



Submission by ARISO to the National Transport Commission in response to the paper on “Options to harmonise testing requirements and test locations”

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Acknowledgement of Country

ARISO is a geographically diverse organisation. We acknowledge the Traditional Owners of Country throughout Australia. We recognise their cultures, histories and diversity and their continuing connection to the land.

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Acronyms

ARISO	Australian Rail Industry Standards Organisation
CoP	Code of Practice
NNI	National Network for Interoperability
NRAP	National Rail Action Plan
NTC	National Transport Commission
ONRSR	Office of the National Rail Safety Regulator
RIM	Rail Infrastructure Manager
RISSB	Rail Industry Safety and Standards Board
RSNL	Rail Safety National Law
RSO	Rolling Stock Operator
RTO	Rail Transport Operator
SFAIRP	So far as is reasonably practicable
SMS	Safety Management System

1 Executive Summary

The Australian Rail Industry Standards Organisation (ARISO) welcomes the opportunity to provide feedback on the National Transport Commission's discussion paper, *Options to harmonise rolling stock testing and test locations*.

ARISO supports the broader national reform agenda to streamline rolling stock approvals and recognises the importance of reducing unnecessary duplication, improving transparency and strengthening interoperability of rolling stock to lift productivity and safety.

Rolling stock certification and registration processes are important safety assurance activities. When requirements, test methods, documentation expectations, and acceptance criteria differ unnecessarily between RIMs, they can increase costs, delays, and uncertainty for Rolling Stock Operators, manufacturers, suppliers, and Rail Infrastructure Managers.

The Infrastructure and Transport Ministers' Meeting (ITMM) in August 2025 tasked the NTC to investigate harmonising testing requirements and testing locations for rolling stock as part of the National Pathway project to streamline rolling stock approvals to support rail modernisation, reduce red tape for industry and lift national productivity.

At the same meeting, ITMM approved ARISO to become the new technical standards authority to strengthen the way standards are initiated, developed, assured and adopted.

ARISO has an important role to play in supporting future reforms to streamline rolling stock approvals, by lifting the quality of standards and assurance processes and to support future mandatory standards and lead on harmonised standards where it returns the most national benefit. Measures to strengthen the legal standing of ARISO standards are also being pursued through regulatory reform to the Rail Safety National Law to embed a three-tiered standards process based on a must do/should do/can do logic.

ARISO considers that the harmonisation of rolling stock testing requirements should be progressed as part of an integrated national reform program and suggests that the AS 7500 rolling stock standards series provides a ready-made path forward.

This work should align with the rolling stock registration application pilot, ONRSR's safety assurance guidance, the TfNSW-led National Product Type Approval Framework, and ARISO's implementation of the national standards prioritisation framework. Outcomes of this work will influence the next steps required for future development of the National Rolling Stock Register and a mandatory standard for rolling stock approvals.

ARISO recommends that NTC consider the establishment of a national testing framework to enable an accessible network of accredited testing facilities of both physical and simulated testing arrangements governed by common, accredited and cross-accepted methods, systems and testing processes. ARISO would provide the technical leadership and standardised protocols to support a variety of track types and configurations for the development and deployment of these facilities. The immediate priority should be to establish a consistent national evidence model that enables consistency of testing practice and for test evidence to be reused (or cross-accepted) where it is deemed to be complete, competent, traceable and relevant to the operating context. Repeat testing or reassessment should only be required where there is a material evidence gap, configuration change, changed operating condition or genuine network-specific risk.

ARISO recommends that the next phase of work focus on:

- mapping existing ARISO standards to test categories and evidence requirements;
- developing a national rolling stock test and evidence matrix;
- standardising test reports, evidence packs and compliance registers;
- documenting and justifying RIM-specific variations; and
- developing clear criteria for the accreditation of test locations and the appropriate recognition of simulation validation.

This approach would provide a practical pathway to harmonisation while maintaining safety assurance and preserving the legitimate responsibilities of Rail Infrastructure Managers for network compatibility and infrastructure interface risks.

ARISO's response is therefore focused on areas where a national standards organisation can provide the greatest value: standards alignment, common terminology, classification of certification and registration evidence, test and evidence matrices, standardised documentation, RIM variation management, simulation validation protocols, recognised test location criteria and leveraging evidence through reuse (cross acceptance) through the National Rolling Stock Register.

