

Transport submission to NTC paper - Options to harmonise rolling stock testing and test locations

About the consultation

The National Transport Commission (NTC) [discussion paper](#) seeks feedback on options to harmonise rollingstock testing requirements and testing locations across Australia, as part of a broader national reform program to streamline rollingstock approvals, endorsed by the Infrastructure and Transport Ministers.

The paper proposes potential approaches to reduce duplication while maintaining safety assurance, such as aligning testing standards across jurisdictions, recognising test results between networks, and making better use of shared or dedicated testing facilities. It forms part of the National Rail Action Plan and the 'National Pathway' for rollingstock approvals, with the ultimate aim of enabling faster, more consistent and nationally interoperable train approvals across Australia's rail networks. Stakeholder feedback on this paper will inform the next phase of reform development and potential policy or regulatory proposals.

Overall position

Transport for NSW and Sydney Trains (Transport) welcomes the opportunity to provide feedback to the NTC in relations to harmonising rollingstock testing from a Rail Infrastructure Manager (RIM) perspective.

Transport supports national efforts to harmonise rolling stock testing, recognising the opportunity to reduce duplication, improve efficiency and enable faster, more consistent approvals across jurisdictions. Realising these benefits will require a holistic, coordinated approach across Rail Infrastructure Managers (RIMs), Rolling Stock Operators (RSOs) and Original Equipment Manufacturers (OEMs), supported by a regulatory framework that promotes a consistent approach across different RIMs

The above ensures that efficiencies are not achieved by shifting workload or risk between parties and avoids different testing requirements being imposed on RSOs to manage the same risk. Strengthening national collaboration and addressing barriers such as intellectual property constraints on sharing testing documentation will be important to support more streamlined and consistent processes.

Transport identifies early alignment on standardised test methodologies, documentation, and recognised test locations, particularly for complex dynamic testing, as key priorities that would deliver immediate benefits. There are also efficiencies in adopting more consistent approaches to freight wagon testing and network acceptance, similar to existing locomotive frameworks. Expanding the use of shared and recognised testing locations would reduce the need for live track occupation or possessions while enabling more flexible, frequent and longer-duration testing.

At the same time, Transport emphasises that harmonisation must reflect the unique safety risks and operating conditions of individual rail networks. Some network-specific requirements remain critical to ensuring safety and performance and cannot be fully replaced by simulation or uniform national standards. Transport therefore supports a practical, staged reform agenda, including agreed equivalence frameworks, shared test locations and consideration of a national testing facility, while recognising the importance

of maintaining strong alignment with network-specific operational and safety requirements.

Please note the content of this submission outlines the views of the Transport portfolio only, and we understand the submission will be published as part of the consultation.

Questions and Answers

In relation to specific questions from the NTC:

1. 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?

Current rolling stock testing requirements and practices imposed by RIMs via standards are generally minimal when considering the entire rolling stock testing program however the timing of the testing places it on the critical path for rolling stock commissioning (See Q4 response for further details). The other portions relates to OEM / RSO testing requirements where the RIM has little/no influence over.

RIM testing requirements are in place to manage identified rail network safety risk, often based on or due to the terrain of the network. They are considered minimum requirements for fulfil Rail Transport Operator obligations under the current regulatory framework.

A formal definition of “equivalence” in both testing requirements and testing locations, agreed between different RIMs, should be prioritised relative to other rolling stock approval elements of the National Pathway.

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

Harmonisation of all dynamic testing (procedure and acceptance criteria), ones which require access to live traffic, would be most effective because it requires the most lead time to plan and resources to undertake.

3. 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? For example, ‘Inspection based compliance checks’ that are largely visual are related to certification.

Please refer to Table below, which reflects TNSW’s current interpretation on the minimum expected of Rail Transport Operator to fulfil its duties, subject to the confirmation from ONRSR. As each category contains requirements, this by default requires certification for all categories. Similarly, as a Rail Transport Operator (RIM or RSO) has a duty to ensure so far as is reasonably practicable, the safety of the operator’s railway operations, all categories are included to network approval

For registration, category items that are not published or used in asset monitoring systems has been categorised as a “No”

Category	Certification	Registration	Network Approval
Static geometric and mass tests	Y	Y	Y

Category	Certification	Registration	Network Approval
Clearance and swing assessments	Y	N	Y
Basic brake functions (static)	Y	Y	Y
Dynamic ride quality and stability	Y	Y	Y
Dynamic ride performance	Y	Y	Y
Acoustic and visibility tests	Y	N	Y
Electrical and signalling interaction	Y	Y	Y
Inspection based compliance checks	Y	N	Y
Structural assessments	Y	N	Y
Calculation based assessments	Y	Y	Y
Environmental performance	Y	N	Y

4. 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?

