Estimating the economic cost of Type Approval processes in the Australian rail industry

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RISSB
RAIL INDUSTRY SAFETY AND STANDARDS BOARD

AUSTRALASIAN RAILWAY ASSOCIATION

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Executive Summary

The Type Approval (TA) framework that applies in the Australian rail industry is a source of significant conjecture among industry stakeholders. Noting the importance of ensuring the safety of rail networks is preserved, there is a view held by stakeholders that the current framework should be revised to reduce the costs incurred by industry and alleviate constraints on long-term productivity.

RISSB's Australian Standard for "Rail Equipment Type Approval" (AS7702) was developed in 2014 and was intended to serve as a guide to a national approach to ensure a consistent TA process. However, being non-mandatory, it is reported that AS7702 is not consistently or appropriately applied across networks.

This report assesses the costs of the existing TA processes and based on consultation with industry participants (network operators, contractors, suppliers), assesses the extent to which these costs are excessive and the scope for direct and indirect cost savings to be achieved under alternative approaches. The main concerns raised by stakeholders about the efficiency of the current framework are summarised as follows:

(a) The existing framework constrains competition and innovation by making it prohibitively difficult to obtain TA for new products and technologies.

(b) The requirements to demonstrate the 'technical' validity of new products and processes are overly burdensome, adding significantly to the cost of TA.

(c) The TA process is being inappropriately applied, with an alternative process more appropriate for innovative products and technologies.

(d) Suppliers bear the cost of duplication of TA requirements across jurisdictions/organisations.

Cost of the existing TA framework

The costs attributable to the current TA framework in the rail industry can be categorised as follows:

- direct costs, being the costs incurred by industry participants in undertaking TA processes (i.e. preparing documentation, studies, trials, evaluations, etc.); and
- indirect costs, being the opportunity costs of the TA process in terms of losses in competition, innovation, and long-term productivity of the rail industry.

The direct cost of undertaking minor and major TAs is estimated at $70,000 and $285,000 respectively. The table below provides a breakdown of these cost estimates by industry stakeholder and cost category.

Direct costs for TA processes (per a representative TA application)

Cost category	Supplier/Submitter	Sponsor of TA application	Approving Entity	TOTAL
Minor				
Internal staff costs	$19,388	$26,300	$8,789	$54,477
Testing/studies/trials	$15,000	-	-	$15,000
Total costs for minor TA	**$34,388**	**$26,300**	**$8,789**	**$69,477**
Major				
Internal staff costs	$141,770	$65,300	$27,939	$235,009
Testing/studies/trials	$50,000	-	-	$50,000
Total costs for major TA	**$191,770**	**$65,300**	**$27,939**	**$285,009**

Note: A minor TA is one that represents approval of an existing product that involves minor modifications of existing equipment already in operation in Australia. A major TA refers to a new asset/technology and/or a first item from a new supplier; or an existing piece of equipment with a major upgrade. We note that there are some differences in the way that RTOs make this distinction (if at all), but it is used here for indicative purposes to show the level likely relative complexity of TAs that are typically assessed.

Source: Based on cost information obtained from industry stakeholders.

These estimates were then applied to the indicative estimates of the number of minor and major TA processes undertaken in each jurisdiction annually to derive an industry-wide estimate of direct costs of $230 million per annum. The table below shows the breakdown of these costs by jurisdictions and by minor and major TA.

Summary of industry-wide annual costs ($m)

	Minor				Major				Total			
	S	SP	AE	Total	S	SP	AE	Total	S	SP	AE	Total
NSW	$1.6	$1.2	$0.4	**$3.2**	$68.1	$23.2	$9.9	**$101.2**	$69.7	$24.4	$10.3	**$104.4**
VIC	$11.3	$8.7	$2.9	**$22.9**	$41.8	$14.2	$6.1	**$62.1**	$53.1	$22.9	$9.0	**$85.0**
QLD	$2.9	$2.2	$0.7	**$5.8**	$10.7	$3.7	$1.6	**$16.0**	$13.6	$5.8	$2.3	**$21.7**
WA	$2.4	$1.8	$0.6	**$4.9**	$9.0	$3.1	$1.3	**$13.4**	$11.4	$4.9	$1.9	**$18.3**
ACT	$0.1	$0.1	$0.0	**$0.3**	$0.6	$0.2	$0.1	**$0.9**	$0.7	$0.3	$0.1	**$1.1**
Totals	**$18.3**	**$14.0**	**$4.7**	**$37.0**	**$130.2**	**$44.3**	**$19.0**	**$193.5**	**$148.5**	**$58.3**	**$23.6**	**$230.5**

Note: S = Supplier, SP = Sponsor (Contractor), AE = Approving Entities

Number of TAs was extrapolated based on capital expenditure.

Source: Based on cost information obtained from stakeholders, extrapolated across industry-wide estimates for total number of TA processes (no capital expenditure incurred in SA, TAS or NT).

The table shows that the vast majority (around 84 per cent) of direct costs incurred in undertaking TA processes relates to major TAs. This is driven primarily by the additional trialling requirements associated with securing approval for these products and technologies and the implications for internal resource requirements, particularly for product suppliers.[1]

[1] Cost information by asset type was sought from rail stakeholders for this review, however the limited data available was not of sufficient granularity to enable any meaningful or reliable distinctions to be drawn beyond high-level

Information and data provided by stakeholders also enabled the direct cost estimate for minor and major TAs to be categorised between meeting 'technical' requirements (i.e. whether the technical specification of the product is workable) and 'non-technical' requirements, relating to issues related to assessing the product having regard to network-specific circumstances and conditions.

Based on the data provided, the costs associated with technical aspects account for around 38 per cent ($87 million per annum) of the total direct costs of TA processes, over 70 per cent of which is incurred by suppliers. Network-specific aspects are subsequently assessed as accounting for 62 per cent of direct costs, with these costs more evenly distributed between suppliers (60 per cent) and sponsors (i.e. rail project contractors/operators) (29 per cent).

While the nature of the indirect costs meant that it was not possible to derive an annual estimate for industry-wide costs, consultation with industry participants indicates these costs are likely to be significantly greater than the quantified direct costs. These indirect costs relate to the opportunity costs and adverse impact on long-term productivity attributable to the significant constraint the current TA framework imposes on competition and innovation in the rail sector. While noting the duplication of requirements across jurisdictions and the cost associated with the provision of unnecessary documentation to demonstrate the technical validity of products, all suppliers consulted with identified this constraint on market access and competition as the most significant source of inefficiency with the current TA framework.

Solutions

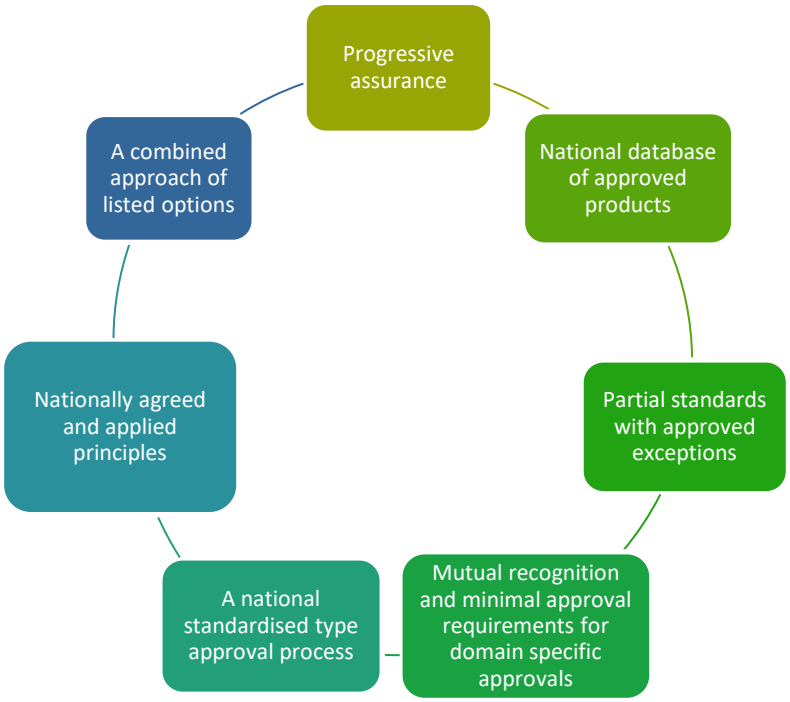
Some potential solutions to address what stakeholders considered to be an excessive cost compliance burden and to ease the constraints on long term productivity imposed by the current TA framework are set out below.

Harmonisation of standards and approvals

The harmonisation solutions that are discussed in the cost-benefit analysis were identified in collaboration with ARA and RISSB. The potential solutions include:

observations. Based on the volume information received, around 50 per cent of the TAs that are processed relate to signalling and systems equipment, and to a lesser extent, electrical (30 per cent) and track and civil equipment (18 per cent).

Rail harmonisation options



Source: Synergies

It is important to note that these potential solutions are not exhaustive and do not represent discrete solutions. It is likely that a combination of the approaches listed above would achieve the most beneficial outcomes for the rail industry.

