layout and architecture. The important visual qualities reflect the historical, cultural and architectural development of the precinct, and contribute to the contextual setting of Ballarat.

The qualities include the urban foci, notably many prominent and larger civic buildings, the dramatic topographical setting on the escarpment, intact Victorian streetscapes, the grid street pattern and gracious boulevard of Sturt Street. The important visual qualities of the Precinct are also enhanced by the street landscape design and layout that has contributed to the appearance of a gracious provincial City.

The Lydiard Street Precinct is **historically** significant at a **LOCAL** level (AHC criterion A, A4, Band H.1).
(a) the place's importance in the course, or pattern, of Australia's natural or cultural history;
(a.4) the importance for association with events, developments or cultural phases which have had a significant role in the human occupation and evolution of the nation, State, region or community;
(b) the place's possession of uncommon, rare or endangered aspects of Australia's cultural history;
(h) the place's special association with the life or works of a person, or group of persons, of importance in Australia's natural or cultural history.

The Precinct was surveyed by the colonial Government Surveyor W.S.Urquhart in late 1851 and is an excellent example of the lasting influence of his work.

The Precinct is historically important for its association with the discovery of gold in the early 1850s. The alluvial rushes in Victoria commenced in August 1851 in the Ballarat area and were of major national and international significance. The Precinct is significant as the site of the Gold Commissioners Camp and the activities of the Native Police, the first police force on the goldfields. It provides the historical context and setting for Eureka Stockade rebellion in 1854 which was an outstanding event in Australia. The Eureka Rebellion as an historical

event and the associated rebel miners' Southern Cross flag, have become symbols for democracy in Australia. The original Southern Cross flag is held in the Ballarat Fine Art Gallery located in the Precinct. The area is significant because of its potential to yield archaeological evidence of underground deposits or artifacts associated with the Government Camp.

The Precinct is historically important for its major contribution to the unified character of Ballarat's urban design that still retains the harmony of its foundation years. It has historic significance for its association with a number of significant activities that links together some of the main themes in the historical, social and architectural development of Ballarat.

The Precinct is associated with the early settlement of the area from squatters, demonstrated by the original use of Sturt Street, the formal layout of a township in the 1850s to the development of a municipality. Many of the individual civic buildings in the Precinct are designed by notable contemporary architects, and have associations with notable Ballarat citizens from the 1850s beyond.

The Lydiard Street Precinct is **scientifically** significant at a **LOCAL** level (AHC criterion C.2 and F).
(c) the place's potential to yield information that will contribute to an understanding of Australia's natural or cultural history;
(f) the place's importance in demonstrating a high degree of creative or technical achievement at a particular period.

The Precinct is of importance for contributing to the history of infrastructure development in Ballarat West, identified by intact bluestone kerbs and gutters.

The Lydiard Street Precinct is **socially** significant at a **LOCAL** level (AHC criterion G.1).
(g) the place's strong or special association with a particular community or cultural group for social, cultural or spiritual reasons.

The Precinct is recognized and highly valued by the wider community for civic, commercial and religious reasons. The Precinct is culturally important as it demonstrates the particular social structure of Ballarat during the 19th century which was conducive to a universally admired aesthetic.

Construction dates	1850,
Hermes Number	156830
Property Number	

Physical Description 1

The Lydiard Street Precinct is dissected by Sturt Street running east / west from Dawson Street to the Bridge Mall and Lydiard Street north / south from the railway to Grant Street. The northern boundary follows Market Street and turns southwards at Armstrong Street to include properties on the northern side fronting Mair Street and both sides of Lydiard Street to the railway area. It then returns south crossing Mair Street to include Camp Street then east along Field Street, south along Cattan Street and along the property boundary east to Grenville Street. The eastern boundary follows Grenville Street to Little Bridge Street where it aligns with the rear of the properties fronting Lewis Street to Albert Street. The southern boundary is formed by Grant Street between Albert and Armstrong Streets and then along property boundaries until Dana Street to Doveton Street. The western boundary extends along Dawson Street and includes buildings fronting Sturt Street to Dawson Street, and Doveton Street to Mair Street.

The Lydiard Street precinct is of state significance.

The precinct was first surveyed by the government surveyor William Urquart, who laid out the city centre on the plateau using a four-block grid pattern. In that plan, Lydiard and Armstrong Streets were main thoroughfares and Mair, Dana and Sturt Streets were cross streets. The survey did not extend east beyond Lydiard Street being the site of the government camp. The camp was the administrative centre established to keep order on the goldfields and was strategically located at the edge of the township where it had views across the diggings.

The precinct includes Ballarat's significant civic, institutional, religious and commercial buildings and monuments. The collection of buildings reflects the wealth that the 1851 gold discoveries brought to Ballarat influenced by the Anglo Saxon immigrants who diversified into other occupations following the gold rush.

Buildings and features in the precinct show the features associated with the civic and commercial development of the area from the 1850's. Notable contemporary architects, such as Casselli & Figgis and Leonard Terry designed many of the civic and commercial buildings. The significant and contributory buildings are predominantly Victorian, Federation, Edwardian and Inter War styles and feature ornate detailing, verandahs and intact interiors and exteriors.

Subdivision of parts of the government camp in the late to mid 1880's was followed by the construction of 'boom style' architecture on the new lots which included the Ballarat Fine Art Gallery, the Old Colonialists Hall, the Mining Exchange, the Ballarat Commercial Club and Bones Buildings. Together with the Post Office and the Victorian buildings on the west side of Lydiard Street, this group of buildings created a distinctive 'boom style' streetscape.

The opening of the railway line attracted hospitality businesses and warehouses to Lydiard Street north, while Lydiard Street South became the focus for the legal and financial businesses. The oldest operating theatre in mainland Australia, Her Majesty's theatre is a substantial presence in Lydiard Street south.

Substantial churches were established at the corner of Dana and Lydiard Streets and added to the importance of Lydiard Street. The character of Sturt Street was being defined in the 1860's with the development of the dual carriageway divided by a udbank, later planted with shrubs and trees known as the Camp Street gardens. The central median strip provided a civic space for structures, monuments and memorials.

Sturt Street originally housed timber buildings but by the 1870's these were replaced by brick shops. Other significant commercial and institutional buildings include the Town Hall, the Myer building and Golden City Hotel.

Key features of the precinct include the retention of the original street grid pattern, the topographical setting of the escarpment, the gracious boulevard of Sturt Street, and significant landmarks. Also included are the intact bluestone kerbs and gutters and remnants of cobblestone paved lanes, two areas of original street paving of large bluestone flagstones, a retained section of tramlines and timber block paving along the north edge of the median strip in Sturt Street near the corner of Armstong Street, an early cast iron post box in Lydiard Street.

This place/object may be included in the Victorian Heritage Register pursuant to the Heritage Act 2017. Check the Victorian Heritage Database, selecting 'Heritage Victoria' as the place source.

For further details about Heritage Overlay places, contact the relevant local council or go to Planning Schemes Online http://planningschemes.dpcd.vic.gov.au/

APPENDIX B:
THE ONRSR WAY: REGULATING RAIL SAFETY ACROSS AUSTRALIA

B

THE ONRSR WAY

REGULATING RAIL SAFETY ACROSS AUSTRALIA

OFFICE OF THE national rail safety regulator

CONTENTS

FOREWORD

Whatever the endeavour, there can be little doubt that a clear understanding of the fundamentals – the what, why and how– is a critical ingredient in any recipe for success.

Clarity breeds confidence which in turn delivers consistency and it's all of these that I want you, as an ONRSR stakeholder, to take from this document and our practical application of the words within.

It is vitally important that you understand how ONRSR works with you both operationally and strategically as we pursue our vision of safe railways for Australia.

A safe rail network is in everyone's interests, and an elemental expectation of every Australian. They should be reassured by, without needing to be intimately aware of, a co-regulatory environment where the management of safety is of paramount concern to both operator and regulator alike.

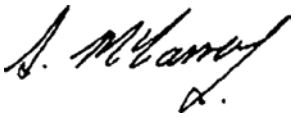
Having experienced regulatory officers that apply and continue to build their knowledge of the rail industry balanced with data analysis to create intelligence forms the heart of The ONRSR Way. This allows us to make both risk and evidence-based decisions when planning our regulatory interactions. When coupled with a scalable approach, consistent across all Australian jurisdictions, this method of regulation ensures our resources are deployed where and when they are required most.

Through our enhanced processes we have an active engagement program that positions ONRSR as an organisation that informs, educates and collaborates through high quality, targeted communications. At all times our engagement with stakeholders is strictly reliable, relevant and responsible.

At ONRSR we are driven by the need to constantly innovate and evaluate, never shying away from improving the way we work in order to foster complementary advances in systems and safety among operators of all types - right across the vast Australian rail network.

Of course, all of these initiatives and interactions are underpinned by ONRSR's values of integrity, respect, independence, diligence and excellence.

By clearly outlining how we will do business, we present to you The ONRSR Way – a way of thinking, a way of working but most importantly a way forward for rail safety in Australia.



Sue McCarrey
Chief Executive / National Rail Safety Regulator

EXECUTIVE SUMMARY

ONRSR strives to be a visible player in the rail industry, respected for conducting value-adding interactions that are informed by a strategic combination of industry intelligence, knowledge of operations and use of rail safety data. ONRSR has the dual, but complementary, roles of administrator of the *Rail Safety National Law* (RSNL) accreditation regime and the regulator of a duty-based safety management regime. The nature of the RSNL means that ONRSR is not a technical regulator.

The regulatory framework is co-regulatory in that the Australian governments do not directly prescribe the standards or rules by which railways need to operate. Rather, they set a performance requirement on railways to operate safely and provide operational flexibility to establish and implement standards, rules and methods of operation necessary to meet the safety performance requirement of their operations. The co-regulatory framework of the RSNL enables ONRSR to tailor our approach to each operator and its circumstances, while at the same time aiming to present a consistent regulatory approach to the rail industry so as not to surprise. ONRSR does not consider consistency of approach to mean the same decision will be made for all operators. Every situation will be judged on its merits.

1. KEY FUNCTIONS

ONRSR has key functions and powers under the RSNL to:

A. Administer

ONRSR administers a national scheme of accreditation, which includes registration and exemption, that provides confidence to the industry and community that those organisations permitted to conduct railway activities are the appropriate parties responsible for the control and management of rail safety and have the competence and capacity to ensure the safety of their operations. Where required by the RSNL, they must also have systematically identified and assessed the risks to safety relating to their railway operations and have demonstrated an ability to manage or mitigate these risks prior to operating.

When assessing applications for accreditation or applications to vary an accreditation, ONRSR consider:

- the operator's competence and capacity to manage risks to safety associated with the railway operations for which accreditation is sought;
- the operator's competence and capacity to implement a safety management system;
- the level of consultation undertaken by the operator in relation to its safety management system; and
- the operator's financial capacity or public risk insurance arrangements to meet reasonable potential accident liabilities.

Registration requires:

- that the applicant is, or is to be, the rail infrastructure manager of a private siding; and
- that the railway operations to be carried out in the private siding are such that registration of the applicant (rather than accreditation of the applicant) is, in ONRSR's opinion, the appropriate action.

Exemption

- Exemption from the requirement for rail transport operator accreditation will be considered in the circumstance where a railway or railway operations are captured by the RSNL but in their nature are not railways of the type intended to be captured by the RSNL.

B. Educate

ONRSR balances the compliance function with an education function in selecting the most appropriate regulatory activities in the context of a risk-based approach to rail safety regulation, delivering education interactions at an individual operator, industry sector or whole-of-industry level. ONRSR's education function is primarily directed towards:

- education and awareness of the legal requirements and the expectations ONRSR has on operators for demonstrating compliance with these requirements;
- raising industry awareness and exposure to information regarding safety issues that exist or are emerging within the rail industry that operators should be aware of; and
- sharing examples of good practice and encouraging continual improvement of safety management systems.

C. Monitor

ONRSR implements a continuing examination of operators' safety management system implementation and safety performance under the test of whether safety is being managed so far as is reasonably practicable (SFAIRP) and whether the operator continues to demonstrate the competency and capacity to safely undertake its railway operations.

D. Enforce

ONRSR undertakes investigations into significant and serious rail safety occurrences and issues with the aim of determining the need to enforce compliance with the law through the application of sanctions or other regulatory interventions. ONRSR's enforcement decisions are made proportionate to the identified risk to safety, the seriousness of any perceived breach, and/or the level of non-compliance with legislative requirements.

2. WORK PROGRAM

The use of a work program is ONRSR's way of planning regulatory activities across the country and is designed so that regulatory activities are carried out in a coordinated manner. ONRSR takes a risk-based approach to the design of work programs which focus resources towards the most significant risks to rail safety and to those areas with scope for improvement.

ONRSR captures regulatory intelligence/data, considers the risks to rail safety and makes decisions in accordance with the requirements of its Risk-Based Regulation Framework. This enables ONRSR to prioritise regulatory activities towards duty holders that have the largest potential impact on the safety performance of the rail industry and conduct most of Australia's railway operations. This means ONRSR prioritises regulatory attention.

EXECUTIVE SUMMARY

3. RAIL SAFETY OFFICERS

ONRSR's rail safety officers work closely with rail operators and their rail safety workers to undertake ONRSR's function of assessing accreditation-related applications, monitoring safety performance, responding to issues and enforcing the law, as required, with the aim of maintaining and improving safety. To be effective under the co-regulatory framework, ONRSR's rail safety officers are expected to inform themselves of the nature and scope of an operator's railway operations, through research and familiarisation activities, to build context for their regulatory activities, interactions and decision making.

To carry out their duties ONRSR's rail safety officers have wide powers of entry, enquiry and investigation and directions under the RSNL, including being able to:

- search a place, rail infrastructure, rolling stock, motor vehicle or other thing on railway premises;
- take, retain and make copies of documents;
- use and operate equipment to access information or examine things;
- secure a site to protect evidence that might be relevant for compliance and investigative purposes or ensuring safety;
- seize things;
- issue directions to operators to provide information or documents; and
- obtain information, documents and evidence.

4. CONDUCT

At all times ONRSR is:

A. Independent and impartial

ONRSR was created (by legislation) to be and act independently from industry, political or other individual influences. ONRSR acts without bias in the best interests of rail safety when making decisions and applying powers and regulatory tools.

B. Transparent, fair and accountable

Transparency means that ONRSR helps rail transport operators and rail safety workers to understand what is expected of them and what they should expect from ONRSR.

ONRSR apply the discipline of rail safety officers fully documenting their decisions and taking responsibility to clearly communicate the reasons for decisions being taken when administering the RSNL.

ONRSR encourages operators to appropriately challenge decisions if they are not clear on what is expected or why the decision has been made.

ONRSR develops materials and conducts interaction sessions for rail safety workers to educate and communicate expectations as the need is identified.

C. Confidential

ONRSR is subject to confidentiality provisions within the RSNL and has processes in place to preserve this. Any publication of data collected is in a non-identified format and reports on industry level performance. ONRSR may provide factual information on incidents that are in the public domain but will not comment publicly on individual rail transport operators.

D. Aware of regulatory capture and conflicts of interest

The decisions made by rail safety officers are impartial with any potential conflict of interest that might influence a decision being disclosed prior to the decision being made. Where practical, ONRSR do not assign tasks to rail safety officers or involve them in any decision making where a known conflict of interest exists.

ONRSR is mindful of the risk of regulatory capture (rail safety officers becoming too close to the operators that they interact with and being influenced through familiarity) and has active strategies in place to mitigate this risk. A noticeable control is that of avoiding allocating a specific rail safety officer to work with an operator for an extended period. This is why operators will see a change in lead rail safety officer roles for regulatory activities at different times.

5. CONTINUOUS IMPROVEMENT

It is ONRSR's role to advocate more broadly for continuous improvement across the rail industry. This approach is incorporated through:

- identifying and focusing activities towards national priorities;
- taking an active role in the identification of industry wide safety issues and facilitating safety improvement in these areas through education, guidance and other regulatory activities;
- publication of and providing access to relevant rail safety data to enable duty holders and other stakeholders to make informed decisions;
- engaging in industry led safety improvement projects and initiatives;
- participating in national rail safety regulatory reform; and
- networking with other related safety regulators.

ONRSR'S PRIMARY OBJECTIVES ARE TO ENCOURAGE SAFE RAIL OPERATIONS, ENSURE COMPLIANCE WITH THE RSNL AND TO PROMOTE AND IMPROVE NATIONAL RAIL SAFETY. ONRSR PROVIDES REGULATORY OVERSIGHT OF THE RSNL THROUGHOUT AUSTRALIA.

INTRODUCTION

ONRSR comprises the National Rail Safety Regulator (NRSR) and two non-executive members. The RSNL provides for the independence of ONRSR, ensuring it is not subject to Ministerial direction in the exercise of its functions or powers. However, ONRSR does report to the responsible Ministers on a range of governance, operational policy and administrative matters. This is done primarily through the Transport and Infrastructure Senior Officials' Committee (TISOC) and the Transport and Infrastructure Council. Additionally, individual Ministers may request that ONRSR undertake specific functions from time to time. Through memorandums of understanding ONRSR also works with other agencies, including the Australian Transport Safety Bureau, National Transport Commission and Workplace Safety Authorities to improve national rail safety performance.

The RSNL sets out ONRSR's functions as being:

- to administer, audit and review the accreditation regime under the RSNL;
- to work with rail transport operators, rail safety workers, and others involved in railway operations, to improve rail safety nationally;
- to conduct research and collect and publish information relating to rail safety;
- to provide, or facilitate the provision of, advice, education and training in relation to rail safety;
- to monitor, investigate and enforce compliance with the RSNL;
- to engage in, promote and coordinate the sharing of information to achieve the objectives of the RSNL, including the sharing of information with prescribed authorities (such as the Australian Transport Safety Bureau and the Rail Industry Safety Standards Board).

In exercising these functions, ONRSR is required to:

- facilitate the safe operations of rail transport in Australia;
- exhibit independence, rigour and excellence in carrying out regulatory functions; and
- promote safety and safety improvement as a fundamental objective in the delivery of rail transport in Australia.

The RSNL sets the following guiding principles for the administration of the RSNL:

- to assist rail transport operators to achieve productivity by the provision of a national scheme for rail safety;
- to operate the national scheme in a timely, transparent, accountable, efficient, effective, consistent and fair way; and
- that fees required to be paid for the provision of the national scheme are to be reasonable, having regard to the efficient and effective operation of the scheme. (Fees are set each year by unanimous agreement of the Transport and Infrastructure Council (Ministerial Council) and are included in RSNL Regulations.)

OBJECTS OF THE RSNL

- provide a scheme for national accreditation of rail transport operators in respect of railway operations
- provide for the effective management of safety risks associated with railway operation
- provide for the safe carrying out of railway operations
- provide for continuous improvement of the safe carrying out of railway operations
- promote public confidence in the safety of transport of persons or freight by rail
- promote the provision of advice, information, education and training for safe railway operations
- promote the effective involvement of relevant stakeholders, through consultation and cooperation, in the provision of safe railway operations

s3 RSNL

1 WHAT TYPE OF REGULATOR ARE WE?

ONRSR provides leadership, advice and acts on behalf of the community when necessary as part of ensuring compliance with the RSNL.

ONRSR has the dual, but complementary, roles of administrator of the RSNL accreditation regime and the regulator of a duty-based safety management regime (an educator, monitor, and enforcer). The nature of the RSNL means ONRSR is not an approver of equipment, services or processes.

In conducting these roles, ONRSR seeks to engage with operators in a way that directly influences those with the ultimate responsibility for delivery of safe railway operations and environments. ONRSR takes a predominantly facilitative approach to regulating safety, with rail safety officers collectively acting as a safety conscience and compliance coach to regulated parties, targeting education where necessary and giving opportunity for operators to address identified safety issues. However, where this is not effective with individual operators, or more immediate publicly accountable action is required, ONRSR employs the range of enforcement options available to secure safe outcomes and compliance with the law.

ONRSR is always open for conversations around new ideas and is willing to support operator innovation in managing safety. Advances in technology, new ways of thinking or lessons from other industries should always be explored to see what benefits can be transferred to the rail industry.

ONRSR actively engages with industry beyond the one-on-one regulatory relationships established by the RSNL, engaging in strategic initiatives and projects aimed at addressing safety issues across broad industry sectors.

1.1 WHAT IS MEANT BY CO-REGULATORY?

Co-regulation is the term used to describe the Australian rail safety regulatory framework established by jurisdictional governments and given effect through the RSNL.
The regulatory framework is co-regulatory in that the Australian governments do not directly prescribe the standards or rules by which railways need to operate. Rather, they set a performance requirement on railways to operate safely and provide operational flexibility to establish and implement standards, rules and methods of operation necessary when undertaking their operations.

The co-regulatory framework is strongly founded on the distribution of responsibility for the management of risks to safety, which is expressed in the RSNL through the:

- principle of shared responsibility for rail safety risks;
- establishment of specific safety duties for rail transport operators, designers, manufacturers and suppliers to the rail industry, loaders and unloaders of freight and rail safety workers; and
- establishment of the role and function of the Regulator.

> The level and nature of responsibility that a person has for rail safety is dependent on the nature of the risk that the person creates from the carrying out of or making a decision regarding railway operations and the capacity that person has to control, eliminate or mitigate those risks.
> Managing risks associated with the carrying out of railway operations is the responsibility of the person best able to control those risks.
>
> s50 RSNL

Key roles under the Australian rail safety co-regulatory framework are:

Governments	Establish through public policy the preferred regulatory framework and set the law to implement this policy, inclusive of: > setting obligations on specific duty holders; and > establishing the role and function of the Regulator
Regulator	Established with functions and powers to: > administer the accreditation regime; > monitor rail safety management performance of operators and duty holders; and > ensure operators and duty holders comply with the requirements and safety management standard set by the law through utilising powers to monitor, facilitate or enforce compliance with the RSNL.
Rail Transport Operators	Accountable for ensuring, SFAIRP, the safety of their specific railway operations, including impacts on interfacing railway and road operations. Accountable for the establishment and implementation of the standards, rules and procedures for the safe operation of their railway, in the form of a documented and implemented safety management system.
Contractors, Suppliers and Manufacturers	Captured as duty holders under the RSNL and accountable for ensuring, SFAIRP, the safety of their activities as they may impact on safe railway operations. Accountable for the delivery of railway operations for rail transport operators in accordance with rail transport operators' safety management systems.
Rail Industry Standards Groups	Supporting rail transport operators and other duty holders through the development of good practice guidance or standards for the effective management of safe railways.

This framework is well suited to the Australian rail environment given the diversity of operators and types of operations. The absence of a one rule for all approach enables individual rail transport operators to tailor and innovate risk management controls to their specific railway operations and risk profiles. This is commonly referred to as the RSNL enabling scalability across operators and industry sectors. It also enables ONRSR to tailor the regulatory approach to individual operators or to specific safety issues.

The success of the co-regulatory framework to manage risks to safety across the range of railway operations that occur in Australia depends on:

> the regulated parties having an interest in controlling the safety of their railway operations;

> all parties being prepared to engage in an open and frank exchange in the disclosure of information regarding the management of safety and safety performance; and

> the parties identified above effectively delivering against their role and accountabilities in cooperation and in consultation with other affected parties.

Co-regulation is not a partnership between ONRSR and the rail industry when it comes to the obligation to ensure, SFAIRP, the safety of railway operations. This responsibility clearly rests with those parties that are directly in a position of control and management of railway operations, which is principally the accredited or registered rail transport operators and their various suppliers and contractors.

The overall success of this regulatory framework to address and mitigate risks to safety is predicated on individual operators and the broader industry fulfilling their respective roles in engaging the appropriate expertise and competence towards collaboratively identifying and assessing risks and developing, applying and maintaining standards and processes to manage safe railway operations. ONRSR has a responsibility to the public and the wider rail industry environment to work cooperatively with industry parties to achieve the highest levels of safety practicable across a diverse Australian railway industry, but where industry parties do not fulfil their role, ONRSR has suitable powers to prevent, prohibit or apply sanctions to unsafe operations.

1.1.1 ONRSR'S NATIONALLY CONSISTENT APPROACH

The co-regulatory framework of the RSNL enables ONRSR to tailor an approach to each operator and their circumstances, while at the same time presenting a consistent regulatory approach to the rail industry. Consistency of approach does not mean the same decision will be made for all operators. Every situation is judged on its merits.

When ONRSR says it delivers a consistent regulatory approach, this means:

- when undertaking a regulatory activity, the administrative process is followed and the outcomes are delivered as expected (e.g. there will always be a report provided following an audit);
- transparency in what is trying to be achieved through the various regulatory activities that may be undertaken and an explanation as to why they have been chosen;
- providing a single, common interpretation to the RSNL and the expectations on operators arising from this interpretation (made public through published guidance material); and
- managing ourselves internally to present a single organisational approach to rail transport operator activities, by operating to a single work program.

The use of a work program is ONRSR's way of planning regulatory activities across the country and is designed so that regulatory activities are carried out in a coordinated manner with rail safety officers having full visibility of activities being conducted regardless of their location.

The work program ensures there is coordination between activities that have a national focus and other more localised activities that may only be relevant to a particular geographical location.

The work program is not shared with external parties. While ONRSR openly communicates national and other safety issue priorities, details are not provided to rail transport operators regarding the scope of specific future activities as documented within the work program. ONRSR does, however, meet with operators to discuss planned interactions for the year recognising that the program is necessarily dynamic.

1.2 HOW ONRSR OPERATES

The fundamental delivery of ONRSR's functions is guided by the following assurances, which aim to support regulatory effectiveness and efficiency by supporting a transparent and collaborative relationship with the rail transport industry and continual improvement in rail safety.

1.2.1 INDEPENDENT AND IMPARTIAL

ONRSR was created (by legislation) to be and act independently from industry, political or other individual influences. ONRSR acts without bias in the best interest of rail safety when making decisions and applying powers and regulatory tools.

1.2.2 TRANSPARENT, FAIR AND ACCOUNTABLE

Transparency means ONRSR helps rail transport operators to understand what is expected of them and what they should expect from ONRSR.

ONRSR applies the discipline of rail safety officers fully documenting decisions and taking responsibility to clearly communicate the reasons for decisions being taken when administering the RSNL.

ONRSR encourages operators to appropriately challenge us if we are not clear on what we expect or why we have made our decisions.

1.2.3 CONFIDENTIALITY

ONRSR is subject to confidentiality provisions within the RSNL and we have processes in place to preserve this. Any publication of data we collect is in a non-identified format and reports on industry level performance. We may provide factual information on incidents that are in the public domain but do not comment publicly on individual rail transport operators.

1.2.4 REGULATORY CAPTURE AND CONFLICTS OF INTEREST

The decisions made by our rail safety officers are impartial with any potential conflict of interest that might influence a decision being disclosed prior to the decision being made. Where practical, we do not assign tasks to our rail safety officers or involve them in any decision making where a known conflict of interest exists.

ONRSR is mindful of the risk of our rail safety officers becoming too close to the operators they interact with and being influenced through familiarity and as such we have active strategies in place to mitigate this risk. A noticeable control is that of avoiding allocating a specific officer to work with an operator for an extended period, which is why operators will see a change in lead rail safety officer roles for our regulatory activities at different times.

1.3 STRUCTURED TO DELIVER

ONRSR is structured and geographically located to provide efficient regulatory coverage of operations across Australia. Delivery of operational regulatory functions is undertaken by staff in a variety of locations.

- The national office in Adelaide is where the Chief Executive and supporting corporate functions are located;
- The Chief Executive of ONRSR is also the Regulator; and
- ONRSR also has offices in Sydney, Brisbane, Melbourne, Perth, Hobart and Darwin.

While the National Operations division is responsible for the delivery of regulatory functions, this can only be achieved by working in a collaborative manner with other divisions of ONRSR as depicted below.

