onrsr Office of the National Rail Safety Regulator

ONRSR Guideline

Interoperability of Railway Operations

safe railways for Australia

for consultation

Office of the National Rail Safety Regulator

Level 1, 75 Hindmarsh Square, Adelaide SA 5000

PO Box 3461, Rundle Mall, Adelaide SA 5000

Phone: 08 8406 1500

Fax: 08 8406 1501

E: contact@onrsr.com.au

W: www.onrsr.com.au

www.twitter.com/ONRSRAustralia

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1 Introduction

This document provides guidance to those accredited rail transport operators (RTOs) that operate on the National Network for Interoperability (NNI) and are required to have systems and procedures in place to identify and consider interoperability matters as part of their safety management system (SMS).

Some accredited RTOs may also be required to have an Interoperability Management Plan (IMP) as part of their SMS, if they are planning changes to their railway operations undertaken on, or that form part of, the NNI. The purpose of the IMP is to ensure that interoperability matters that have been identified, are considered before an RTO makes changes to their railway operations.

1.1 Disclaimer

This is a guideline only and is intended to be read in conjunction with the legislation and relevant Office of the National Rail Safety Regulator (ONRSR) policies. The contents of this guideline impose no legal duty, and where actions or requirements are described as mandatory these reflect requirements in the Rail Safety National Law (RSNL) or Rail Safety National Law National Regulations 2012 (the National Regulations).

It is not intended to replace the provisions of the RSNL or other relevant legislation or to limit or expand its scope. In the event of an inconsistency between this guideline and the legislation, the legislation will prevail. It is recommended that you obtain your own independent legal advice about the legislation or contact ONRSR for further information, if required.

1.2 Purpose

This guideline establishes ONRSR's minimum expectations for the identification and consideration of interoperability matters. It helps RTOs to understand what ONRSR will take into consideration when reviewing their SMS.

This guideline details the matters that should be addressed by the systems and procedures for considering interoperability matters and included in an IMP. This includes processes for engagement with other RTOs in relation to interoperability matters that may arise from an RTO planning changes to its railway operations.

1.3 Background

Improving interoperability across the NNI is a clear priority under the National Rail Action Plan, as reducing differences and getting greater alignment across rail network will improve the safety and productivity of rail in Australia.

The NNI comprises connected but separately managed rail networks, with different signalling systems and operating rules. It is these differences that impact the efficiency of moving people and goods by rail in Australia.

Governments and private entities are continuing to invest in modernising rail networks. With this significant investment there is an opportunity to address the differences and in doing so increase the interoperability of the Australian rail network.

Infrastructure and Transport Ministers have agreed to amend the *Rail Safety National Law* to introduce further requirements related to the interoperability of Australia's rail network. More information is available here: Review of the Rail Safety National Law | National Transport Commission.

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The requirement for accredited RTOs that access and/or manage rail networks on the NNI to consider interoperability is a first step to delivering a more interoperable network.

Improving interoperability on the NNI seeks to:

- improve safety
- improve efficiency by reducing duplication of effort, lowering operational costs, and streamlining investment decisions
- promote collaborative, cross-network planning, reducing inefficiencies caused by isolated decision-making
- facilitate long-term, coordinated investment strategies that better reflect national transport priorities
- support improved service reliability, lower freight costs, and deliver a more competitive rail transport system by reducing delays, handover issues, and incompatibilities

1.4 Legislative requirements

Accredited RTOs are subject to the requirements of the RSNL and National Regulations as administered by ONRSR.

The Rail Safety National Law National Regulations (Safety Management System) Amendment Regulations 2024 changed the National Regulations to introduce the requirement for some accredited RTOs to consider the interoperability of railway operations.

This regulatory change comes into effect on 1 November 2025 with a transition period running until 28 February 2026.

1.5 Who should use this Guideline?

Rail transport operators

This guideline is for all accredited rail infrastructure managers (RIMs) that form part of the NNI and accredited rolling stock operators (RSOs) that have accreditation to operate on the NNI, as advised by the Regulator.

Government transport and infrastructure agencies

Government transport and infrastructure agencies that own and invest in rail networks could use this guideline to gain a better understanding of interoperability matters.

Network developments and improvements on the NNI, encompassing both greenfield and brownfield projects, may be overseen by government agencies. These agencies are not always accredited RTOs and are not required by the RSNL to consider interoperability.