Harmonisation, through any of these potential solutions, could also be further underpinned by the introduction of national product standards (or specifications).

In order to quantify the scale of potential cost savings that are likely to be available, we have relied upon the information submitted by stakeholders which provided a guide as to the relative proportion of the direct cost base that would be likely to deal with technical aspects of assessments. Costs associated with technical aspects are estimated to account for around $87 million per year. Based on stakeholder consultations, a significant portion of the costs incurred in technical assessments relate to the provision of (perceived) unnecessary documentation to substantiate that products are workable on a network, coupled with some duplication of this effort across jurisdictions/organisations.

The current resourcing costs spent on technical assessments could be reduced through solutions that reduce the level of duplication and the scale of unnecessary documentation that is required. The scale of cost reduction that is possible will depend

on the degree of harmonisation that is ultimately adopted, and the level of consistency achieved across jurisdictions/organisations.

Repurposing of the TA process

By introducing harmonisation provisions and national product standards for some products, this provides scope for the existing TA framework to be refocused more towards assessing those assets and technologies that are genuinely considered 'productivity enhancing' products. Actions taken to reduce costs associated with conducting complex, major proposals (without compromising safety) are likely to have the greatest cost impact (both in terms of reducing direct costs and indirect costs).

Improved precision of network specific assessments

Our analysis identified that costs dealing with non-technical (i.e. network specific) aspects are estimated to account for the majority of TA costs. A significant proportion of the costs relate to trialling and testing. Several stakeholders included in our consultations expressed the view that there are some trials or tests that are undertaken without a clear need or objective being specified. The implementation of a measure that required approving entities to identify the specific objectives of a trial or test (e.g. voluntary charter) would reduce the number of unnecessary trials and tests that are required, hence reducing the direct costs and avoiding unnecessary delays for suppliers, contractors, and network operators. There could be benefits, for example, if the industry were to 'clarify' when it is appropriate to apply for a TA, and alternatively, when it is not appropriate. More directly, clarifying the language around whether a 'type approval' is required for activities that are more related to 'approving' or 'checking' physical equipment as delivered, to the specification it was procured to. Some specific advice, for example, that identifies the circumstances in which a TA should not be used could be useful.

Contents

Figures and Tables

1 Introduction

1.1 Purpose

In July 2009, as part of the Government's Seamless National Economy agenda, the Council of Australian Governments (COAG) agreed to national transport regulation reforms including the establishment of a national rail safety law and national rail safety regulator. The rail reform aimed to resolve a century of inconsistent regulatory practices between the states and territories that have constrained rail transport operators across jurisdictional borders.

Significant inroads have been made to improve the efficiency of regulations and streamline compliance requirements. Today's rail safety framework is a risk-based approach whereby the Government sets a performance requirement on railways to operate safely and provides operational flexibility to establish and implement standards, rules, and methods of operation necessary to meet safety performance requirements.

While flexibility is a legitimate policy objective that can help to drive innovation, it can also impose unintended costs. The current framework allows rail businesses, including rail infrastructure managers (RIMs) to adopt and administer their own standards, according to their safety management system and associated risk assessments.

The resulting scope for inconsistency and duplication, should it exist, can be problematic for equipment suppliers (and their sponsors) who seek to invest in new technology and equipment, because they must first pass each rail business' 'bespoke' testing and approval requirements before the technology can be introduced. This can be costly and burdensome for a supplier that has products that could be used across multiple networks, as TAs with one rail network does not necessarily contribute towards an approval with another. This report explores the extent to which these inefficiencies exist, the magnitude of the subsequent cost impact on the industry and whether there is scope to implement solutions to facilitate more efficient TA processes and cost savings for the industry.

There are calls from the rail industry for a more 'harmonised' TA framework to address some of the inconsistencies and duplication of effort involved in existing TA processes. Streamlining existing processes could potentially involve TAs by one network operator acting as a 'trust marker' for other operators. A range of options are under active consideration by rail stakeholders, including the development of draft national principles by transport agencies, and RISSB undertaking a review of the 2014 Australian Standard 7702 with industry.

1.2 Overview of scope

The efficiency of TA processes is a complicated issue. Rail safety is a legitimate and paramount concern for network providers. However, there is some industry debate about the extent to which there may be inefficiencies within the existing framework and the scale to which the framework can accommodate changes without compromising safety.

To assist the rail industry better understand if there is inefficiency in the existing process and the potential benefits from the introduction of a more streamlined approach, if warranted, this report presents information on the costs of existing TA processes and identifies those costs likely to represent potential savings associated with a more harmonised and targeted approach to TA.

1.3 Report structure

This report is structured as follows:

- Section 2 outlines at a high level the current stages of the TA process;
- Section 3 explains our approach to quantifying the cost of TA processes and assessing potential cost savings;
- Section 4 presents a summary of stakeholder consultations;
- Section 5 sets out the direct costs associated with the current TA framework;
- Section 6 details the indirect costs attributable to the TA framework and discusses how this constrains innovation and long-term productivity; and
- Section 7 identifies potential solutions for improving the efficiency of the TA process; and assesses the benefits that could be achieved under a more harmonised and targeted approach.

2 The Type Approval process

This section provides an overview of the regulatory framework that applies to TA applications in the Australian rail industry and of the implications for industry stakeholders in terms of requirements and responsibilities. The section also includes an overview of the total number of TA processes that are undertaken annually.

2.1 Type Approval framework

The Rail Safety National Law imposes the duty on accredited rail companies to provide safe networks and operations. Australia's co-regulatory framework allows rail operators to adopt and administer their own standards, requirements, competencies, processes, and procedures, according to their safety management systems and associated risk assessments. A key requirement for operators under the co-regulatory model is to ensure that approval processes are reflective of their unique operating environment. This framework, and the fact that operators are held accountable and must manage their own risk can result in a lack of harmonisation.

TA is the process by which an organisation satisfies itself that a particular type of product or methodology meets the rail transport operator's requirements and specifications. TAs require new and/or novel products/assets/technologies to pass through discrete due diligence testing prior to being adopted by railway operators.

Currently, where a service provider is seeking to operate a new (or modified) technology or product on a network, it must pass through the relevant railway operator's specific approval process prior to being rolled out, regardless of whether the technology, product or process has been approved or applied in other jurisdictions/organisations. That is, TA with one operator does not necessarily currently serve as a 'trust marker' to another rail operator. This is a significant constraint on the capacity for service providers to develop and supply technological innovations and productivity-enhancing products across the rail industry.

RISSB's Australian Standard for "Rail Equipment Type Approval" (AS7702) was developed in 2014 and is intended to serve as a guide to a national approach to ensure a consistent TA process. The purpose of the Standard was to provide a common framework for Rail Transport Operators (RTOs) to evaluate 'novel' or 'modified' railways products for type approval. The Standard was intended to be applied to railway products and to specify the following:

(a) the minimum requirements to be evaluated for TA of railway products

(b) the information to be provided by the supplier of railway products requiring TA

(c) the evaluation process to be applied

(d) the responsibility of those organisations that use the TA process and/or result

(e) the standard TA certificate and supporting documents

(f) a framework for the production of TA documentation.

The RTOs remain responsible for ensuring that any risks introduced by new products are controlled so far as is reasonably practicable. By describing a standard or generic process, the Standard aimed to provide productivity gains for both RTOs and suppliers.[2]

However, being non-mandatory, it is reported that AS7702 is not consistently or appropriately applied across networks. We understand that RISSB is separately reviewing AS7702 as part of the normal periodic review process however in the current context, any update to AS7702 will struggle to solve problems brought about by its non-mandatory nature.