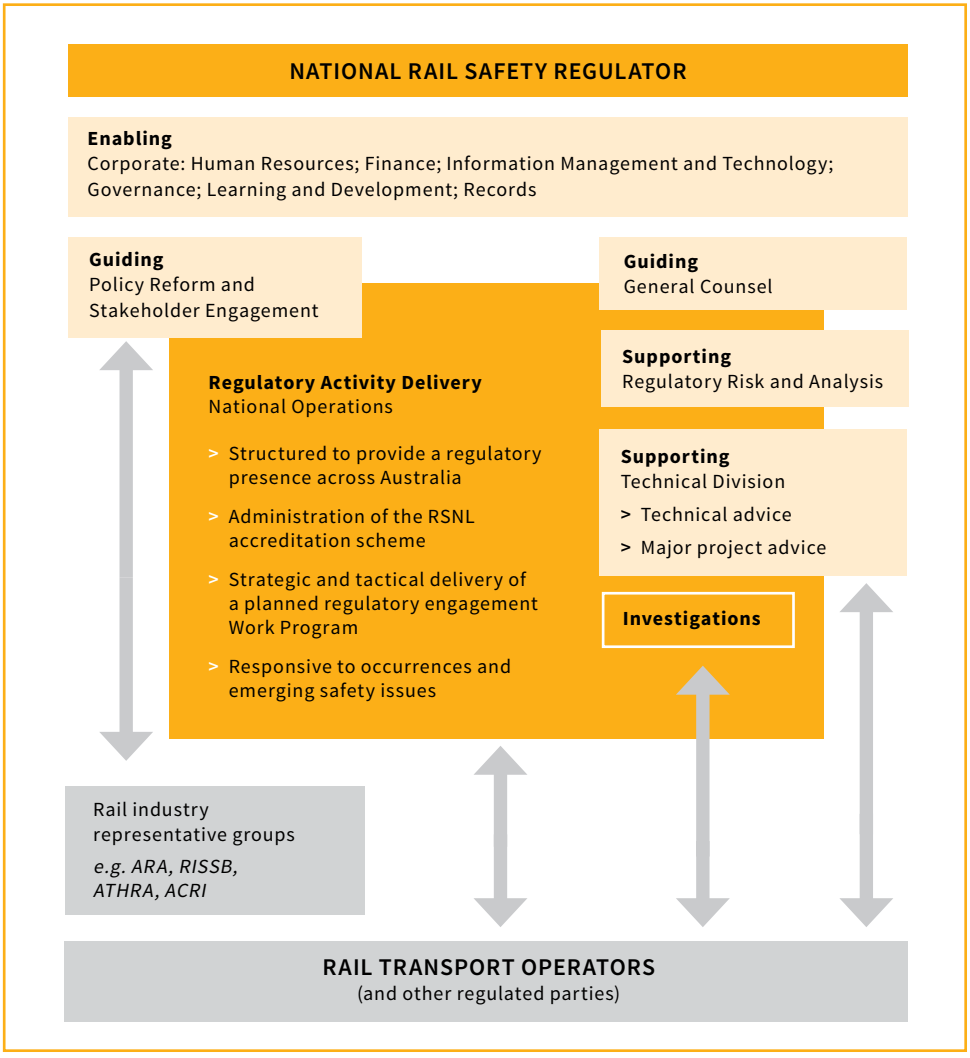


FIGURE 1: Model of regulatory functions delivery to industry

1.3.1 ROLE OF THE RAIL SAFETY OFFICER

ONRSR rail safety officers work closely with rail operators and their rail safety workers to undertake functions of assessing accreditation-related applications, monitoring safety performance, responding to issues and enforcing the law, as required, with the aim of maintaining and improving safety. ONRSR's rail safety officers have responsibility for providing the regulatory oversight necessary to ensure rail operations in Australia are being managed safely, and the many ways this is done is outlined further in section 3 and 4 of this document.

To be effective under the co-regulatory framework rail safety officers are expected to inform themselves of the nature and scope of an operator's railway operations, through research and familiarisation activities, to build context for their regulatory activities, interactions and decision making.

It is through the activities, judgement and decision making of rail safety officers that ONRSR builds the overall understanding of an operator's safety culture. By analysing the range of data and information collected, ONRSR considers the safety and compliance performance of an operator to form an opinion of whether it is:

- continuing to demonstrate competency and capacity to manage risks to safety from its operations and to implement its safety management system (i.e. is still demonstrating what is required to continue to hold accreditation); and
- demonstrating a reasonable approach to the management of risks to safety from its operations through the effective implementation of its safety management system.

To carry out their duties rail safety officers have wide powers of entry, enquiry and investigation and directions under the RSNL, including being able to:

- search a place, rail infrastructure, rolling stock, motor vehicle or other thing on railway premises;
- take, retain and make copies of documents;
- use and operate equipment to access information or examine things;
- secure a site to protect evidence that might be relevant for compliance and investigative purposes or ensuring safety;
- seize items;
- issue directions to give information or documents; and
- obtain information, documents and evidence.

As outlined above, rail safety officers have the power to enter a railway site without permission from the rail organisation. However, it is expected that rail safety officers immediately identify themselves upon arrival at a site and provide proof of identity in the form of an ONRSR identification card. Rail safety officers will also provide on-site staff with a clear understanding of why they have attended and what is required of them. Rail safety officers can be asked to complete an induction to a site, or submit to a drug/alcohol test, but have the discretion to refuse should the request present an immediate hinderance or obstruction to an officer's urgent need to exercise their powers. At all times rail safety officers are required to actively minimise the impact of their activities, and advice or direction may be given to assist rail safety officers with this obligation.

When a rail safety officer is on-site, it is the legal responsibility of operators and their staff to answer all relevant questions, provide assistance to the rail safety officer and not hinder a rail safety officer's work in any way. Where a rail safety worker is compelled under a power or function of the RSNL to answer a question or provide a document, that answer or document cannot be used as evidence against the rail safety worker in civil or criminal proceedings. It is an offence to provide false or misleading information (including verbal information) or documentation to a rail safety officer.

1.3.2 ONRSR POLICY DEVELOPMENT AND SUPPORTING DOCUMENTATION

A core element of delivering a consistent regulatory approach is that ONRSR develop operational policy that guides the implementation of the higher level policy decisions embodied in the RSNL. On request from Transport and Infrastructure Council, ONRSR will also make recommendations to Ministers in relation to strategic policy that informs changes to the RSNL, and provide input into strategic policy positions developed by the National Transport Commission for consideration by Transport and Infrastructure Council.

ONRSR has an important role of interpreting the RSNL, explaining this to regulated parties, and acting consistently with this interpretation. Operational policies provide headline information on how ONRSR administers the law in respect of particular subject areas and rail safety issues for broader topics such as level crossings, and are intended to influence decision makers. All external ONRSR policies are available on the ONRSR website **(www.onrsr.com.au)**.

In addition to policies, ONRSR develops comprehensive guidelines which clearly articulate our expectations in relation to complying with the RSNL. These guidelines provide key information and clarification to both the rail industry and the public on legislative, regulatory and technical matters.

Additional information is available on a range of topics in the form of fact sheets, which are brief and cover a specific topic or issue.

All relevant policy and guideline development is undertaken in consultation with stakeholders.

2 RISK-BASED REGULATORY APPROACH

Risk-based regulation is an approach to regulation in which regulatory effort is commensurate with risk and scope for improvement. Administering the RSNL using a risk-based approach means that key decisions, such as the setting of national priorities and the development of the work program, are informed by an assessment of risks to rail safety. This involves:

- developing an understanding of the risks to the safety of railway operations in Australia;
- prioritising these risks and determining which risks can be influenced through regulatory activities; and
- designing, prioritising and delivering regulatory activities and outcomes in a way that best maintains and improves rail safety.

ONRSR's regulatory approach recognises the broad range of operators and other duty holders with responsibilities under the RSNL, and accounts for their varying safety risk profiles and the environments in which they operate when setting expectations and making regulatory decisions that impact them.

2.1 ONRSR'S MODEL FOR RISK-BASED REGULATION

Our four-stage model for risk-based regulation is illustrated in Figure 2 and is summarised over the following sub-sections:

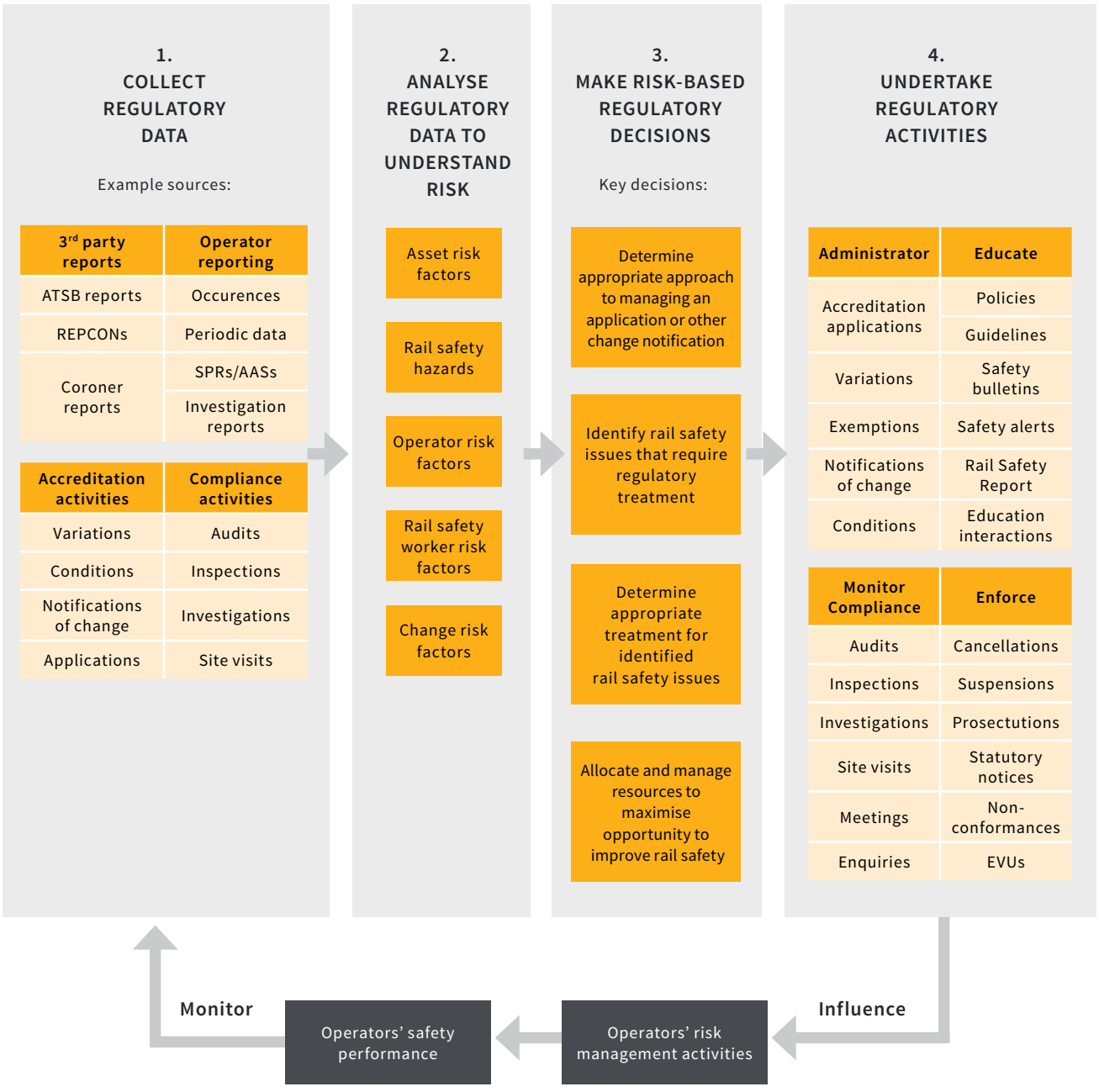


FIGURE 2: ONRSR's model for risk-based regulation

2.1.1 COLLECT REGULATORY DATA

Regulatory data is collected from a variety of sources, including operator reporting, third party reports and through interactions with industry. This enables the monitoring of industry-wide and operator-specific safety management and performance to support both ONRSR's legal requirements and those of industry.

All regulatory data is captured and managed through a regulatory information system that has been developed for this purpose. ONRSR's approach to data capture and management is driven by:

- the need to collect and analyse data at a level of detail necessary to guide decision making regarding which operators and/or issues require resources to be focused on; and
- the expectation of ONRSR to monitor and report on high level industry wide safety performance.

ONRSR also makes some of this regulatory data available to regulated parties and other stakeholders through a range of safety data publications, reports and data extracts, in accordance with the confidentiality provisions of the RSNL, to assist with decisions being made by these parties.

2.1.2 ANALYSE REGULATORY DATA TO UNDERSTAND RISKS TO RAIL SAFETY

By analysing and drawing upon the regulatory data collected, ONRSR can build a picture of risks to rail safety across the industry. This includes, for example, understanding safety risk profiles of operators and the risks associated with capital investment projects.

ONRSR needs to have a good understanding of the risks to safety being presented by railway operations to focus regulatory activities towards ensuring the responsible duty holders are managing those risks. References to risks to rail safety primarily means the risk of rail safety events such as derailments and collisions, which have the potential to cause harm to workers, passengers and members of the public across the rail network.

ONRSR's interest in operational rail safety risks must be considered separately to, and does not in any way impact on, the risk management responsibilities placed on safety duty holders under the RSNL. It is the duty holders' responsibility to manage risks to safety from railway operations, SFAIRP. ONRSR's interest, collation of data, risk analysis and safety performance monitoring in this space is conducted in line with the principles of co-regulation and shared responsibility for risk management set out in the RSNL. These are further explained with a focus of the risks we seek to manage in Figure 3.

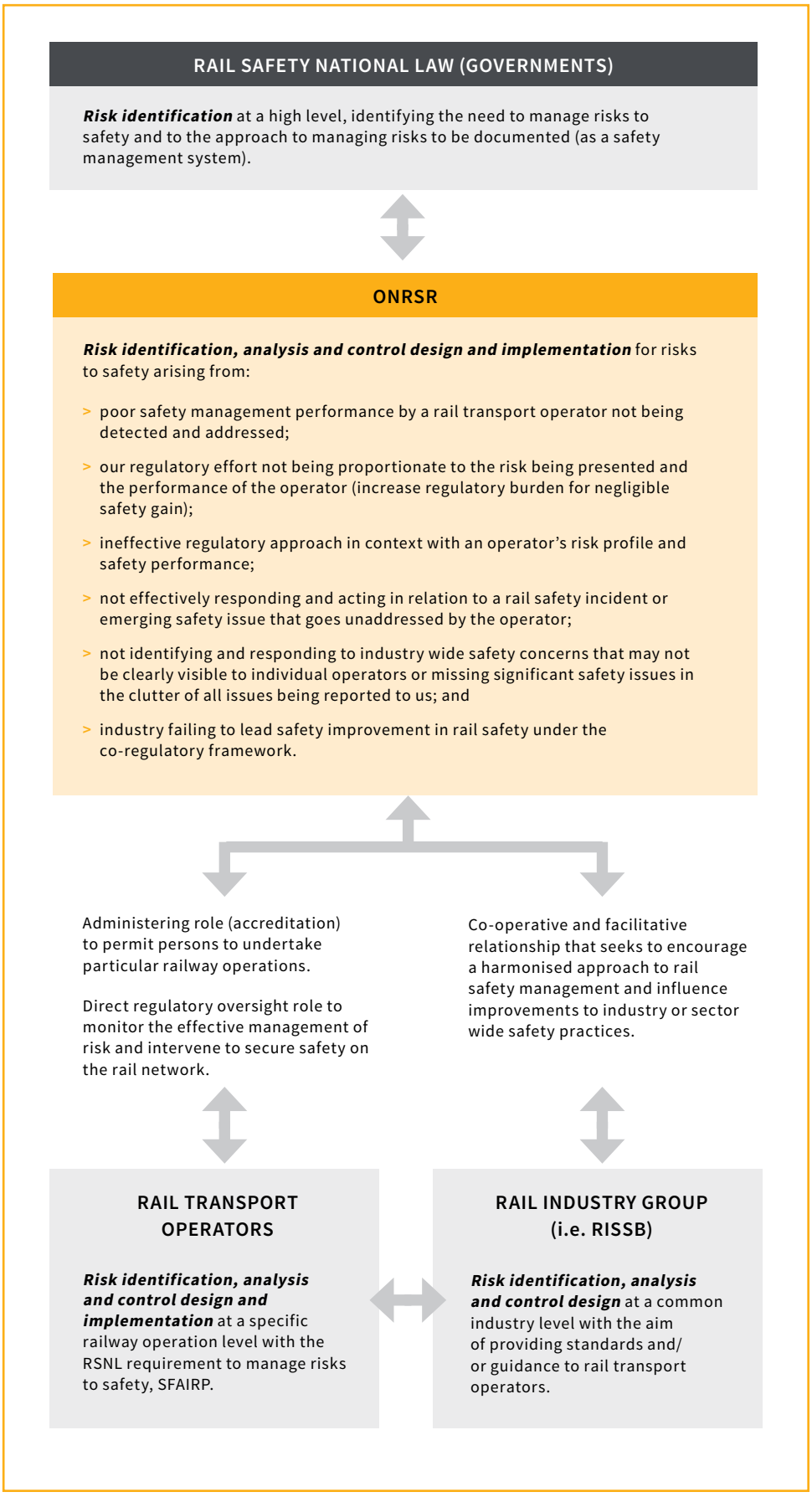


FIGURE 3: Accountability for risk management under the co-regulatory framework

2.1.3 MAKE RISK-BASED REGULATORY DECISIONS

Based on our understanding of risks to rail safety, ONRSR makes informed regulatory decisions to best drive and influence risk reduction across industry.

Risk-based decision making is fundamental to ONRSR's approach to regulation. However, not all decisions carry the same level of regulatory importance, have the same potential to impact rail safety, or require the same commitment of resources.

For example, a decision to select and focus regulatory effort on a new national priority area has a much greater potential to impact rail safety, requires a significant commitment of resources over an extended period, and is therefore of greater regulatory importance than a decision to select a new publishing provider for corporate reports.

A scalable approach to risk-based decision making is therefore required to ensure the level of rigour and effort expended on a decision is commensurate to the regulatory importance of that decision. To achieve this, ONRSR's framework for risk-based regulation focuses on the most important regulatory design and planning decisions, as listed in Figure 1.

Taking a risk-based approach to the most important regulatory decisions ensures focus on the most significant risks to rail safety and those areas with greatest scope for improvement. However, this is not to say that attention is not paid to less significant risks or to compliance with other aspects of the RSNL.

While the legislation clearly articulates ONRSR's powers to monitor and enforce operator and duty holder compliance with the requirements of the RSNL, there is little detail on the specifics of the broader function to work with rail transport operators, rail safety workers, and others involved in railway operations to improve rail safety nationally. To satisfy this function, ONRSR is an active participant in broader industry groups and committees, contributing to activities such as the development of standards, research into new technologies, and the sharing of safety data. This supports ONRSR's principal objective of facilitating the safe operation of rail services across Australia and a commitment to always strive to work with the broader industry on problem-centric issues to achieve this objective.

2.1.4 UNDERTAKE REGULATORY ACTIVITIES

Risk-based decisions and plans are implemented by interacting with industry and government stakeholders using a variety of regulatory activities, tools and measures, ranging from publication of guidelines to taking enforcement actions.

ONRSR's regulatory activities are designed to achieve an appropriate balance between focusing on program-centric work and problem-centric work. At its simplest level program-centric work leads to a scheduled program of regulatory interactions ensuring that monitoring time (and activity) is allocated to all accredited operators.

Problem-centric activities build on the identification of safety issues (problems) that need regulatory attention at a national, industry sector and specific operator level, leading to tailored regulatory activities being incorporated into the work program at an operator level and broader engagement with industry in safety initiatives and education programs, targeting an individual rail transport operator or industry sector issues.

2.2 MAKING A PROPORTIONATE RESPONSE

In keeping with the co-regulatory framework, ONRSR has a strong preference for giving regulated parties the opportunity to correct identified contraventions of the RSNL through the corrective action and change management processes of their safety management systems. This approach is reliant on a demonstrable willingness and capability by the operator to address the safety issue and to comply with the RSNL. However, ONRSR assesses the circumstances of each identified breach to determine the required relevant and proportionate level of enforcement.

The response to contraventions of the RSNL is not progressively escalated through the range of enforcement options available to ONRSR, rather the option selected is considered the best to achieve a safe and compliant outcome given the specific circumstances. This approach reflects the likelihood of selecting one of the various compliance tools (see section 3.4) or sanctions available depending on the following factors:

- the severity of any realised consequences from failing to manage the risk to safety of rail safety workers or the public;
- the seriousness of an immediate and/or ongoing risk to the safety of rail safety workers or the public and the speed required for resolution;
- the historical safety performance of the operator in context of the breach;
- the capacity of the regulated party to address the breach;
- the safety management performance of the operator, taking into consideration past history of breaches, regulator interventions, serious occurrence rates;
- actions taken, or not taken, to any advice or direction given by ONRSR to the party in relation to the circumstances of the breach; and
- the party's level of cooperation and willingness to address the identified breach.

Operators should be aware that all enforcement options are always available to be utilised against all duty holders at any time.

3 REGULATORY ACTIVITIES

The Regulator has key functions and powers under the RSNL to administer, educate, monitor and enforce. ONRSR delivers a range of activities, mostly via rail safety officers, to ensure those functions are met. The figure below identifies the core activities against the key functions. The expectations and regulatory outcomes from these activities are expanded on throughout this document and summarised in Appendix 1.

ADMINISTER	MONITOR COMPLIANCE	ENFORCE	
		Facilitated	Sanctioned
Accreditation & Registrations	Notifications of Change	Education interactions	Investigations
Variations of accreditation & registrations	Safety Performance Reporting reviews	Advice	Prohibition Notices
Exemptions	Site visits & meetings	Non-conformance reports (NCRI)	ONRSR imposed conditions of restrictions
	Audit	Improvement Notices	Prosecution
	Inspections		Suspension / Cancellation
	Notificable occurence response & monitoring		
	Enquiries		
INFORM & EDUCATE			
Policies	Guidelines	Safety Bulletins	Safety Alerts
Rail Safety Report	Newsletters	Industry education sessions/ interactions	Publication of research

FIGURE 4: Regulatory activities

In addition to the above activities, rail safety officers may also request information from operators to confirm facts, clarify uncertainties with existing information held or improve ONRSR's understanding of a safety issue or element of railway operations. Depending on the circumstances, the request may range from a phone call seeking clarification of a simple and/or minor matter through to formal written communication using relevant sections of the RSNL.

The range of activities listed above are used principally to administer and monitor compliance with and, if necessary, initiate actions to enforce or sanction breaches of the RSNL. Rail safety officers select the activity which best fits their intended purpose for interacting with an operator. However, at all times rail safety officers are expected to remain vigilant of safety issues and are empowered to act to secure compliance with the RSNL or to address a safety issue regardless of the activity in which they are engaged.

As an example, rail safety officers conducting a site visit may identify a safety concern that warrants additional examination. In this case, they could immediately cease the site visit and advise the operator that they were now making enquiries into the identified safety issue.

In all cases, if rail safety officers are going to change the nature of the regulatory activity being undertaken a representative of the operator is advised.

3.1 ADMINISTER

ONRSR administers a national scheme of accreditation, which includes registration and exemption, that provides confidence to the industry and community that those organisations permitted to conduct railway activities are the appropriate parties responsible for the control and management of rail safety and have the competence and capacity to ensure the safety of their operations. Where required by the RSNL, they must also have systematically identified and assessed the risks to safety relating to their railway operations and have demonstrated an ability to manage or mitigate these risks prior to operating.

3.1.1 ACCREDITATION

In administering the national accreditation regime under the RSNL it is ONRSR's task to exercise powers under the RSNL which includes making the decision to grant, with or without conditions, accreditation to a person or organisation that has the competence and capacity to undertake the intended railway operations. Accreditation is refused for those applicants who cannot sufficiently demonstrate the requirements set out in the RSNL. Any person or organisation captured by the RSNL that seeks to undertake railway operations within Australia is required to be:

- accredited for those railway operations;
- registered in relation to a private siding to be able to undertake rail infrastructure related railway operations;
- working for an organisation that is either accredited for or registered in regard to those operations; or
- exempted from the requirement for accreditation or registration.

ONRSR can only accredit, register or exempt a person or organisation that is a rail transport operator, having the role of one or both of a rail infrastructure manager or rolling stock operator, as defined by the RSNL.

There are fees attached to the accreditation scheme and these are described in the ONRSR Fees Policy.

ONRSR is required to decide to grant or refuse an application for accreditation within six months of receiving a complete application. This is known as the relevant period under the RSNL, the timing of which is formally re-set if further information is required to process the application.

The actual time taken to process an application for accreditation depends on the scope and complexity of the applicant's railway operations and the completeness and quality of the documentation provided with the application. ONRSR uses its best endeavours to work with applicants' operational timeframes, but will not enter an agreement that shortens the relevant period for decision (i.e. that is less than six months from receipt of a complete application).

Granting of accreditation for railway operations is a declaration that ONRSR is satisfied the rail transport operator has demonstrated it has the competency and capacity to manage the risk to safety associated with its specific railway operations. It does not mean that

ONRSR has approved or endorsed an organisation's safety management system, specific technology or methods of operation. These are subject to ongoing oversight through regulatory activities.

Accreditation is granted through the issue of a notice of accreditation, which sets out the scope of operations for which the operator is being permitted.

As accreditation is granted for specific railway operations it is not unusual that an operator's business activities or methods of operating will change beyond their current scope of accredited railway operations. Where this occurs, the operator is required to apply for a variation to accreditation which is assessed in the same way as an accreditation.

Potential applicants for accreditation, registration or exemption are encouraged to discuss with ONRSR their intended railway operations (or change to operations) prior to making an application.

Major Projects

In cases where the intended railway operations may be considered a major project, which typically involve an application for accreditation or variation to accreditation, ONRSR has developed further guidance setting out the expectations on operators for planning, management and safety assurance of such projects in the ONRSR *Major Project Guideline*, which is available on the ONRSR website.

While ONRSR does not have a strict definition of a major project, they will typically involve a significant technical or operational change, particularly involving novel or innovative approaches, the introduction of new rolling stock or railway infrastructure or will be associated with high level of complexity due to intricate, multi-party organisational or contractual structures. If the intended railway operations fall into these definitions then early engagement with ONRSR, well ahead of any formal application considerations, is encouraged.

A **rail transport operator** is a person or organisation that is one or both a:

- **rail infrastructure manager** – having effective control and management of the rail infrastructure whether or not the person owns the infrastructure or has a statutory or contractual right to use the rail infrastructure or to control, or provide, access to it
- **rolling stock operator** – having effective control and management of the operation or movement of rolling stock on rail infrastructure for a railway.

s4 RSNL

A. What determines effective control and management?

Ensuring that we are accrediting, registering or exempting the correct party is an important part of granting the accreditation. Detailed assessment of an application will not commence until confirmation is established that it is the correct party making the application.

The determination of effective control and management is a question of fact. It is a case-by-case determination that in most cases is straightforward, based on simple ownership and control, or statutory control. However, more complex commercial contracting or partnering arrangements exist that present more of a challenge to determine who the correct legal entity to hold the accreditation is.

It is not ONRSR's role to directly influence or dictate what commercial or organisational arrangements should be struck between parties in the conduct of railway operations. However, the form of arrangements in place, particularly when relating to responsibility and accountability for various activities, will directly influence the decisions as to who can be accredited for what railway operations. ONRSR works with parties to provide advice on the implications of their contracting or other similar decisions to ensure that there is a clear understanding of the effective control and management of the parties, and that the intentions of the parties in relation to responsibility for the railway operations are met.

To determine the correct effective control and management party, evidence is requested for consideration around:

- ownership, including leasing and contracting;
- the ability to influence or direct the approach taken to manage risks or how railway operations are to be managed; and
- the control over standards, specifications for performance, quality acceptance and risk controls.

B. ONRSR's view on granting accreditation to enable tendering for railway work

Accreditation can only be granted to an organisation that can demonstrate they are the effective control and management party for their proposed railway operations. ONRSR has no ability to grant an accreditation in a provisional or anticipatory manner for organisations that are looking to tender for railway operations and are not able to demonstrate they are the effective control and management party.

ONRSR is able to provide advice to contracting and contractor parties in regard to implications for accreditation of parties to contractual arrangements ahead of tenders being released or submitted.

ONRSR does not facilitate arrangements of convenience between multiple parties in terms of who holds accreditation. Evidence is sought, through access to commercial contracts or other forms of agreements of responsibilities as necessary, to ensure the party seeking accreditation can clearly demonstrate it has effective control and management for its proposed railway operations.

C. How is an application for accreditation assessed?

Once established that an applicant is the rail transport operator (i.e. the effective control and management party) for the railway operations, the RSNL requires ONRSR to assess

and grant (with or without conditions) or refuse an application. This is done by considering that the applicant has:

- the competence and capacity to manage risks to safety associated with the railway operations for which accreditation is sought;
- the competence and capacity to implement its safety management system;
- undertaken consultation in relation to its safety management system;
- the financial capacity or public risk insurance arrangements to meet reasonable potential accident liabilities.