Government agencies are encouraged to engage with relevant RTOs early in the planning process so that interoperability matters are sufficiently considered.

1.6 Definitions

Interoperability	For the purpose of this guideline, it is the ability of one RTO's railway systems to operate with those of other RTOs to enable the RTO's railway operations to be undertaken safely and seamlessly on the NNI.

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Interoperability management plan	A document that sets out any interoperability matters identified and includes systems and procedures to ensure these interoperability matters are taken into consideration before changes are made to an RTOs' railway operations.
Interoperability matters	Matters that impact the ability of one RTO's railway systems to operate with those of other RTOs to enable the RTO's railway operations to be undertaken safely and seamlessly on the NNI.
National Network for Interoperability	Rail networks specified as the National Network for Interoperability by map or by description (or both). To be updated from time to time by the Regulator, following the unanimous approval of the responsible Ministers, by notice in the South Australian Government Gazette, and on ONRSR's website. The NNI map is available at **Appendix A**. The NNI includes major freight and passenger railways linking Australia's ports, passenger terminals, and regional centres of national importance.
National Rail Safety Register	The Register established by the Regulator under section 42 of the RSNL and published on ONRSR's website.
National Regulations	Rail Safety National Law National Regulations 2012
Safeworking Rules	The rules, systems and procedures that form part of an RTO's network rules and define the interaction between workers and engineering systems for the safe operation of a railway.
Tourist and heritage railway operator	A rail transport operator determined by the Regulator to be a tourist and heritage railway operator as recorded in the National Rail Safety Register.
Railway operations	Means any of the following: (a) the construction of a railway, railway tracks and associated railway track structures; (b) the construction of rolling stock; (c) the management, commissioning, maintenance, repair, modification, installation, operation or decommissioning of rail infrastructure; (d) the commissioning, use, modification, maintenance, repair or decommissioning of rolling stock; (e) the operation or movement, or causing the operation or movement by any means, of rolling stock on a railway (including for the purposes of construction or restoration of rail infrastructure); (f) the movement, or causing the movement, of rolling stock for the purposes of operating a railway service; (g) the scheduling, control and monitoring of rolling stock being operated or moved on rail infrastructure.
Regulator	The National Rail Safety Regulator as appointed under the RSNL

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RIM	The person who has effective control and management of the rail infrastructure, whether or not the person – (a) owns the rail infrastructure; or (b) has a statutory or contractual right to use the rail infrastructure or to control, or provide, access to it.
RSO	A person who has effective control and management of the operation or movement of rolling stock on rail infrastructure for a railway but does not include a person by reason only that the person drives the rolling stock or controls the network or the network signals
RTO	Rail Transport Operator - (a) a rail infrastructure manager; or (b) a rolling stock operator; or (c) a person who is both a rail infrastructure manager and a rolling stock operator

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2 Requirements under the National Regulations

Regulation 20A of Schedule 1 of the National Regulations requires accredited RTOs on the NNI to include in their SMS:

- Systems and procedures for the identification and consideration of interoperability matters when planning changes to their railway operations that are undertaken on, or form part of, the NNI.
- An IMP to take into consideration any identified interoperability matters before changes are made to the railway operations on the NNI.

The IMP must set out any interoperability matters identified and include systems and procedures to ensure these interoperability matters are considered before making changes to railway operations on the NNI.

2.1 ONRSR will identify RTOs on the NNI

Accredited RTOs are required to consider interoperability when planning changes to their railway operations if they have been notified in writing by the Regulator that they are an RTO with railway operations that are undertaken on, or form part of, the NNI.

The Regulator will notify

- each RIM who is accredited to manage rail infrastructure that forms part of the NNI
- each RSO that is accredited to operate rolling stock on the NNI.

If an RTO does not receive a notification from the Regulator, it does not need to consider interoperability or prepare an IMP as part of its SMS.

The Regulator will notify RIMs and RSOs of the requirement to establish systems and procedures to consider interoperability when planning changes on the NNI:

- soon after the requirement comes into effect (1 November 2025)
- as part of the process for considering and determining an application for an accreditation for RIMs that form part of the NNI, or RSOs that operate on the NNI
- as part of the process to vary an accreditation to include the NNI for the first time for an individual RTO.