2.2 The Type Approval process

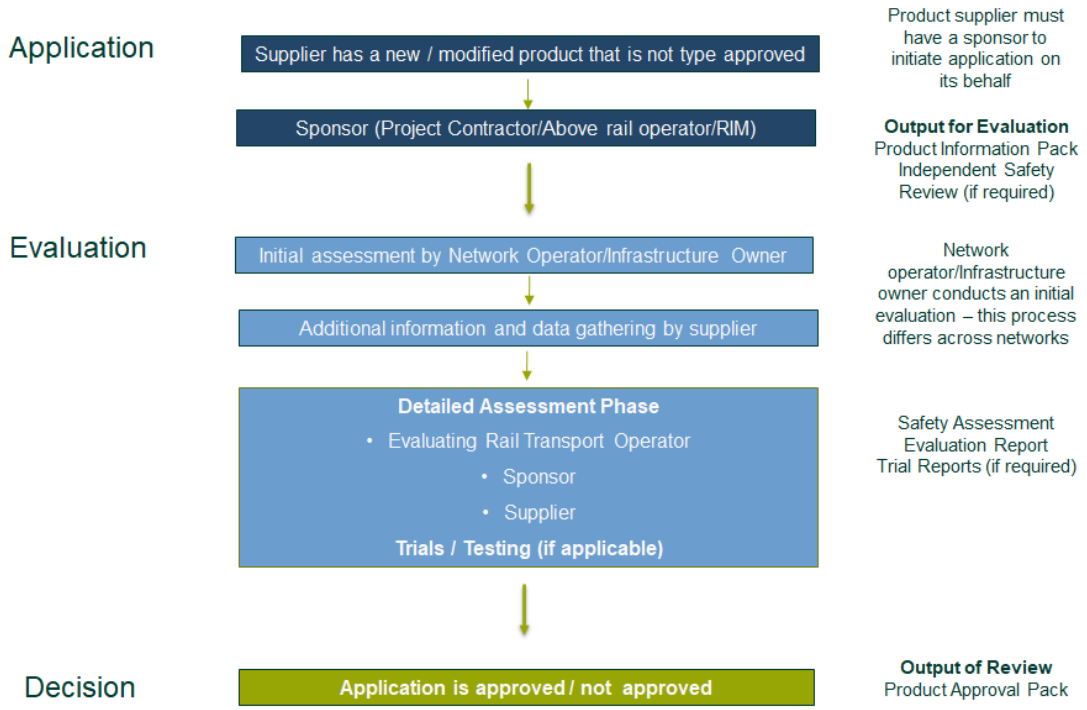
The significant cost associated with administering TA processes, both for product suppliers and approving entities, has resulted in some approving entities, and other key stakeholders, being unwilling to commence TA processes in the absence of a clearly defined need for a new product or technology.

As a consequence, TA processes have become effectively project driven. That is, a need for a product or technology that does not have TA is identified over the course of a project and a TA process is subsequently commenced. Following this, RTOs engage with contractors and suppliers to identify the nature of the TA required and the information and data necessary to assess the TA. For some assets and technologies, laboratory testing and field studies can be required as part of the TA process.

The typical process for a TA application is detailed in the following figure.

[2] See RISSB (2014), AS7702:2014 Rail Equipment Type Approval, Standard, p.10

Figure 1 Indicative process for a Type Approval



Source: Synergies.

There are three key stages (1) application (2) evaluation and (3) decision. Under the current framework, a product supplier must effectively find a sponsor (typically a rail construction project contractor, rail operator, or infrastructure owner, which is the prospective customer) to support or champion its product. A clear need for a new product or technology must be demonstrated, which is largely a project driven process.

We recognise this is a simplified interpretation of the current framework that implies that there is one such TA pathway. While this may be true of some evaluating entities, it may not be entirely representative of all jurisdictions/organisations (some jurisdictions have a risk-based assessment approach for applications).

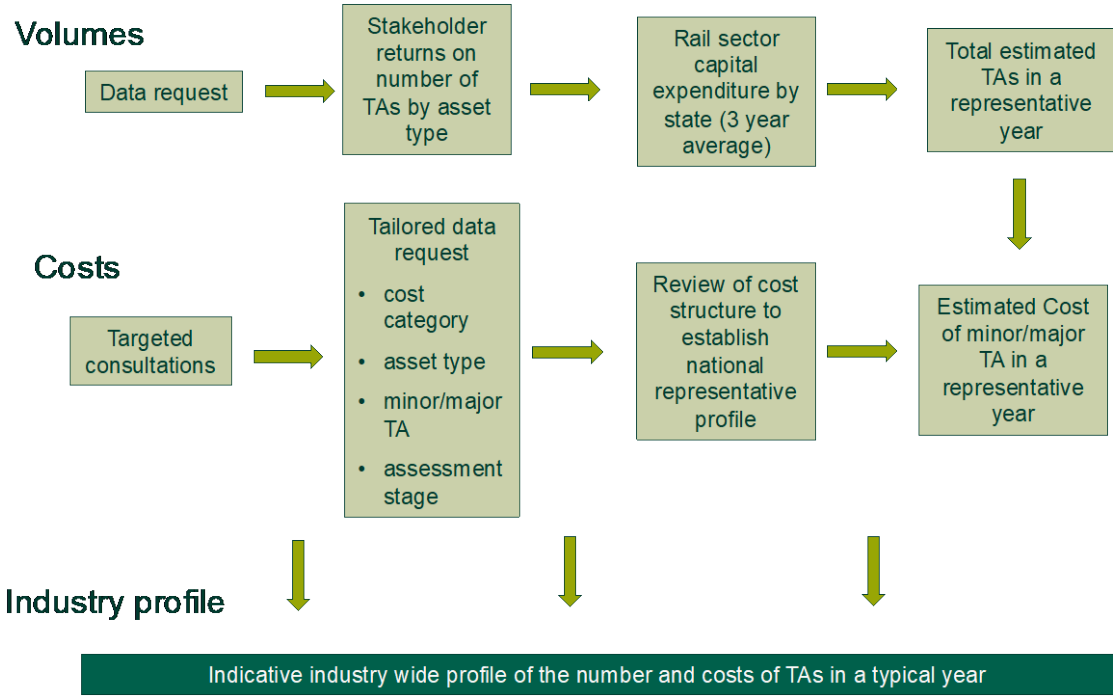
An evaluating rail transport network operator conducts an initial assessment to assess the validity of the application and whether all of the required documentation has been provided. Depending on the nature of the product (particularly if it is a new product) this can be a labour intensive process (particularly for the supplier).

There is some industry conjecture about the core function of TA in terms of where it 'starts' and where it 'ends'. However, based on our industry consultations, the TA process can be separated into two main components: (1) assessment of the technical validity of the product and (2) assessment of the product to ensure it is consistent with the individual network characteristics and conditions.

3 Approach

The assessment of the extent to which changes to the TA framework have the potential to achieve material cost savings for the rail industry, while preserving network safety, firstly required the development of industry-wide estimates of the costs incurred in administering TAs. The figure below summarises our approach to developing this industry-wide cost estimate.

Figure 2 Methodology for cost estimation



Source: Synergies.

3.1 Stakeholder consultation

There are two means by which consultation with industry stakeholders has informed this analysis:

(a) Identifying the number (and category) of TAs undertaken across the rail industry annually – this initial information was necessary for extrapolating the results of the analysis for each category of type approval to obtain an industry-wide cost estimate under the base case; and

(b) Informing the quantification of direct costs incurred in relation to each category of TA.

For the first of these processes, a relatively broad consultation approach was conducted, as it was necessary to canvas a representative sample of companies to ensure the number and distribution of TAs was indicative of the industry-wide total. The process for this stage of the consultation was as follows:

1. Synergies liaised with the ARA and RISSB to identify a sufficiently representative sample of companies;
2. the ARA and RISSB established contact and informed stakeholders of the project and upcoming information request; and
3. Synergies prepared a simple information request to obtain required information on number and distribution of TAs sought by stakeholders.

The second stakeholder consultation process involved more targeted consultation with a small selection of stakeholders. The process for this stage of the consultation was:

4. Synergies liaised with the ARA and RISSB to identify key stakeholders to provide input into developing detailed costings for each category of TAs;
5. the ARA and RISSB established contact and informed stakeholders of the project and process for gathering required data and information; and
6. Synergies met with interested stakeholders to discuss the nature of the costs that they incur and provided a data request.

Synergies liaised with stakeholders to address any key gaps in data and information as required.

3.2 Defining the base case

Robust definition and quantification of the base case is critical to exploring whether changes are required to existing TA processes and requirements. A base case has been defined for each category of TA, based on the data and information obtained through the review of available documentation and detailed consultation with industry stakeholders.

The base case has been defined having regard to the following types of costs:

(a) direct internal costs (e.g. development of testing plans, pilot studies) – 'internal' costs are those which are incurred by the supplier / sponsor / evaluating entity;

(b) value of time of internal resources (e.g. staff time required for documentation of testing results, consultation and communication with RTOs);

(c) external procurement costs – those costs incurred by the supplier/sponsor/ evaluating entity incurs as a result of commissioning of reports/evaluations with third parties; and

(d) other costs incurred (e.g. increased operational costs during testing).

These reflect the major categories of costs that apply throughout the TA process in terms of:

- consultation with RTO to identify requirements for type approval
- scoping and development of testing and evaluation plans
- testing and field trials
- documentation and reporting of testing and trial results
- changes to complementary procedures and processes
- further evaluation requirements.

A critical part of defining the base case was establishing a national profile for the number of TAs that would be expected to be processed across all jurisdictions in a representative year. To do this, Synergies used a correlation between published data on rail sector capital expenditure (using a three year average[3]) and the number of TAs provided by stakeholders to establish the base case.