D. What is meant by competence and capacity?

Testing for competence and capacity is not checking that the safety management system is compliant with the law. It is necessary to determine whether the rail transport operator can demonstrate organisational level competency and capacity. This is not about checking that individuals have the required competency to perform their roles but whether the organisation as a whole (represented by its senior management) can present:

- a clear description of the railway operation they are intending to undertake;
- a good understanding of the risks to safety associated with the intended railway operation, supported by documented risk assessment process and risk assessments;
- a clear plan for resourcing and building organisational capacity to undertake the operations, supported by organisational charts, key position descriptions and the demonstrated capability to implement this plan;
- a structured approach to the management of risks to safety, demonstrated through a developed safety management system and the knowledge and understanding of the system functionality by those that will be responsible for oversighting its implementation;
- an understanding of the need for, and evidence of, the approach taken, or to be taken, to manage a safety assurance process for the decisions made regarding the proposed operations and the form and content of the safety management system; and
- in the case of a variation of accreditation, evidence that the safety management system has been implemented to the extent possible prior to the new operations, e.g. change management processes have been followed.

ONRSR samples a range of elements of the safety management system and may require the detailed documentation and access to the staff responsible for the documentation in order to examine its completeness, appropriateness and integration into the broader safety management system.

If an applicant for accreditation cannot satisfy their competence and capacity to manage risks to safety associated with its proposed railway operations, the application is refused and the applicant provided the reasons for refusal in writing.

E. What consultation needs to have been undertaken?

ONRSR's preference is for applications to have considered any submissions made regarding the consultation with affected stakeholders associated with the commencement or variation of their railway operations.

The following is considered during the assessment process:

- what consultation has occurred and how the applicant has considered and acted in response to any submissions provided during the consultation process; and
- whether the applicant has a comprehensive consultation plan established for implementation when rail safety workers, contractors and other stakeholders are engaged to perform the rail safety work.

If consultation with affected stakeholders is feasible, in that the stakeholders are identified, in place and capable of providing a response to the applicant (particularly in relation to interface agreement requirements), ONRSR would expect this consultation to have occurred at the time of application or during the early stages of our assessment period.

F. What insurance arrangements are required?

ONRSR does not prescribe any specific level of public liability insurance (or financial capability) that is required by an operator to be accredited. Insurance cover proposed by an applicant is compared with other insurances that are held by organisations for similar railway operations as an indicative measure. This is for internal assessment purposes only and ONRSR does not disclose insurance arrangements of an operator to an applicant.

Where ONRSR is not satisfied that an appropriate level of cover is, or will be, held by an applicant, evidence is sought that the applicant has properly presented the nature of - and risks associated with - their specific railway operations to their insurance company and relies on insurance industry specialists to determine an appropriate level of cover.

G. Why does ONRSR impose conditions and restrictions on accreditation?

The RSNL enables ONRSR to impose conditions and restrictions on an accreditation for the following reasons:

- to define in more detail the limitations to the scope of railway operations allowed under the accreditation to more clearly establish what is and what is not being permitted;
- to limit the application of railway operations that are permitted under the accreditation to a specific location, methodology, purpose or other factor;
- to secure a specific method of operation or use of technology that the operator has committed to in order to achieve accreditation (meaning that the operator will need to apply for a variation to accreditation to change this);
- to introduce notification of change or provision of information requirements that are in addition to those contained in the RSNL and Regulations; and
- to impose limitations to railway operations resulting from identified contraventions of the RSNL or safety issues that have not been addressed to ONRSR's satisfaction.

In addition to the operator being able to seek to remove or vary a condition or restriction through an application for variation to accreditation, ONRSR monitors the effectiveness and relevance of what was imposed. ONRSR will act to remove these, without initiation by the operator, should it be decided that the condition or restriction is no longer needed for ONRSR's purposes (e.g. a condition requiring notification of change beyond that required by the Regulations).

H. When is accreditation, registration or exemption needed prior to commencing construction works?

ONRSR acknowledges that when constructing railway infrastructure a range of work is undertaken in preparation for, and ancillary to, the construction of the railway, such as initial site clearance, establishment of construction camps or staging areas, relocation of utilities and services and roadworks. These works, along with planning and design activities, can be undertaken by organisations that do not hold accreditation for railway operations as ONRSR do not include these activities in the definition of construction of a railway, railway tracks and associated railway track structures – for which accreditation is required.

As each project or construction work is different operators or other interested parties are encouraged to come and speak to ONRSR so that a more detailed assessment of the activities can be done. It is never a 'one size fits all' approach.

I. What are the accreditation implications to other parties interfacing with railways?

While the RSNL requires rail transport operators to be accredited to undertake railway operations, sometimes the line between rail infrastructure operations (i.e. construction, repair and maintenance) and road or utility operations can blur.

ONRSR does not seek road managers or utility managers to be accredited for undertaking their tasks on or around railways where their operations are restricted to the core functions associated with being a road or utility manager.

The expectation is that the relevant rail infrastructure manager and road/utility manager will work jointly to manage shared interfacing risks (noting the requirement of the RSNL for rail infrastructure managers and road managers to seek to enter into interface agreements).

ONRSR works with infrastructure managers to provide clarification of requirements under the RSNL on representation from one or both of the managers. ONRSR intervenes where difficulties are identified between parties and/or where a proposed approach would not be consistent with our interpretation of how to apply the RSNL.

J. The notice of accreditation

While ONRSR does not publish operators' notices of accreditation or exemption, the RSNL does require an accredited (or exempted) rail transport operator to make its current notice of accreditation or notice of exemption available for inspection by any person at the operator's place of business. As such, ONRSR drafts notices so they can be read and understood by a person not directly involved with the operator.

The notice of accreditation is drafted in a way that:

- broadly describes the nature and scope of a rail transport operator's railway operations, avoiding, where possible, making the description too specific (e.g. identifying rolling stock class or infrastructure types). This provides some flexibility to the operator to make changes to operations without having to apply for a variation to accreditation every time; and
- provides sufficient description to the extent of permission being given to the railway operations that were requested as part of the application. ONRSR does not provide accreditation for railway operations that were not directly sought by an applicant or are not ancillary to the core purpose for which accreditation was sought.

3.1.2 REGISTRATION

Registration enables the registered rail transport operator to undertake railway operations associated with the management, maintenance and operation of railway infrastructure of the private sidings listed on their registration. The registered rail infrastructure manager is still required to manage, SFAIRP, the risks to safety associated with the operations.

ONRSR needs to establish from an applicant for registration as a rail infrastructure manager for a private siding that:

- the applicant is, or is to be, the rail infrastructure manager of the private siding; and
- the railway operations to be carried out in the private siding are such that registration of the applicant (rather than accreditation of the applicant in respect of the railway operations) is, in ONRSR's opinion, the appropriate action.

A registered operator cannot undertake rolling stock operations unless they also hold accreditation for this purpose.

When is registration appropriate?

ONRSR's decision as to whether the railway operations to be undertaken within a private siding are appropriate for the granting of a registration is based on the potential risks to safety. This assessment is based on the type, scale and complexity of those activities and whether there is a need to require a competency and capacity test of the operator in regards to the controls that are being put in place by the rail infrastructure manager (i.e. require accreditation) prior to operations commencing.

A practical implication of the registration scheme is that, given ONRSR is not required to undertake a competency and capacity test on the private siding operator, rolling stock operators are not able to rely on any confidence they may receive from dealing with an accredited rail infrastructure manager. It is expected that rolling stock operators take a higher level of responsibility for ensuring that the siding is fit for their operations and that appropriate safe working rules are in place and implemented than they would when operating on an accredited operator's railway. It is where the scale and complexity of the siding operations reaches the point where this expectation would be unreasonable that ONRSR's decision of whether registration is appropriate is influenced.

Other key factors that influence decisions may include whether the facility constitutes a marshalling yard, crossing loop, passenger terminal, freight terminal or a siding of a class prescribed by regulation not to be a private siding (being elements of railways that are excluded from being private sidings by the RSNL).

The inclusion of freight terminals in the above may appear to exclude the predominant use of a private siding, which is the loading and unloading of freight. Sidings that are used solely to support bulk handling facilities (e.g. coal, grain or mineral facilities) within the definition of a freight terminal are included in an operator's private siding registration. Likewise, sidings solely facilitating the loading/unloading of specialised freight for a single operator may also be suitable for inclusion in a registration, subject to the other factors such as:

- who controls the movement of trains on the railway/private siding and how these movements are controlled. The more direct involvement a rail infrastructure manager has in the safeworking control of trains and train related movements, the more likely that accreditation will be required;

- the length of any track from the interface with an accredited rail infrastructure manager or another private siding owner. Where the train movements on a siding are more than predominantly a shunting type operation (i.e. involve a significant portion of travel distance that is undertaken at or near normal operations speeds), the operation is more likely to be considered a branch line type operation better suited to being accredited;
- the operating speed. In operations where train speeds are likely to exceed normal shunting yard speed limits, the greater the potential for high consequence incidents and the more likely accreditation is considered appropriate; and
- the number and size of the trains operating on the section of track for which there is an application for registration. As the complexity of movements increase and the rail infrastructure manager needs to take more direct control of the scheduling, safeworking of trains and infrastructure work, the more likely the need for accreditation is considered.

3.1.3 EXEMPTION

ONRSR can grant exemptions to operators from the requirement to be accredited or registered to undertake railway operations. However, given the co-regulatory nature of the RSNL that affords reasonable flexibility to rail transport operators to tailor their safety management systems and the existence of the registration scheme for lower risk profile siding operators, the use of exemptions is limited to exceptional circumstances. Exemption from the requirement for rail transport operator accreditation is considered where a railway or railway operations are captured by the RSNL but in their nature, are not railways of the type intended to be captured by the RSNL. Examples for exemption may include rolling stock testing facilities, amusement type railways that are captured by other safety certification regimes, elements of railway type activity that are integrated into factory or plant operations and unique one off operational scenarios.

Exemption from accreditation is based on the nature and scope of the railway operations in question, and exemptions are not granted based on whether an operator can or cannot demonstrate an effective safety management system.

Exemption from registration requirements is unlikely to be granted as the registration process does not contain any requirement to demonstrate competency and capacity to manage risks to safety.

Where an exemption has been given, the operator is still required to comply with the general safety duties set out in the RSNL and remains subject to regulatory activities. This is so ONRSR can be assured that circumstances have not changed since the exemption was granted.

3.1.4 EXEMPTION FROM SPECIFIC PROGRAM REQUIREMENTS UNDER THE RSNL

The RSNL (Subdivision 3 of Division 6 of Part 3) enables the Regulator to grant an exemption from the requirements of the RSNL[1] in relation to:

- security management plans;
- emergency management plans;
- health and fitness management programs;
- drug and alcohol management programs; and
- fatigue risk management programs.

However, the nature of the RSNL, which provides flexibility to operators in how they meet these requirements, means exemptions are not typically needed as most rail transport operators should be able to find a means of compliance. Exemptions against the above will only be considered in exceptional circumstances where:

- a rail transport operator's operations present sufficiently low risk that complying with all the requirements of the RSNL for the above plans or programs imposes a disproportionate burden without a resultant safety benefit; or
- a rail transport operator can demonstrate an alternative means of complying with a duty under the law without complying with a resulting disproportionate requirement of the RSNL.

The purpose of granting an exemption for all or part of the above plans or programs is to reduce unnecessary or excessive compliance burdens for some railways commensurate to their level of risk. While an outright exemption is unlikely to be granted from the requirements for the above plans, it is more likely that any exemption is due to a unique environment or conditions.

Exemptions do not reduce the standard to which safety must be managed as the operator must continue to comply with the overarching duty to ensure safety SFAIRP, as well as other duties that may be applicable. To ensure that safety is not reduced conditions may be imposed on an exemption in order to secure the operator's alternative means of compliance or introduce additional notification requirements to monitor an operator's safety performance in context to the removal of a RSNL requirement.

Each application for exemption is treated and assessed on a case-by-case basis, taking into consideration the scope and nature of the rail transport operator's railway operations and the circumstances in question. ONRSR is required to decide to grant or refuse an application for exemption (including an application for variation of exemption) within six months of receiving a complete application (this is known as the relevant period under the RSNL, which is formally restarted if further information is required to process the application).

[1] Note these specific exemptions are differentiated from the more general exemptions that are referenced in section 207 of the RSNL and addressed in section 3.1.3 of this document.

Exemption is granted by the issue of:

- a notice of exemption (in the case of a variation of exemption, this is a consolidated notice of exemption that incorporates the change to the particulars); and
- a cover letter to the notice of exemption confirming the extent of railway operations that the exemption covers, providing the reasons for any conditions or restrictions imposed and addressing any other issues relevant to the commencement of railway operations under the exemption.

Where exemption is refused, which would typically be where ONRSR considers it is reasonable for the operator to comply with the plan and/or program requirements of the RSNL, notification is by a letter setting out the reasons for refusal.

Surrendering accreditation, registration or exemption

It is at an operator's own discretion as to when they may cease operations and no longer require their accreditation, registration or exemption. The RSNL enables an operator to surrender its accreditation, registration or exemption by notifying ONRSR on the intention to surrender by a specified date.

While a surrender from an operator can be refused, ONRSR does not unreasonably withhold acceptance of surrender when presented with reasonable arrangements for the management of risks to safety of other rail transport operators or the public associated with the ceasing of railway operations. To provide time to review an operator's arrangements for ceasing operations, advice of the intention to surrender is requested at least 28 days prior to when the operator wants the surrender to take effect.

Any concerns with the arrangements for ceasing of railway operations are advised in writing and best endeavours are used to work with the operator to resolve these concerns prior to the operator's intended date of surrender.

While acknowledging that there may be commercial implications attached to surrender dates, ONRSR does not give effect to a surrender until satisfied with the arrangements to cease operations. Until this occurs the operator is still subject to the RSNL.

3.1.5 MINISTERIAL EXEMPTIONS

Under s203 of the RSNL a Minister may, after consultation with the Regulator, and by notice in the Gazette, grant exemptions from the RSNL or any part thereof, to a specified person or railway. The exemption expires after 3 months, however it can be varied or withdrawn during this time. The exemption may contain conditions and if these are not complied with penalties apply.

3.2 EDUCATION

Education involves the provision of information and advice to rail transport operators and other duty holders to help with the understanding of the requirements of the RSNL and awareness of rail safety issues, with the aim of improving safety of railway operations. This is done through:

- provision of advice and information to individual rail transport operators by rail safety officers when undertaking regulatory activities;
- publication of guidance material to assist operators to understand what is required to comply with the RSNL;
- publication of industry safety performance data and information on rail safety issues;
- publication of safety bulletins/alerts; and
- delivery of targeted educational programs and projects to industry groups and sectors.

As appropriate and practicable, ONRSR works individually with rail transport operators or through workshops or similar sessions with industry groups or sectors. ONRSR's education function is primarily directed towards:

- education and awareness of the legal requirements and the expectations on operators for demonstrating compliance with these requirements;
- raising industry awareness and exposure to information regarding safety issues that exist, or are emerging within the rail industry, that operators should be aware of; and
- sharing examples of good practices and encouraging continual improvement of safety management systems.

3.2.1 OPERATOR SPECIFIC EDUCATION INTERACTIONS

ONRSR's rail safety officers are actively encouraged to use an educational approach as part of their regulatory interactions with individual rail transport operators as an option for securing compliance and improving safety. As discussed in the monitoring section of this document, rail safety officers may provide advice to an operator demonstrating a lack of awareness about, or misinterpretation of the RSNL or the particulars of their accreditation as long as the breach is minor in nature and the rail transport operator demonstrates a willingness to take measures to make improvements. The advice is provided in good faith and based on the considered view of the rail safety officer as to the operator's preparedness and capability to take and consider the advice.

In situations where it is observed an operator is demonstrating a poor understanding of the requirements of the RSNL or where an operator has experienced a turnover of staff that suddenly creates gaps in their knowledge of what is required, ONRSR may conduct a formal education interaction. This is to assess the rail transport operator's awareness and understanding of its legal obligations, provide advice and seek a commitment to act on how to address these gaps.

Information obtained from these interactions is used to shape ongoing regulatory activities with the operator.

3.2.2 EDUCATION WITH INDUSTRY GROUPS AND SECTORS

As previously outlined, some of the key functions of ONRSR include:

- to work with rail transport operators, rail safety workers, and others involved in railway operations, to improve rail safety nationally;
- to conduct research, collect and publish information relating to rail safety;
- to provide, or facilitate the provision of, advice, education and training in relation to rail safety; and
- to engage in, promote and coordinate, the sharing of information to achieve the objects of this law, including the sharing of information with a prescribed authority.

Safety improvement in the rail industry is a fundamental objective and educational programs are one of the important ways national safety priorities are addressed. In developing these programs ONRSR encourages, enables and supports industry by working with groups such as the Rail Industry Safety and Standards Board (RISSB) and the Australasian Centre for Rail Innovation (ACRI) to develop and encourage the use of educational products and resources.

ONRSR will run safety education programs as part of general safety improvement programs. These education programs are targeted more broadly at industry rather than on the specific requirements of a particular operator. While these can and are discussed at an individual operator level, the focus is on enhancing knowledge and understanding across industry by ONRSR running specific industry forums and/or by using dedicated forums such as the CEO Industry Reference Group and Safety Managers Group.

The tools and material ONRSR develops through its educational projects comes in the form of presentations, instructional videos, interactive information sessions, guidance material, safety bulletins and campaigns.

ONRSR provides industry with a consistent and clear regulatory platform to support the enhancement of rail safety, and works with rail transport operators and other rail safety stakeholders, through the co-regulatory model, to continuously improve rail safety and ensure industry:

- understands what SFAIRP means;
- collects and reports safety performance data that can contribute to improved safety;
- identifies individual operator safety risks;
- identifies collective industry safety risks nationally, or in sector groupings, that are appropriate for risk mitigation strategy development purposes; and
- undertakes appropriate research to underpin the development of risk identification and such innovation and knowledge as is necessary to reduce risks SFAIRP.

In doing so ONRSR agrees practical means and timeframes for the implementation of safety initiatives and standards and does not duplicate appropriate safety activities that are already being demonstrably carried out by industry.

3.2.3 EDUCATION AND INFORMATION EXCHANGE FORUMS

Operator Forum	Each ONRSR office may, at its discretion, conduct an Operator Forum. The forum provides the office and representatives of the rail industry with the opportunity to exchange ideas and to discuss operational rail safety issues. ONRSR Directors Operations work with local industry representatives to develop agendas and protocols for Operator Forums that suit their specific needs.
National Operations Forum	The National Operations Forum is an adjunct to an internal monthly meeting where all ONRSR key operational decision makers are present. The National Operations Forum is available for any multi-jurisdictional operator to meet and discuss issues with senior ONRSR representatives to gain a greater appreciation of the decision-making processes. The intent is to generate a greater shared commitment to improving rail safety.

In addition to these forums, ONRSR is represented by Executive members at industry forums such as Safety Managers Group and Australian Tourist and Heritage Railway Association (ATHRA) meetings which provide further opportunities for sharing information and education as well as consulting with industry on policy and guideline development and educational initiatives.

It is recognised that ONRSR, RISSB and the Australian Railway Association (ARA) all hold responsibilities in relation to information sharing and education and partner together to hold information and education sessions across Australia.

3.3 MONITORING

Monitoring is the ongoing oversight and examination of organisations' railway operations and safety management performance. It also builds knowledge and understanding of a rail transport operator's specific railway activities and safety risk profiles that are used to tailor regulatory activities.

ONRSR oversees a continuing examination of operators' safety management system implementation and safety performance under the test of whether safety is being managed SFAIRP and whether the operator continues to demonstrate the competency and capacity to safely undertake the railway operations.

Monitoring activities are scheduled using the risk-based decision making processes outlined in section 2 of this document. Monitoring activities undertaken range from simple queries to those described in the following that, along with their regulatory outcomes, are summarised in Appendix 1.

3.3.1 NOTIFICATION OF CHANGE

The purpose of the notification of change is to inform ONRSR of certain operational changes that are within the scope of the rail transport operator's accredited railway operations, as specified in their notice of accreditation. This helps ONRSR to better monitor railway operations and is one aspect of regulating management of change.

ONRSR does not approve or reject these changes. By initially granting accreditation to a rail transport operator, the Regulator has been satisfied that the operator has the competence and capacity to manage the risks, implement the controls and manage changes associated with the railway operations for which it is accredited.

Receipt of a notification is acknowledged and then assessed as to whether the change meets the requirements for a notification of change (i.e. is within the scope and nature of the operator's accreditation, as specified in their notice of accreditation, and meets the requirements of regulation 9). In determining what further action to take in response to a notification ONRSR considers whether the rail transport operator:

- is following its risk and change management processes;
- is complying with the requirement to notify ONRSR of certain changes to the safety management system; and
- has considered the impact the change may have on others (including through consultation as appropriate).

On expiration of the notification period under regulation 9 the rail transport operator may implement the change as planned. However, ONRSR may still request information or undertake an audit or inspection at any point as part of compliance monitoring activities.

If the change is outside the scope of the accreditation or raises safety concerns, ONRSR will contact the operator as early as possible to discuss the situation. Note that this will very likely impact planned change timeframes.

3.3.2 SITE VISIT EXPECTATIONS

Rail safety officers undertake site visits to observe railway operations and railway premises for the purposes of:

- gathering information about a rail transport operator's railway operations;
- seeking clarification about the nature of an incident or potential safety issue;
- raising familiarity and awareness for ONRSR's staff regarding the operator and its railway operations; and
- observing a specific feature of an operator's railway operations.

During a site visit rail safety officers may request assistance with accessing track and/or rolling stock or entry to a maintenance workshop or construction site.

The following can be expected regarding ONRSR's site visits:

- site visits are conducted with and without notice;
- regardless of whether notice is provided, upon exercising the legislative power to enter railway premises rail safety officers present to a representative of the operator and ask to be directed to the person responsible for the site, to explain the purpose of the visit;
- rail transport operators are not expected to make available any other staff than would be normally present at the site, unless additional representation from the railway organisation is discussed and agreed prior to the site visit; and
- requests for access to documented elements of the safety management system (e.g. procedures, standards or instructions) and records generated under the system that would normally be available at the site.

3.3.3 INSPECTION EXPECTATIONS

ONRSR's rail safety officers undertake inspections to observe and enquire into the management and conduct of railway operations on railway premises to:

- confirm that the practices of an operator in conducting its railway operations are compliant with its processes and procedures (as set out in the safety management system); and
- review whether the practices, processes and/or procedures of the rail operator are effective in addressing safety.

An inspection may be initiated as a proactive action for compliance monitoring (typically scheduled in our work program), reactively in response to an identified safety incident or issue, as follow-up to a notification of change or as a means of confirming the implementation of an operator's safety action in response to a non-conformance report or statutory notice.

An inspection may involve witnessing railway operations, conducting a detailed review of any part of a rail transport operator's operating methods and the application of processes and procedures from the safety management system, or an examination of records or other information generated by the system.

Inspections are generally conducted by two or more rail safety officers, one of which is identified as the lead officer for managing the conduct of the inspection and to be the primary contact for the operator in regard to the inspection.

3.3.4 AUDIT EXPECTATIONS

ONRSR's rail safety officers undertake audits of accredited and registered rail transport operators for the purpose of examining the content and application of an operator's safety management system to:

- confirm the safety management system is compliant with the requirements of the RSNL;
- confirm the safety management system is implemented and being used to manage the safety of the operator's railway operations; and
- review whether the safety management system is effective in addressing the safety risks associated with the operator's railway operations.

An audit is generally initiated as a proactive action for compliance monitoring, typically scheduled in the work program, or reactively in response to an identified safety incident or issue. An audit involves a detailed review of all or any part of a rail transport operator's safety management system, including an examination of records or other information generated by the system.

Audits may be conducted by two or more rail safety officers, one of which is identified as the lead officer for planning the audit arrangements, managing the conduct of the audit and to be the primary contact for the operator in regards to the audit.

3.3.5 ENQUIRIES

An enquiry is ONRSR's term for when a rail safety officer is tasked with obtaining more information following a notifiable occurrence or when information is received of a safety issue via other formal channels such as REPCON confidential reports. The rail safety officer conducting an enquiry initially seeks to establish the basic facts surrounding the incident or safety issue, which informs ONRSR's decision on whether to require the rail transport operator to investigate the incident (e.g through s122 of the RSNL) and/or initiate an ONRSR investigation or other regulatory response. The outcome may also be that no further action is needed.

Where there has been an incident (or repeated incidents) or a safety issue identified of a serious nature the Regulator wants to be satisfied the rail transport operator has the ability to safely continue carrying out railway operations associated with the incident or issue. Accordingly, a rail safety officer's enquiry will seek information and evidence that the rail transport operator has:

- demonstrated an understanding of the factors that led to the incident and the subsequent risk of the incident reoccurring; and
- identified and taken action(s) to give confidence that such an incident will not be repeated if the railway operations are to continue.

It is important to note that an enquiry is not intended in any way to prejudice investigations being undertaken by the rail transport operator or ONRSR. The aim is to ensure any immediate safety concerns have been considered and addressed at the time rather than waiting for the conclusion of any investigative process.

In cases where the rail safety officer or Regulator is not satisfied the rail transport operator has demonstrated the matters referred to above, enforcement action is considered. This action includes (but is not limited to) the issue of a prohibition notice (where there is an immediate risk to safety) or an improvement notice, to prevent any further carrying out of the activity that led to the incident. The Regulator may even consider suspending an

operator's accreditation or registration. For more detailed information on this process, see section 3.4.2 Tools for achieving compliance and expectations.

It is acknowledged that any actions implemented immediately following an incident can only be taken based on the information available at the time. As an investigation by the rail transport operator and/or ONRSR develops over time it is accepted that information may come to light that renders the immediate actions taken obsolete or no longer appropriate. In such cases ONRSR expects the rail transport operator to amend its actions to reflect the new information and, where the incident response is being monitored by ONRSR, inform ONRSR appropriately.

3.3.6 NOTIFIABLE OCCURRENCE RESPONSE

The RSNL requires rail transport operators to report Category A notifiable occurrences and prescribed incidents (rail safety incidents) immediately, and in writing within 72 hours for all Category B occurrences identified in the regulations to the RSNL.

ONRSR receives immediate notification of Category A and prescribed incidents, but does not have a first responder or emergency response role. ONRSR's role in response to being notified of a notifiable occurrence is principally to:

- confirm the details and circumstances of the occurrence;
- make an assessment as to any ongoing concerns with continuing railway operations in light of the incident and respond accordingly; and
- decide whether to undertake independent post incident drug and alcohol testing.

Any rail safety officers that may be deployed to an incident site, liaise with other agencies on site including the Australian Transport Safety Bureau and emergency services as well as any rail transport operators involved. ONRSR's objectives when attending an incident site are to preserve evidence and gain a fuller understanding of the facts to inform any follow up regulatory activities.

ONRSR has the power under the RSNL to secure evidence at the site and will liaise with the rail transport operator affected if this occurs.

3.3.7 OTHER MONITORING ACTIVITIES

Another key monitoring activity undertaken by rail safety officers, which may also initiate additional interaction, is the review of reports and other information required, or otherwise provided, in order to identify any regulatory action that needs to be undertaken.

This includes:

Review of investigation report into notifiable occurrences	Initiated on receipt of an investigation report following a request or requirement (Notice under s122 of the RSNL) to provide an investigation report into a notifiable occurrence or safety issue.
Reviewing notifiable occurrences	Initiated daily upon processing of received notifiable occurrences. All notifiable occurrences are reviewed and decisions are made daily regarding whether anything needs to be responded to immediately. Ongoing trend monitoring of notifiable occurrences is a key input into ONRSR's risk-based regulatory decision making processes that inform the work program.
Review of safety performance report or annual activity statement	Initiated following the receipt of a report or statement from an operator. ONRSR reviews the contents of safety performance reports and annual activity statements to gain an overall impression of the safety and safety management of a rail transport operator's operations. Rail safety officers may use the intelligence from these reports to inform and plan compliance activities. A safety report or annual activity statement is not a public report and are treated as confidential.
Monitoring closure of NCRs and Notices	ONRSR monitors the corrective action plans submitted by operators in response to Non Conformance Reports (NCR), improvement notices and prohibition notices and trigger actions to follow-up with the operator to confirm that progress is being made and targets are being met against the plans. Follow-up occurs in various ways but typically involves: > requesting information; > meeting with the operator; or > conducting a site visit, inspection or audit.
Review of other reports	ONRSR receives and monitors reports from other agencies including Coroner's Courts, Commissions of Enquiry, as well as REPCON confidential reports from the ATSB. These reports are reviewed and assessed on their merits as appropriate.

3.4 ENFORCEMENT

Enforcement aims to facilitate an improvement to safety or compliance with the RSNL by giving direction to a rail transport operator, imposing sanctions or seeking court penalties for contraventions of the RSNL.