ARISO complements the roles of Rolling Stock Operators, Rail Infrastructure Managers, and ONRSR, through providing nationally consistent and interoperable technical leadership and guidance. Rolling Stock Operators should remain responsible for managing rolling stock certification risks and providing competent, complete, and traceable evidence of compliance. Rail Infrastructure Managers should continue to oversee registration, network compatibility, and the management of infrastructure interface risks. ONRSR should maintain its role in setting regulatory expectations for safety assurance and change management.

In this context, ARISO supports the discussion paper's direction and offers the following responses to the consultation questions.

2 Addressing the key matters in the discussion paper

This section addresses the questions in the discussion paper from the perspective of ARISO's role in national standards development and adoption.

2.1 Rolling stock testing requirements, practices and prioritisation

Question 1: Inefficiency, Delays, and Prioritisation

To what extent do current rolling stock testing requirements and practices contribute to inefficiency and delay in certification and registration? How should efforts to address testing requirements be prioritised relative to other rolling stock approval elements of the National Pathway?

ARISO Response:

Inconsistent testing practices are one of the primary drivers of delay and cost in rolling stock introduction. While tests across RIMs share similar underlying safety objectives, variations in test setup, tolerances, documentation, and mandatory physical locations force RSOs to perform near-identical testing repeatedly for different networks.

Current testing requirements and practices do contribute to inefficiency and delay, but they are not the only cause. The larger issue is the lack of a consistent national assurance architecture across certification, registration and network approval.

As identified in the ARISO white paper [Streamlining the Rolling Stock Approval Processes](#), testing contributes to inefficiency where RSOs are required to:

- repeat tests that have already been completed for another RIM;
- repackage the same evidence in different formats;
- satisfy different acceptance criteria for tests with the same underlying safety objective;
- undertake additional testing where comparable evidence already exists;
- provide historical evidence that is not readily transferable when rolling stock changes ownership.

ARISO recommends that testing harmonisation be prioritised as an enabling workstream within the National Pathway. The immediate focus should be on reducing low-value duplication in evidence and documentation while preserving an accurate assessment of genuine network-specific interface risks.

Harmonising testing requirements should be progressed in parallel with the single registration application form (Reform 2) and safety assurance guidance (Reform 1). A unified application form delivers administrative efficiency, but maximum productivity gains will only be realised when the technical evidence required by that form (the test results) are standardised and mutually recognised across and between networks and operators.

Question 2: Effective Target Areas for Harmonisation

Are there particular types of tests or approvals where harmonisation would be most effective?

ARISO Response:

Testing is a critical element of rolling stock certification and provides the evidence base that supports the RIM registration activity. Harmonisation should therefore prioritise agreement on the applicable testing requirements, the evidence needed to demonstrate compliance, and the acceptance criteria to be applied, using the ARISO suite of the AS 7500 series of rolling stock standards as the national baseline.

Harmonisation should begin where test intent, method and evidence requirements are already broadly aligned, and where network-specific risk is limited or can be managed through documented parameters. Harmonisation efforts should be focused on the testing of requirements (processes and outcomes) and not the requirements themselves, with a view to establishing a common method of conformance assessment and decision making.

2.2 Test classification into the three stages of certification, registration and network approval of rolling stock approvals.

Question 3: Mapping Tests across Stages (Certification vs. Registration vs. Network Approval)

In rolling stock approvals, there are three stages: certification, registration and network approval. For Table 1 on pages 21–22, could the various tests be identified as either belonging to certification, registration and network approval?

ARISO Response:

The tests should be classified by the primary purpose of the evidence, noting that some evidence may support more than one stage. However, all tests should be completed during the certification stage of the process. An ‘Independent Competent Person’ should review these tests in accordance with AS 7501 Certification requirements. A selected subset of the test results will be required for the registration and network approval phase.

ARISO recommends using the following distinction:

- Certification: evidence that the rolling stock design, construction, configuration and performance comply with nominated standards and specifications. This is primarily RSO-led.
- Registration: RIM may review vehicle compliance evidence to confirm compatibility with a specific network.
- Network approval/access: route-specific or operating-condition-specific approval, including restrictions, operating limits, or access conditions for the train or movement.

The classification should be based not only on when the test is performed but also on the risk decision the evidence supports.

2.3 International approaches to rolling stock testing requirements or approvals

Question 4: International Learnings and Practices

Are there additional learnings, or approaches from international jurisdictions that should be investigated to inform potential reforms to rolling stock testing requirements or locations in Australia?

ARISO Response:

While international learnings are valuable, the application of practice would need to be cognisant of Australia’s rail environment and features, including multiple RIMs, gauges, legacy infrastructure, a wide geography, and varied operating environments.