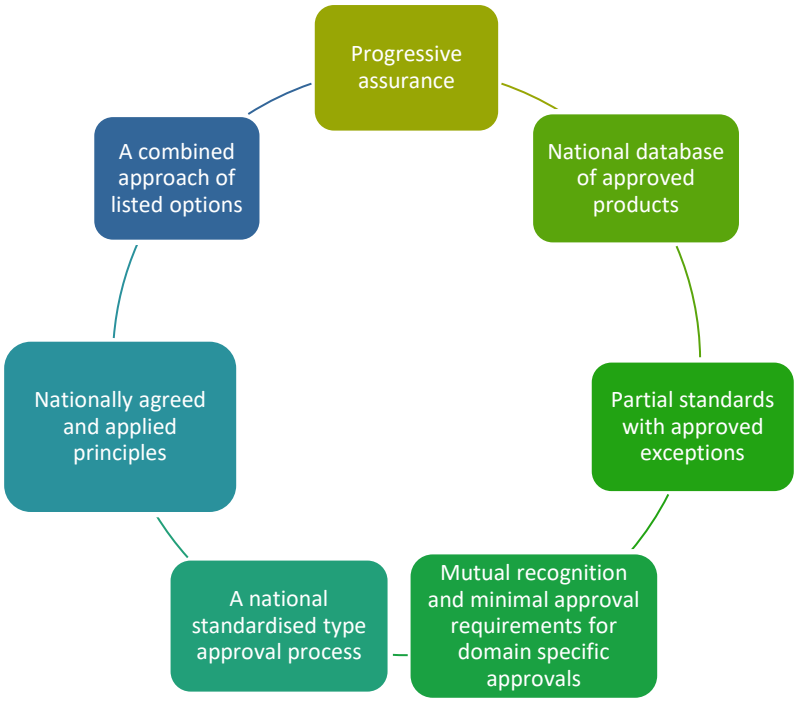
Another critical part of defining the base case was to determine the degree to which any of the identified requirements and associated costs are duplicated across jurisdictions and whether there is a basis for this duplication.

3.3 Identifying and assessing options

Indicative options that were assessed in the cost-benefit analysis were identified in collaboration with ARA and RISSB. The potential options included are identified below (and discussed further in section 7). While not exhaustive, these options are useful in demonstrating the range of options available and in assessing their strengths of weaknesses. It is also important to note that these options are not discrete and the solution that yields the greatest benefit to the rail industry is likely to be a combination of the potential solutions.

[3] Synergies has relied on rail sector capital expenditure published by the Australia NZ Infrastructure Pipeline as a relevant proxy. See https://infrastructurepipeline.org/ for more information.

Figure 3 Rail harmonisation options



Source: Synergies.

Regardless of whether an alternative framework is developed and implemented for securing TAs, entities will still incur costs in securing TA for new assets or technologies. Hence, it is important for the analysis to identify which of the quantified costs under the base case is reduced or avoided under an alternative, harmonised scenario.

For example, while field testing may still be required for a new signalling technology, a company may be required to undertake three different field tests due to the duplicative TA requirements across jurisdictions/organisations under the base case, with only one field test being required under a harmonised approach.

Identifying the reduced or avoided costs is a key component of assessing the economic benefit attributable to a more harmonised approach.

3.4 Quantification of industry-wide benefits

The final step in the analysis involves the extrapolation of the modelling results for each category of TA across the entire rail industry.

This draws upon the outcomes of industry consultations to obtain an overall estimate for the total number of each category of TA sought on an annual basis, with the results from the modelling referred to above. We have then applied these estimates to produce industry-wide benefit estimates.

Benefit estimates are reported as a whole-of-industry benefit estimate. Given the data made available, it has not been possible to quantify the economic benefits associated with each shortlisted harmonised option. This is instead discussed in qualitative terms based on information provided through stakeholder consultations.

4 Summary of stakeholder consultations

Synergies consulted with a range of industry stakeholders to inform the analysis, including network operators, rail construction project contractors, and suppliers. This section provides a summary of the key themes emerging from the consultation, including the key drivers of the costs of the current TA framework and identification of any perceived inefficiencies that might currently exist.

The main concerns raised by stakeholders about the efficiency of the current framework are summarised as follows:

1. The existing framework is seen to constrain competition and innovation by making it prohibitively difficult for suppliers to obtain TA for new products and technologies.
2. The requirements to demonstrate the 'technical' validity of new products and processes are considered to be overly burdensome, adding significantly to the cost of TA.
3. The TA process is being inappropriately applied, with an alternative process more appropriate for innovative products and technologies.
4. Suppliers, in their view, bear the cost of duplication of TA requirements across jurisdictions/organisations.

These issues are discussed in more detail below.

4.1 Constraint on competition and productivity

The long-run productivity of the Australian rail industry is contingent upon the use of innovative and efficiency-enhancing products and technologies. As the process through which new products and technologies secure approval to be supplied to rail infrastructure projects and rail operators, the TA process plays an important part in facilitating enhancements in efficiency and long-run productivity.

Stakeholders that Synergies consulted with, in particular product suppliers, indicated that the TA process is currently a significant constraint on the efficiency and long-run productivity of the industry. The key source of this constraint is that, in many instances, suppliers are excluded from tender processes where their products and technologies have not already secured TA on the relevant network. That is, for suppliers to be considered for a tender for a rail infrastructure project, their products must already be type approved. This is often despite the product or technology being widely used internationally and even in other Australian jurisdictions.

The root cause of this constraint is the administrative cost and delay risk associated with TA processes. As noted above, this has resulted in approving entities being reluctant to conduct TA processes without a clear need for a new product or technology being identified. Hence, the TA process has become largely 'project driven', whereby suppliers are required to secure sponsors for their product or technology (typically project contractors), who then liaise with the approving entity to undertake the TA process.

Given the sponsor is required to absorb the administrative costs and delay risk associated with the TA process, there is limited incentive for project contractors to undertake a TA process unless there is an overwhelming need for a new product or technology (or those products and technologies with TA are inappropriate).

This culminates in rail construction contractors specifying, for most tenders, that products must have TA, and suppliers acting accordingly (i.e. not seeking to include new products or technologies in tender responses even where they are available and would result in more efficient outcomes), resulting in sub-optimal outcomes both in terms of the delivery of the project and the long-term productivity of the rail sector. This is compounded by the typically insufficient allowance within project budgets and schedules for TA processes.

This process means there is a very limited set of circumstances under which suppliers are likely to be successful in obtaining TA for a new product or technology. Not only must suppliers secure a sponsor to commence the TA process, but the sponsor must also be willing to take on the cost and risk of delay associated with undertaking the TA process within the scope of a capital project.

Suppliers often incur significant costs attempting to secure a sponsor, including commissioning laboratory testing, extensive engagement, and providing sample products without charge. Some suppliers reported that despite incurring significant costs over extended periods of time, they have remained unable to secure a sponsor for new products and technologies (see case study in section 7).

This problem is most likely caused by several factors, including where evaluating entities (RTOs) may not always have sufficient in-house capability and/ or capacity to assess products, so they are more inclined to apply/invoke a TA process. This results in a more risk-averse approach being applied and a presumption that safety and technical issues are more elevated than would otherwise be the case. This practice escalates the TA application to more senior staff to assess, which takes time and additional resourcing costs. This results in additional costs imposed on submitters to make an application and provide all of the supporting information.

4.2 Overly burdensome requirements

Stakeholder feedback indicated that there are essentially two components to the TA process from an approving entity's perspective (1) ensuring a product/asset works; and (2) assessing whether it is consistent with network-specific conditions and the network owner's asset management strategy.

The majority of stakeholders were of the view that, in most cases, the former should be a simple process, particularly where an asset is being used in other jurisdictions (particularly in Australia), while the latter does require consideration of network-specific factors and hence may have more significant approval requirements.

Despite this, suppliers reported that the requirements in terms of provision of documentation and information and potentially additional testing requirements to demonstrate the technical validity of new products and technologies can be significant, even where there is limited risk associated with technical validity due to the product effectively being operated in multiple Australian and/or overseas jurisdictions.[4]

Stakeholders reported that network operators typically default to requiring extensive trialling of new products or technologies, regardless of the extent to which the product/technology has been used for extended periods in other Australian or international jurisdictions. Stakeholders argued that greater emphasis should be placed on ensuring that assessment requirements are clearly linked to genuine network-specific issues. For example, if operating under extreme heat is a consideration, this could be addressed through evidence that the asset successfully operates on a network located in an environment with similar maximum temperatures, rather than a costly and time-intensive trial being necessary.

It is worth noting that some evaluating entities may have a strong incentive to 'set the bar high', to minimise the extent to which granting TA to multiple products and technologies impacts on network maintenance costs (noting also the paramount importance of TA for ensuring safe operation of new assets and technologies). This incentive is particularly strong if there are characteristics on its network that make it unique and/or comparatively more complex than other networks.

This process does not facilitate a rapid adoption of new products and technologies, and in some cases leads to obsolete and outdated equipment continuing to be used in favour of productivity-enhancing products and technologies. Greater specificity around the specification of the objectives of trials could improve the process by ensuring that trials

[4] Noting that suppliers did acknowledge that the requirements to demonstrate technical validity are typically lower where it can be demonstrated that a product or technology has TA in another Australian jurisdiction.

are only conducted where the approval requirements cannot be satisfied through lower cost and less time-intensive processes such as documentation of evidence from other jurisdictions or laboratory testing.