The need to undertake enforcement actions may be identified from any of the monitoring activities previously discussed. Enforcement decisions are made proportionate to the identified risk to safety, the seriousness of any perceived breach, and/or the level of non-compliance with legislative requirements. The seriousness of a matter is determined by considering several factors, including:

- the actual or potential harm caused to employees and third parties, including passengers and other railway users, and to the public interest;
- the degree to which the requirements of the law have not been met;
- the culpability of the offender, including whether the rail transport operator has acted negligently, recklessly, knowingly or intentionally; and
- the history of compliance and incidents involving the party.

Enforcement action that involves the application of sanctions or penalties will typically be taken on completion of an investigation, which is principally undertaken to determine breaches of the RSNL.

3.4.1 INVESTIGATION EXPECTATIONS

An investigation is a formal, detailed and compliance focused examination of the circumstances and operators' actions associated with an occurrence or safety issue to determine whether a breach of the RSNL has occurred. ONRSR may initiate an investigation in response to a range of triggers that include, but are not limited to:

- a notifiable occurrence;
- an adverse finding from an audit;
- outcomes identified from an inspection;
- outcomes identified from an enquiry;
- confidential or other intelligence reports; or
- a written direction from a responsible Minister for a participating jurisdiction on a rail safety matter relating to that jurisdiction.

ONRSR targets its investigative resources to investigating the more serious incidents or those with the potential to be serious. In ONRSR's statutory role, it is neither possible, nor necessary, to investigate all potential issues of possible contravention of the law. In selecting which complaints or reports of incidents or injury to investigate, and in deciding the level of resources to be used, the following factors are considered:

- the severity and scale of potential or actual harm resulting from an incident or potential breach of the law;
- the seriousness of any potential or actual breach of the law;
- knowledge of the operator's compliance history; and
- the wider relevance of the event, including serious public concern or scrutiny.

3.4.2 MEANS OF GATHERING INFORMATION FOR AN INVESTIGATION

Rail safety officers have various powers under the RSNL to compel the production of documents and to require answers to questions for the purposes of investigating suspected contraventions of the RSNL.

The three primary ways to compel information are:

- using s154 of the RSNL to require the production of documents and answers to questions once a rail safety officer has entered onto railway premises;
- using the delegated power under s20 of the RSNL to obtain information; and
- using s168 and/or s168A of the RSNL to require a person to supply their name and address, and to produce specific types of documents, respectively.

s154 powers	The powers to require production of documents and answers to questions in s154 of the RSNL arise when a rail safety officer has lawfully entered railway premises. Once entry has lawfully occurred, the rail safety officer may, under s154(1) of the RSNL: > require a person to tell the officer who has custody of, or access to, a document; > require a person who has custody of, or access to, a document to produce that document to the officer while the officer is at the place, or within a specified period; or > require a person at the place to answer any questions put by the officer. The "person" referred to in each of these three powers will be an individual (not a corporation). Before exercising one or more of the powers, the rail safety officer needs to be satisfied that the power of entry in s143 of the RSNL has been exercised. s154(2) requires the rail safety officer to give written notice to produce documents, unless the person elects to volunteer the information, or the circumstances require the rail safety officer to have immediate access to the document. Immediate access refers to where a rail safety officer has, while on railway premises, required a document to be produced in circumstances that requires access without delay. In all other circumstances, any requirement to produce a document will be done under a s154 Notice to produce that document to the rail safety officer while they are on premises, or within a specified period. Documents, in these circumstances, also includes any computer, disc, tape or other article or material from which sounds, images, writings or messages are capable of being reproduced; photographs, drawings, plans or maps. When exercising powers under s154 rail safety officers are required under s156 to give a warning to the person that explains the implications of the power being exercised.

s20 powers	s20 is a delegated power that applies if the Regulator has reasonable grounds to believe that a person is capable of giving information, providing documents or giving evidence in relation to a possible contravention of the RSNL or that will assist to monitor or enforce compliance with the RSNL. If one of the above circumstances apply, the Regulator may by written notice under s20(2) of the RSNL served on a person (an individual or a corporation), require the person to do one or more of the following: > give the Regulator in writing signed by the person (or in the case of a corporation, by a competent officer of the corporation) and within the time and in the manner specified in the notice, that information of which the person has knowledge; > produce to the Regulator, in accordance with the notice, documents; and > appear before a person appointed by the Regulator on a day, and at a time and place, specified in the notice (being a day, time and place that are reasonable in the circumstances) and give either orally or in writing that evidence and produce those documents.
s168 and a168A powers	A rail safety officer may, under s168(1) of the RSNL, require a person to provide the person's name and residential address if: > the officer finds the person committing an offence against the RSNL; or > the officer finds the person in circumstances that lead, or has information that leads, the officer reasonably to suspect the person has committed an offence against the RSNL; or > the officer reasonably believes that the person may be able to assist in the investigation of an offence against the RSNL. A rail safety officer may, under s168A (1) of the RSNL, direct a person to make available for inspection by the officer, or produce to the officer for inspection, at a specified time and place: > a document that is required to be kept by the person under the RSNL; or > a document prepared by the person under the RSNL for the management of rail infrastructure or the operation of rolling stock that the officer reasonably believes is necessary to consider in order for the officer to understand or to verify a document that is required to be kept under the RSNL; or > a document held by, or under the control of, the person relating to the carrying out of railway operations. *NOTE: At the time of printing s168A does not apply in Western Australia.*

3.4.3 TOOLS FOR ACHIEVING COMPLIANCE AND EXPECTATIONS

When presented with a potential breach against the RSNL, ONRSR has a range of powers and legislative sanctions that can be applied to facilitate or require improved safety management, require compliance or penalise non-compliant behaviour from rail transport operators and other duty holders. These are outlined below:

Provision of advice or education	Rail safety officers may provide advice or education in regard to legal requirements in response to an identified breach of the RSNL in circumstances where: > an operator is demonstrating a lack of awareness about, or misinterpretation of the RSNL or the particulars of their accreditation; > the breach is minor in nature; and > the rail transport operator demonstrates a willingness to take measures to make improvements to comply with the RSNL. Rail safety officers may give advice verbally or in writing. It is provided in good faith and based on the considered view of the rail safety officer as to the operator's preparedness and capability to take and consider the advice. Typically, during an audit or inspection, rail safety officers provide advice in the form of identifying opportunities for improvement (referred to as 'observations'). Observations are provided in writing to the operator as informal advice, with a supporting explanation. There is no legal obligation for an operator to comply with informal or general advice given by ONRSR and a formal response from the operator is not expected or required, but a record is kept that advice was given and any action taken by the operator may be followed up as part of future compliance activities.
Finding of non-conformance	Rail safety officers may issue a finding of non-conformance in response to identifying a breach of the RSNL by an operator where: > the breach does not present an immediate threat to safety or is believed to be relatively minor or administrative in nature; and > the rail safety officer is satisfied the rail transport operator has demonstrated a willingness and capability to address the breach within its safety management system procedures. ONRSR issues a non-conformance report (NCR) in writing, typically contained within a report of the regulatory activity during which the breach was identified. The NCR details the identified breach and provides clear reasons for raising the NCR. A NCR is not enforceable and represents the highest level of informal advice to correct an identified breach. An operator is requested to provide written advice of the corrective action(s) that will be taken to address the non-conformance, including timelines. It is expected the rail transport operator will record and address any non-conformances through its own audit / review / corrective action processes, as part of its safety management system. If a rail transport operator fails to provide advice of the intended corrective actions or to adequately address a non–conformance within the agreed timeframe the matter may be escalated.

Improvement notice	Rail safety officers may issue an improvement notice where they reasonably believe a rail transport operator is: > contravening or has contravened a provision of the RSNL; and > carrying out or has carried out railway operations that threaten safety. Improvement notices are issued as stand-alone written notices, which describe the contravention or threat to safety, the reasons for the officer's decision, any directions in regard to rectifying the contravention or safety threat, and provide advice on the legal procedures associated with the notice. The notice includes the right of appeal. An improvement notice is issued where a rail safety officer believes that it is necessary to place an enforceable requirement on an operator to remedy the contravention or address the threat to safety. It is also to ensure that action is taken, and/or to require certain matters to be considered or actions taken, by the operator in rectifying the contravention or safety threat. ONRSR aims to provide operators the opportunity to remedy contraventions or threats to safety in a way that is best suited to the operator's operational and risk environment. This is consistent with ensuring the risk management responsibility (and ownership of the risk controls, which are contained in the safety management system) remains with the operator. In deciding whether an enforceable requirement should be placed on an operator through an improvement notice, officers consider the: > risks to safety being presented by the contravention or safety threat and the respective urgency for securing a remedy; > safety performance and history of compliance of the rail transport operator; and > effective management of prior contraventions and threats to safety and demonstrated willingness of the operator to act to remedy the matter. This is a judgement rail safety officers make based on the historical performance and the immediate presentations being made by the operator regarding the contravention or safety threat. When setting timeframes for the operator's response to an improvement notice, while ONRSR consults with the operator on the likely timeframe for their intended corrective actions, the setting of a timeframe for compliance is not by agreement. ONRSR retains the decision as to required timeframes and sole discretion for granting any extensions to these timeframes that may be requested by the operator. If the operator is directed to take specified action to remedy a contravention (or a likely contravention) or to prevent the likely contravention, or to remedy the things or operations causing the contravention (or likely contravention), ONRSR must also consider whether a cost benefit analysis is required, in accordance with the ONRSR Application of Cost Benefit Analysis Requirement Policy.

Prohibition notice	Rail safety officers may issue a prohibition notice where they believe on reasonable grounds there is an immediate risk to safety if railway operations continue in the way they are being conducted and that immediate action is required to cease the activity until the matters that give rise to the risk to safety are remedied. A prohibition notice may be issued verbally by rail safety officers but is always confirmed by issuing a stand-alone written notice (typically by the following business day). A verbal notice has immediate effect. In deciding whether a prohibition notice should be issued, rail safety officers will consider the: > consequences associated with the immediate risks to safety and the respective urgency that the unsafe practice be ceased; and > demonstrated willingness of the operator to act and the actions being undertaken immediately by the operator to remedy the matter. This is a judgement rail safety officers make based on the historical safety management and corrective action performance of the operator and the immediate presentations being made by the operator regarding the safety threat. Rail safety officers are encouraged to act to secure safety in response to observing or identifying a threat to safety during all their interactions with operators. Where the rail safety officer has identified an immediate safety issue, and the rail transport operator is reluctant to address the concern, they are expected to issue a prohibition notice.
Non-disturbance notice	Rail safety officers may issue a non-disturbance notice when it is imperative to the work being undertaken by ONRSR that evidence is preserved. An example could be where ONRSR elects to investigate following an incident and requires the rail transport operator to ensure the preservation of evidence associated with the incident. The non-disturbance notice prevents the site, including the operation of plant from being disturbed for a period of no more than 7 days. If required, further non-disturbance notices may be issued for periods not exceeding 7 days at a time.

Infringement notice	ONRSR has the power under the RSNL to issue an infringement notice in circumstances where a rail transport operator or an individual has breached the RSNL. Infringement notices impose administrative fines and are an alternative to prosecution for breaches. If an operator or individual is issued with an infringement notice, they can choose to pay it (which will finalise the matter) or elect to have the matter dealt with by the court. Infringement penalty provisions are listed in s233 of the RSNL and include, but are not limited to, matters such as a failure to provide materials within a specified timeframe. An infringement notice will be issued within 12 months from ONRSR forming the view that a breach has occurred. As infringement notices are administrative, there are circumstances in which ONRSR may need to consider escalating its enforcement activities beyond infringement notices, such as: > where there was a serious risk to safety; > where the offence was intentional or formed a pattern of breaches; > where the penalty would be inadequate in relation to the nature and or gravity of the offence; and > where the penalty would not provide sufficient deterrent. ONRSR can, at any time before the deadline for payment of the infringement notice, withdraw the infringement notice by serving a withdrawal notice on the rail transport operator or individual. If the infringement notice is not paid and is not withdrawn the Regulator may institute proceedings in respect of the breach.
Direct amendment of a safety management system	ONRSR can direct a rail transport operator to amend its safety management system in a specified manner to address any deficiencies that have been identified. The preferred approach is for operators to remain fully responsible for selection of risk controls and the content of their safety management systems. This option is only considered where ONRSR believes there to be only one option for the operator to address a significant risk to safety and that the use of other compliance tools or imposition of sanctions (including prohibition) are not warranted to address the safety issue. If a direction is being considered, the operator is provided the opportunity to propose their own response to the matter of concern before proceeding with a direction. ONRSR must also consider whether a cost benefit analysis is required, in accordance with the ONRSR Application of Cost Benefit Analysis Requirement Policy.

Prosecution	ONRSR can act to prosecute organisations or individuals for breaches of the RSNL. The circumstances that may give rise to considering a prosecution include: > significant and/or repeated breaches of a similar nature that give rise to increased risk because of persistent and significant poor compliance; > rail safety operations have been undertaken without, or in serious non-compliance with, a legal authorisation to do so (i.e. without the appropriate accreditation, registration or exemption); > a failure to comply with an improvement or prohibition notice or there has been a repetition of the specific contravention; > false information has been supplied wilfully, or there has been an intent to deceive, in relation to a matter which gives rise to significant risk; > a rail safety officer has been intentionally obstructed by the rail transport operator in a way that prevents them from carrying out their lawful duties; and > a rail safety officer has been the subject of an assault. In making the decision to prosecute the following is taken into consideration: > whether the person or organisation has been reckless towards managing the risk to an individual that could lead to death, serious injury or illness; > the gravity of an alleged safety offence, in context with the seriousness of the potential or realised consequences of events related to the alleged offence; and > whether there has been a significant financial benefit or competitive advantage to the offending rail transport operator as a result of the alleged offence. Prosecution is only pursued where sufficient evidence has been collected to provide a realistic prospect of conviction and it is in the public interest to prosecute. ONRSR recognises that prosecutions can be resource intensive and available resources are finite. ONRSR only seeks to expend resources on appropriate cases. Regarding public interest and community expectations, the following factors are also considered: > expectation for action in response to the seriousness of the realised, or potential, consequences of an incident related to an alleged offence. For example, where a death or serious injury has occurred because of an action or inaction leading to an alleged offence; > the prevalence of the alleged offence and the impact of prosecution-related action on general deterrence (i.e. reducing the likelihood that other duty holders will commit similar offences) or specific deterrence (i.e. reducing the likelihood that the duty holder will commit a further breach of rail safety laws);

Prosecution (continued)	> the availability and likely effectiveness of any alternatives to prosecution, such as one of the other enforcement options, for example enforceable voluntary undertakings. > the public expectation for punitive action to be taken following serious incidents that have involved death or serious injury to persons outside the rail workplace, or significant property damage to property not part of the railway.
Acceptance of enforceable voluntary undertaking	Having made a case to launch a prosecution or initiate a suspension or cancellation of accreditation against an individual or organisation for an alleged contravention of the RSNL, ONRSR may consider accepting an enforceable voluntary undertaking on application by the offending individual or organisation. An enforceable voluntary undertaking represents a high level commitment from the rail transport operator and it is up to the operator to make their case that acceptance of the undertaking represents a better outcome to safety than the compliance action being proposed. While it is a voluntary action on behalf of the operator to seek agreement to an undertaking from ONRSR, once accepted it becomes a legally binding agreement that is enforced through the courts if required. Accepting an enforceable voluntary undertaking is considered where: > it is not for a contravention, or alleged contravention, of a Category A offence (as defined in the RSNL); > the public interest is better served by acceptance of a voluntary undertaking rather than proceeding with prosecution or cancellation or suspension of accreditation or registration; > the organisation is likely to comply with the undertaking, considering the organisation's record of compliance and upholding of previous commitments; > the actions proposed to be undertaken address and are likely to provide effective long-term rectification of the matters that have given rise to the contravention; or > a reasonable period to complete the tasks identified in the undertaking is proposed, and the tasks are given a high priority by the organisation and appropriately resourced.

Condition or restriction of accreditation or registration	ONRSR-initiated variations of an accreditation, or the variation or imposition of conditions or restrictions on an accreditation or registration may be appropriate in circumstances where the rail safety officer has formed an opinion that the rail transport operator does not have the competence and capacity to undertake railway operations to the extent allowed by its current notice of accreditation or registration. In considering a decision to impose or vary conditions or restrictions on accreditation or registration for the purposes of enforcing compliance, ONRSR considers: > the rail transport operator's history of compliance whether railway operations are or are not conducted to an adequate standard of safety and the safety management system complies with the RSNL; and > whether the rail transport operator is temporarily or permanently unable or unwilling to undertake any relevant remedial action necessary to satisfy the requirements for accreditation or registration. Prior to varying, revoking or imposing a new condition or restriction, ONRSR must provide the rail transport operator with a notice to "show cause" why the condition or restriction should not be varied, revoked or imposed as the case may be. ONRSR must also consider whether a cost benefit analysis is required, in accordance with the ONRSR Application of Cost Benefit Analysis Requirement Policy.
Suspension of accreditation or registration	ONRSR can suspend an accreditation or registration (in full or in part) where the accredited or registered rail transport operator: > no longer can demonstrate the requirements for accreditation or registration or satisfy the conditions or restrictions of the accreditation or registration; > contravenes the law; > has not conducted the railway operations or managed the private siding/s for which the accreditation or registration was granted for at least the preceding 12 months; or > has failed to pay the annual fee for accreditation. Unless there is an immediate and serious risk to safety (in which the Regulator may immediately suspend the accreditation or registration for a period up to 6 weeks), prior to making the decision to suspend ONRSR must provide the rail transport operator with a notice to "show cause" why the accreditation or registration should not be suspended. Where accreditation or registration is suspended, ONRSR continue to work with the suspended operator to provide appropriate guidance and information regarding what they need to address in order to have the suspension cancelled.

Cancellation of accreditation or registration	ONRSR can cancel an accreditation or registration (in full or in part) where the accredited or registered rail transport operator: > can no longer demonstrate the requirements for accreditation or registration or satisfy the conditions or restrictions of the accreditation or registration; > contravenes the law; or > has not conducted the railway operations or managed the private siding/s for which the accreditation or registration was granted for at least the preceding 12 months; Cancellation of accreditation is viewed as a last resort in response to a sustained history of poor safety performance, sustained non-compliant behaviour, a demonstrable lack of intent by the operator to address safety risks or no intent to resume operations at any stage in the future. Prior to making the decision to cancel the accreditation or registration ONRSR must provide the rail transport operator with a notice to "show cause" why the accreditation or registration should not be cancelled.

A summary of the most common compliance tools and the expectation on operator response to these is provided at Appendix 2.

3.5 REVIEWABLE DECISIONS

Many of the decisions made by ONRSR are reviewable under section 215 of the RSNL. As an independent regulator ONRSR accepts such decisions are subject to rigorous and appropriate scrutiny. When notification of a decision that is subject to a formal review process under the RSNL is provided, ONRSR also provides details as to what the review process is.

3.6 NATIONAL RAIL SAFETY REGISTER

ONRSR is required by the RSNL to establish and maintain a National Rail Safety Register, which is made available on our website. The register provides summary information about the accreditation, registration and exemption of rail transport operators and information about improvement, prohibition and non-disturbance notices issued to these operators or any person, as well as information relating to rail safety undertakings.

The purpose of the register is to provide a public record of the major decisions that impact railway operations across Australia, specifically recording:

- persons and organisations that are permitted to undertake railway operations through accreditation, registration or exemption to these; and
- statutory notices that have been issued to operators.

ONRSR aims to review and update the contents of the register monthly. While information is not normally removed from the register, in the case of cancelled statutory notices, the record of the notice is removed from the register six months after the date the notice has been cancelled.

4 CONTINUOUS IMPROVEMENT

It is not ONRSR's role to draw the line under an operator's safety management system and state they have ensured the safety of their operations SFAIRP. This task is a duty requirement placed on rail transport operators. It is ONRSR's role to advocate more broadly for continuous improvement across the rail industry, which is incorporated into ONRSR's approach through:

- identifying and focusing activities towards national priorities;
- taking an active role in the identification of industry wide safety issues and facilitating safety improvement in these areas through education, guidance and other regulatory activities;
- publication of, and providing access to, relevant rail safety data to enable duty holders and other stakeholders to make informed decisions;
- engaging in industry led safety improvement projects and initiatives;
- being a participant in national rail safety regulatory reform; and
- networking with other related safety regulators.

4.1 IDENTIFYING AND ACTING ON NATIONAL PRIORITIES

A national priority is defined as a rail safety area of regulatory focus that applies to multiple jurisdictions and operators and warrants a sustained period of regulatory activity. ONRSR targets national priority areas using tailored regulatory solutions, typically through operator-centric, national compliance projects or industry wide or sector wide educational programs.

ONRSR's national priorities and the associated compliance and educational projects are reviewed at least every two years, and are communicated to industry in the ONRSR Rail Safety Report, published in December each year.

Setting national priorities is one of the key decisions within scope of ONRSR's framework for risk-based regulation (refer to section 2.1.3). As such, a structured, evidence-based risk assessment process is applied to inform the decision. The process involves an analysis of multiple sources of rail safety data and intelligence including:

- ATSB Rail Safety Investigation Reports;
- REPCON reports;
- rail operator notifiable occurrence reports;
- rail operator safety performance reports;
- rail operator incident investigation reports;
- outcomes and findings of regulatory interactions with operators; and
- findings from stakeholder forums and consultation groups.

These inputs are reviewed and analysed to identify common themes, trends, systemic issues and areas of concern for consideration as an ONRSR national priority.

A risk score is then assigned to each priority area under consideration, based on an assessment of a series of quantitative and qualitative risk factors, such as:

- **industry safety management performance** – industry's performance at controlling risks related to the priority area, SFAIRP;
- **industry exposure** – the extent and applicability of issues relating to the priority area across industry sectors and operators;
- **regulatory response** – the amount of unplanned regulatory effort recently expended on issues relating to the priority area;
- **degree of influence** – operators' level of control over the risks related to the priority area;
- **worst credible harm**– the most severe level of harm to people that could reasonably be expected in the event of an accident relating to the priority area; and
- **industry concern** – the level of safety concern in relation to the priority area recently expressed by industry.

Finally, ONRSR reviews the potential priority areas in order of risk score to identify those that most warrant a nationally coordinated and sustained period of regulatory focus and, with the additional consideration of other intelligence and knowledge of operator safety performance from our regulatory officers, the appropriate regulatory response to deliver safety benefits for the community.

4.2 ENGAGING WITH OTHERS FOR REFORM AND IMPROVEMENT

ONRSR undertakes regular and purposeful engagement with operators and other stakeholders focused on improving the operation and outcomes of the regulatory scheme and rail industry safety in Australia.

The type and level of engagement used for a particular matter reflects the intended purpose of that engagement. In general, ONRSR engages actively with industry and other stakeholders as rail safety is co-regulatory and a range of parties associated with railways have safety responsibilities.

We participate actively in higher level policy development when it affects the regulation of rail safety in Australia. This involves developing policy where requested to do so, such as for drug and alcohol, fatigue and cost recovery. ONRSR also undertakes joint processes with the National Transport Commission and others in policy development and legislative change.

ONRSR develops operational policy and engages with stakeholders in undertaking this work and consults widely prior to issuing policies and guidelines or implementing change processes.

ONRSR also engages with other regulators within Australia and overseas due to a collective interest in good regulatory practice and safety for industry and the community, as well as state, territory and Commonwealth senior officials and Ministers.

There are several forums set up to support this engagement, these being:

- Chief Executives' forum;
- national and local operations forums;
- specific reference groups; and
- RSNL maintenance group.

ONRSR representatives also attend industry forums such as the Safety Managers Group and ATHRA meetings to ensure input is received from a broad range of stakeholders.

4.3 PROVISION OF RAIL SAFETY DATA AND INFORMATION

Not only is access to and use of regulatory and rail safety data an important element of ONRSR's risk-based regulatory approach, ONRSR recognises the value of the information it holds to regulated parties and other key industry and government stakeholders. ONRSR is able to collate information at an industry sector or whole-of-industry level that may be used to assist others for making safety decisions, investment decisions or to benchmark safety performance.

ONRSR's data and information use, particularly regarding the publication and release, is governed by the confidentiality provisions set out in the RSNL. In accordance with these provisions, ONRSR provides data and information to the rail industry in several ways, including:

- publication of the ONRSR *Rail Safety Report* (annual);
- publication of national safety data on the ONRSR website **(www.onrsr.com.au)**, including the ability to download the published data sets;
- provision of summary data to industry working groups, jurisdictional level crossing committees and other stakeholder forums;
- provision of benchmarking data to regulated rail transport operators; and
- on request to rail safety related stakeholders (in some circumstances, where permitted under the RSNL).

ONRSR continues to examine how it can provide, to relevant parties, the data and information that is collected through legislative reporting requirements and generated through regulatory activities to improve the level of information available to support rail safety decision making outside of ONRSR's own regulatory decision making. ONRSR will do this in a way that appropriately preserves confidentiality (and compliance with the RSNL) and in acknowledgement of the importance of maintaining frank and open exchanges of information between ONRSR and regulated parties under the co-regulatory framework for rail safety regulation.

APPENDICES

APPENDIX 1

Regulatory outcomes from rail safety officer lead regulatory activities

			REGULATORY OUTCOMES	
Regulatory Activity	**Purpose**	**Notification**	**No adverse findings (minimum response)**	**Observation**
Discussion	Externally initiated safety or compliance matter discussion.		Acknowledgement of discussion, may lead to other activity.	
Meeting	Facilitate discussion on any compliance, accreditation or safety matter.	Meeting arranged between parties.	Mutual agreement for documenting outcome.	Issued in writing (email or letter) 5 days post meeting.
Site Visit	Rail safety officer visit to rail premises to observe site and/or operations.	Announced - Mutual arrangements confirmed in writing (email). Unannounced – Notification on entry.	Verbal or email confirmation of site visit as soon as practicable post visit.	Issued in writing (letter) 5 days post site visit.
Education Interaction	Provide education to an operator regarding RSNL requirement or safety issue.	Mutual arrangements confirmed in writing (email). -	Written confirmation of the interaction setting out expectations (letter) 5 days post interaction.	Issued in writing (letter) 5 days post interaction.
Inspection	Formal review of the application of a SMS for specific railway operations and activities.	Announced - Written notification and scope provided. Unannounced – Notification on entry.	Written confirmation (letter) 5 days post visit. Verbal or written (email or letter) confirmation 5 days post inspection.	Issued in writing (letter) 5 days post inspection.
Audit	Formal review of a SMS against the requirements of the RSNL, including implementation and effectiveness.	Arrangements agreed between parties. Written notification and scope provided 20 days prior to audit.	Audit Report issued. Preliminary Report provided for factual comment 4 weeks post audit.	Issued in writing within Audit Report. Preliminary Report provided for factual comment 4 weeks post audit.
Enquiry	Examination of an operator's risk management and actions arising from an incident or safety issue.	Notification verbally or in writing (email or letter).	No response may be provided other than confirmation the enquiry has been completed.	Issued in writing (letter) post enquiry.
Investigation	Formal investigation into potential breach of the RSNL.	Written notification (letter).	Written summary of investigation outcome (letter).	

NOTE: In the above, days are working days and the time frames are indicative targets. Where a preliminary audit or inspection report is issued the operator is typically provided 10 days for factual review and comment with the final report issued within 10 days of ONRSR receiving the operator's comments.
*includes prosecution, voluntary enforceable undertakings, cancellation or suspension of accreditation.

REGULATORY OUTCOMES					
Non-conformance Report (NCR)	**Improvement Notice**	**Prohibition Notice**	**Infringement Notice**	**Vary condition or restriction of accreditation**	**Prosecution or higher order enforcement***
		Notice issued in response to an immediate risk to safety.			
		Notice issued in response to an immediate risk to safety.			
		Notice issued in response to an immediate risk to safety.			
Issued in writing within an Inspection Report 4 weeks post inspection. A preliminary report may be issued for factual comment.	Notice issued separate to other correspondence.	Notice issued in response to an immediate risk to safety.	Notice issued separate to other correspondence.		
Issued in writing within Audit Report. Preliminary Report provided for factual comment 4 weeks post audit.	Notice issued separate to other correspondence.	Notice issued in response to an immediate risk to safety.	Notice issued separate to other correspondence.	Managed through stand-alone documentation and correspondence.	
Issued in writing within an investigation summary report post investigation.	Notice issued separate to other correspondence.	Notice issued in response to an immediate risk to safety.			
	Notice issued separate to other correspondence.	Notice issued in response to an immediate risk to safety.	Notice issued separate to other correspondence.	Managed through stand-alone documentation and correspondence.	Managed through stand-alone documentation and correspondence.

APPENDIX 2

It is important that rail transport operators have clear expectations as to what outcomes may follow on from compliance monitoring activities and what response is required from them when various compliance tools are applied.

Below is a summary of the most common tools and outcomes.