2.2 Exclusions

RTOs that are determined by the Regulator to be a tourist and heritage railway operator for the purpose of regulation 20A of Schedule 1 of the National Regulations are exempt from the requirement to consider interoperability matters, and will not have to prepare an IMP, even if they undertake railway operations and are planning changes on the NNI.

These RTOs will be published on the National Rail Safety Register.

3 Interoperability of railway operations

For those accredited RTOs notified by the Regulator (notified RTOs) that their railway operations are undertaken on, or form part, of the NNI, their SMS should be updated to include a new **Interoperability of railway operations** element that complies with the requirements of clause 20A of Schedule 1 of the National Regulations.

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This new element should include systems and procedures for the identification and consideration of interoperability matters associated with any change to the RTOs railway operations on the NNI to determine whether an IMP is required before a change is made to the RTO's railway operations.

The systems and procedures to identify and consider interoperability are in addition to any that are in place to identify and manage any risks to rail safety.

If, after applying the systems and procedures, an RTO identifies interoperability matters the RTO's SMS must be updated to include the IMP.

The IMP must set out any interoperability matters identified and include systems and procedures to ensure they are taken into consideration before changes are made. The level of detail contained in an IMP should be proportional to the impact of the change on interoperability and the associated risk on RTOs on the NNI.

3.1 Consultation requirements

When updating the SMS to include the new requirements, RTOs must comply with the requirements of section 99 of the RSNL, including consultation with:

- people likely to be affected by the change to the SMS
- health and safety representatives
- relevant unions
- RTOs with interface agreements
- the public, as appropriate

Consultation under section 99 must also be undertaken each time an IMP is developed, as each IMP forms part of the SMS.

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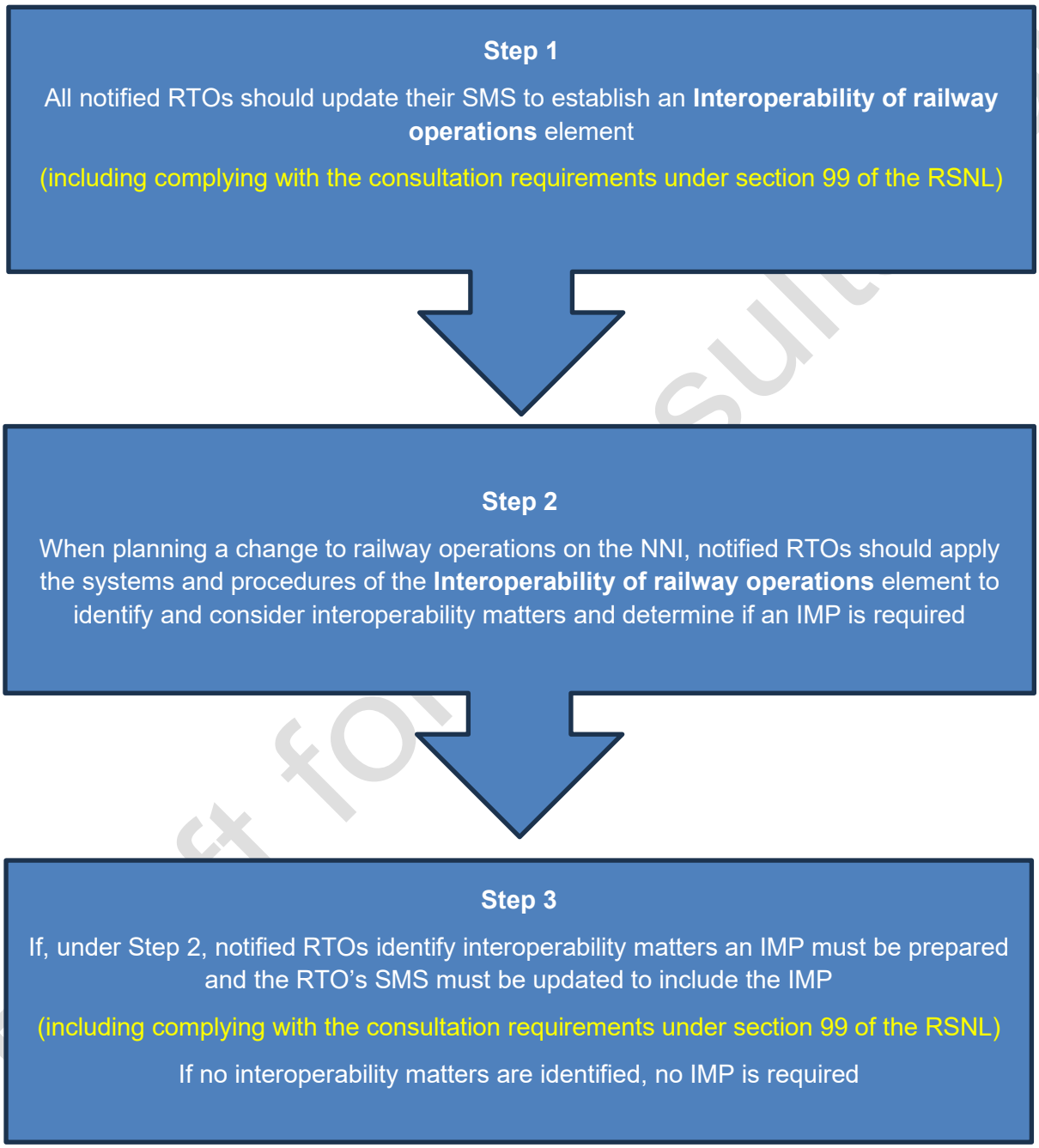
3.2 Considering interoperability