Every rail network has specific risks which are translated into test requirements, requiring compliance / demonstration / fulfilment. Examples in NSW include long descending grades on the Blue Mountains and Illawarra ranges and tight gauge clearances in the Zig Zag tunnels. While it is acknowledged that other networks may share similar risks or constraints, without guidance and assurance from ONRSR, RIM are unable to assess the historic performance of such location to develop a testing similarity framework.

In addition, it is important to appreciate the basis on the why the approaches taken by other international jurisdictions has worked. Such as:

- Requirements in the AAR manual are very prescriptive as compared to requirements in Australian rail and RIM standards
- Technical Specifications for Interoperability (TSI) and EN standards referenced in the TSI are legislated as compared to requirements in Australian rail and RIM standards which are not
- KiwiRail is a vertically integrated railway, and this is not common in Australia

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

A national testing facility in Australia is welcomed. The facility maybe managed by an independent body similar to MxV Rail in the US who would be responsible for assessing and prioritising testing requests onsite. Location wise it should be located on the National Network for Interoperability (NNI) and preferably nearby a rolling stock manufacturing facility.

Factors to consider on whether to establish testing facility include:

- Whole of life cost (construction, maintenance and calibration of test equipment including track, technology investment, ongoing on site management)
- Accessibility costs (e.g. WA based equipment accessing the east coast, medium width passenger rolling stock needing to use the NIN to access the site etc) and management of non standard gauge vehicles
- The testing facility's responsibility and authority in rolling stock certification

Dynamic testing would benefit most due to limited live track availability for testing and limited suitable locations to undertake certain dynamic tests.

A dedicated testing facility would allow the testing of key characteristics of vehicles that are of concern or require investigative approaches over and above standard testing.

A national testing facility could also cover passenger rolling stock, light rail vehicles, track machines and small plants operating on rail.

6. 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?

The options are better considered as standalone options as they are generally discrete enough to be investigated and implemented in parallel, instead of in groups or treated as one project which may delay the overall delivery. Priority, ranked from highest to lowest in terms of value add to the industry and considering the complexity involved, is listed below

- i. Standardised test methodologies and documentation: Standardisation provides clear expectation and consistency in relations to information required, minimum requirements and pass/fail criteria. This will assist in reducing delays
- ii. Shared and recognised test locations: This is a neat and discrete package where RIMs can nominate test locations and discuss/agree on mutual recognition
- iii. Harmonised acceptance criteria: It is noted that this area will overlap with ARISO's remit in standards development, but harmonising acceptance criteria may help in addressing variations across Australia.
- iv. Test requirement matrix: As outlined in AS 7501 Rolling Stock Compliance Certification, it is the Independent Competent Persons (ICP's) responsibility to ensure that all requirements for the rolling stock (for its intended operating area) are identified in an appropriate register.
- v. Consolidated Australian standards with documented RIM variations: This involves both Australia and RIM standards and is envisaged to a complex and resource intensive piece of work

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

Tests that are similar across different RIMs with similar acceptance criteria could be quickly harmonised to delivery immediate benefits. Tests with acceptance criteria that are identical across majority of RIMs and documented in an Australian Standard, such that the twist test, may be a suitable candidate to consider. The support from the

regulator in assisting Rail Transport Operators to demonstrate certain test requirements, as a form a risk control, is no longer reasonably practicable would contribute to the pace in the delivery of immediate benefits.

The development and publication of a baseline “worst case” actual track data where all rolling stock tested will be deemed compliant to the relevant testing requirement.

A sample test report contain prefilled sections may be used to clearly articulate RIM documentation requirements to testing parties.

8. 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?