OUTCOME	OPERATOR ACTION REQUIRED
No Adverse Findings	The rail safety officer has not identified any issue of concern.
Observation	Observations are made in writing. ONRSR does not seek a specific action in regard to such advice but rail safety officers may review how the advice has been considered and implemented during future compliance audits and inspections.
Non Conformance Report (NCR)	ONRSR communicates the NCR in writing and request a written corrective action response from the rail transport operator. Rail transport operator expected to comply with rectifying identified non-conformances.
Improvement Notice	Findings are communicated in an improvement notice. Further action from the rail transport operator to comply with the notice is required.
Prohibition Notice	Compliance with prohibition notice required.

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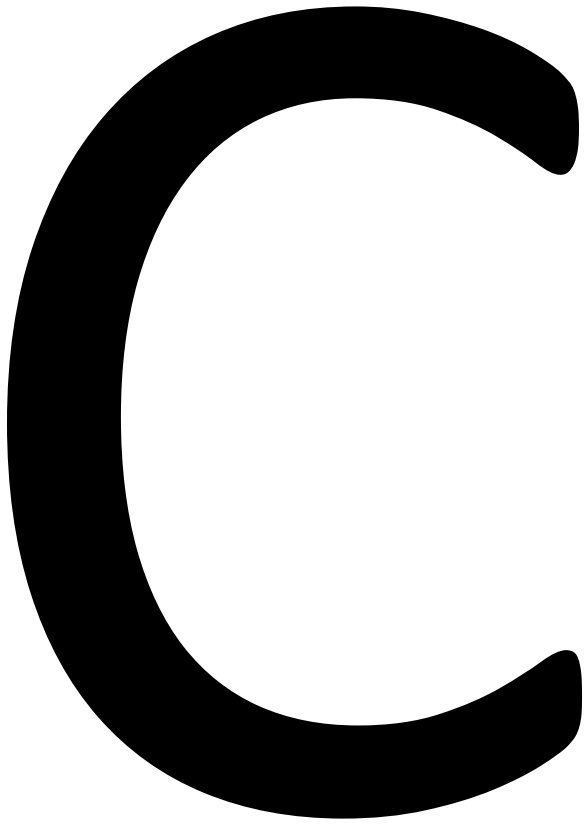
APPENDIX C:
ONRSR GUIDELINE: MEANING OF DUTY TO ENSURE SAFETY SO FAR AS IS REASONABLY PRACTICABLE



OFFICE OF THE national rail safety regulator

ONRSR Guideline

Meaning of duty to ensure safety so far as is reasonably practicable

safe railways for Australia

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Version number:	Date	Comment
1.0	20 January 2013	First Issue
2.0	24 December 2014	Guidance on quantitative risk analysis and the relationship between SFAIRP and ALARP Additional references to RSNL, other ONRSR Guidelines and ISO 31000 Further guidance on continuous improvement and Reverse SFAIRP.
2.1	5 July 2016	Format review
2.2	17 May 2021	Updated references to the RSNL, RISSB Safe Decisions and the VoSL figure Additional detail provided in the case study at Appendix A Minor text updates to improve clarity Format review

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1 Introduction

Sections 52, 53 and 54 of the Rail Safety National Law (RSNL) provide that rail transport operators and associated industry participants (contractors, manufacturers, designers and suppliers) – referred to collectively as duty holders – have an obligation to ensure the safety of railway operations. These statutory duties do not require safety at any cost. Duties to ensure safety are qualified by the statement 'so far as is reasonably practicable' (SFAIRP).

ONRSR has prepared this guideline to provide guidance on the interpretation and application of the term 'so far as is reasonably practicable' in considering the standard that a duty holder is expected to meet under the RSNL and RSNL National Regulations (National Regulations).

This guideline accompanies and is complementary to the RSNL and National Regulations. It is intended for general application across the rail industry where the RSNL applies. The advice provided in this document is not intended to replace the provisions of the RSNL or other relevant legislation or to limit or expand the scope of such legislation. In the event of any perceived inconsistency between this guideline and relevant legislation, the legislation will prevail.

This document is a general guideline only and is not a substitute for professional legal advice. The contents of this document are correct at the time of writing. However, there may be subsequent decisions of courts or tribunals on the matters covered by this guide which mean that the contents are no longer accurate.

This guideline was originally adapted from the Safe Work Australia Interpretive Guideline – Model Work Health and Safety Act – "The Meaning of Reasonably Practicable"[1] and ONRSR acknowledges the work of Safe Work Australia.

2 Management of risks 'So Far As Is Reasonably Practicable'

Under section 46 of the RSNL, duty holders are required:

> to eliminate risks to safety so far as is reasonably practicable; and

> if it is not reasonably practicable to eliminate risks to safety, to minimise those risks so far as is reasonably practicable.

The above duties are referred to in this guideline as the duties to 'ensure safety SFAIRP'.

The concept of SFAIRP is to achieve the best possible safety outcomes, to the extent that is 'reasonably practicable' under the circumstances.

The RSNL (s99) requires a Rail Transport Operator to have a safety management system (SMS) that provides for systems and procedures for compliance with the risk management obligations under the RSNL. The National Regulations (Reg 16) requires the SMS to provide for all of the matters listed in Schedule 1 of the National Regulations, which includes a requirement for risk management to be part of an SMS.

ISO 31000[2] establishes principles for effective risk management, and a framework for integrating the process for managing risk into an organisation. ONRSR considers that this document provides good practice for duty holders in the management of risk although it should be noted that the RSNL has specific requirements for risk management. Sole compliance with ISO 31000 is not sufficient to meet these requirements and the specifics of the RSNL must be taken into account. Further guidance on the legislative requirements of the SMS and how ISO 31000 can be used in conjunction with these requirements can be found in the ONRSR document *Safety Management System Guideline*.

[1] Safe Work Australia Interpretive Guideline – Model Work Health and Safety Act – The Meaning of Reasonably Practicable

[2] International Standard ISO 31000 Risk management – Guidelines

Further guidance is also available in the Rail Industry Safety and Standards Board (RISSB) Guideline – Safe Decisions[3], which sets out a framework for industry stakeholders to use when making decisions that have the potential to affect safety.

3 How is 'Reasonably Practicable' defined?

In this context, and under the RSNL (s47), reasonably practicable means that which is, or was at a particular time, reasonably able to be done to ensure safety, taking into account and weighing up all relevant matters including:

> the likelihood of the hazard or the risk concerned occurring; and

> the degree of harm that might result from the hazard or the risk; and

> what the person concerned knows, or ought reasonably to know, about the hazard or risk, and ways of eliminating or minimising the risk; and

> the availability and suitability of ways to eliminate or minimise the risk; and

> after assessing the extent of the risk and the available ways of eliminating or minimising the risk, the cost associated with available ways of eliminating or minimising the risk, including whether the cost is grossly disproportionate to the risk.

4 What is reasonably practicable is an objective test

What is 'reasonably practicable' is determined objectively. This means that a duty holder must meet the standard of behaviour expected of a reasonable person in the duty holder's position and who is required to comply with the same duty.

There are two elements to what is 'reasonably practicable'. A duty holder must first consider what can be done - that is, what is possible in the circumstances for ensuring safety. The duty holder must then consider whether it is reasonable, in the circumstances to do all that is possible. This means that what can be done should be done unless it is only reasonable in the circumstances for the duty holder to do something less.

The determination of what is 'reasonably practicable' can never be a simple formula that the duty holder calculates by inputting values for known variables. The 'comfort' of the individual duty holder is borne from adhering to the decision-making process and taking into account all relevant matters in an appropriate way. There are no guarantees that a court will agree with a duty holder's determination of what is or was 'reasonably practicable' in a given situation. However, it is far more probable the court will agree with the duty holder's determination of what is or was 'reasonably practicable' if a process of justified decision-making is or was adhered to.

5 How to determine what is reasonably practicable – The process

To identify what is or was 'reasonably practicable' all relevant matters must be taken into account. These matters must be weighed up and a balance achieved that will provide the highest possible level of protection that is reasonable in the circumstances. Some matters may be relevant to what can be done, while others may be relevant to what is reasonable to do. This applies equally to determinations that have a long-term impact (e.g. the introduction of new rolling stock) as it does to determinations that have a short-term impact (e.g. degraded mode operation of rolling stock).

Section 47 of the RSNL sets out a number of specific considerations for ensuring safety SFAIRP. All of these factors must be considered when determining what is reasonably practicable. However, they should not be read in isolation as there may be other factors that could be considered.

[3] Rail Industry Safety and Standards Board (RISSB) Guideline – Safe Decisions

For example:

> there may be other legislation that requires or prohibits certain activities and limits what a duty holder can do; and

> the level of control or influence a duty holder has over a particular asset, activity or the actions of another person, such as managing risks where the management is to a certain extent 'contracted out' to a supplier. The RSNL (s51) makes it clear that a duty holder cannot avoid responsibility in such an arrangement which means the duty holder must have arrangements for ensuring such suppliers comply with the requirements of the RSNL.

In addition, the RSNL and the National Regulations specify other risk management requirements, including documentation, with which accredited rail transport operators and registered rail infrastructure managers must comply.

The duty holder should consider all of the facts and identify and consider everything that may be relevant to the risks and means of eliminating or minimising those risks.

The matters that must always be taken into account and weighed up are discussed in the following paragraphs.

5.1 Likelihood and severity

Risk is a product of the likelihood of a hazard or risk occurring and the degree of harm that may result (severity). Both factors must be carefully considered to ensure safety SFAIRP.

The greater the likelihood of a risk eventuating, the greater the significance this will play when weighing up all matters and determining what is reasonably practicable. If harm is more likely to occur, then it may be reasonable to expect more to be done to eliminate or minimise the risk.

The greater the degree of harm that could result from the hazard or risk, the more significant this factor will be when weighing up all matters to be taken into account and identifying what is reasonably practicable in the circumstances. Clearly, more may reasonably be expected of a duty holder to eliminate or minimise risks with the potential for fatalities than risks of lesser harm.

When considering the degree of harm, all credible consequences of the hazard or risk should be taken into account. Typically, the greater the degree of harm that may result from the hazard or risk the more time and effort should be expended in ensuring safety.

The assessment of the likelihood of the hazard or risk occurring should take into account the possibility of human error and reasonably foreseeable forms of misuse on the part of workers or other persons.

Depending on the nature of the risk, determining the likelihood and severity may be done either qualitatively or quantitatively. Irrespective of the method used the degree of uncertainty in the assessment should be accounted for, particularly when assessing low likelihood, high severity hazards or risks (such as train collisions), where there is typically a lack of recent incident data to inform the assessment and the range of consequences can vary greatly.

Any risk criteria[4] set by a duty holder for the purposes of evaluating its risks must be appropriate to the nature of the risk to be evaluated. For quantitative risk assessments ONRSR encourages duty holders to establish quantitative risk criteria[5] (see also ONRSR's *Major Projects Guideline*). In setting any risk criteria for the evaluation of risk, the duty holder should ensure that the risk criteria are not in conflict with requirements of the RSNL to ensure safety SFAIRP.

[4] ISO 31000: Risk management – Guidelines defines risk criteria as the terms of reference against which the significance of a risk is evaluated, relative to organisational objectives, values and resources. The results of risk analysis are compared against risk criteria in order to assist in determining what action, if any, is required to treat the risk.

[5] Quantitative safety risk criteria are typically described in terms of individual risk (the probability an individual exposed to the risk will be killed in a year) or fatalities/Fatalities and Weighted Injuries per year.

5.2 What the person concerned knows, or ought reasonably to know, about the hazard or risk and any ways of eliminating or minimising the risk

The knowledge about a hazard or risk, and any ways of eliminating or minimising the hazard or risk, will be what the duty holder actually knows, and what a reasonable person in the duty holder's position (e.g. a person in the same industry) would reasonably be expected to know. This is commonly referred to as the 'state of knowledge'.

A duty holder can gain this knowledge in various ways, for example by:

> consulting their workers;

> consulting others in the industry and determining what is industry good practice;

> undertaking risk assessments;

> analysing previous rail safety incidents;

> engaging subject matter experts;

> considering relevant Regulations, Codes of Practice and other sources of information, such as:

- material published by ONRSR;
- reputable technical standards, such as those published by RISSB and Standards Australia;
- industry publications; and
- published scientific, academic and technical literature.

Knowledge about the hazard or risk

It is reasonably practicable for a duty holder to:

> proactively take steps to identify hazards within their business or undertaking before they cause an incident, injury or illness. This should be done before the activity is undertaken or the circumstances occur that result in the risk.

> understand the nature and degree of any harm that an identified hazard may cause, how the harm could occur, and the likelihood of the harm occurring.

It is also reasonably practicable for a duty holder to consider and understand, within the available state of knowledge, how the following may cause or increase hazards and risks:

> potential failure of assets including plant and equipment, systems of work or safety measures;

> human error or misuse, spontaneity, panic, fatigue or stress; and

> interaction between multiple hazards that may, together, cause different risks.

Knowledge about ways of eliminating or minimising the risk

Approved Codes of Practice or industry standards may provide practical guidance on methods of eliminating or minimising risks, SFAIRP. A court may have regard to an approved Code of Practice or industry standard as evidence of what is known about a hazard or risk, risk assessment or risk control, and may elect to rely on the code or standard in determining what is reasonably practicable in the circumstances to which the code relates.

Ways of eliminating or minimising risks can also be identified by reviewing good practice measures that other duty holders may have in place, to address similar risks in similar operational environments.

Good practice and standards may in some cases be sufficient to ensure safety SFAIRP. Duty holders should consider the relevance of a particular good practice or standard to the risk to be managed, determine whether it is still current and whether additional controls are also required. In particular, care should be taken when a standard is specified as a minimum requirement or where the standard has options in how it is applied. In such cases, duty holders should determine whether the minimum is sufficient, and what options are required to ensure safety SFAIRP.

In the case of technical standards, they can often apply to particular systems, structures or sub-systems. Duty holders should consider system interfaces and what effect these may have on the suitability of standards to ensure safety SFAIRP.

Although duty holders do not usually have to strictly comply with approved Codes of Practice, when determining what is reasonably practicable, duty holders must be able to demonstrate a level of safety that is the same, equivalent or better than that achieved by the approved Code of Practice (RSNL s250).

There may be many different ways of eliminating or minimising risks. The duty holder should identify as many of these as it reasonably can, to give them the greatest scope to choose and apply the most appropriate means to eliminate or minimise a risk in the particular circumstances.

5.3 Availability and suitability of ways to eliminate or minimise risks

This part requires a consideration of not only what is available, but also what is suitable to ensure safety SFAIRP. A risk control that may be effective in some circumstances or environments may not be effective or suitable in others, because of factors such as the physical characteristics of the system, skills of relevant workers, or the particular way in which the work is done.

Equipment to eliminate, or if this is not reasonably practicable, to minimise a hazard or risk is regarded by ONRSR as being available if it is provided on the open market, or if it is reasonably possible to manufacture it. A work process (or change to a work process) to eliminate, or if this is not reasonably practicable, to minimise a hazard or risk is regarded by ONRSR as being available if it is feasible to implement.

A way of eliminating, or if this is not reasonably practicable, of minimising a hazard or risk is regarded by the ONRSR as suitable if it:

> is effective in eliminating or minimising the likelihood and/or degree of harm of a hazard or risk;

> does not introduce new and higher risks in the circumstances; and

> is practical to implement in the circumstances in which the hazard or risk exists.

In assessing the suitability of risk controls, the duty holder may also consider whether they will be:

> technically and logistically suitable, for example, compatible with the existing systems or operating requirements, or available at the locations required;

> environmentally suitable, for example, suited to the climatic conditions or operating environment;

> effective at reducing the risk.

The following points should also be considered:

> as well as meeting the SFAIRP test, any decision to reject risk controls and/or tolerate high or extreme risks must be made in compliance with an individual duty holder's SMS;

> the level of risk reduction offered by a control under consideration;

> other independent risk controls providing protection;

> the potential for common failure modes which could render more than one risk control ineffective; and

> the hazards a particular control deals with.

Some workplace health and safety legislation requires application of the hierarchy of controls. This provides a priority order in which potential control measures should be considered when determining which are reasonably practicable. The hierarchy promotes the selection of controls that have a greater effect on reducing the risk and which are more reliable. For example, an engineering control is promoted ahead of administrative controls or the use of personal protective equipment. While the hierarchy of controls is not a feature of the RSNL, ONRSR still expects duty holders to prioritise more effective and reliable controls ahead of less effective ones.

In determining risk treatments to ensure safety SFAIRP, options that eliminate risk should be given due consideration and priority. Where elimination is not reasonably practicable, the extent to which a control may reduce a risk, on its own or together with other controls, should be considered when weighing up what can reasonably be done.

Some controls may lower the likelihood of harm, others may lower the degree of harm that may result, and some may lower both. While the hierarchy of controls is a useful reference, it may be necessary for a duty holder to implement more than one control in order to eliminate or minimise a risk SFAIRP.

A rail transport operator must implement its SMS, including implementation of available and suitable risk controls. ONRSR expects identification and documentation of who is responsible for implementing the risk control measures (National Regulations, Schedule 1), and where external parties are involved, the respective roles and responsibilities of these parties.

Section 100(2) of the RSNL requires rail transport operators to keep a detailed record of all aspects of the risk assessment process. Importantly, this also includes documenting the reasons for both selecting and rejecting each of the control measures considered. If it is concluded that the decision to do nothing is reasonably practicable then this decision must also be documented.

Non-safety related considerations

Commercial considerations may also be a factor in a duty holder's decision-making. For example, it is rational and indeed necessary that duty holders consider foreseeable political and public reactions to possible accident scenarios (e.g. those involving multiple fatalities). It is important that duty holders consider the implications arising from those incidents (loss of assets, revenue, patronage, etc.), and as a result, consider whether this justifies a higher level of risk control than would otherwise be provided. This is an appropriate method for taking into account 'societal concerns', recognising that perceptions of safety affect the reality of commercial performance to the extent to which they affect behaviour of customers, the public and other persons potentially affected by the undertaking of the railway operations.

5.4 Cost of eliminating or minimising the risk

Although the cost of eliminating or minimising risk is relevant in determining what is reasonably practicable, there should be clear favourability of safety ahead of cost.

The RSNL requires that the cost of eliminating or minimising risk should be taken into account after identifying the extent of the risk (the likelihood and degree of harm) and the available ways of eliminating or minimising the risk.

The costs of implementing a particular control measure may include costs of purchase, installation, maintenance and operation of the control measure and any impact on productivity as a result of the introduction of the control measure.

A calculation of the costs of implementing a control measure should also account for the savings associated with any benefits the control measure introduces, e.g. fewer incidents and injuries, fewer equipment failures, potentially improved productivity and other business savings.

In identifying whether a particular expenditure is reasonable in the circumstances, the duty holder must consider:

> the likelihood and degree of harm of the hazard or risk; and

> the anticipated reduction of the likelihood and/or degree of harm that the control measure would introduce, if it was adopted. This is also referred to as the risk reduction.

In considering the risk reduction, at least two estimates of risk should be made; one before the implementation of a control measure and one after. The risk reduction is the difference in risk between the two estimates, summed over the life of the risk control. The risk reduction may also be referred to as the 'safety benefit'.

Often, a simple comparison of the risk reduction and the costs of the improvement can lead to a decision whether or not to implement the risk control. On other occasions, there may be a need to translate the risk reduction into monetary terms and measure it against the cost of the risk control. This is referred to as a cost benefit analysis. The safety benefit component of a predicted reduction in injuries and fatalities is translated into financial terms by applying a Value of Statistical Life (VoSL). There is no standard VoSL used in the Australian rail industry although various values have historically been published by government departments. The Office of Best Practice Regulation[6] provides a credible estimate of the VoSL of $5.0m (2020 figures). This estimate is based on international and Australian research and is derived from empirical evidence that has been assessed to ensure it is comprehensive and rigorous. If a duty holder intends to undertake analysis using a VoSL, it should document the selected VoSL in its SMS. The VoSL may also be referred to as the value of a prevented fatality (VPF).

A challenge in cost benefit analysis is that the estimation of risk, risk reduction and costs are subject to uncertainties. In determining what control measures are reasonably practicable, particularly where quantitative methods are used, consideration of the sensitivity of factors to test the robustness of the decision making should be undertaken. ONRSR recommends the use of a precautionary approach in the face of uncertainty, i.e. assume that control measures should be adopted unless there is a compelling case not to adopt them.

The cost of risk control options, individually and together, may be relevant when deciding which of the available options are reasonably practicable. If there are a range of options available to mitigate a risk that each provide the same level of risk reduction, a duty holder may choose to apply several of the least costly options. Cheaper, available and suitable options may be used instead of a costlier option that may further minimise the risk, where the cost of the costlier option is grossly disproportionate[7] to the additional risk reduction it affords. Choosing a low-cost option that provides less protection simply because it is cheaper is unlikely to ensure safety SFAIRP.

It is also important to consider the lead time between the decision to adopt a reasonably practicable control measure and the introduction of that control measure into service. In particular, a complex, engineered safety control may have a development lifecycle spanning several months to years. In such circumstances, duty holders must determine whether it is reasonably practicable to introduce interim safety control measures. This may, for example, involve the application of temporary control measures or operational restrictions to minimise exposure to the associated risk.

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[6] Best Practice Regulation Guidance Note: Value of statistical life, Office of Best Practice Regulation, August 2020

[7] At Law, there is no precise 'gross disproportion factor'. In making a judgement on gross disproportionality, particular attention is paid to the degree of uncertainty in the assessment of costs and safety benefits, and the range of potential safety consequences. For the purposes of this guideline, the evidence at the Sizewell B Public Inquiry in the UK provides a starting point. Although this evidence was produced some time ago, ONRSR is not aware of subsequent legal proceedings or public inquiries in Australia or the UK that have countered these views or provided alternatives. In this evidence it has been suggested a gross disproportion factor of up to 3 for workers was applied. For risks to the public, it was suggested that the factor would depend on the level of risk, and where the risks were low a factor of about 2 was suggested, whereas for higher risks the factor should be about 10. There is no guarantee that a court would adopt the above suggested gross disproportion factors.

Capacity to pay is not relevant

The question of what is reasonably practicable is to be determined objectively, and not by reference to the duty holder's capacity to pay or other particular circumstances. A duty holder cannot expose people to a lower level of protection simply because it is in a lesser financial position than another duty holder. If a particular duty holder cannot afford to implement a reasonably practicable risk control, the duty holder should not engage in the activity that gives rise to that hazard or risk.

6 Monitoring and review

An objective of the RSNL is to provide for continuous improvement of the safe carrying out of railway operations. Related to this is a requirement for rail transport operators to have procedures for monitoring, reviewing and revising the adequacy of risk controls (RSNL s99).

The decisions on what is required to ensure safety SFAIRP should be reviewed when new risk controls become available or costs change, to determine whether additional measures are reasonably practicable. Similarly, the likelihood or degree of harm of a hazard or risk may change over time which would require previous decisions to be reviewed. For example, if a new failure mode for an asset is discovered, controls may need to be enhanced to ensure safety SFAIRP.

As operational practices and railway assets age, newer versions can be developed which more effectively manage the associated risk. For example, newer passenger rolling stock will typically have traction interlocking on its doors which will prevent the traction system from operating when one or more doors are open. By comparison, older rolling stock may not originally have this control but retrofit may be reasonably practicable.

A duty holder is obliged to implement modern practices where it is reasonably practicable to do so. Existing practices and assets should be compared against relevant modern standards, including those that were not in force when they were first introduced and commissioned. This should be done across the lifecycle of the practice or asset.

For railway assets in particular, the future planned lifetime of the asset may be a factor in determining whether its operation is still reasonably practicable. When assets age, there may be no obvious transition from 'safe' to 'not safe'. In such cases specific monitoring and review of asset condition may be a reasonably practicable control. Further guidance on this subject can be found in ONRSR's *Asset Management Guideline*.

Proposed limits on remaining operating life of the asset may be taken into consideration in determining control measures required to ensure safety SFAIRP, but this cannot be used to justify an asset operating at a level incompatible with the risk criteria stated in the duty holder's SMS. A case not to make an improvement based largely on limited future lifetime would only be acceptable where the maximum extent of the future operational life is irrevocably fixed. In cases where the planned lifetime is not irrevocably fixed, an appropriate period of typical life extension should be selected having regard to all relevant matters (which may include industry norms) for the purposes of determining what is reasonably practicable.

7 ALARP vs. SFAIRP

Sometimes the term As Low As Reasonably Practicable (ALARP) is used by the rail industry. Both ALARP and SFAIRP have at their core the concept of 'reasonably practicable'. The ALARP framework was originally developed to assist those with legal obligations for safety to comply with these obligations. ONRSR considers that those duties to ensure safety SFAIRP and the ALARP framework generally both call for the same tests to be applied. In legal proceedings, the particular term cited in the relevant legislation will be used. Whilst some legislation in Australia cites the term ALARP[8], in the case of the RSNL the term cited is SFAIRP.

[8] For example, the Commonwealth Offshore Petroleum and Greenhouse Gas Storage (Safety) Regulations 2009.

Duty holders should be cautious of using ALARP guidance documents produced by other jurisdictions or for legal frameworks other than the RSNL. Any such guidance should be used only if it supports compliance with the RSNL.

A common feature of ALARP guidance is the so-called 'ALARP triangle'[9]. The triangle, referred to as the tolerability of risk framework, divides levels of risk into three regions – the unacceptable region, the ALARP or tolerability region and the broadly acceptable region. Each region then has a corresponding set of requirements for a duty holder. Defining such regions is a way of establishing risk criteria and may be helpful for organisational priority setting based on risk.

Duty holders are encouraged to establish risk criteria[10] for the evaluation of safety risk; in particular, ONRSR considers it good practice to establish an upper limit of risk beyond which a duty holder will not accept the risk unless it is reduced (for major projects ONRSR specifies this as one of several minimum expectations – see the *Major Projects Guideline*).

However, it is important to note that risk criteria must not be set such that they diminish obligations set by the RSNL. Specifically, should a duty holder define a 'broadly acceptable' region in its criteria, ONRSR will still expect the duty holder to eliminate or minimise risks assessed as being in this region SFAIRP – in other words a risk cannot be excluded from the requirements of the RSNL merely because it is assessed as being small.

8 Reverse SFAIRP

Duty holders may on occasion wish to remove a risk control that they believe to be no longer reasonably practicable. ONRSR acknowledges there may be very specific, albeit limited, occasions when it may be shown that an existing control is no longer necessary to ensure safety SFAIRP. These include:

> where the cost of maintaining the control has substantially increased (however in this instance, it may be reasonably practicable to introduce a new control rather than accept an increase in residual risk);

> the risk reduction provided by the control has reduced due to the risk reduction achieved by other or new controls;

> where a risk control interacts adversely with another risk control; or

> it can be shown that the introduction of the control was not necessary to ensure safety SFAIRP in the first place.

Any argument to remove risk controls should be subject to comprehensive risk assessment undertaken before the removal has taken place.

Examples of circumstances where ONRSR would not consider it appropriate to remove a control include:

> where the residual risk is no longer eliminated or minimised SFAIRP;

> transferring resources from areas, activities or exposed groups with lower risk to those experiencing higher risk. The RSNL requires every risk to be eliminated or minimised SFAIRP, and it is not acceptable to do less than this simply because the risk is even higher elsewhere;

> where one duty holder (e.g. the rolling stock operator) relaxes risk controls at the expense of another (e.g. the rail infrastructure manager) without documented risk transfer through an appropriate instrument (e.g. a Safety Interface Agreement);

[9] For example, the UK Health and Safety Executive document, Reducing Risks Protecting People 2001, which sets out a framework for the tolerability of risk.

[10] Risk criteria should be developed to match the nature of the risk being evaluated. I.S. EN 31010:2010 (Risk management – Risk assessment techniques) provides guidance on developing risk criteria.

- where changes result in a level of risk to the public, passengers or workforce which the duty holder's SMS rates as intolerable; or
- where a control is removed to reduce operational costs or increase operating profit without consideration of whether the control is reasonably practicable.

These are just some examples. There may be other situations where it is inappropriate to remove a control.

Appendix A – The operation of reasonably practicable – An example

ABC Rail Pty Ltd operates a high-speed, overnight freight transport service. Each night the freight must be loaded and unloaded at different terminals. The type of freight varies and the weight and configuration must be re-checked with each load. This is time-consuming and the loading equipment is somewhat unreliable and requires skilled workers to manually calculate the weight in some instances.

ABC Rail's Chief Operating Officer has decided to initiate a review of terminal operations with the goal of improving safety and productivity. A critical part of this review is a risk assessment of the existing freight loading and unloading practices.

ABC Rail's risk management process is defined within its safety management system. It is consistent with the guidance set out in ISO 31000 and ONRSR's Safety Management System Guideline and involves several steps, which are applied as follows:

Scope, context and criteria

> The scope of the risk assessment is defined, and context is provided to ensure those involved in the assessment are adequately informed.