4.3 Excessive use of TA process

A number of stakeholders consistently reported that, in their view, the TA process is currently being used for too many products, which is neither appropriate nor an efficient use of resources for the purpose that the TA framework was designed. Stakeholders considered that there should be a simpler process for products that either have minimal safety implications or reflect minor variations on products that already have TA.

By way of example, a supplier noted that it had been granted TA for turnouts, however, a new TA process was required for minor variations to the asset. The supplier noted that a similar level of effort was incurred for each TA process (i.e. the original application and for the variation), while functionality and compatibility with the network did not differ across the different components. This is likely driven by rail network operators and RIMs seeking to limit the number of type approved products and technologies on their networks, having regard for the potential impact on network maintenance practices. That is, type approving products that are effectively substitutes for existing type approved products can result in network operators and RIMs having to carry additional spare parts, train maintenance staff to maintain and replace multiple products, etc.

A similar TA process is generally used for all new assets and technologies, including those that represent minor departures from assets already in use on a rail network. This reflects a number of factors, but it is most likely being driven by a lack of a national standard for various products that detail the specifications with which a product must align, in addition to not utilising a risk-based approach.

Stakeholders identified that there is a need to consider whether the current TA process is fit for purpose. Consideration should be given to whether it is appropriate for assets and technologies that represent a material change in operations and may result in significant productivity enhancements – to be put through the same process that minor TA processes are. The relatively higher volume of minor approvals often means that the processing of these applications is constraining the framework's consideration of major, complex TAs.

4.4 Duplication across jurisdictions

Under the current TA framework, there is no formal recognition by approving entities of TAs that apply in other jurisdictions/organisations; rather there is a requirement for the same information to be submitted and assessed repeatedly.

One stakeholder reported what while there is extensive duplication, there are also some economies of scale in submitting TA processes for the same assets in other jurisdictions. This is because, in most cases, the technical information has already been gathered and therefore the main costs are associated with approving entities undertaking their assessments of the compatibility of the asset/technology with their network specifications.

Numerous stakeholders acknowledged that, while there had been previous attempts to standardise TA processes across jurisdictions to reduce duplication costs, approving entities in the respective jurisdictions have typically reverted back to conducting their own assessment processes. These may be several reasons for this, including network owners adopting a risk averse approach to approving new assets and technologies on their networks.

5 Direct cost of Type Approval processes

The costs attributable to the current TA framework in the rail industry can be categorised as follows:

- direct costs, being the costs incurred by industry participants in undertaking TA processes (i.e. preparing documentation, studies, trials, evaluation, etc.); and
- indirect costs, in terms of the constraints imposed on competition and innovation and the long-term opportunity cost to the rail industry in terms of lost productivity.

This section assesses and quantifies the direct costs, based on data and information obtained from industry stakeholders. The indirect costs, anticipated to be significantly greater than the direct costs albeit far more difficult to quantify, are discussed in section 6.

5.1 Incidence of direct costs

Table provides an overview of the key activities and costs associated with TA processes and the distribution of these costs across stakeholders and the three stages of the TA process.

Table 1 Summary of costs incurred by stage of TA process and stakeholder

Stage	Supplier	Sponsor	Approving entity
Pre-application – industry engagement	• Establishing local presence, market engagement, establishing a relationship with prospective sponsor	• Internal staff costs	• Nil – may be involved in preliminary consultations with supplier and/or potential sponsor
Stage 1 – Application preparation	• Internal staff costs (engineers, technicians, design personnel) • Internal product testing and preparation of documentation • Laboratory testing and trialling costs	• Internal staff costs (communicating with supplier and approving entity, reviewing supplier documentation) • Preparation of studies and documentation of results	• Internal staff costs – liaising with supplier/contractor on TA requirements
Stage 2 – Assessment by approving entity	• Liaise with Sponsor/Contractor	• Internal staff costs (communicating with supplier and approving entity) • Preparation of studies and documentation of results	• Internal staff costs – reviewing application, liaising with supplier/contractor on additional requirements • Reviewing outcomes from studies/trials
Stage 3 – Post-approval and ongoing monitoring	• Liaise with Sponsor/Contractor	• Internal staff costs (communicating with supplier and approving entity)	• Granting of final TA approval

Stage	Supplier	Sponsor	Approving entity
		• Preparation of studies and documentation of results	

Source: Based on consultation with industry stakeholders.

As shown in the table above, the direct costs incurred by stakeholders in undertaking TA processes can be categorised as follows:

- internal staff costs, related to the preparation of required documentation, including the outcomes of laboratory testing and trials/studies, communications between stakeholders to scope requirements, and the assessment of TA applications and supporting information by approving entities; and
- external costs, related to the commissioning of necessary laboratory testing, field studies and trials, as required by the approving entity for TA to be granted.

Table 2 presents the cost estimates derived for indicative minor and major TA processes.

Table 2 Typical direct costs for TA processes based on consultation with stakeholders

Cost category	Supplier/Submitter	Sponsor	Approving Entity	TOTAL
Minor				
Internal staff costs	$19,388	$26,300	$8,789	$54,477
Testing/studies/trials	$15,000	-	-	$15,000
Total costs for minor TA	**$34,388**	**$26,300**	**$8,789**	**$69,477**
Major				
Internal staff costs	$141,770	$65,300	$27,939	$235,009
Testing/studies/trials	$50,000	-	-	$50,000
Total costs for major TA	**$191,770**	**$65,300**	**$27,939**	**$285,009**

Note: A minor TA is one that represents approval of an existing product that involves minor modifications of existing equipment already in operation in Australia. A major TA refers to a new asset/technology and/or a first item from a new supplier; or an existing piece of equipment with a major upgrade. We note that there are some differences in the way that RTOs make this distinction (if at all), but it is used here for indicative purposes to show the level likely relative complexity of TAs that are typically assessed.

Source: Based on cost information obtained from industry stakeholders.

The table shows that:

- a minor TA is expected to cost around $70,000 from application through to final evaluation. Around half of these costs are borne by the supplier in preparation of the application and provision of supporting documentation; and
- a major TA is estimated to cost around $285,000, which is commensurate with the increased rigour and additional testing and increased resourcing costs that are incurred. While suppliers bear the bulk of the costs (around 70 per cent), the costs borne by sponsors (contractors/operators) and approving entities are materially higher than the costs attributable to a minor TA process.

It is noted that while the costs incurred in undertaking TA processes may be initially incurred by suppliers, these costs are likely to be passed on to customers in most cases. However, as the purpose of this report is to assess the industry-wide cost attributable to TA processes and the scope for cost savings to be achieved, the distribution of these costs among industry participants has not been assessed.

5.2 Estimating industry-wide direct costs of TA processes

The preceding sections detail the direct costs of undertaking individual minor and major TA processes across the five key asset types identified in this review. To derive an estimate for the industry-wide direct costs incurred in undertaking TA processes, it is necessary to extrapolate these cost estimates across the population of TA processes undertaken across the industry annually.

The section below first provides industry-wide estimates of the number of minor and major TAs undertaken by jurisdiction and asset type.

5.2.1 The industry-wide TA task

TA processes can be differentiated based on asset type and complexity. In identifying the number and categories of TAs across the industry, Synergies liaised with ARA and RISSB to obtain the required information from a representative sample of companies, which was subsequently extrapolated based on publicly available rail project capital expenditure data.[5]

The five key asset types included in this review are:

- signalling and systems;
- electrical
- track and civil;
- rollingstock equipment; and
- stations.

In terms of complexity, information on the number of minor and major TAs was collected. A minor TA is considered to be one that represents approval of an existing product that involves minor modifications of existing equipment already in operation in Australia. A major TA refers to a new asset/technology and/or a first item from a new

[5] Rail capital expenditure data was based on the Australia and New Zealand Infrastructure Pipeline (ANZIP) which provides a forward view of major infrastructure projects and contracts.

supplier; or an existing piece of equipment with a major upgrade. We note that there are some differences in the way that RTOs make this distinction (if at all), but it is used here for indicative purposes to show the breakdown of the TA task across the industry in terms of the level of complexity of TA processes.

The table below presents the industry-wide data on the number of TA processes undertaken across the rail industry by asset type, complexity, and jurisdiction.

Table 3 Breakdown of TA processes undertaken in the rail sector per annum

Jurisdiction	Signalling and Systems		Track and Civil		Rollingstock		Stations		Electrical		Total	
	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major	Minor	Major
NSW	18	139	5	41	-	-	-	-	23	175	47	355
VIC	173	115	57	38	5	3	3	2	91	60	328	219
QLD	55	37	28	19	-	-	-	-	-	-	83	55
WA	37	25	15	10	-	-	-	-	18	12	71	47
ACT	2	1	1	1	-	-	-	-	1	1	4	3
SA												
TAS												
NT												
Totals	**285**	**317**	**106**	**109**	**5**	**3**	**3**	**2**	**133**	**248**	**533**	**679**

Note 1: In extrapolating the data across jurisdictions, Synergies used 2022 capital expenditure data from the Australia and New Zealand Infrastructure Pipeline: NSW ($5.8bn), VIC ($7.9bn), QLD ($2bn), WA ($1.7bn) and ACT ($0.1bn), and applied this to the assumption of approximately 69 TAs per $1bn capital spend, based on data provided by stakeholders and publicly available information.