Focus should also be given to adopting emerging parallel national initiatives such as the “[National product type approval process \(NPTAF\)](#)” without reinventing the wheel.

The most useful international learnings are not simply the existence of test tracks or central facilities. The more important lessons may be:

- Evidence follows the asset

Test evidence, configuration information, conditions of use and compliance records should remain associated with the rolling stock throughout its life. This is essential when

ownership changes or the vehicle is introduced to a new network and is aligned with best-practice asset management. A fully developed national rolling stock registration system will serve this requirement well.

- Validated simulation protocols

International practice supports the use of validated simulation for some dynamic performance assessments. Consideration should be given to developing clear validation protocols rather than leaving simulation acceptance to individual RIM interpretation. Europe's structured substitution of physical dynamic testing with validated multi-body dynamic simulation models provides a proven roadmap. Establishing national simulation acceptance frameworks dramatically reduces the reliance on physical track time.

- Common conformity assessment before local acceptance

The NPTAF already provides an emerging relevant Australian model. The rolling stock equivalent would be that RSO-led certification evidence is prepared once against nationally recognised requirements, then RIMs assess only genuine network-specific matters.

- Risk-based categorisation

The level of testing and review should depend on novelty, complexity, safety criticality, change impact and operating context. This aligns with the NPTAF tiering concept and should be adapted for rolling stock registration.

As a more general point regarding scope of the discussion paper and the ability to identify lessons learned and consider international good practice, the NTC may consider including **test laboratories** within the study. The contemporary UK example would be the National ETCS Test Lab (Net-Lab) operated by AtkinsRealis (Ref: [NET-Lab: National ETCS Test Lab – AtkinsRealis](#)).

While this facility and those like it provide a whole host of ETCS-related technology development and deployment benefits that may be worth considering but fall outside the scope of this discussion paper, analysis may be warranted on the rolling stock and on-board testing regimes and approaches.

2.4 A national testing facility in Australia

Question 5: Need and Viability of a National Testing Facility

To what extent is there a need for a national testing facility in Australia, and how could it deliver value to the industry?

ARISO Response:

A national testing facility may have value, but it should not be assumed to be the only or most cost-effective solution. Australia's market size, vast geography, and multiple track gauges (Standard, Broad, Narrow) makes it challenging to build a purpose-built, standalone facility akin to Pueblo TTC (USA) (Ref: [Transportation Technology Center \(TTC\) | FRA](#)) or Velim (Czech Republic) (Ref: [Railway Research Institute, a. s.](#)).

Static testing is generally conducted at the manufacturer's facility. Completion of static testing demonstrates that the vehicle is safe to go out on track under restricted conditions.

According to current standards, dynamic testing necessitates a straight track segment under possession. The track quality should reflect the conditions where the vehicle is intended to

operate, which logically falls under the responsibility of the relevant RIM. Additionally, relocating vehicles subject to restricted operating conditions to a central location in Australia could pose logistical challenges.

ARISO recommends consideration of a **virtual/distributed national testing framework** potentially comprising:

- Centralised and coordinated management of the testing facilities with **ARISO** providing the funded technical leadership and stewardship sufficient to establish the holistic testing capabilities and the testing delivery and assurance consistency.
- A network of **accredited testing locations** on existing operating track segments with a prescribed variety of track types and configurations sufficient to support a national testing regime.
- Establishing standardised protocols for **simulation testing and laboratory validation**.
- Provision of shared access arrangements for specific high-speed or heavy-haul test tracks managed co-operatively with major RIMs.

While not in the scope of this discussion paper, NTC may wish to consider the merits of an independent national ETCS test and integration facility that would support the technology development and deployment remit that is central to the NNI and would have benefits to the broader national rolling stock environment.

A register of accredited testing locations could deliver value if it provides testing conditions that could be reliably accessed or controlled trials for new technology.

Before committing to a national testing facility, focus should first be on exhausting lower-cost reforms that are likely to deliver earlier benefits.

2.5 Harmonisation option mentioned in discussion paper (section 4.3)

Question 6: Combination and Prioritisation of Harmonisation Options

Are the options for harmonisation mentioned in section 4.3 better considered as standalone options, as a combination of options, or altogether? Which options should be implemented as a priority?

ARISO Response:

The options in section 4.3 should be treated as an integrated and staged package. However, the starting point should not be the creation of entirely new test requirements. Significant national standards work already exists through ARISO rolling stock standards, including standards that support certification, static assessments, braking, dynamic behaviour, identification and other rolling stock requirements.