> The scope covers safety risks associated with the loading and unloading activities, including the equipment and procedures used to calculate and check the weight and configuration of the load.

> Confirmation is provided that the risk criteria outlined in ABC Rail's risk management procedure will be used during the risk assessment, including application of its risk assessment matrix.

Risk Identification, Analysis and Evaluation

> The workplace hazards and risks associated with the activities are identified, which include personal injuries from loading and unloading unknown volumes of freight.

> Risks to the safety of railway operations associated with the loading and unloading activities are identified, including the risk of a derailment caused by an imbalanced load. Potential consequences of this risk include train crew injuries and fatalities.

> Previous incident history and the reliability of current controls are considered in order to estimate the likelihood and severity of train crew fatality, as a result of the derailment risk. Using the risk assessment criteria contained in the safety management system, this risk is considered 'High'.

> Consideration is initially given to stopping the activity to fully eliminate the risk. This was not considered a realistic option as the loading, unloading and transportation of freight is integral to ABC Rail's core business of freight delivery.

> A review is undertaken to identify other ways to minimise the risk. The review involves:

- determining the legal requirements under the RSNL and the National Regulations (e.g. for training and instruction, and engineering control requirements);
- obtaining information from relevant standards, Codes of Practice, industry publications and machinery suppliers about the various ways of minimising the likelihood or consequence of an incident;
- exploring what control measures similar freight terminal operators have in place to control the risk; and
- consulting with subject matter experts.

> Two potential treatment options are identified:
  - automating the loading process with newer computer-based technology that does not require manually calculated load weights and limits. This also allows loaders and unloaders to stay a safer distance away from the loading / unloading operation and includes a cut-off to stop the operation if a worker comes too close to moving parts; and
  - retrofitting scales to identify the weight of a load and the combined weight with the rolling stock.

> The two treatment options are evaluated to determine whether they are available and suitable for use in the circumstances, and the degree to which they will either individually or collectively minimise the risk SFAIRP. This involves:
  - considering the level of risk reduction (safety benefit) provided over the life of the two options; including whether they introduce other hazards or increase other risks.
  - considering the costs of implementing the two options, offset by any savings that they introduce. This includes the cost of purchase, installation, maintenance and operation of the options, together with any efficiency or other business savings they introduce.

> Having taken into account and weighed up all relevant matters, ABC Rail decides to purchase the new computer-based technology. Although it is more expensive than retrofitting the existing system, it provides significant safety benefits and also increases efficiency. Given the cost of the option compared with the risk reduction anticipated from the new system, the costs are considered unlikely to be grossly disproportionate to the risk.

Risk Treatment

> ABC Rail establishes the Automated Loading Project, a dedicated project for the procurement and implementation of the computer-based loading and unloading technology. The safety change management procedures contained within the safety management system are applied throughout the lifecycle of the project to help ensure safe outcomes.

> When scoping the project, ABC Rail recognises that it will be approximately six to nine months before the technology enters into service. A decision is made to introduce a temporary, administrative control in the interim, which includes a requirement for manually calculated weights to be checked by a supervisor.

> Upon receipt of the new equipment, ABC Rail installs it according to the manufacturer's instructions and provides its workers with relevant training on the safe operation and maintenance.

Monitoring and Review

> The effectiveness of the temporary, administrative risk control is reviewed in consultation with workers one month after implementation. This included an audit to confirm that the requirement for supervisors to check manually calculated weights is being adhered to.

> The effectiveness of the new technology is also reviewed one month after its implementation in consultation with workers. This includes a review of incident data to determine whether there has been a corresponding improvement in reportable load irregularities.

> Periodic review of the effectiveness of the risk controls is undertaken in accordance with ABC Rail's risk management procedure.

Communication and consultation

> Throughout each step in the risk management process, ABC Rail communicates and consults with relevant workers and stakeholders. This includes risk owners, control owners, subject matter experts and those that are exposed to the risk. This provides the duty holder with assurance that all reasonably foreseeable risks and the ways to eliminate or minimise them have been considered.

Recording and Reporting

> ABC Rail keeps a detailed record of all aspects of the risk assessment process in the form of a risk assessment report, meeting minutes, risk register entries and safety change management documentation.

> Regular reports are provided to management on the progress of the Automated Loading Project, as well as the ongoing effectiveness of critical risk controls, through established safety performance indicators.

APPENDIX D:
HUMAN FACTORS REPORT

D

Human Factors Review: Fixed heritage gates option at Lydiard St Crossing, Ballarat

Background

This review relates to a proposed redesign of the pedestrian crossings at Lydiard St to accommodate the restored heritage gates in a fixed position adjacent to the track. The proposed positioning is documented in *Lydiard Street Level Crossing Upgrade General Overview Plan – Option 3* (1485_C1021 Revision A sheet 01; see Figure 1).

The design includes the placement of the four heritage gates in a fixed position on each quadrant of the crossing, parallel to the tracks. The pedestrian crossings on either side of the road crossings are planned to be shifted further away from the road crossing in order to accommodate the heritage gates and other heritage protected items.

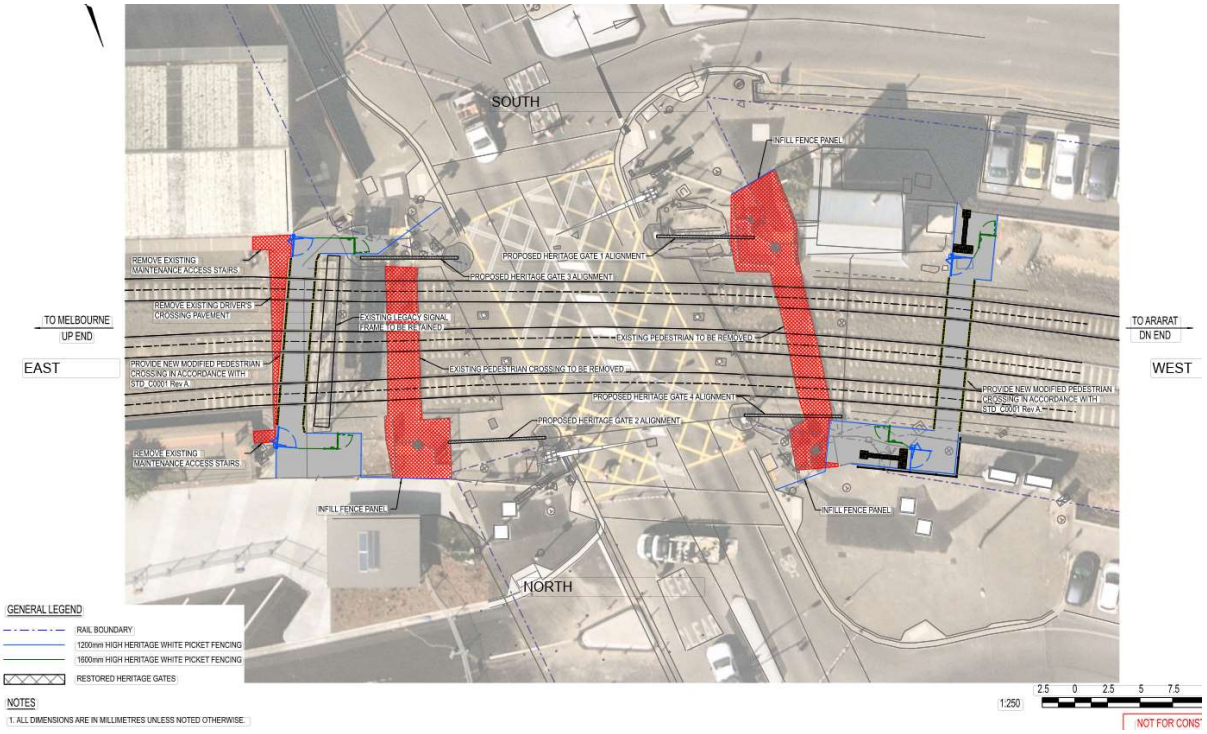


Figure 1 – Imagery taken from Document 1485_C1021 Revision A

The purpose of the review is to identify possible issues associated with this design option relating to Human Factors, accessibility, wayfinding, customer experience, safety risk and impacts to intended users to assist with future risk management activities.

Note that factors relating to construction and maintenance (including accessibility for ongoing maintenance) have not been considered in this review.

The issues documented in this report were identified during a workshop held on 20 Jan 2023 with the following attendees:

- [redacted]

- [redacted]

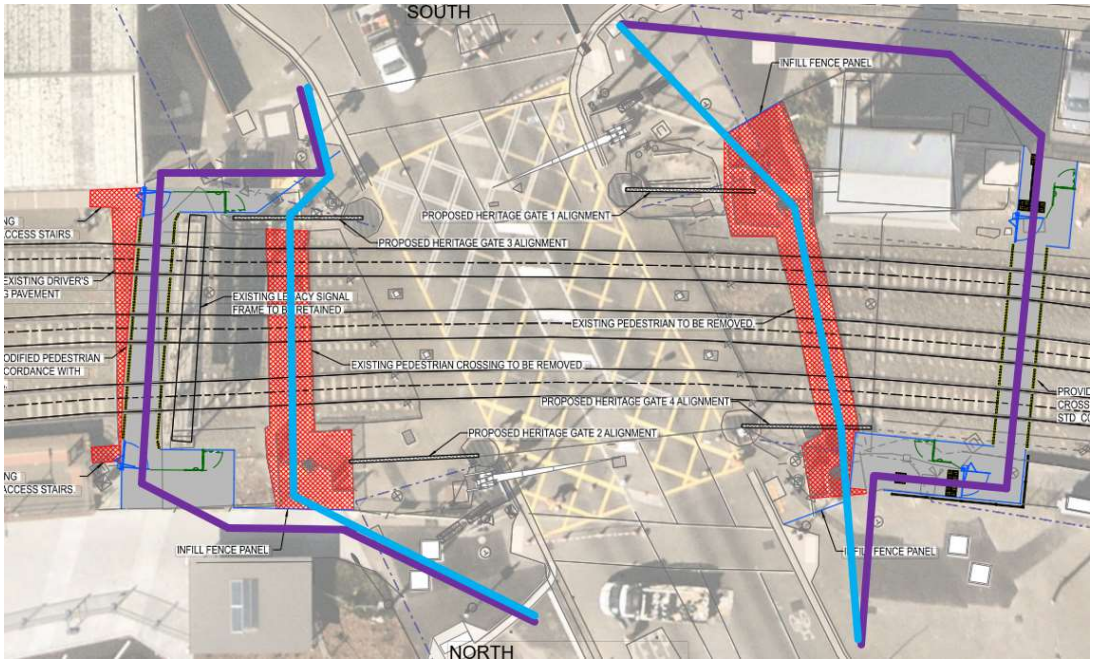
Additional input was provided during subsequent meetings and phone conversations with the following staff:

- [redacted]

The workshop considered potential impacts of the design on the following user groups:

- Pedestrians (both using V/Line services and other) including those with disabilities, prams, bicycles, scooters, mobility aids, walking sticks
- Cyclists, scooter & e-scooter riders
- Road vehicle (car) drivers
- Road vehicle (bus) drivers including those entering and exiting the interchange
- V/Line staff
- Emergency services
- Other members of the public

Potential issues

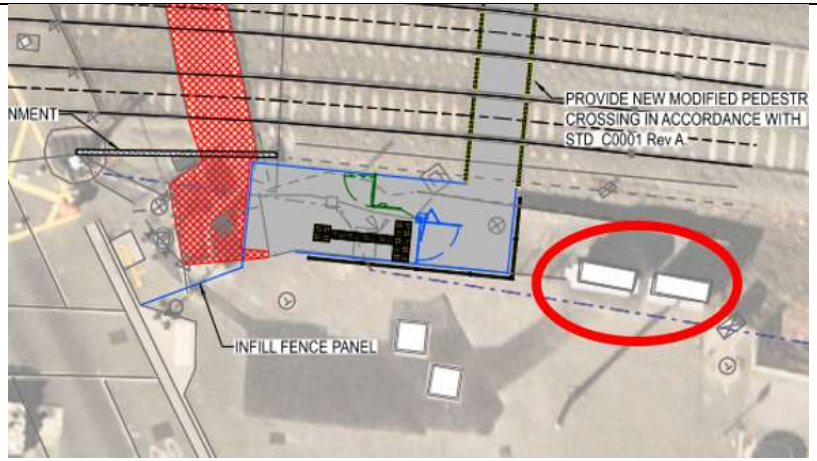
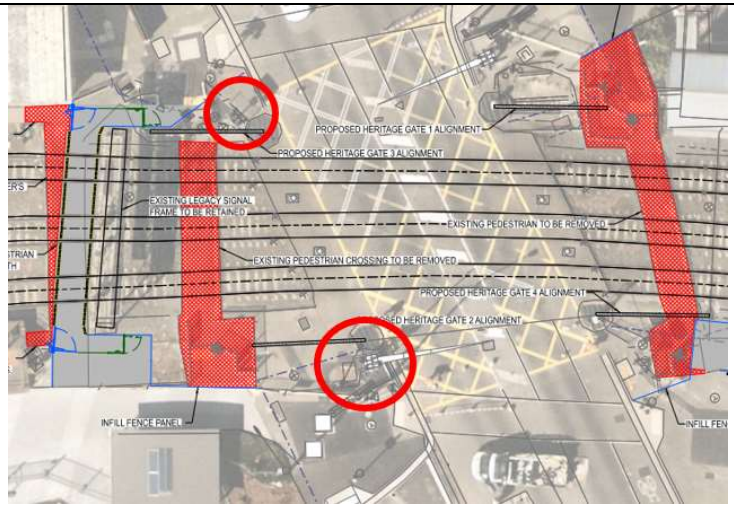
1.	Pedestrians seeking to cross the tracks may have difficulty finding / seeing the pedestrian crossings due to: • the ped crossings being less visible from the road due to the increased distance • the ped crossings being in a non-intuitive location (i.e. not adjacent to the road crossing as is more normal) • having visibility blocked by buildings, signage, vehicles etc. • the ped crossings not aligning with line of sight of users walking along the footpaths on Lydiard St. These may increase likelihood of pedestrians bypassing the ped crossing and crossing at the road instead without protection.	 
2.	Longer walking distance (and therefore time) to cross at the new pedestrian crossings may cause inconvenience and discontent and may increase likelihood of pedestrians crossing at the road without protection. This may particularly affect people who are rushing (e.g. to catch a train) and people who may find long walk distances difficult (e.g. elderly people, people with injuries, people pushing prams or carrying luggage etc). Longer walking distances are also known to impact accessibility (see AS 1428.2 and table below) See image: Indicative current travel path (blue) and proposed path under Option 3 path (purple) indicates change to walking distance for users walking along Lydiard St. (Note that when travelling from the north end car park to the train station, the walking distance may be reduced rather than increased so the design will	

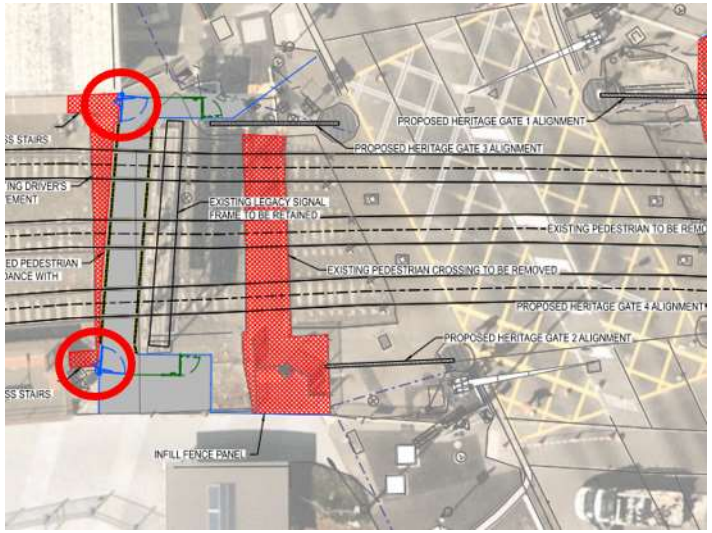
<table>
<tr><td></td><td>benefit users on that particular path).</td><td>The following table shows the demonstrated ability of people with disabilities to move more than a stated distance without a rest.
<table><tr><th rowspan="2">Type of disability</th><th colspan="5">Percentage unable to move more than the stated distance
m</th></tr><tr><th>18</th><th>68</th><th>137</th><th>180</th><th>360</th></tr><tr><td>People who use wheelchairs</td><td>0</td><td>5</td><td>5</td><td>60</td><td>85</td></tr><tr><td>People with vision impairment</td><td>0</td><td>0</td><td>5</td><td>50</td><td>75</td></tr><tr><td>People who use walking aids</td><td>10</td><td>25</td><td>40</td><td>80</td><td>95</td></tr><tr><td>Ambulatory people</td><td>5</td><td>15</td><td>25</td><td>70</td><td>80</td></tr></table></td></tr>
<tr><td>3.</td><td>Space for manoeuvring mobility devices may be reduced, additional requirements for turns are incorporated and turning angles may be tighter (particularly on the south-east corner), resulting in possible difficulty for users with mobility devices in accessing and travelling through the pedestrian crossings.

(NB. It is recognised that these will be made compliant, but also that the proposed plan is likely to be more difficult to manoeuvre in a mobility device than the existing crossings due to the factors above)</td><td>(See image for item 2 above, showing turning requirements and angles for the proposed vs. current design)</td></tr>
<tr><td>4.</td><td colspan="2">Pedestrians may prefer to cross at the road instead of the ped crossings because this path matches their desire line (i.e. shortest and most easily navigated route) and it provides a more direct and obvious route across the track. This will be most likely for pedestrians who are walking along Lydiard St and do not want to go to the station or detour via Ararat St.</td></tr>
<tr><td>5.</td><td colspan="2">The South-West ped crossing exits onto Ararat St. Users intending to continue along Lydiard St may be confused about where to cross. Additionally, users exiting the crossing onto Ararat St may lose situational awareness (having expected to exit at Lydiard St). This may increase confusion, dissatisfaction, increased pedestrian walk time and risk of people crossing the road and crossings at unsafe locations.</td></tr>
</table>

6.	The location of the South-West ped crossing exit on Ararat St may encourage pedestrians to cross the road at that point (where there is no formal crossing, and where visibility of oncoming traffic is potentially impacted by buses and parked cars, particularly for people using mobility aids who may have a lower viewing point). There is no infrastructure preventing users from crossing at this point. Walking back to Lydiard St to cross at a safer location may be considered too onerous due to the walking distance and backtracking required. It is suggested that a pedestrian crossing should be provided at this location if the design proceeds.	
7.	The proposed crossing entries / exits on the Western side are in a location with a downhill gradient towards the track. Considerable works would need to be undertaken to ensure an appropriate gradient is maintained for the new ped crossing to reduce risk of people / items (e.g. luggage, prams) rolling towards the track and to ensure that people using mobility devices are able to exit.	

8.	Wayfinding through the pedestrian crossings may be more challenging for people with vision impairment because the new crossings require multiple changes of direction, the route is less direct and the design is less intuitive (e.g. further from the road crossing and with the South-West ped crossing exiting to a different street from the entry). The new design may be difficult for these users to adapt to (even with wayfinding tactiles, which would be required).	
9.	The shift of ped crossings further from the road crossings may result in potentially reduced auditory location cues for people with vision impairment (although it is noted that the ped crossings will be fitted with the standard alarms)	
10.	Pedestrians may identify perceived or actual risk to safety when using the pedestrian crossings that are further from the road (and therefore less covered by street lighting and less visible to road users) in dark conditions (e.g. at night). Exiting next to the shadow of a building, near parked cars on a side street, for example, may be perceived as dangerous and pedestrians may perceive that it is safer to illegally cross at the road crossing instead.	
11.	For users with bicycles and electric scooters (for example) dismounting and walking through the crossing will be more laborious and take more time due to the increased walk distance and turning angles than the previous crossing design. This may increase the likelihood of these users (potentially including those who may not be sufficiently competent to ride on the road) avoiding the pedestrian crossings and crossing at the road instead. Crossing at the road increases risk to these users both because of proximity to road vehicles and because the tracks are not perpendicular to the road crossing (increasing risk of wheels getting caught in the train tracks)	
12.	Road vehicle drivers' visibility of the track and surrounds (including where pedestrians may be walking) may be impacted by the positioning of the heritage gates and the new crossing equipment.	
13.	Risk of potential collision between motor vehicles and pedestrians / cyclists will increase as pedestrian use of the road crossing increases (due to factors mentioned above)	
14.	Pedestrians may enter / exit crossings and appear at different locations to where motor vehicle drivers may expect them (e.g. due to the changed conditions, or for pedestrians having difficulty with wayfinding), increasing the risk of driver distraction / collisions.	

15.	Ambient lighting of the pedestrian crossings from street lighting etc. may be reduced (particularly Western crossing) as a result of the relocation further from the road crossing. Lighting levels will need to be measured and addressed if below standard.	
16.	Proposed UP end ped crossing location may result in Insulated Rail Joints (IRJs) or axle counters being in close proximity to the pedestrian crossing. This may introduce increased opportunity for vandalism / horseplay, and may also compromise access for maintenance (e.g. for inspecting IRJ track circuit connections and welds)	
17.	Signal control boxes are in closer proximity to the pedestrian crossing, decreasing the distance between members of the public and Signal Maintenance Technicians while undertaking maintenance. (May increase risk of distraction, abuse to staff while undertaking maintenance activities)	
18.	The static timber gate locations close to LX equipment may restrict maintenance access (e.g. to LX mechanisms, boom arms, LED lights on the booms, flashing mast). May compromise maintainability	

19.	Accessibility for maintaining the UP end ped crossing gate motors (both ends) is limited. May compromise maintainability	
20.	Query as to who will be responsible for maintaining the heritage gates when installed (e.g. damage, graffiti)	
21.	A Traveller's Aid Buggy has been considered for use on the East/Up end pedestrian crossing but has not progressed in part due to risks associated with the buggy conflicting with passengers on the crossing. If this design proceeds, consideration to how this could be safely incorporated should be considered.	
22.	Additional lighting provided for the pedestrian crossings (particularly on the UP end) may interfere with viewing of the signal at the end of the platform (i.e. if lights are located behind the signal from the driver's perspective). Lighting placement would need to consider signal viewing.	
23.	The DOWN end pedestrian crossing might (in conjunction with the existing bluestone bridge and track curvature) impact sighting (e.g. of track and crossing) when approaching from the Ararat side. Appropriate line of sight will need to be ensured.	
24.	Likely increase in pedestrians bypassing the pedestrian crossing and crossing at the road instead may increase the likelihood of train to person collision, near hits, and associated trauma and stress to drivers.	

APPENDIX E:
RAILWAY CROSSING RISK REPORT

E

Nelson-Furnell
Level Crossing Risk Consultants
A.B.N. 64 617 862 405

Railway Crossing Risk Assessment Report

LYDIARD STREET BALLARAT NORTH

Report version 1.0 – Final

4th July 2023

Version	Release Date	Description	Author
0.1	13 Jun 2023	Initial Draft	Peter Nelson-Furnell
0.2	22 June 2023	Final Draft	Peter Nelson-Furnell
1.0	4 July 2023	Final	Peter Nelson-Furnell

BACKGROUND

The Lydiard Street railway crossing is located just to the east of the Ballarat Railway Station as shown in Figure 1.

Figure 1 Lydiard Street railway crossing as at 17/12/2021. Image courtesy of Google Earth.

The crossing was controlled by swing gates (pictured in Figure 2) from 1885. They were initially operated by a local signaller and later connected to CENTROL in Melbourne and operated remotely using CCTV to monitor crossing closure and vehicle clearance. Electronic interlocking provided advice on whether the gates were closed and locked.

Figure 2 Swing gates as operated in 2019

Figure 3 shows a satellite view of the gates in their open position (no train present as pictured in Figure 2) as they existed in January 2019.

Figure 3 Lydiard Street crossing layout as at 28/01/2019. Image courtesy of Google Earth

On 30 May 2020 a VLine VLocity rail car traveling down from Melbourne was unable to brake effectively on the approach to the Ballarat Station. It travelled through the station at high speed and crashed through the gates which were still closed, destroying both down-side gates. The gates had not begun to operate and there was almost no warning delivered to vehicle drivers as no crossing warning lights were present.

Lydiard Street was then closed and the remaining gates were ultimately removed for storage and replaced with modern flashing light and boom barrier controls. These are noted as being commissioned on 13 November 2021. Two of the four gates were destroyed in the collision. The remaining two have been preserved.

The pedestrian facilities at the crossing are modern automatic pedestrian gates with the emergency egress gates fitted with electromagnetic latches. These are located outside the closed road gates. The pedestrian crossings can be seen in Figure 3. This facility remains in place.

Given the historical significance of the swing gates there is a proposal to install replicas of the gates beside the crossing as shown in Figure 4.

The gates will interfere with or block the current pedestrian crossings as shown hashed red.

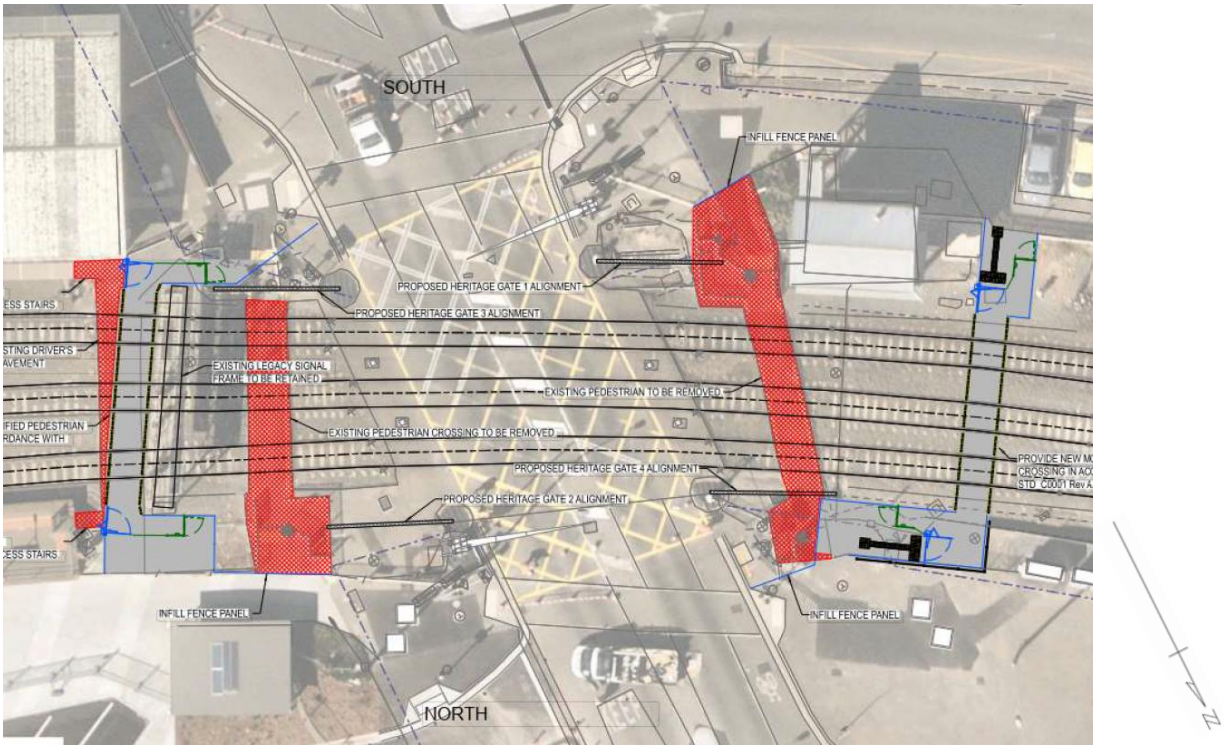


Figure 4 Proposed display installation of heritage gates.

It has been proposed that the pedestrian crossings are relocated to the positions shown shaded in blue. A driver's crossing located at the end of the platform is also shown as being removed.

A safety analysis of the pedestrian crossing relocation has been commissioned to determine the safety and public risk impacts of this proposal.

This report has employed an updated Australian Level Crossing Assessment Model (ALCAM) survey of the road and pedestrian crossings to quantify risk of collision based on the national model. It has also used the principals of the Austroads Guide to Road Safety Audit Part 6: Road Safety Audit Edition 6.0, particularly as they apply to pedestrian safety to take a systems view of pedestrian behaviour at the site.

EXECUTIVE SUMMARY

The upgrade to half boom barriers and flashing light controls at the road crossing has eliminated the hazard posed by the closed swing gates over the tracks being struck by trains as occurred in the 2020 collision. It also alleviates the danger of vehicles being trapped on the crossing by the manually operated gates.