Note 2: Synergies assumed a 60/40 split for minor and major TAs for all jurisdictions apart from NSW, where data received indicated this to be predominantly major approvals at a 12/88 split. Proportions to derive the breakdown of TAs by asset type was based on data received from stakeholders.

Source: Based on information obtained from industry stakeholders.

The table shows that:

- *Industry wide* - we estimate that around 1,200 TAs are processed nationally in a representative year;
- *Jurisdiction* – the bulk of the TAs are processed in Victoria (45%) and NSW (33%);
- *Complexity* – whilst jurisdictions/organisations tend to have just one pathway for assessing TAs, we expect that there are slightly more major (or complex) TAs than minor TAs, although this profile is mostly driven by assessments in NSW where the majority of TAs are regarded as 'major' TAs and are subject to a full, intensive evaluation. This contrasts with other jurisdictions (Victoria, Queensland and WA) where most of the TAs that are processed are regarded as minor approvals; and
- *Asset type* – Around half of the TAs that are processed relate to signalling and systems equipment, and to lesser extent, electrical (30%) and track and civil equipment (18%).

The following sections detail the extrapolation of the direct cost estimates for individual TA processes by complexity across these industry-wide estimates. Cost information by asset type was sought but the limited data available was not of sufficient granularity to enable any meaningful or reliable distinctions to be drawn beyond the high-level estimates shown above.

5.2.2 Summary of direct costs of TA processes

Table 4 and Figure 4 below details the industry-wide estimates for the cost of TA processes for all assets.

Table 4 Summary of industry-wide annual costs ($m)

Jurisdiction	Minor				Major				Total			
	S	SP	AE	Total	S	SP	AE	Total	S	SP	AE	Total
NSW	$1.6	$1.2	$0.4	**$3.2**	$68.1	$23.2	$9.9	**$101.2**	$69.7	$24.4	$10.3	**$104.4**
VIC	$11.3	$8.7	$2.9	**$22.9**	$41.8	$14.2	$6.1	**$62.1**	$53.1	$22.9	$9.0	**$85.0**
QLD	$2.9	$2.2	$0.7	**$5.8**	$10.7	$3.7	$1.6	**$16.0**	$13.6	$5.8	$2.3	**$21.7**
WA	$2.4	$1.8	$0.6	**$4.9**	$9.0	$3.1	$1.3	**$13.4**	$11.4	$4.9	$1.9	**$18.3**
ACT	$0.1	$0.1	$0.0	**$0.3**	$0.6	$0.2	$0.1	**$0.9**	$0.7	$0.3	$0.1	**$1.1**
SA	-	-	-	**-**	-	-	-	**-**	-	-	-	**-**
TAS	-	-	-	**-**	-	-	-	**-**	-	-	-	**-**
NT	-	-	-	**-**	-	-	-	**-**	-	-	-	**-**
Totals	**$18.3**	**$14.0**	**$4.7**	**$37.0**	**$130.2**	**$44.3**	**$19.0**	**$193.5**	**$148.5**	**$58.3**	**$23.6**	**$230.5**

Note: S = Supplier, SP = Sponsor (contractor), AE = Approving Entities

Source: Based on cost information obtained from stakeholders, extrapolated across industry-wide estimates for total number of TA processes.

Figure 4 Minor Type Approval and Major Type Approval Cost Breakdown

Source: Based on cost information obtained from stakeholders, extrapolated across industry-wide estimates for total number of TA processes.

We estimate that the combined total direct cost of processing TAs is around $230 million per year. The bulk of the costs are incurred in conducting major approvals, which is

driven primarily by the additional trialling requirements associated with securing approval for these products and technologies.

For both of minor and major TAs, the bulk of these costs are incurred by the supplier, and to a lesser extent, the sponsor.

Technical and non-technical assessments

Information submitted by stakeholders can also provide a guide as to the relative proportion of the direct cost base that is likely to deal with technical and non-technical aspects of assessments. In this regard:

- *Technical* – these costs reflect matters covering the technical specification of an asset or technology to ascertain whether the product is workable on a network; and
- *Non-technical* – these costs reflect matters that are more complex in nature and must necessarily take into account individual circumstances and conditions of a specific network or segment.

The breakdown of costs that cover technical and non-technical aspects is presented below.

Table 5 Annual direct costs for TA process ($m)

Category	Technical				Non-Technical			
	S	SP	AE	Total	S	SP	AE	Total
Minor								
Stage 1	$12.9	$2.2	$0.4	**$15.5**	$3.2	$0.5	$0.1	**$3.9**
Stage 2	$1.6	$4.1	$2.8	**$8.5**	$0.4	$1.0	$0.7	**$2.1**
Stage 3	-	-	-	**-**	$0.2	$6.2	$0.6	**$7.1**
Total	***$14.5***	***$6.2***	***$3.2***	***$24.0***	***$3.8***	***$7.8***	***$1.4***	***$13.1***
Major								
Stage 1	$45.3	$4.8	$1.0	**$51.1**	$78.3	$8.2	$1.8	**$88.3**
Stage 2	$2.2	$5.8	$4.4	**$12.4**	$3.8	$9.9	$7.6	**$21.4**
Stage 3	-	-	-	**-**	$0.5	$15.7	$4.2	**$20.4**
Total	***$47.6***	***$10.5***	***$5.4***	***$63.5***	***$82.6***	***$33.8***	***$13.6***	***$130.0***
Minor & Major								
Stage 1	$58.3	$6.9	$1.5	**$66.6**	$81.5	$8.8	$1.9	**$92.2**
Stage 2	$3.8	$9.8	$7.2	**$20.8**	$4.2	$10.9	$8.3	**$23.5**
Stage 3	-	-	-	**-**	$0.7	$21.9	$4.8	**$27.5**
Total	***$62.1***	***$16.7***	***$8.7***	***$87.5***	***$86.5***	***$41.6***	***$15.0***	***$143.1***

Note: S = Supplier, SP = Sponsor (Contractor), AE = Approving Entities
Source: Based on cost information obtained from industry stakeholders.

The table shows that:

- Costs associated with technical aspects are estimated to account for around $87 million (representing around 38 per cent of total direct costs).
  - Of this cost, approximately 71 per cent is attributable to Suppliers, 19 per cent attributable to Sponsors, with the remaining 10 per cent attributable to Approving Entities.
- Costs dealing with non-technical aspects account are estimated to be in the order of $143 million and account for the majority (62 per cent) of TA costs. Around 60 per cent of these costs are borne by Suppliers, 29 per cent by Sponsors and around 10 per cent of costs are borne by Approving Entities.
- Minor TAs have a higher proportion of costs that deal with technical aspects (65 per cent technical/35 per cent non-technical) than major TAs.
- In contrast, and not unexpectedly major TAs have a higher proportion of costs that deal with non-technical aspects (33 per cent technical/67 per cent non-technical).

6 Indirect costs

The indirect costs attributable to the TA framework relate to the adverse impact on, and lost opportunities for innovation and long-term productivity due to the constraint on competition under the current framework. These costs are inherently difficult to quantify, however consultation with stakeholders indicates that these costs are likely to significantly outweigh the direct costs quantified in section 5.

6.1 Innovation and long-term productivity in the rail sector

The ARA's 2020 Report[6] into rail innovation in Australia, noted the following in terms of the importance of technological innovation for the long-run productivity of Australia's rail industry:

- the global market for rail technology is large; it is estimated to be worth $362 billion, and is growing at 3.2 per cent per year, and there is evidence that the pace of innovation in rail transport is 'quickening';
- new technology can deliver higher relative benefits than traditional project approaches including cost savings, additional capacity, improved reliability, time savings, safety, and energy efficiency;
- Australia has a large land mass, extremes of temperature and operating conditions, and a relatively small urban population. As a result, its railways can struggle to be cost efficient. This need for lower cost productivity gains is the strongest case for Australian railways to invest in innovation; and
- Australia is due to spend $155 billion on rail construction over the next 15 years – a 'once in a generation' opportunity to boost land transport productivity across the country. Efforts now to maximise innovation will set up the Australian rail sector for future productivity.

Innovation is therefore a critical input for the next wave of rail transformation. Facilitating opportunities for rail innovation is critical to achieving government policy objectives, including but not limited to reduced carbon emissions and long term environmental sustainability.[7]

An example of where such innovation is likely to drive improved rail operating efficiencies is presented in the box below. This is only one such example, but a TA

[6] ARA (2020), Finding the fast track for innovation in the Australasian rail industry, October 2020.

[7] Cress Consulting (2022). National Rail Carbon Footprint Study; KPMG (2022). The journey to net zero – Inspiring climate action in the Australian transport sector.

framework that can both facilitate and support investment in productivity enhancing assets is needed for such efficiencies to occur.