The following steps cover how notified RTOs should consider interoperability matters under the SMS in accordance with the National Regulations. The steps are outlined in Figure 1:

Figure 1: Consideration of interoperability matters



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4 Systems and Procedures to identify and consider interoperability matters

ONRSR expects that not all changes made by notified operators will have interoperability impacts and require the preparation of an IMP.

The purpose of the systems and procedures notified RTOs include in their SMS under the **Interoperability of railways** element is to:

- identify and consider potential impacts to interoperability on the NNI resulting from a change to railway operations; and
- determine whether an IMP is required as a result of that change.

At a minimum, ONRSR would expect that the systems and procedures provide for:

- the identification of the types of changes to railway operations on the NNI that may impact interoperability on the NNI
- the identification of RTOs that manage or operate on the NNI that may be impacted by the change
- consultation with identified RTOs to determine if and how the planned change will impact interoperability on the NNI

It is possible that an RTO may have more than one IMP for different changes being undertaken.

4.1 Identifying the type of changes that may impact interoperability

The **Interoperability of railway operations** element should include systems and processes for identifying what types of changes should consider impacts to interoperability. Notified RTOs are not required to consider interoperability for any changes to railway operations that are not on, or form part of, the NNI.

ONRSR expects all notified operators to consider the interoperability matters for any changes associated with signalling and control systems, and safeworking rules on the NNI.

Through the National Rail Action Plan, the National Transport Commission is working with industry and government to make sure digital train control systems can work together and to develop a set of common operating rules and practices recognised across networks.

4.1.1 Signalling and control systems

When investing in new technology, RIMs should consider whether it will support interoperability.

When investing in new rolling stock, RSOs should consider whether the onboard technology will support interoperability.

All RTOs operating on the NNI should take associated safeworking rules into account when implementing changes of this nature.

4.1.2 Safeworking rules

When proposing amendments to safeworking rules for railway operations on the NNI, RTOs should consider the potential impacts on drivers and other rail safety workers, particularly those who are likely to work regularly across multiple networks.

4.1.3 Other changes to railway operations

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When assessing if other changes on the NNI may impact interoperability, RTOs should consider whether the change relates to any of those identified in Australian Standard AS7450:*2021 Rail systems interoperability* (listed below), and/or meets the other categories below:

> *List of changes where rail interoperability should be considered (AS7450:2021):*

- Wheelsets interfacing with the rails (e.g. wheel profiles)
- Gauge clearance issues (especially at turnouts and loops)
- Differing kinematic envelopes and passing clearances
- Different crew-change / train operating procedures (e.g. stowing, handbrake application)
- Communications (both onboard and wayside)
- GPS/ location devices (e.g. formats, accuracy)
- Wayside systems (particularly train monitoring systems)
- Performance reporting
- Locomotion – power, speed, braking
- Rolling stock differences (e.g. locomotive length, cab visibility, wagon length, couplings)
- Infrastructure specifications (e.g. cant, platforms, signage).