In many cases, the issue is not the absence of national standards, but that:

- RIMs apply different network interface requirements in addition to national standards;
- RIMs interpret or apply the same national standards differently;
- acceptance criteria, evidence expectations and documentation formats vary;
- test results are not consistently recognised across networks;
- RIM-specific variations are not always visible, justified or consolidated in one place;
- Applicants are required to repackage or repeat evidence even where the underlying test intent has already been satisfied.

Accordingly, the preferred approach should be to build on the existing ARISO standards framework in the following sequence to address inconsistent approaches:

1. **standards mapping:** identify existing ARISO standards relevant to each test category (Table 1)
2. **evidence matrix:** create a test requirements matrix that links test categories to ARISO standards, evidence and RIM variations.
3. **test methodology & documentation harmonisation:** develop common evidence packs, test report templates and compliance registers.
4. **variation management:** document and justify RIM-specific variations to ARISO standards.
5. **targeted standards updates:** amend or develop standards only where genuine gaps are identified. In the development and review of Australian Standards, full utility and linkage should be made to the relevant ISO/IEC international standards and protocols for testing.
6. **recognition mechanisms:** support evidence reuse (cross-acceptance) through the National Rolling Stock Register, recognised test locations and agreed simulation protocols.

Note: Although [AS 7702: 2023 Rail Equipment Type Approval](#) currently excludes rolling stock from its scope, its concepts remain useful in the context of this discussion paper, particularly the use of structured evidence packs, standards compliance registers, assessment reports, conditions of use and mutual recognition principles.

This approach recognises that ARISO standards already provide a substantial technical foundation for rolling stock certification and testing. The priority is therefore to strengthen adoption, interpretation, evidence consistency and mutual recognition, rather than duplicate existing standards work.

2.6 Harmonisation of specific acceptance criteria or documentation requirements

Question 7: 'Quick Wins' for Acceptance Criteria and Documentation

Are there specific acceptance criteria or documentation requirements that could be quickly harmonised to deliver immediate benefits ('quick wins')?

ARISO Response:

ARISO concurs with the discussion paper in recognising that testing protocols and conventions can be aligned independent of standards harmonisation (initially) and that there is a case for the agreement of common testing arrangements ahead of standards harmonisation (Discussion Paper Section 2.2.5 refers). It is logical that any 'quick wins' would be sourced from the testing / acceptance criteria areas of operation.

Value will be generated from harmonising the application, interpretation and documentation of existing ARISO standards (especially AS 7501), rather than developing entirely new technical requirements.

Immediate quick wins should include the following.

- Standardised test report templates linked to existing ARISO standards
- Common standards compliance register

- Common evidence pack
- Common terminology for testing

2.7 Allowing greater flexibility in where dynamic and static tests are conducted

Question 8: Flexibility in Testing Locations

Would allowing greater flexibility in where dynamic and static tests are conducted (for example, recognising results from a wider range of approved sites or simulators) help reduce costs and improve timing?

ARISO Response:

Greater flexibility in where tests are conducted could reduce costs and improve timing, but only where that flexibility is supported by recognised ARISO standards, consistent test methods, competent assessment, and clear rules for evidence acceptance.

All static testing is generally conducted at the manufacturer's facility. For static tests, the location should generally matter less than the assessor's competence (Ref: **Independent Competent Person (ICP)** framework (as outlined in AS 7501)), the quality of the method, the calibration of the equipment, the vehicle configuration, and the completeness of the evidence. These tests must be passed before provisional approval is granted to proceed to dynamic testing.

For dynamic testing, the location may be important because results may be affected by the characteristics of the test route or location.

For dynamic tests, the issue is not simply whether a test has been performed. The key question is whether the test conditions are sufficiently representative of the network, route or operating condition for which registration or access is sought.

A register of recognised test locations would support greater flexibility. However, the register should identify what each location is suitable for, rather than simply listing available locations. If a test location meets agreed track geometry, profile, and speed parameters, the test results should be accepted by all participating RIMs without requiring repeat trials on local or alternative / nominated tracks / sites. This is akin to operating accredited dynamic and static test sites like nationally accredited and recognised laboratories.

2.8 Simulation testing as a viable alternative to physical trials.

Question 9: Simulation Testing as a Viable Alternative

Is simulation testing a viable alternative to physical trials and, if so, what protocols would need to be adopted to validate simulation models? Are there specific tests that simulation testing could be used to demonstrate compliance?

ARISO Response:

Simulation is a viable alternative to, or supplement for, physical testing in some rolling stock assessments, particularly when it is necessary to evaluate dynamic performance in extreme conditions such as with rolling stock or track condition degraded to the allowable limits of wear, which is difficult or impracticable to do in a physical test. However, it should not be treated as a universal substitute for all physical trials.