Box 1 The role of innovation in autonomous driving technology

One area of potential transformative change in rail that represents both a challenge and opportunity is autonomous driving technology. For rail, driverless technology offers the potential to achieve greater efficiency for operations. For example, autonomous freight rail could operate more safely and could use less fuel to complete the freight task (by optimising breaking behaviour) in passenger rail autonomous vehicles could vastly increase capacity on urban rail networks by reducing the head-way between trains. Implementing driverless technology in rail is challenging as it requires improvements to signalling and communications infrastructure to a point where the trains can make the transition to driverless.[1]

6.2 Constraints on competition, innovation, and long-term productivity

The ARA's 2020 report also found that Australia has been slower to adopt major rail technologies than its global counterparts. A key driver of this slow adoption is the high degree of market fragmentation that creates deep structural barriers to the efficient take-up and procurement of new technologies.

The report also noted that Australia's rail industry culture was, relative to other countries, more reluctant to experiment and trial new technologies, safety conscious to the point of high risk aversion, and unwilling to mobilise major change management around new technologies and systems. These issues are exacerbated by the presence of multiple rail operators and owners and multiple standards and TA processes that lead to the inconsistent implementation of technologies across jurisdictions.

These findings are directly relevant for this current report which identifies that the current TA framework is hindering the take up of rail innovation. The case study presented below is based on information provided to Synergies as part of its stakeholder consultation for this project and aims to shed light on the practical difficulties of broader market entry and the introduction of technology into the rail market.

All suppliers consulted with as part of the assessment identified the TA process as a major obstacle in terms of getting their products and technologies to the market. Feedback indicates that the TA process acting as a constraint on market access was a significantly greater concern than the direct costs incurred in undertaking TA processes (noting the significant inefficiencies and cost duplication associated with these processes).

The underlying reasons for this can be explained as follows. The TA framework has emerged, largely as a result of the incentives of infrastructure operators to limit the

number of TAs that are permitted. This is understandable, given the costs incurred in undertaking assessments, but more so, in seeking to limit the number of products that receive TA so that infrastructure operators avoid having to deal with multiple products on their respective networks, which can add cost and complexity for inventory management, asset maintenance, training and competencies as well as scheduling.

As a result of these incentives, the TA system has emerged whereby a supplier of a new product effectively requires a 'sponsor' to support or champion the product (either a rail project contractor or a rail operator). These entities are only like to be incentivised where they can derive a direct benefit from the TA. Under this scenario, a clear need for a new product or technology must be demonstrated, which is largely a project driven process.

This problem is exacerbated further where 'sponsors' are almost always likely to be rail project contractors who are incentivised to deliver against strong commercially driven objectives such as limited project budgets and firm timeframes. These considerations are less able to accommodate the necessary time and costs involve in securing TAs for new, innovative products and technologies TA's, to the detriment of the broader industry and community.

The box below contains a case study example of one supplier for which the current TA framework has significantly constrained the extent to which the supplier has been able to achieve market access. This is despite the supplier's products being widely used internationally with evidence of significant productivity gains.

Box 2 Local experience with market entry into the Australian rail supply market

One rail supplier included in our consultations has been seeking to establish a local presence in the Australian market for several years (with its parent company based in Germany and offering level crossing systems, track insulation systems, vibration mitigation products and light rail systems to rail network operators across Europe).

Despite its parent company having an Australian presence and supplying rail products in Australia for many years, the supplier has experienced significant challenges in introducing a particular line of specialised products into the Australian market over the past three years. As with most companies seeking to introduce new products into the Australian rail market, the supplier has focused on opportunities to supply products as part of the development of large rail infrastructure projects as well as on the existing state networks.

The company has intensively engaged with the successful tenderers on large urban metro rail projects in Sydney, Perth, and Brisbane to offer an alternate product to the specified supplier. The company priced against the specified product but was ultimately unsuccessful because, in each case, the respective contractors advised that the cost and risk (i.e. project delay risk) associated with the TA process was prohibitive.

In one specific case, the supplier was advised by a contractor that despite their product being cheaper than an alternative product, the fact that the supplier's product did not have TA meant that it was not commercially feasible for the rail project contractor to select the supplier's product and embark on a potentially costly and time-consuming TA process. This was exacerbated by the fact that the products are part of the final fit out of tunnels, and on the critical path to complete the project delivery process.

It is also noted that in addition to the foregone opportunity, the supplier incurred significant costs throughout the procurement process, including the submission of pricing information and product documentation to the supplier over a period of several months. The major benefit was to the lead contractor as the supplier effectively drove down the price of the nominated product.

In another instance, the supplier received feedback that a rail asset owner awarded a tender for the supply of a product line to another supplier primarily on the basis that the other supplier's product was type approved under that asset owner's processes.

The supplier included in Synergies' consultations has also encountered incidents that demonstrate the strong preference of evaluating entities to limit the opportunities for products to undergo TA. For example, as part of one TA application, an evaluating entity permitted the supplier to install dampers as part of a trial, however, would not permit it to simultaneously trial its noise panel system[8] on the basis that, if successful, the evaluating entity did not want to create a precedent (i.e. undertake more installation with little budget in other parts of its network). This is despite the supplier's noise attenuation panel and dampers system having been installed in cities across Europe. With another product line (light rail track green track systems) it was accepted by one Australian city to be considered in developing the detail design whilst in another city it was precluded from being considered for a green track trial yet the system is in place in over 30 cities across Europe with nearly 300kms of track installed.

Strategies to bring rail products to the Australian market

Given the difficulties in attempting to bring their products to the Australian market as a result of the current TA framework, the supplier has advised that it has sought to adopt a multi-faceted approach:

1. **Seek TA through large contractors.** This is considered the fastest pathway to obtain TA with sponsorship of a major contractor but if the tender documentation does not allow alternative products by using a performance based specification, then new products are effectively blocked from consideration.
2. **Seek TA through existing Asset Owners.** This is considered bureaucratic, costly and time wasting as it can take several years to progress; with limited probability of success and takes up a lot of management time with each of the 5 jurisdictions having different processes and where being successful in one state does not automatically flow into another.
3. **Offer to undertake trials of products.** This is generally the way the supplier introduces new products to the market in Europe where the asset owner will test the product in situ over a period of time. If it passes the relevant tests, then it is approved for use. The client then pays for the materials. Australia insists on its own trials again and will not accept EU based results.
4. **Use project references and extensive experience in Europe to gain market entry.** Some Major Project's rail contractors (nearly all have an international presence) accept the premise of a supplier's international experience and may provide opportunities for the supplier to provide the latest test results based on standard EU tests and technical data support to the rail construction designers/constructors preparing the full project design or a segment of a project. It may not win a rail product supplier a job, but it allows the supplier to have established product acceptance with that major contractor as a good reference for a future bid. This is a medium term strategy.
5. **Acceptance Testing Standards for TAs**. Some product lines that are perceived to be new to the Australian rail market (e.g. rail web dampers) have been operational in Europe for several years and are subject to specific standards under the European Standard Test Methods. The supplier cites these reports in TA documentation in Australia, however despite this, has not been able to gain approval for installation in Australian railways.
6. **Australia modifying European test methods.** The supplier has been attempting to supply a particular rail web damper to an urban metro rail project. The results from European testing were not accepted and the company was required to

[8] The supplier stated that this product can replicate a high concrete noise wall performance at one-third of the cost and a maximum height of 1200 mm.

test the product under modified test conditions. The supplier's European office was then required to engage a French laboratory to undertake the testing at the company's expense, after which the contractor requested the supplier to reprice its offering on three separate occasions. Despite this protracted process and no award to date through which the Supplier incurred significant cost, the testing results were still not fully accepted for the project where the asset owner still wanted in track testing of 100m of material to be undertaken. The supplier was advised that only 8 weeks notice could be given for materials were to be supplied for testing. To meet this compressed deadline where shipping is at least 15 weeks now the products would have to be air freighted to Australia at an additional cost of another $90 000.

Source: Synergies based on stakeholder consultation.

The current TA framework represents an artificial barrier to new entry if rail suppliers are effectively excluded from competing in the market. This acts as a drain on competition and long term rail productivity. In these circumstances, there is a risk that potential new entrants will most likely withdraw from the market (in some cases, after an extended period of time and lost sunk investments), inhibiting future long term goals of innovation and productivity.

7 Solutions and benefits

The two key problems identified through our review into the costs of TA processes can be summarised as follows:

- **Compliance requirements not fit for purpose and imposing inefficient costs on the industry** - the TA framework is overly burdensome (i.e. requirements exceed those necessary to maintain network safety) in terms of the requirements imposed on suppliers, and to a lesser extent, on project contractors/sponsors; and
- **Constraint on long term productivity** - the current framework acts as a significant constraint on competition in rail supply chains and the product supply market. This results in a constraint on long-term innovation, whereby the incentives of the industry stakeholders required to engage in the TA process are not aligned with the principle of maximising the long-term productivity of the rail industry. Consultation with stakeholders indicates that this is the key source of inefficiency with the current TA framework.

These problems are different in nature and complexity but are likely to require complementary solutions. This is explored further below.