> Any of the decisions, events and changes described at items 1 through to 10 of regulation 9 of the National Regulations, that require notification to the Regulator (provided at **Appendix B**)

> Any changes requiring the notified RTO to apply to the Regulator for a variation to accreditation. This would be in circumstances where the scope and/or nature of the RTO's operations on the NNI are changing.

Examples of a change of nature include, but are not limited to:

- commencing passenger operations in addition to freight operations
- a change in operations from tourist and heritage to commercial
- a change in role from maintenance activities using rolling stock to rail infrastructure manager

Examples of a change of scope include, but are not limited to:

- a change from lineside to in-cab signalling
- a change of the grade of automation for rolling stock operations
- the introduction of new traction systems such as hydrogen or battery electric rolling stock.

> Any changes to rolling stock or rail infrastructure relating to:

- railway tracks and associated railway track structures
- service roads, signalling systems, communications systems, rolling stock control systems, train control systems and data management systems
- notices and signs
- electrical power supply and electric traction systems.

> Any changes to the standards used by the notified RTO.

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> Any other changes that may have interoperability implications on the NNI.

4.2 Identifying and consulting with affected RTOs

Once a notified RTO determines the change to its railway operations might impact interoperability on the NNI, the **Interoperability of railway operations** element should set out systems and procedures for the identification and consultation with affected RTOs.

The purpose of this consultation is to allow the notified RTO to determine if there are interoperability impacts resulting from the change, and if so, what these matters are. The element should include systems and procedures for:

> identifying stakeholders impacted by the change including with directly interfacing RTOs and other networks and operations across the NNI
> consulting with the identified RTOs
> capturing the reasonably known impact to each affected RTO's railway operations resulting from the change.
> capturing and recording the outcomes of the consultation.

5 Interoperability Management Plan

5.1 When is an IMP required?

If, after applying the systems and procedures under section 4 of this guideline, notified RTOs identify interoperability matters, an IMP that complies with the requirements of regulation 20A (2) of Schedule 1 of the National Regulations must be prepared.

Each time an IMP is prepared, notified RTOs must comply with the consultation requirements under section 99 of the RSNL as each IMP forms part of the SMS.

The requirement to prepare an IMP is in addition to the requirements in Schedule 1 of the National Regulations to have procedures:

> for the identification of interface risks to the safety of railway operations (regulations 22); and
> to appropriately manage any changes to railway operations (regulation 12).

RTOs may refer to the **Management of change** element of their SMS and consider the applicability of AS7472:2018 – *Railway operations – Management of Change* to assist with the development of an IMP.

While the **Management of change** requirements ensure any changes that may affect the safety of railway operations are managed so far as is reasonable practicable (SFAIRP), the IMP should detail how the RTO will take into consideration the interoperability impacts of the change to ensure all affected railway operations on the NNI can be operated seamlessly and safely SFAIRP.

Together, the **Management of change** element of an RTO's SMS and the IMP, ensure change is effectively managed so that railway operations are safe and any risks to safety are either eliminated or managed SFAIRP. Changes, and the risks that arise as a result, will vary in complexity. Managing risks to rail safety SFAIRP should be the principal consideration when developing an IMP.

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5.2 What should be included in an IMP?

The IMP must set out any interoperability matters identified and include systems and procedures to ensure they are taken into consideration before changes are made.

The interoperability impacts of the change may vary in complexity. To ensure effective management of change, the rigour in the systems and procedures applied should be commensurate with the complexity of the changes to railway operations.

5.2.1 Classification of the identified interoperability matters

Each IMP should provide an appropriate level of detail, having regard to the scope, nature and risks to safety of the operator's railway operations, and to the operator's duties under section 52 (Duties of rail transport operators) as per regulation 16 of the National Regulations.

Notified RTOs may consider establishing procedures and processes to classify the identified impacts on interoperability into low, moderate or high levels. This classification will assist notified RTOs to determine the level of detail to incorporate into an IMP so that the consideration of interoperability matters is proportionate to the impact of the change on RTOs on the NNI.