The queue relocation system of traffic lights interlocked with the railway signals provides effective prevention of queuing over the crossing.

The road crossing is therefore considered to be safer with boom barriers than when the swing gates were in operation. Any reinstatement of these gates in an operational state would compromise safety.

The proposed relocation of the railway pedestrian crossings in order to display the heritage gates beside the road crossing will increase the distance and complexity of the pedestrian route. This is very likely to result in an increased number of pedestrians using the roadway to cross without the benefit of pedestrian controls.

People tend to follow paths which are as close as possible to their desire lines (where they wish to go). The proposed path arrangement, particularly on the down side pedestrian crossing, involves a significant departure from these desire lines.

The proposed pedestrian control design for the enclosure on the north side of the down path does not comply with Australian Standards and is likely to be confusing and hazardous to vision impaired pedestrians.

The relocation of the pedestrian crossings is not recommended as it will compromise pedestrian safety.

It is recommended that an alternative display location for the heritage gates be explored.

DESCRIPTIVE CONVENTIONS

The following descriptive conventions are used in this report:

Up and Down Track direction
The Up track direction is the direction from the crossing facing toward the origin of the rail network. For Victoria this is generally toward Melbourne. The Down track direction is facing away from the origin, or in the direction of increasing running distance.

Left and Right road or path approaches
The left or right side of the crossing is determined as viewed when standing at the crossing facing in the Up track direction.

Up and Down train traffic
An Up train is a train traveling in the Up direction, a Down train traveling in the Down direction. When describing train speed, for example, the Down train speed is the speed of trains approaching the crossing from the Up direction (the origin) and traveling down.

Active controls
Primary crossing controls which provide train activated flashing light warning of approaching trains.

Passive controls
Primary crossing controls which warn of the danger of trains but require vehicle drivers or pedestrians to view approaching trains and assess the risks of crossing.

AS1742-7
Australian Standard AS1742 part 7:2016 Manual of Uniform Traffic Control Devices is the standard which applies to public road and pedestrian crossings in Australia, describing (among other things) signage appearance and placement. It includes the definition of the requirements for sighting distances which are used in ALCAM surveys.

SSD Sighting (road crossings)
Stopping Sight Distance. The distance needed at any road crossing in order for the driver to see the crossing's controls and stop in time.

S2 Sighting (road crossings)
The approach sighting distance required at give way sign road controls for the driver to see a train while approaching the crossing in time to judge whether to stop and give way or continue through the crossing.

S3 Sighting (road crossings)
The sighting distance required at passively controlled road crossings in order for the driver to see trains when stopped at the stop bar in sufficient time to start the vehicle, cross and clear the crossing before it arrives.

Pedestrian Sighting Distance
Similar to S3 distance for road crossings.

The sighting distance required at passively controlled pedestrian crossings in order for pedestrians to see trains when standing at the pedestrian hold position and have sufficient time to cross the crossing safely before it arrives.

RIM
Under Rail Safety National Law a Rail Infrastructure Manager (RIM) is the rail organisation responsible for the management of the rail infrastructure (the track, signalling and communications systems and train control functions). The RIM at the crossings in this report is understood to be VLine.

SFAIRP
An acronym for "So Far As Is Reasonably Practical", a common term used in legislation related to the management of risk.

RAIL SAFETY NATIONAL LAW

Australian public railways are regulated under Rail Safety National Law. This Act provides for a national system of rail safety regulation. The core legislation is the Rail Safety National Law (South Australia) Act 2012 which is enacted in each state by enabling legislation. In Victoria this enabling legislation is the Rail Safety National Law Application Act 2013.

In respect to the management of risks at level crossings it is important to understand the obligations placed on both rail and road authorities by the Act. These obligations will be relevant to the recommendations in this report.

The following sections are extracted from the Rail Safety National Law (South Australia) Act 2012:

46—Management of risks

A duty imposed on a person under this Law to ensure, so far as is reasonably practicable, safety requires the person—

(a) to eliminate risks to safety so far as is reasonably practicable; and

(b) if it is not reasonably practicable to eliminate risks to safety, to minimise those risks so far as is reasonably practicable.

47—Meaning of reasonably practicable

In this Part—

reasonably practicable, in relation to a duty to ensure safety, means that which is (or was at a particular time) reasonably able to be done in relation to ensuring safety, taking into account and weighing up all relevant matters, including—

(a) the likelihood of the hazard or the risk concerned occurring; and

(b) the degree of harm that might result from the hazard or the risk; and

c) what the person concerned knows, or ought reasonably to know, about—

(i) the hazard or the risk; and

(ii) ways of eliminating or minimising the risk; and

(d) the availability and suitability of ways to eliminate or minimise the risk; and

e) after assessing the extent of the risk and the available ways of eliminating or minimising the risk—the cost associated with available ways of eliminating or minimising the risk (including whether the cost is grossly disproportionate to the risk).

107—Interface coordination—rail infrastructure and public roads

(1) A rail infrastructure manager must—

(a) identify and assess, so far as is reasonably practicable, risks to safety that may arise from railway operations carried out on or in relation to the manager's rail infrastructure because of, or partly because of—

(i) the existence of road infrastructure of a prescribed public road; or

(ii) the existence or use of any rail or road crossing that is part of the road infrastructure of a public road; and

(b) determine measures to manage, so far as is reasonably practicable, those risks; and

c) for the purpose of managing those risks—seek to enter into an interface agreement with the road manager of that road.

(2) The road manager of a public road must—

(a) identify and assess, so far as is reasonably practicable, risks to safety that may arise from the existence or use of any rail or road crossing that is part of the road infrastructure of the road because of, or partly because of—

(i) the existence of road infrastructure of a prescribed public road; or

(ii) the existence or use of any rail or road crossing that is part of the road infrastructure of a public road; and

(b) determine measures to manage, so far as is reasonably practicable, those risks; and

c) for the purpose of managing those risks—seek to enter into an interface agreement with the rail infrastructure manager of the rail infrastructure.

ALCAM

The Australian Level Crossing Assessment Model (ALCAM) is a system of risk modelling for railway crossings used across Australia and New Zealand.

The models describe the risk to human life posed by collisions between trains and motor vehicles or pedestrians.

ALCAM is widely accepted as a comprehensive risk identification tool which is used by rail and road organisations as part of risk assessment activities at level crossings as required in Australia under Rail Safety National Law.

There are two ALCAM risk models. The ALCAM Road Model is used to model risks at road crossings with the ALCAM Pedestrian Model covering the risks of pedestrian collisions with trains at crossings

ALCAM ROAD MODEL

The ALCAM Road Model is applied to road crossing risk. It describes Risk as the product of Likelihood of a level crossing collision and the Consequence of a collision should it occur.

While there are other costs and consequences to level crossing collisions such as damage to railway rolling stock or motor vehicles, as a personal risk model ALCAM only takes into account human consequences of level crossing collisions.

Likelihood is expressed as the probable number of collisions per year while Consequence is the likely number of fatalities (or equivalent fatalities) per collision.

Risk is therefore the likely number of equivalent fatalities per year.

Likelihood can be inverted to show a return period - the probable number of years between collisions. Risk can also be inverted to show the probable number of years between fatalities. This can give a more easily understood number, similar to the familiar "1 in 100 year flood".

This Road Model calculates Likelihood of collision by considering the exposure to train and road traffic, the type of controls present as well as the local characteristics and environment of the site which can influence driver behaviours and likely causes of error.

Local risk factors are modelled within the Raw Infrastructure Model. Raw infrastructure points are allocated to crossing characteristics with those scoring higher being those which are more likely to contribute to collisions. These can be used to analyse the nature of risk at the crossing and identify treatments which are likely to be most effective in reducing risk.

Collision consequence is calculated based on factors which may lead to loss of life. These include train and vehicle speed, the number of passengers on trains, the likelihood of heavy vehicles being involved and the presence of obstacles or trackwork which may cause secondary collisions or overturned trains.

ALCAM PEDESTRIAN MODEL

The ALCAM Pedestrian Model is structured around pedestrian risk. Like the ALCAM Road Model it has a Raw Infrastructure component which considers the crossing's characteristics (such as proximity to risk inducing features such as stations and schools, the proportion of various high risk pedestrian groups and pedestrian sighting distances to trains). The structure and presence of the range of pedestrian controls such as warnings, fencing etc. is also considered as risk mitigations from which an Infrastructure Score is derived.

Exposure (the number of trains and number of pedestrian users) is combined with the Infrastructure Score to derive a likelihood of collision.

Consequence is deemed to be a constant as pedestrian fatalities in the event of a collision are less predictable from site to site than for road collisions.

The ALCAM Pedestrian Model produces an un-dimensioned risk score rather than a probability of collision and fatality. While this score has no units it can be used to compare and rank crossings and to determine the relative risk benefits of changes to site conditions or controls.

RISK AND LIKELIHOOD BANDS

The ALCAM models do not specify limits as to when a crossing might be considered as “unsafe” and requiring action or “safe enough”. Any railway crossing has risks and even crossings with a low overall model score may still have attributes which in themselves require attention and may lead to collisions and fatalities.

The ALCAM model scoring therefore is a rating of risk which can be compared to that of other crossings or used to analyse a range of risks at the site, but does not give a pass/fail indication.

To assist users of the data to understand whether a score is high or low a range of Bands are provided as part of the ALCAM outputs. These bands compare the score to that of the population of other crossings divided into 5 equal bands as follows:

High	Within the highest 20% of crossings
Medium High	Between the highest 20% and 40% of crossings
Medium	Within the median 20% of crossings
Medium Low	Between the lowest 20% and 40% of crossings
Low	Within the lowest 20% of crossings

Different bands are provided as follows:

1. By both Likelihood and Risk score;

2. Compared against crossings of the particular class of control present (eg. a stop sign controlled crossing will be compared against other stop sign controlled crossings) or against crossings of any control;

3. Compered against crossings in the jurisdiction they are within (eg. all crossings in Victoria) or with all crossings in the ALCAM data set (Australia and New Zealand).

Comparing the different bands can give insights into how the different components of the score vary. A high Likelihood Band but a low Risk Band, for example would show that the site and its traffic pose many risk factors to collision which are greater than most crossings but that the consequence is relatively low if a collision occurs due to slow trains or no passengers etc.

LX2214 LYDIARD ST, BALLARAT (A1189)

113.923km BALLARAT - MARYBOROUGH - YELTA line

Figure 5 Road Crossing Overview

Location (lat/long): -37.5581166666667, 143.858477777778 Click here to view in Google Maps

Primary controls: Half Boom Flashing Lights - (duplicated)

Rail Infrastructure Manager: VLine

Road Manager: Ballarat City Council

ALCAM ROAD MODEL OUTPUTS FOR THIS CROSSING

Likelihood

Exposure Factor: 0.02562

Raw Infrastructure Factor: 45

Infrastructure Factor: 0.92551

Likelihood Factor

0.02393 probable collisions per year (42 years between collisions).

Within Victoria this places the site in the High Likelihood Band for all crossings and in the High Likelihood band for crossings with Boom Barrier type controls.

Across all public crossings in the ALCAM system the site is in the High Likelihood Band for crossings of all control types and in the High Likelihood band for crossings with Boom Barrier controls.

Consequence

Consequence Factor is 0.03405 probable equivalent fatalities per collision

Risk

Risk Factor is 0.000815 probable equivalent fatalities per year (1,227 years between fatalities).

Within Victoria this places the site in the Medium Risk Band for all crossings and in the Medium Low Risk Band for crossings with Boom Barrier type controls.

Across all public crossings in the ALCAM system the site is in the Medium Risk Band for crossings of all control types and in the Medium Low Risk Band for crossings with Boom Barrier controls.

TRAFFIC SUMMARY

Average Daily Rail Traffic: 61.16

Average Daily Road Traffic: 6,240.0

Percentage of Heavy Vehicles: 4%

Last ALCAM Survey: 5/06/2023

TRAFFIC DETAIL

Highest Train Speeds

Up Direction: 80kph

Down Direction: 80kph

Types of trains using the crossing

PASSENGER and FREIGHT

Road Vehicle Speeds

Signposted: 60kph

Measured 85th percentile Vehicle Operating Speed - Left Approach: 57kph

Measured 85th percentile Vehicle Operating Speed - Right Approach: 48kph

Largest Road Vehicle Classes using the crossing

Level 1 - Semi Trailer

RISKY CHARACTERISTICS

The following characteristics of the crossing have been identified as adding to the risk of collision.

Longest approach warning time

Rated as 3, 11 Raw Infrastructure Points

The warning time for the active controls at this crossing has been assessed as longer than the standard design duration. Trains which stop at the station activate the road crossing with the boom barriers staying down while passengers alight and leave the train.

When the crossing is closed for longer periods there is a greater chance that drivers will cross against the controls, believing them to be faulty or that the train is slow or not coming. This can lead to misjudgement with the vehicle being caught on the crossing.

Long ring times are usually related to abnormal train operations in combination with the design of train detection and signalling systems. Passenger stations may be located within the detection circuit so the crossing rings while passengers are disembarking, or trains may be slower than the design speed, forcing the controls to be active longer than designed.

Longest train length (typical)

Rated as 3, 8 Raw Infrastructure Points

As freight trains use this line the train length is longer with trains taking some time to pass over the crossing, delaying vehicles for some time.

This may lead some drivers who have been delayed by the trains before to wish to get over the crossing before the train by racing it and disobeying the controls.

This can lead to misjudgements and collisions.

Slowest train speed at crossing (typical)

Rated as 3, 8 Raw Infrastructure Points

The speed of the slowest trains using this crossing has been identified as being low. This means that if active warning is provided it is likely to be excessive for slow trains. Vehicle drivers may believe that they can easily cross in front of the train as they have experienced long delays in the past.

This complacency may lead to drivers misjudging the risk of the train, leading to collisions.

Proximity to station

Rated as 5, 6 Raw Infrastructure Points

This crossing is located close to a passenger platform. This can have an effect on the consequence of a collision where a vehicle can be pushed along the track and crushed against the platform by the train.

Being close to a station can also imply that the driver may be in a hurry to catch a train and willing to disobey controls and race across ahead of trains, or may be subject to distraction and train sighting impediments caused by people waiting on the platform.

The ALCAM Road Rating report for this crossing produced by the ALCAM system is included within Appendix A.

FLAGS

Some particular risk factors at a site require consideration regardless of the overall ALCAM risk score. These are indicated by ALCAM as Flags. The following flags have been identified at this site:

Multiple Tracks

More than one operational track makes vehicle driver decision-making more complex, possibly leading to errors.

3 Tracks

ASSESSMENT SUMMARY

Background risks

The following risks and countermeasures relate to this site regardless of the road crossing gate controls used. They generally apply whether the crossing is controlled by swing gates or the current automatic gates.

Train Properties
The crossing site has a number of characteristics which make it high risk.

The high train frequency means the road crossing is often closed. It closes for an extended period of time when trains stand in the station.

The number of operational tracks and variable train speeds induced by the close proximity of the station mean that some trains stop while others do not and trains can arrive on different tracks. Train speeds and behaviours are not predictable which may confuse drivers.

Trains may also be of different lengths as both passenger and freight trains run through the crossing.

These properties may lead drivers to make mistakes when anticipating train behaviour which may lead to collisions.

Queue Relocation system
The controls at the crossing which include road traffic signals interfaced with level crossing train detection and warnings are well designed. An effective queue relocation system provides traffic lights which act in advance of the level crossing gates to stop vehicles before they queue onto the crossing when the train is approaching. These controls are shown in Figure 6.

Controls visible from all approaches
Duplicated flashing light controls are currently placed on all quadrants of the crossing so that drivers of vehicles approaching from the various side roads are able to clearly see them.

When the swing gates were present this control coverage was performed by road traffic signals aimed at approaching motorists. The railway signals give a clearer indication that the vehicles must stop for an approaching train rather than just a rotation of the traffic light sequence.

Risks which vary between current and former controls

Four Quadrant Gates
Gates which block the entry and exit to road crossings are called Four Quadrant Gates as they enclose the whole crossing, preventing entry on both sides of the road. They also can block the exit of a car from on the crossing, trapping it. Such gate systems are rare in Australia and generally are used with CCTV monitoring by train controllers to ensure that the crossing is clear before allowing a train to pass through the crossing. Such a system was employed at Lydiard Street to control the swing gates.

Half boom crossings such as the current controls at Lydiard Street block only the entry lanes to the crossing, allowing a vehicle which is on the crossing when the gates come down to simply drive off the tracks.

The operation of the swing gates at this crossing required manual operation and CCTV monitoring to ensure vehicles were not trapped. This will have considerably increased the time the gates were closed for each train.

The strength of the large wooden gates which blocked the path of the train when open may be perceived as offering protection for motor vehicles on the crossing, but at the time of the 2020 collision were in fact shown to be actively hazardous when the train burst through them, scattering debris into the surrounding area.

The automatic crossing now present activates the gates when trains approach without the need for manual intervention. Signalling has been modified to ensure that the gates close for any train regardless of speed.

It is suggested that the road crossing is now better controlled and safer than it was with the swing gates.

Figure 6 Road controls (northern approach)

ALCAM PEDESTRIAN MODEL OUTPUTS FOR PEDESTRIAN CROSSINGS

The arrangement of the pedestrian crossings has not been modified since prior to the 2020 collision. The automatic gated controls provide an open and unobstructed path across the tracks which does not require pedestrians to navigate any kind of maze obstruction. This is shown in Figure 7.

Emergency egress areas provide a safe place for pedestrians to go if the gates start to operate while they are on the crossing. The escape gates allowing egress from these areas are fitted with electromagnetic latches which prevent them from being opened from the outside so that they cannot be used to bypass the closed gates. The gate mechanism is shown in Figure 8.

Figure 7 Open path through the pedestrian crossing

Figure 8 Emergency egress gate latch release

The ALCAM model takes into account such things as the proximity to the station and therefore the likelihood of pedestrians rushing to catch trains. The scoring for the two pedestrian crossings is shown below. The up side crossing closest to the station has a higher risk score due to such factors.

UP SIDE

Likelihood

Infrastructure Factor: 37

Exposure Factor: 30,580

Risk Factor: 1,124,089

Within Victoria this places the site in the Medium High Risk Band for all crossings and in the Medium Risk Band for crossings with Train Activated Gates type controls.

Across all public crossings in the ALCAM system the site is in the Medium High Risk Band for crossings of all control types and in the Medium Risk Band for crossings with Train Activated Gates controls.

DOWN SIDE

Likelihood

Infrastructure Factor: 35

Exposure Factor: 30,580

Risk Factor: 1,083,350

Within Victoria this places the site in the Medium High Risk Band for all crossings and in the Medium Risk Band for crossings with Train Activated Gates type controls.

Across all public crossings in the ALCAM system the site is in the Medium High Risk Band for crossings of all control types and in the Medium Risk Band for crossings with Train Activated Gates controls.

TRAFFIC SUMMARY

Average Daily Rail Traffic: 61.16

Up Side Pedestrian Crossing:

Average Daily Pedestrian Traffic: 500.0

Peak Hourly Pedestrian Volume: 50

Down Side Pedestrian Crossing:

Average Daily Pedestrian Traffic: 500.0

Peak Hourly Pedestrian Volume: 20

RATING SUMMARY

The existing pedestrian crossings have the highest available level of pedestrian control and is considered to be as safe as is reasonably practical.

PROPOSED CHANGES RELATED TO THE INSTALLATION OF GATE DISPLAY

The pedestrian crossings at this site have not been modified since prior to the collision. Their risks have not changed and no comparative analysis is necessary.

The relocation of the pedestrian crossings is proposed in order to anchor gates to posts in the original positions but display the gates opening outwards along the track.

It must be remembered that any level crossing, including the original swing gate arrangement at Lydiard Street shown in Figure 9, leaves a large roadway opening through which it is possible for pedestrians to walk.

In the CCTV footage of the 2020 collision a group of people are shown crossing along the roadway approximately 40 seconds before the train crashes through the gates. This group used the roadway rather than the open pedestrian gates and path because their desired path was diagonally across the crossing.

Figure 9 Original Lydiard Street gate and roadway arrangement.

The paths which pedestrians take follows their desire line. This will be the most direct, quickest or easiest route to their destination.

Most people will follow an indirect route if they are directed to by signage or fencing, or because it is formally designated and well made. At these pedestrian crossings there is CCTV monitoring and guide fencing showing the correct pedestrian path and the route is visible.

For a proportion of the population, however, the further out of their desired path they must walk the more likely they are to consider a more direct route even if it means walking on a roadway without any warning of trains.

In the case of Lydiard Street the roadway surface is good and road traffic in a large proportion of the day is light enough that crossing on the roadside may be perceived by pedestrians as not being particularly hazardous.

The current pedestrian crossings with their automatic gates provide a direct open path beside the road which is no more inconvenient than walking on the roadside. It is therefore generally well used by most pedestrians.

Figure 10 compares the designated routes (shown in green) with the informal routes on the roadway (shown in red). It can be seen that there is no significant distance saving in using the roadway.

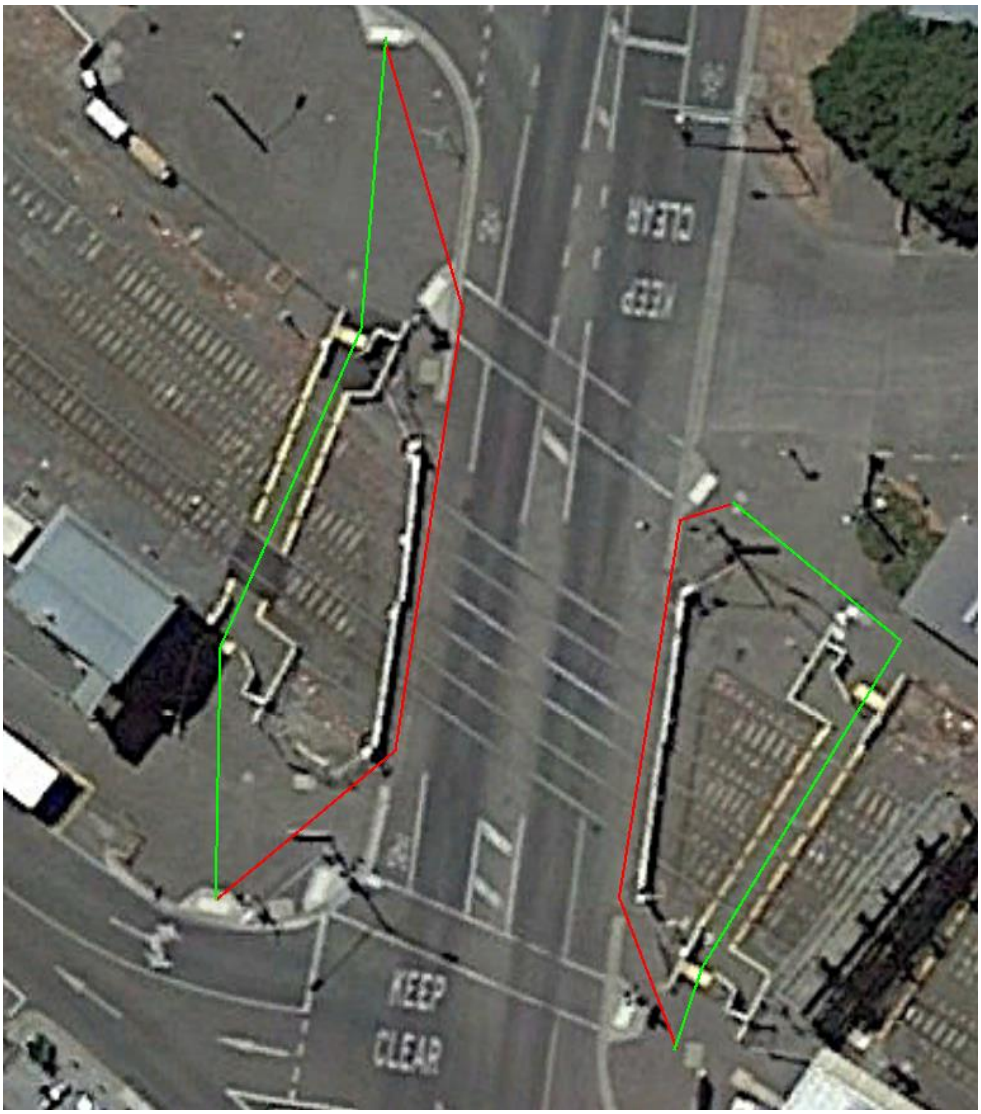


Figure 10 Existing pedestrian routes

ALCAM Model risk score impacts

The ALCAM pedestrian model does not currently analyse how far the crossing route varies from the most direct path (the desire line). Provided that a relocated crossing has the same path distance and is built to the same standard the score will not change. The Model is therefore not suitable to compare or quantify risk increases between the existing and proposed alignments.

Analysis of the specific elements which may cause risk is a more effective tool to determine the risk impacts of the proposed pedestrian crossing relocations.

UP SIDE PEDESTRIAN CROSSING

The proposed changes to the crossing on the up side of the road (toward the station) is shown in Figure 11.

It uses the route currently occupied by the driver's pathway shown in Figure 12.

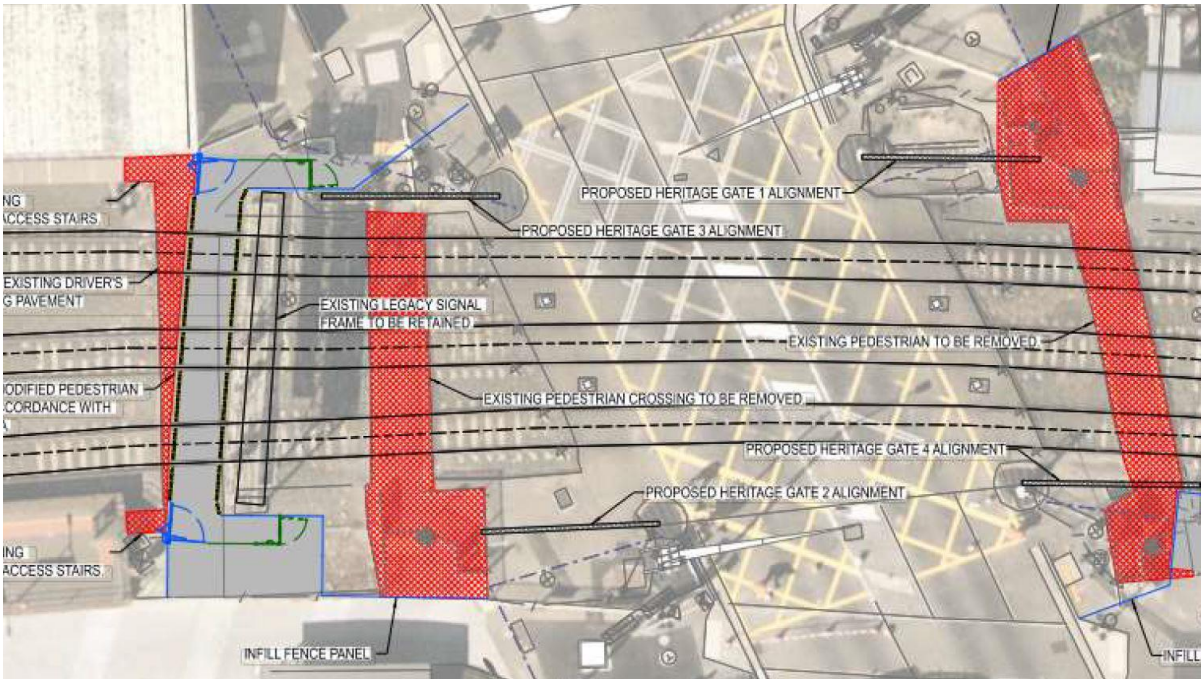


Figure 11 Up side proposed pedestrian crossing relocation

Figure 12 View across proposed Up side pedestrian route looking North

The crossing does not currently cross the tracks parallel to the roadway as it is designed to be relatively square with the tracks as required by the level crossing provisions of AS1742-7. This principal is also followed by the proposed design.

The access point on the southern side of the up (station side) pedestrian crossing is shown in Figure 13. The proposed new entrance will be between the gantry (seen above the wall to the right) and the end of the station platform. The heritage gate will stand across the space currently occupied by the pedestrian crossing fencing.

This entrance will be less visible and intuitive and will involve approximately an additional 22m of walking distance, exiting further into the station car park area.

Pedestrians who simply wish to walk along the eastern side of Lydiard Street may have difficulty in finding the crossing and will be more likely to use the roadway.

Figure 13 Access path to the existing Up side pedestrian crossing

DOWN SIDE PEDESTRIAN CROSSING

The proposed down side route is shown in Figure 14. This is an even more significant deviation, constrained by the heritage signal cabin.