There are time and cost benefits associated with test planning by allowing greater flexibility in where dynamic and static tests are conducted. However, the proposed test location must meet the test location requirements and/or demonstrate equivalence to original specified test location. Examples include line speed, track quality (roughness), gradient and curve combination and cant deficiency.

For locations where equivalence has been demonstrated, such the ride performance, TfNSW has accepted dynamic testing to be conducted at locations on other networks. On balance, for a common network segment to be used as a test track, the host RIM will need to commit to a prescribed infrastructure standard, maintenance regime and track condition data sharing.

9. 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?

As stated in Q1, RIM specified testing only contribute to a small fraction to the overall testing program in the certification and registration process. Simulation cannot fully replace physical testing in providing assurance and demonstrate compliance. In areas where the testing environment is tight, simulation is already used as an alternative to physical tests. However, for tests where the input parameters are too complex to reflect the actual environment or where simulation is unable to clearly demonstrate compliance to the requirement in the first instance, simulation is not a viable alternative to physical trials.

EN 14363 Annex T.3 and UIC 518 Appendix K provide useful advice on a validation process for simulation models. Currently the Australian freight industry does not validate their simulation models to the degree required to that of these standards. In addition, the availability of actual track data to validate simulation model proves to be an ongoing challenge.

There are also intellectual property issues associate with using simulation unless the source model belongs to the Original Equipment Manufacturer which is also the managing the registration and certification of the rolling stock on behalf of the rolling stock operator(s). In the absence of mutual agreement, a single repository documenting vehicle performance characteristics would be a good start for RSOs/RIMs to prepare/assess claims of similarity.

10. 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?

A separate, dedicated project. This is based on the reasons due to this niche subject and also lessons learnt from the existing Technical Working Group for the single registration application pilot, detailed below.

The single registration application pilot is heavily focused on the process whereas harmonisation of testing requirements and locations should be technical focused and hence be led/facilitated by a NTC appointed technical advisor which has strong rolling stock and testing competency and credentials.

In addition, most of the harmonisation of testing requirements and locations belong to the certification scope rather than the registration scope (refer to Q3 response), which is the focus of the single registration application pilot Technical Working Group. The issue of a common testing location is also discussed in response to Q5 and Q8.

11. Would a testing location register be useful?

Yes. A testing location register will be useful. Please refer to a list of dynamic test locations on the Metropolitan Heavy Rail Network (MHRN) for both passenger and freight rolling stock.

Location	Test	Passenger / Freight/ Both	Network specific risk	Track Features
Blacktown St Marys (West Suburban Line)	Ride Performance	Both	Track damage, hunting, excessive braking distance - Portion of network designed for highest operating speeds	Main Line High Density (OC3) (original design 160km/h), predominantly tangent minimal curves, 12km length, TCI <45
Waterfall Helensburgh (Illawarra Line)	Kinematic Outline	Passenger	Striking with infrastructure - exceeding kinematic envelope	OC3, Long (800+m) constant radius/super curves plus transitions to test high speed passenger (160mm cant deficiencies)
Springwood Emu Plains (Main West)	Kinematic Outline	Both	Striking with infrastructure - exceeding kinematic envelope	OC3, Multiple curves (45+) of various curvature (240-600m) and super with transitions to test kinematic performance (110mm cant

Location	Test	Passenger / Freight/ Both	Network specific risk	Track Features
				deficiencies), 22km, TCI <50
Valley Heights (Main West)	Park brake	Freight	Uncontrolled runaway - Steepest grade on mainline	Grade 1:33, within the Springwood – Emu Plains test section. Faulconbridge 1: 31locations also possible.
Hawkesbury River – Cowan (Main North)	Traction Performance	Freight	Failure to lift load - worst gradient - curve combination on the network	OC3, 1:40 averag e grade, with curves down to 220-600m with super and transitions, 9km.
Lithgow Newnes Jtc (Main West)	Kinematic Outline	Passenger	Striking with infrastructure - Reduced kinematic envelope	Dedicated track section specific to Sub Medium rolling stock outline/transit space.
Wynyard (Shore Line)	Park brake	Passenger	Uncontrolled runaway - Steepest grade on mainline	1:30+ steep grade

*Main Line High Density (OC3) – 60kg rail, continuous welded, concrete sleepers (to be confirmed in all test areas)