RTOs should consider:

- What are the impacts to safety resulting from the change?
- Will the change impact the current level of safety and productivity performance of the rail network?
- What is the technical complexity of the change?
- How innovative is the change?
- What is the estimated cost of the impact on interoperability resulting from the change?
- Are there alternative solutions with different impacts on the level of interoperability across the NNI?
- What are the likely long-term impacts of the change?
- How many RTOs are impacted by the change?
- What is the impact of the change on rail safety workers? How many rail safety workers are likely to be impacted by the change?

5.2.2 IMPs for changes with low interoperability impacts

Where a change to an RTO's railway operations on the NNI is likely to have a low impact on interoperability, the RTO's IMP should document the change to the railway operations on the NNI and must set out the interoperability matters identified. To give consideration to the interoperability matters, RTOs should consider including the following matters in the IMP:

- processes and procedures for continued consultation with affected RTOs on the NNI and impacted stakeholders that were identified in section 4.2.
- documenting the outcomes of the consultation
- documenting the measures taken and rationale to address the interoperability matters.

5.2.3 IMPs for changes with moderate to high interoperability impacts

Where a change to an RTO's railway operations on the NNI is likely to have a moderate or high impact on interoperability, the RTO's IMP should document the change to the railway operations on the NNI and must set out the interoperability matters identified. To give consideration to the interoperability matters, RTOs should consider including the following matters in the IMP:

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- processes and procedures for consultation and communication with identified RTOs on the NNI including documenting meetings, minutes, correspondence, attendance sheets and any other relevant matters of the consultation.

- the long-term investment strategies of impacted RTOs in relation to the identified interoperability matters to the extent possible

- identification of consequences and risks of implementing the change on all affected RTOs

- systems and procedures to undertake a risk assessment/ evaluation of the interoperability matters identified on all affected RTOs on the NNI. This should be done in consultation with the affected RTOs and should include:
    - consideration of each stage of the lifecycle of the change including planning, implementation and post-implementation.
    - consideration of interoperability impacts under normal, emergency and degraded operational conditions.
    - assessing changes to the risk profiles of all affected RTOs
    - assessing any required accreditation changes needed by all affected RTOs

  In undertaking the risk assessment / evaluation of the interoperability matters over the lifecycle of the change, the matters should be considered:

    - Configuration management – the management, upgrade, and update of systems, assets, infrastructure, standards and processes should maintain interoperability.
    - Maintenance – the management of maintenance is a critical factor. Interoperable assets should be deployed and maintained in a manner that protects interoperability functionality.
    - Technology – an optimal interoperability outcome should be the result of considering reliability, availability, maintainability and safety targets, consistent user information delivery interface, scalability for future expansion, system obsolescence, and the interface between passenger and freight operations.
    - Cyber security- any cyber security requirements, updates and upgrades applied to an interoperable system may need to consider the impact on interfacing RTOs, and the ongoing interoperability of the system.
    - Human factors – consistency of operating rules, procedures, interfaces across interoperable systems will achieve an improved outcome. Human intervention should be minimised for the transition between networks.

- systems and procedures to control, monitor and communicate the safety risks associated with the interoperability matters

- review, and where relevant, update of interface agreements to reflect changes arising from the identified interoperability matters

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- systems and processes for reviewing and monitoring the IMP to ensure it remains fit for purpose and consistent with rail network developments.

List of useful resources

Safety Management System Guideline

Australian Standard 7450:2021 – Rail Systems Interoperability

Australian Standard 7472:2018 – Railway operations – Management of Change

Appendices

Appendix A – National Network for Interoperability (NNI) map.

Appendix B – List of decisions, events and changes requiring notification to the Regulator under National Regulations