The route involves an additional 25m of walking distance which includes traveling some 20m west down Ararat Street. Again, finding the entrance to the crossing is likely to be difficult and a percentage of pedestrians who simply wish to travel along Lydiard St will consider using the roadway.

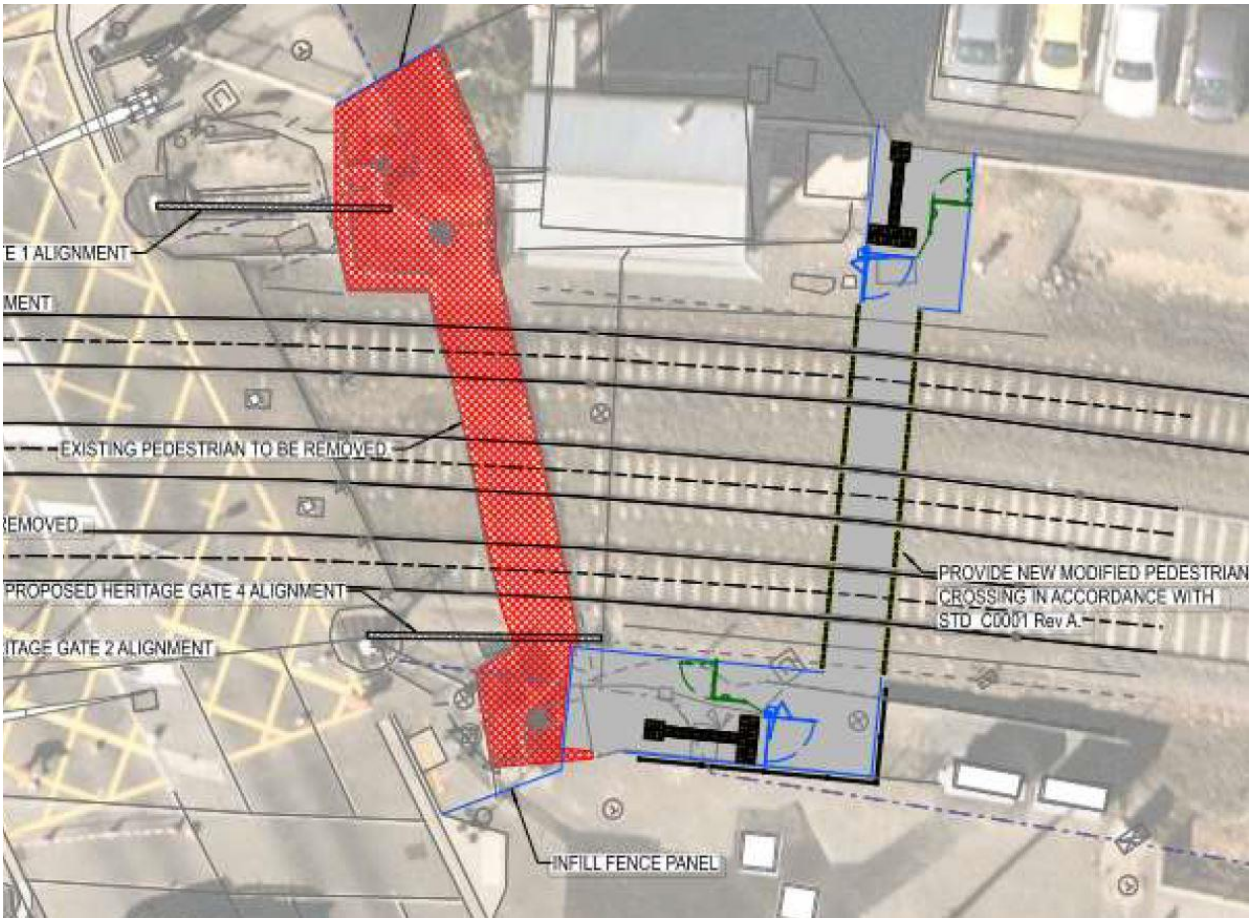


Figure 14 Down Side pedestrian crossing proposed relocation

The proposed location of the down side path looking toward the north western quadrant (the lower part of the Figure 14 view) is shown in Figure 15. The pedestrian fencing will occupy part of the sleeper retaining wall supporting the signal location boxes.

It can be seen that the ground rises quite steeply from the track up to the street footpath on this quadrant which is approximately 1m above track level. The design of the proposed path seems to be intended to keep the entire maze control area level and connect back to the existing crossing enclosure.

Figure 15 View of proposed down side path location

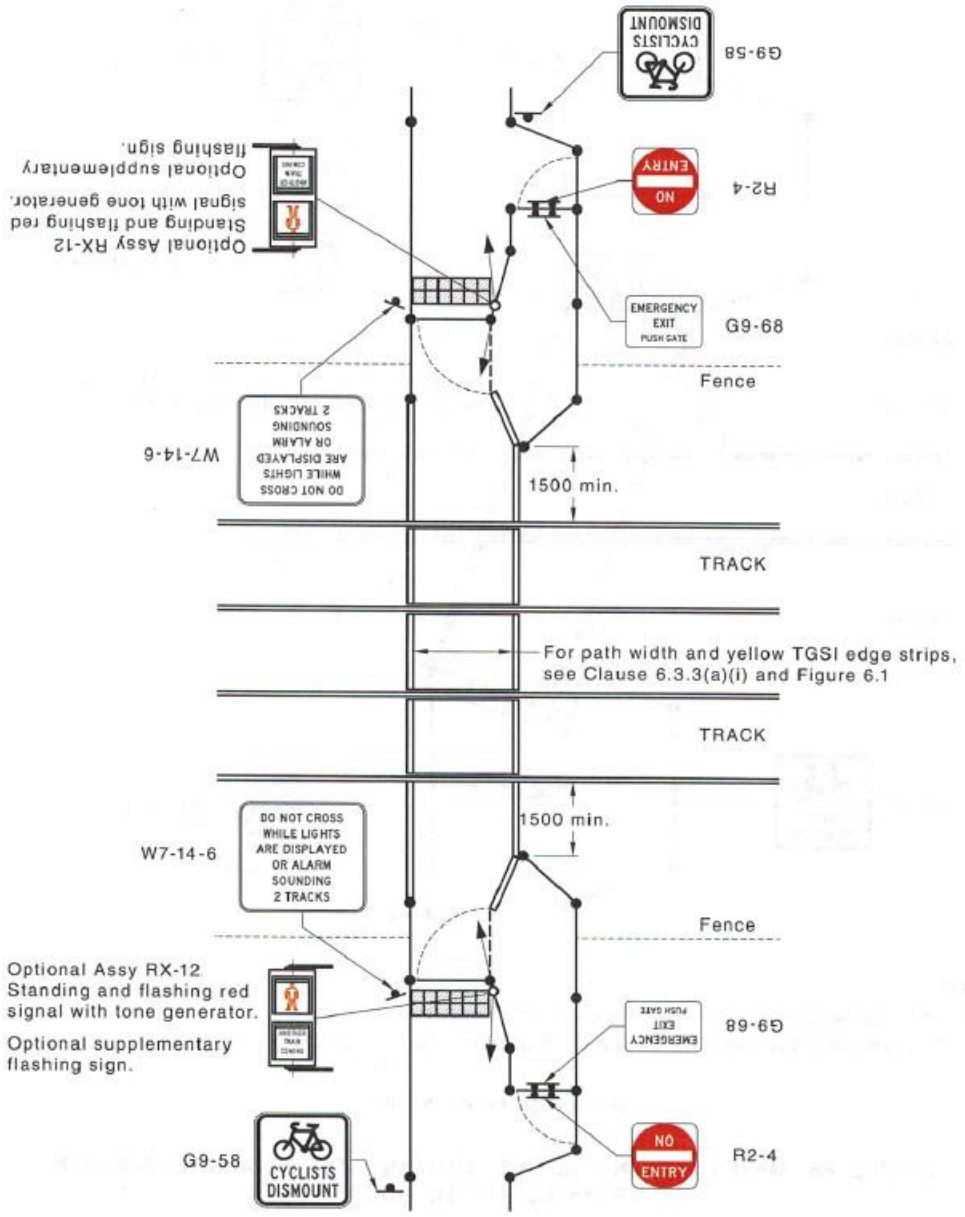
It can also be seen in Figure 15 that there is very little space between the track and the higher ground of the car parking area. This limits the area where a pedestrian control can be built.

This has led to the controls being designed so that the holding line faces west in the same direction as the track rather than facing the track. Pedestrians traveling north to south over this crossing will wait with their backs to trains coming from the station, walk through the gate then turn toward the track.

Figure 16 shows the typical design for an active pedestrian crossing from AS1742-7. The configuration of pedestrian emergency escape areas and exits varies from site to site depending on how they must interface with paths and nearby facilities. The common principle, however, is that the hold line faces the track.

Section 6.4 (a) of AS1742-7 indicates that the pedestrian hold line must be located immediately before the start of the section of footpath across the track. This is not the case under this design. Visually impaired pedestrians in particular will be confused by this layout and are likely to walk into the fence of the enclosure. Any TGSI guidance and hold lines which are used to assist them to turn toward the track would be inside the gate, which may lead them to be trapped if a train activates the crossing as they negotiate the control.

It is therefore suggested that this design does not conform to the Standard and is also unsafe.



NOTE: Requirements for the use of the CYCLISTS DISMOUNT sign are specified in Clause 6.5.4.

DIMENSIONS IN MILLIMETRES

Figure 16 AS1742 part 7 illustration of typical active pedestrian crossing

CONCLUSION

The various pedestrian routes are shown in Figure 17 with the proposed modified path route shown in yellow. It can be seen that these routes are significantly longer than the current path, particularly for the down side.

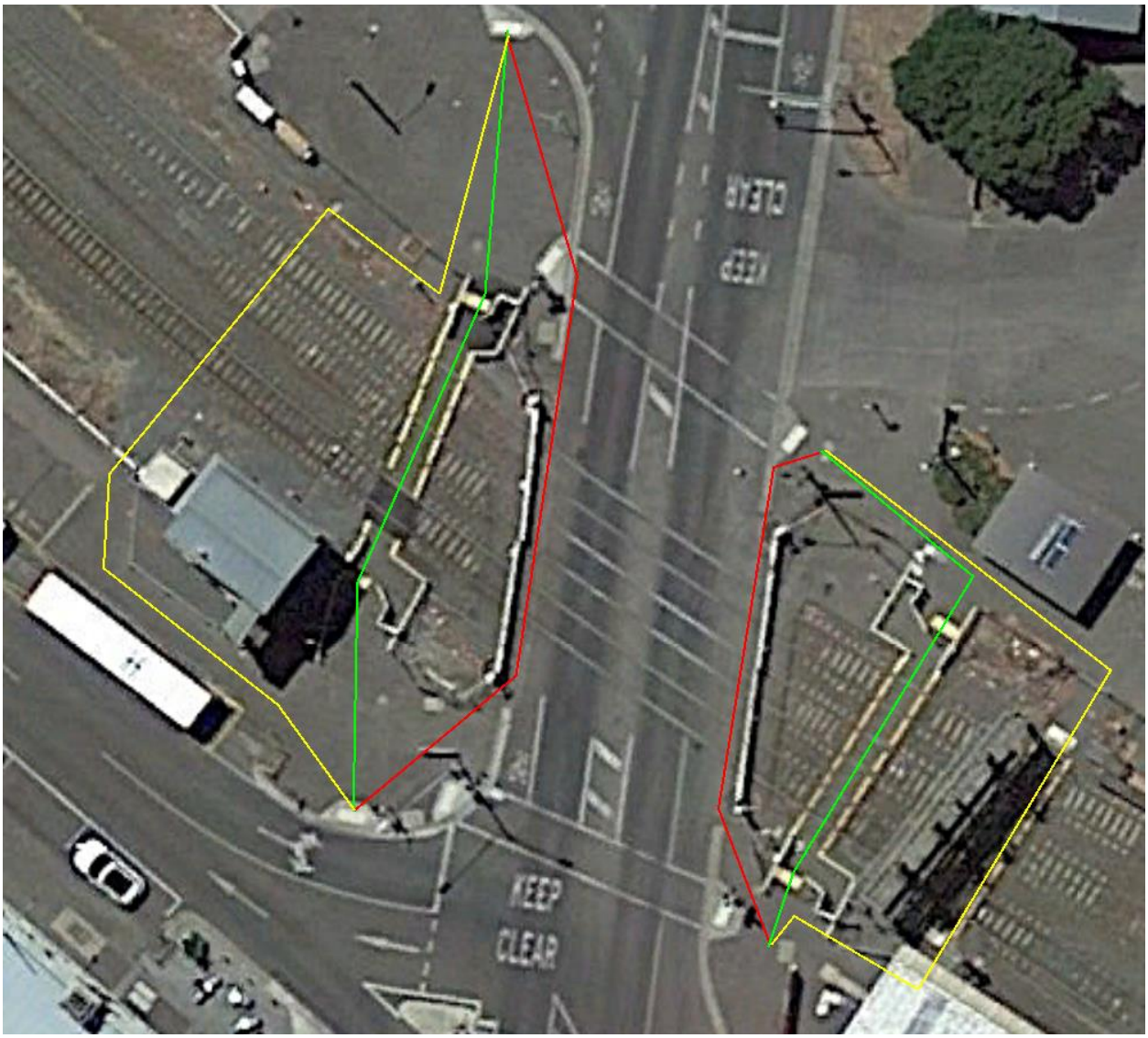


Figure 17 Comparison of pedestrian routes

Relocating the pedestrian facilities at this site as proposed will compromise the safety of this crossing by prompting a significant increase in the number of pedestrians using the road to bypass the automatic gated paths.

Increasing the travel distance will dissuade some pedestrians, while others will be confused by having their route blocked by the large static heritage gates and needing to search for the path entrance.

The configuration of the crossing also does not meet the Standard.

The heritage value of the gates and the desire to have them visible is understood, but it is suggested that a display location which does not reduce the safety and amenity of the pedestrian crossings be found.

The primary consideration of any option must be that it does not compromise the safety of users of the crossing.

THE AUTHOR

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Peter is the developer of the ALCAM LXM database system and former chair of the national ALCAM committee.

He is a key knowledge holder on the ALCAM models and systems and has been directly involved in advising and leading the ALCAM program since 2004.

Nelson-Furnell Pty Ltd provides expert consulting, field survey services and training for the ALCAM community, including stakeholder rail and road organisations such as DPT Victoria, and to government and other bodies concerned with level crossing risk.

APPENDIX A - ALCAM RATING REPORTS

The full rating detail as produced by the ALCAM risk models and used in this report is included below.

Characteristics	*Condition*	*Points*	*Score*	*% of total*
CONTROL DETAILS				
11. Effectiveness of equipment inspection and maintenance	Good	0	0	0%
12. Longest approach warning time	30 to 45 secs	3	11	28%
ROAD GEOMETRY				
21. Proximity to intersection/control point	>200m	0	0	0%
22. Proximity to siding/shunting yard	>200m	0	0	0%
23. Proximity to station	<50m	5	6	15%
24. Possibility of short stacking	Low	0	0	0%
25. Number of lanes (number of lines of traffic)	1 lane(s)	0	0	0%
26. Vulnerability to road user fatigue	Low	0	0	0%
ROAD TRAFFIC CONTROL				
31. Presence of adjacent distractions	Low	0	0	0%
32. Condition of traffic control at crossing	Good	0	0	0%
33. Visibility of traffic control at crossing	Good	0	0	0%
34. Distance from advance warning to crossing	Good	0	0	0%
35. Conformance with AS 1742.7 and NZTA Part 9	Yes	0	0	0%
36. Likelihood of vandalism to controls	Low	0	0	0%
ROAD VEHICLES				
41. Heavy vehicle proportion	<5%	0	0	0%
42. Level of service (vehicle congestion)	Lvl E - Close to Capacity	4	4	10%
43. Queueing from adjacent intersections	None	0	0	0%
44. Road traffic speed (85th percentile vehicle speed)	<=60 kph	0	0	0%
RAIL VEHICLES				
51. Seasonal/Infrequent train patterns	Regular trains	0	0	0%
52. Slowest train speed at crossing (typical)	20 to <40 kph	3	8	21%
53. Longest train length (typical)	>300 to 1000m	3	8	21%
54. High train speed	>60 to 80 kph	1	0	0%
CROSSING GEOMETRY				
61. Number of operational rail tracks	>2 tracks	5	2	5%
62. Road surface on approach/departure (not Xing panel)	Good	0	0	0%
63. Is the crossing on a hump, dip or rough surface?	No	0	0	0%
VISIBILITY				
71. SSD - advance visibility of crossing from road	>100%	0	0	0%
72. S2 - approach visibility to train (vehicle approaching crossing)	<50%	5	0	0%
73. S3 - visibility to train (vehicle stopped at crossing)	<50%	5	0	0%
74. Possible sun glare sighting crossing on road approach	No sunglare	0	0	0%
75. Possible sun glare sighting train	No sunglare	0	0	0%
76. Temporary visual impediments - sighting of crossing	No	0	0	0%
77. Temporary visual impediments - sighting of train	No	0	0	0%
			39	

Controls

Controls at Crossing	Half Boom Flashing Lights - (duplicated)
Additional Crossing Controls	Bells/Audible Warning Devices
Additional Crossing Controls	"Keep Tracks Clear" signs and yellow box marking
Additional Crossing Controls	Backing Boards / LED Lights
Additional Crossing Controls	R6_25 / NZ WX-62 Signage (confederate flag)
Additional Crossing Controls	Overhead Mounted (mast arm) Traffic Control
Additional Crossing Controls	RX-9 Railway Crossing Width Marker Assembly
Advance Warning	SINGLE Standard Advance Warning (W7-4, W7-7, NZ WX1 OR NZ WX3)
Train Related	Whistle board / location board for train
Crossing Environment	Street lighting at crossing
Crossing Environment	Maintenance programme for vegetation etc (Road)
Signalling / Detection Systems	Healthy state monitoring
Signalling / Detection Systems	Queue relocation

Crossing Volume (AADT) Road: 6240 Rail: 61.16

Outputs

Raw Infrastructure Factor:	**39**		
Infrastructure Factor:	**0.92551**		
Exposure Factor:	**0.02562**		
Likelihood Factor:	**0.02371**	Years Between Collisions:	**42**
Consequence Factor:	**0.02307**		
Risk Score:	**0.00055**	Years Between Fatalities:	**1828**

Risk / Likelihood Bands

Across Control Classes

Risk Band All:	**Medium**	Likelihood Band All:	**High**
Risk Band Jurisdiction:	**Medium**	Likelihood Band Jurisdiction:	**High**

Within Boom Barrier Control Class

Risk Band All:	**Medium Low**	Likelihood Band All:	**High**
Risk Band Jurisdiction:	**Medium Low**	Likelihood Band Jurisdiction :	**High**

Flags:

Multiple Tracks

Mechanisms

UNABLE TO AVOID	
Unable to stop in time	0
Stuck on tracks	0
Stopped on tracks	3
UNAWARE	
Distracted	0
Could not see control	0
Could not see train from road approach (S2)	0
Could not see train from at crossing (S3)	0
Assumes train will stop	0
Does not expect second train	0
Finds crossing protection is ambiguous	0
Is fatigued	0
Mislead by Controls	0
UNWILLING TO RECOGNISE	
Queued on tracks	0
Overhangs on tracks	0
Racing train or misjudged train speed	2
Driving through passive warning without looking	0
Driving through flashing lights	0
Driving around boom gates	34
	39

Characteristics	*Condition*	*Points*	*Score*	*% of total*
CONTROL DETAILS				
11. Effectiveness of equipment inspection and maintenance	High	0	0	0%
12. Shortest approach warning time from start of flashing lights to train	20 to 28 secs	3	1	3%
13. Longest approach warning time from start of flashing lights to train	>28 secs	5	0	0%
ADJACENT ACTIVITY				
21. Presence of adjacent distractions (visual)	Few	0	0	0%
22. Proximity to passenger station	<100m	5	1	3%
23. Proximity to siding / shunting yard	<100m	5	0	0%
24. Proximity to licensed / special event venue (eg. pub, club, sports	<100m	5	2	6%
25. Proximity to school playground or aged facilities	>500m	0	0	0%
26. Ambient noise level / audibility of alarm	Low	0	0	0%
27. Adjacent road traffic activity	Busy	5	0	0%
PEDESTRIAN TRAFFIC CONTROL				
31. Conspicuity of pedestrian control	Good	0	0	0%
32. Visibility of pedestrian control	Good	0	0	0%
33. Likelihood of vandalism to control	No History	0	0	0%
PEDESTRIAN TRAFFIC				
41. Volume of pedestrians (peak flow)	>20 to 50 pedestrians per hour	3	3	8%
42. Type of pedestrians (children)	Low Risk	0	0	0%
43. Type of pedestrians (physically disabled)	Low Risk	0	0	0%
44. Type of pedestrians (sensory disabled)	Low Risk	0	0	0%
45. Type of pedestrians (intellectually disabled)	Low Risk	0	0	0%
46. Type of pedestrians (cyclists, wheelchairs, prams etc)	Low Risk	0	0	0%
47. Type of pedestrians elderly	Medium Risk	3	11	31%
RAIL VEHICLES				
51. Train volume (high is bad) (if high then greater probability of	>60 trains per day	5	0	0%
52. Infrequent / seasonal movements / special trains	Low	0	0	0%
53. Highest train speed at crossing (typical)	>60 to 80 kph	1	0	0%
54. Longest train length (typical)	>300 to 1000m	3	0	0%
CROSSING GEOMETRY				
61. Number of operational rail tracks (including sidings)	>2 tracks	5	3	8%
62. Angle of crossing & condition / width of flange gap	70-90deg	0	0	0%
63. Condition of crossing (fencing/path surface etc)	Good	0	0	0%
64. Freight trains stand across crossing	Rarely	0	0	0%
65. Gradients, widths and manoeuvring space of pathway/maze	Does not meet DDA	5	15	42%
66. Change of path alignment between pedestrian maze and track	Adequate	0	0	0%
67. Crossing to Australian/NZ Standards (signage & path marking)	Fully meets AS	0	0	0%
VISIBILITY				
71. Visibility from crossing to train (from pedestrian holding point)	<50%	5	0	0%
72. Sun glare issues at crossing	No	0	0	0%
73. Temporary visual impediments	No	0	0	0%
74. Masking of trains (moving or stationary) timetabling etc	Rarely	0	0	0%

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Controls

Physical Controls	Automatic Gates
Audio Visual Controls	Signs only
Audio Visual Controls	Unmarked crossing
Adjacent Controls	Adjacent boom gates and audio
Emergency Egress	With latch (including holding enclosure)
Pedestrian Signage / Path Marking	Tactile ground surface indicators
Crossing Environment	Path lighting at crossing
Crossing Environment	Maintenance of vegetation
Crossing Environment	Whistle boards
Crossing Environment	Wing/funnel/guide fencing
Crossing Environment	Adjacent corridor fencing
Operational	Train lights

Crossing Volume (AADT) Pedestrian: 500 Rail: 61.16

Outputs

Infrastructure Factor: **36.75897**

Exposure Factor: **30,580**

Risk Score: **1,124,089**

Risk Bands

Across Control Classes		**Within Train Activated Gates Control Class**	
Risk Band All:	**Medium High**	Risk Band All:	**Medium**
Risk Band Jurisdiction:	**Medium High**	Risk Band Jurisdiction:	**Medium**

Mechanisms

UNABLE TO AVOID

Unable to stop in time, late recognition of danger	0
Caught in tracks (stuck, slip, trip, fall)	15
Unable to cross quickly enough	13
Trapped by controls (if no gates then all values are zero)	3
Unable to determine the orientation of the crossing	0

UNAWARE

Distracted	0
Did not see train or visual warning signals	0
Did not hear train or audio warning signals	0
Has limited capacity to recognise danger and react	0
Under the influence of alcohol	1
Does not recognise crossing	0
Does not expect second train	0
Assumes train would stop	0
Misjudges train speed	0
Does not expect train	0
Does not expect train movement(s)	0
Mislead by infrastructure	1
Mislead by controls	0

UNWILLING TO RECOGNISE

Deliberately ignored control	1
Bypassing active control	1
Crawling under wagons (if no trains stopping then all values are zero)	0
Skylarking	1

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Characteristics	*Condition*	*Points*	*Score*	*% of total*
CONTROL DETAILS				
11. Effectiveness of equipment inspection and maintenance	High	0	0	0%
12. Shortest approach warning time from start of flashing lights to train	20 to 28 secs	3	1	3%
13. Longest approach warning time from start of flashing lights to train	>28 secs	5	0	0%
ADJACENT ACTIVITY				
21. Presence of adjacent distractions (visual)	Few	0	0	0%
22. Proximity to passenger station	<100m	5	1	3%
23. Proximity to siding / shunting yard	<100m	5	0	0%
24. Proximity to licensed / special event venue (eg. pub, club, sports	<100m	5	2	6%
25. Proximity to school playground or aged facilities	>500m	0	0	0%
26. Ambient noise level / audibility of alarm	Low	0	0	0%
27. Adjacent road traffic activity	Busy	5	0	0%
PEDESTRIAN TRAFFIC CONTROL				
31. Conspicuity of pedestrian control	Good	0	0	0%
32. Visibility of pedestrian control	Good	0	0	0%
33. Likelihood of vandalism to control	No History	0	0	0%
PEDESTRIAN TRAFFIC				
41. Volume of pedestrians (peak flow)	>5 to 20 pedestrians per hour	2	2	6%
42. Type of pedestrians (children)	Low Risk	0	0	0%
43. Type of pedestrians (physically disabled)	Low Risk	0	0	0%
44. Type of pedestrians (sensory disabled)	Low Risk	0	0	0%
45. Type of pedestrians (intellectually disabled)	Low Risk	0	0	0%
46. Type of pedestrians (cyclists, wheelchairs, prams etc)	Low Risk	0	0	0%
47. Type of pedestrians elderly	Medium Risk	3	11	31%
RAIL VEHICLES				
51. Train volume (high is bad) (if high then greater probability of	>60 trains per day	5	0	0%
52. Infrequent / seasonal movements / special trains	Low	0	0	0%
53. Highest train speed at crossing (typical)	>60 to 80 kph	1	0	0%
54. Longest train length (typical)	>300 to 1000m	3	0	0%
CROSSING GEOMETRY				
61. Number of operational rail tracks (including sidings)	>2 tracks	5	3	9%
62. Angle of crossing & condition / width of flange gap	70-90deg	0	0	0%
63. Condition of crossing (fencing/path surface etc)	Good	0	0	0%
64. Freight trains stand across crossing	Rarely	0	0	0%
65. Gradients, widths and manoeuvring space of pathway/maze	Does not meet DDA	5	15	43%
66. Change of path alignment between pedestrian maze and track	Adequate	0	0	0%
67. Crossing to Australian/NZ Standards (signage & path marking)	Fully meets AS	0	0	0%
VISIBILITY				
71. Visibility from crossing to train (from pedestrian holding point)	<50%	5	0	0%
72. Sun glare issues at crossing	No	0	0	0%
73. Temporary visual impediments	No	0	0	0%
74. Masking of trains (moving or stationary) timetabling etc	Rarely	0	0	0%

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Controls

Physical Controls	Automatic Gates
Audio Visual Controls	Audible alarm only
Adjacent Controls	Adjacent boom gates and audio
Emergency Egress	With latch (including holding enclosure)
Pedestrian Signage / Path Marking	Tactile ground surface indicators
Crossing Environment	Path lighting at crossing
Crossing Environment	Maintenance of vegetation
Crossing Environment	Whistle boards
Crossing Environment	Wing/funnel/guide fencing
Crossing Environment	Adjacent corridor fencing
Operational	Train lights

Crossing Volume (AADT) Pedestrian: 500 Rail: 61.16

Outputs

Infrastructure Factor: **35.42676**

Exposure Factor: **30,580**

Risk Score: **1,083,350**

Risk Bands

Across Control Classes		**Within Train Activated Gates Control Class**	
Risk Band All:	**Medium High**	Risk Band All:	**Medium**
Risk Band Jurisdiction:	**Medium High**	Risk Band Jurisdiction:	**Medium**

Mechanisms

UNABLE TO AVOID

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UNAWARE

Distracted	0
Did not see train or visual warning signals	0
Did not hear train or audio warning signals	0
Has limited capacity to recognise danger and react	0
Under the influence of alcohol	1
Does not recognise crossing	0
Does not expect second train	0
Assumes train would stop	0
Misjudges train speed	0
Does not expect train	0
Does not expect train movement(s)	0
Mislead by infrastructure	1
Mislead by controls	0

UNWILLING TO RECOGNISE

Deliberately ignored control	1
Bypassing active control	1
Crawling under wagons (if no trains stopping then all values are zero)	0
Skylarking	1

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