[AS 7509 Rolling Stock Dynamic Behaviour](#) includes requirements for simulations and is currently being revised by ARISO to clarify when simulations can replace on-track tests and the level of physical testing required to validate them. This revised standard will provide a key input into nationally consistent utilisation of simulation testing.

2.9 Progressing the harmonisation of testing requirements and locations work

Question 10: Governance and Delivery Mechanism

Should harmonisation of testing requirements and locations be progressed as a separate, dedicated project, or could it be effectively managed by the Technical Working Group for a single registration application pilot during a future stage of the National Pathway?

ARISO Response:

Harmonisation of testing requirements and locations should be progressed as a dedicated workstream within the National Pathway, as it is a key element of the certification and registration process. ARISO is well positioned to support this work, in collaboration with the NTC and provide technical leadership, expertise and alignment.

The dedicated workstream should include RIMs, RSOs, rolling stock technical experts, ONRSR, ARISO and the National Rolling Stock Register. It should also draw directly from the TfNSW-led National Product Type Approval (NPTA) Framework work, particularly its conformity assessment, common templates, tiering, assessor competency and cross-jurisdictional information-sharing principles.

2.10 Testing location register

Question 11: Utility of a Testing Location Register

Would a testing location register be useful?

ARISO Response:

A testing location register would be useful and provide much needed transparency on where specific static and dynamic tests can be conducted, but only if it is part of a broader test recognition framework.

As previously identified, the register should not merely list available sites. It should identify what each site is recognised or accredited for and the conditions under which test results may be accepted.

Among the factors determining whether a test location is suitable are:

- The quality of the track
- The level of traffic
- The specific accredited dynamic and static tests that can be conducted at the site
- Network access and the presence of passing loops and refuges to allow other trains to pass
- Signalling requirements
- Proximity to facilities for modifications and adjustments
- Proximity to accommodation and other supporting facilities and amenity.

In addition to saving the RSO or supplier time in finding a suitable location, a register would allow RIMs to make long-term plans to make the section of track available and to ensure its physical condition is maintained.

3 Conclusion

ARISO supports the intent of the NTC's discussion paper and the broader National Pathway objective of streamlining rolling stock approvals. Harmonising rolling stock testing requirements and test locations has the potential to reduce duplication, improve transparency, support innovation and investment in new rolling stock, and strengthen interoperability across Australian rail networks.

ARISO considers the most effective approach is to build on the substantial foundation already available through ARISO's AS 7500 rolling stock standards series, existing rolling stock certification processes, the National Rolling Stock Register, the single registration application pilot, ONRSR's safety assurance guidance, and the TfNSW-led National Product Type Approval Framework.

The key opportunity is to move industry from a duplicative and wasteful network-by-network assessment model to a structured national evidence and recognition model, generating the corresponding productivity gains.

Under this model, Rolling Stock Operators would remain responsible for managing certification risks and providing complete, competent and traceable evidence of compliance. Rail Infrastructure Managers would retain responsibility for registration, network compatibility and infrastructure interface risks.

Repeat testing or reassessment should only be required where there is a material evidence gap, a configuration change, a changed operating condition, or to mitigate a genuine network-specific risk.

ARISO considers that the highest-value next steps are to:

- map existing ARISO standards to the test categories and evidence requirements identified in the discussion paper;
- develop a national rolling stock test and evidence matrix based on existing standards;
- classify evidence into certification, registration and network approval categories;
- standardise test report templates, standards compliance registers, configuration records and evidence packs;
- document and review / justify RIM-specific variations to national standards;
- develop guidance for reuse (Cross-Acceptance) of previous test evidence, including where rolling stock changes ownership or is introduced to a new network;
- develop criteria for accredited test locations and simulation validation protocols;
- support the National Rolling Stock Register as the mechanism for recording and reusing rolling stock certification, registration, test evidence, conditions of use and limitations.

ARISO is well placed to support this work, including the development or maintenance of standards, codes of practice, guidelines, templates, evidence matrices and RIM variation structures.

In summary, ARISO supports the direction of the NTC's work, provided it is implemented as part of an integrated national reform program. The focus should be on better use of existing national standards, transparent management of RIM variations, consistent evidence requirements and improved mutual recognition. This approach will provide a practical and sustainable pathway to reduce duplication and improving consistency while maintaining safety assurance and respecting the legitimate network-specific responsibilities of RIMs.