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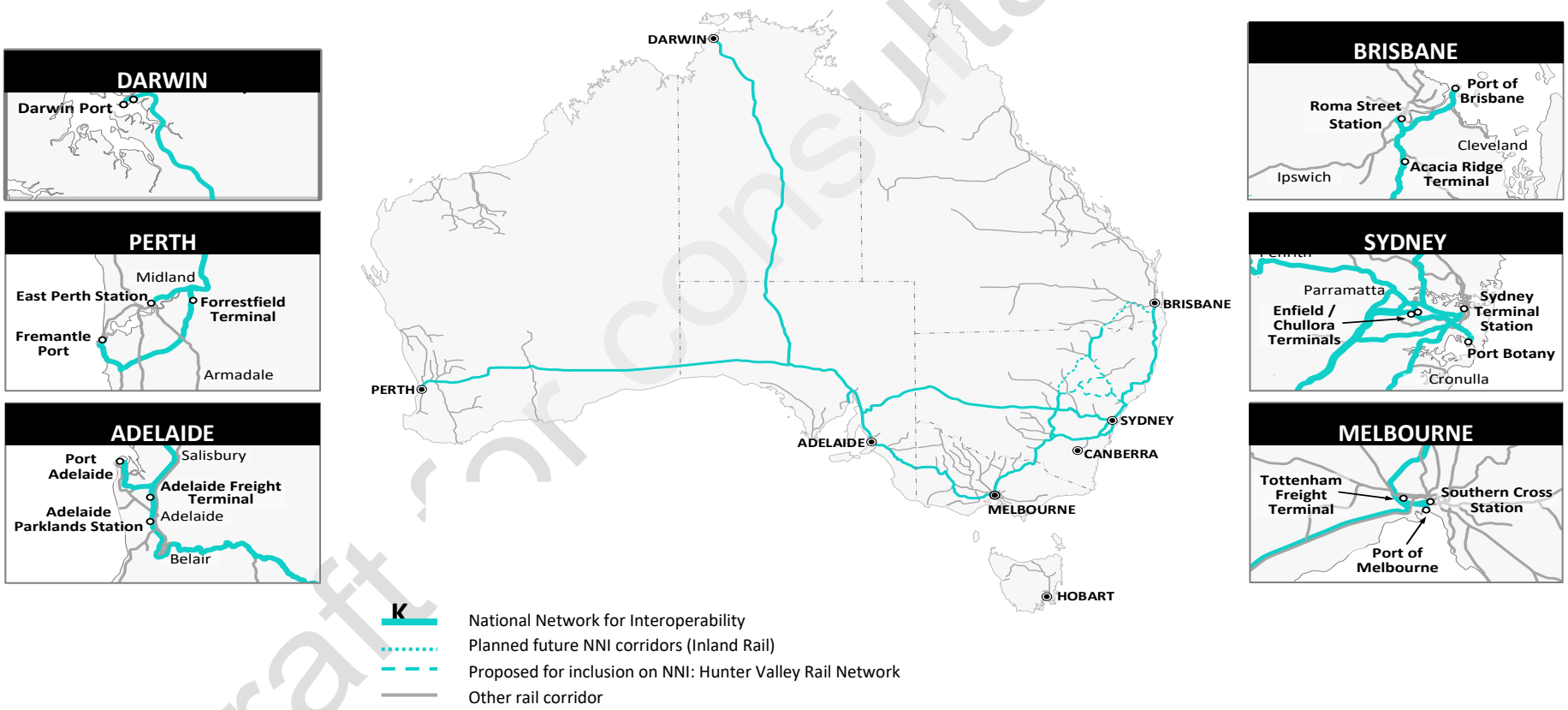
Appendix A - National Network for Interoperability (NNI) map.

- See also: https://experience.arcgis.com/experience/aff43ce73c1d4684bc2fd1a300b01785.



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Appendix B – List of decisions, events and changes requiring notification to the Regulator under National Regulations

These are the decisions, events and changes described at items 1 through to 10 of regulation 9 of the National Regulation and require accredited operators to notify the Regulator. Interoperability should be considered regardless of if the change requires the Regulator to be notified.

- A decision to design or construct, or to commission the design or construction of, rolling stock or new railway tracks.
- The introduction into service of rolling stock of a type not previously operated by the operator, or the re-introduction into service of rolling stock not currently operated by the operator
- A change to a safety critical element of existing rolling stock.
- A change to one or more of the classes of rail infrastructure used in the operator's railway operations
- A change to a safety standard for the design of rail infrastructure or rolling stock.
- The decision to adopt a new safety standard for the design of rail infrastructure or rolling stock.
- A change to the frequency of, or procedures for, the inspection or maintenance of railway infrastructure or rolling stock.
- A change to the network rules relating to the conduct of the operator's railway operations.
- A decision to introduce a new network rule relating to the conduct of the operator's railway operations.
- A decision to change any work scheduling practices and procedures set out in the operator's fatigue risk management program.

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