7.1 Harmonisation of standards and approvals

The need for a more 'harmonised' TA framework to address some of the inconsistencies and duplication of effort involved across jurisdictions has previously been identified by industry stakeholders. The current framework allows rail businesses, including RIMs, to adopt and administer their own standards, underpinned by different safety management systems and approaches to risk assessments. This framework, and the absence of mandated standards, means that RIMs are able to choose which standards to set or adopt for their network (or alternatively, to author their own standards). This also results in RIMs and network operators often having insufficient regard for the outcomes of approval processes in overseas jurisdictions.

7.1.1 Harmonisation solutions

Harmonisation would address these inconsistencies and improve clarity regarding the requirements for TA. Benefits of harmonisation have previously been considered in other forums and classified into input cost savings, operational (efficiency) benefits, safety and training benefits, and market forces benefits.[9] The scale of potential

[9] BITRE (2006), Optimising harmonisation in the Australian railway industry, report 114, p.41

harmonisation scenarios that could deliver savings in relation to the direct cost of TA processes are set out in Table 6.

Table 6 Harmonisation options

Option	Description	Benefits	Limitations
Progressive assurance	• Approval is provided continuously as the project lifecycle progresses. Each aspect of the product is assured and certified as it is being tested.	• Can reduce costs if issues with a product are resolved as the project progresses	• Requires a close, collaborative approach between supplier, sponsor, and approving entity
National database of approved products	• A national database is established and approving entities are required to publish details type approved products	• Improved transparency of TA decisions; central repository of documentation	• Requires a central coordinating body to establish and monitor to ensure register is being accurately maintained • Is unlikely to significantly reduce compliance burden on suppliers
Partial product standards, with approved exceptions	• RTOs agree to standards for specific asset classes, but variations permitted on an exceptions basis.	• Could help reduce compliance burden for all parties (suppliers, contractors/rail operators, evaluating entities) for some products by not being required to prepare detailed approval documentation for each evaluating entity or undertake new, localised tests to prove product capabilities that can already be established with existing information from other jurisdictions • Could also be used as a 'test' for how effective standards are applied to enable the industry to progressively add more products to that approach	• RTOs could still elect to move away from the standard and apply their own standards. In this case, it is unlikely to significantly reduce compliance burden on suppliers
Mutual recognition and minimal approval requirements for domain specific approvals	• RTOs agree to formally recognise and accept TAs granted in other jurisdictions/organisations (in Australia, and potentially, overseas) as sufficient evidence for evaluation of specific issues • Additional assessment would only be warranted when assessing to a different standard or condition (i.e the additional assessment would only be undertaken for the gap)	• Improved transparency of TA decisions; could help reduce compliance burden for all parties (suppliers, contractors/ rail operators, evaluating entities	• Some RTOs could be resistant to such change if the perceived level of risk is high • Consultation indicates there is already a certain amount of informal mutual recognition for TAs granted across Australian jurisdictions / organisations, meaning cost savings from implementation of option may be marginal
A national standardised TA process	• RTOs agreed to one national, uniform process • Such a model could take a number of different structures (a) each evaluating entity complies	• Improved transparency of TA decisions; could help reduce compliance burden for all parties (suppliers, contractors/ rail operators, evaluating entities	• Some RTOs could be resistant to such change if the perceived level of risk is high and that a national process does not sufficiently accommodate

Option	Description	Benefits	Limitations
	with a national standardised process (b) a new central body to conduct TAs is established.		individual network risks and unique characteristics • Some suppliers may also be resistant to such change if a rigid, inflexible system is adopted • If a centralised body is established to conduct all TAs, issues about structure, governance, funding, mutual risk sharing arrangements would need to be resolved.
Nationally agreed and applied principles	• Core principles for a national model of the Type Approval process	• Applying a consistent approach to drive efficiency, harmonisation and standardisation within the process and matching the assessment process to the risk and complexity of new products.	• Not mandated and requires central coordination to support implementation.

Source: Synergies

As noted above, these options are not exhaustive or mutually exclusive, with the solution that delivers the greatest benefit to the rail industry likely to involve a combination of these options (as well as other solutions not considered in this report, such as recognition of outcomes of approval processes in overseas jurisdictions).

Some solutions detailed in the table above represent a progressive 'step up' in the degree of harmonisation and the scale of direct cost savings would be expected to increase accordingly.

Harmonisation could also be further underpinned by the introduction of national product standards (or specifications). Such standards could be implemented for those products that are designed to maintain rail assets to preserve and/or keep them in a steady state of operation (i.e. such products are not regarded as productivity enhancing, but are simply used to maintain the existing condition of the network). Focusing on these products, as opposed to products with greater complexity, would avoid the risk of standards becoming overly complex, driving up operational costs and potentially negating the benefit of standardisation.

7.1.2 Potential cost savings

In considering the potential savings in direct costs that could be achieved through solution such as the harmonisation of TA processes and requirements, it is important to acknowledge that, based on the stakeholder consultation adopted, any direct cost savings are likely to be lower than the potential benefits that could be derived from alleviating the constraint on competition and long-term productivity in the rail sector.

Noting this, the harmonisation solutions detailed above have the capacity to achieve significant savings in the direct costs incurred by industry participants in navigating TA processes. These cost savings are most likely to be observed in relation to the requirements to demonstrate the technical validity of the product or technology for which TA is being sought (as opposed to addressing network-specific issues).

In assessing the likely quantum of these cost savings, we have relied upon the information provided by stakeholders in relation to the proportion of direct costs that relate to technical[10] aspects. As noted in Section 6.2.2, these requirements are estimated to account for around $87 million per annum (around 38 per cent of total direct costs).

As discussed in section 4, a significant proportion of the costs incurred in addressing technical requirements involve the preparation of documentation and conducting testing, despite the product or technology being successfully operated in several other jurisdictions. Removing these requirements, in particular the extent to which they are duplicated across jurisdictions, has the capacity to significantly reduce the direct costs incurred in relation to this component of the TA process.

While the precise magnitude of the cost savings from removing this duplication across jurisdictions would depend on the degree of harmonisation that is ultimately adopted and the level of consistency achieved across jurisdictions/organisations, stakeholders consulted with indicated that over 50 per cent of the requirements could be avoided, indicating an annual cost saving of over $40 million.

7.2 Repurposing of the TA process

While harmonisation solutions, including greater reliance on product standards and the harmonisation of technical approval requirements, have the potential to reduce the direct costs incurred by industry stakeholders in undertaking TA processes, addressing the constraint on competition and innovation is likely to require a fundamental overhaul of the TA system. Addressing this constraint will require the implementation of a framework that moves away from the current project-driven focus and improves access to the TA process for suppliers of products that have the potential to materially improve the efficiency and productivity of the Australian rail sector.

This could be achieved by refocusing of the scope of the TA framework, with the process being used primarily to assess those products and technologies that would result in a material change in rail operations. That is, rather than using the TA process to assess those products and technologies that represent a continuation of the status quo, the

[10] These costs reflect matters covering the technical specification of an asset or technology to ascertain whether the product is workable on a network.

process be repurposed to focus on those products and technologies that would result in a material operational change.

Repurposing the TA process to focus on these products and technologies has the potential to provide two benefits to the rail industry:

- direct cost savings through the streamlining of the TA process, thereby significantly reducing the number of TA applications and the costs incurred by suppliers, sponsors, and approving entities in preparing and evaluating TA applications; and
- removing a significant constraint on innovation and long-term productivity in the rail sector by moving away from the current TA framework, whereby TA processes are project-driven and towards a framework under which it is easier for suppliers of new products and technologies to seek TA.

The European approach to railway certification provides an example of an approach that facilitates the approval of new products and technologies that contribute to enhancing the long-term productivity of the rail industry.

Box 3 European approach to railway certification

The European Commission (EC) has sought to deliver on several key objectives including opening of the rail market to competition, improving the interoperability and safety of multiple networks, and facilitating the development of rail infrastructure. The EC adopts a 'system wide' approach, which is comprised of two key directives:

- *a safety directive* – which deals with systemic aspects of the network: roles and responsibilities, regulatory structure, safety levels and methods; and
- *an interoperability directive* – which deals with technical and operational aspects of railway infrastructure – rollingstock, operational rules, staff requirements, signalling, infrastructure.
  - Under this directive, there are technical specifications for interoperability via European standards specifications and technical documents. These standards are designed to eliminate technical barriers to trade and increase market access.
  - For TAs, there are requirements for conformity assessment whereby certification is conducted by third party notified bodies ('NoBos'). These bodies are charged with assessing the EC conformity of products subject to specific directives and specifications before being placed on the European market.
  - The manufacturer of the product has to contract a notified body in order to assess the EC conformity of the product.
  - The notified body has several roles from explaining the legislative framework, scrutinising design, testing, and commissioning. It may delay introduction of a product where additional trialling or surveillance is deemed appropriate.
  - There are registers which are maintained that promote transparency and market access.

Source: DG Move (2019), Developing rail interoperability – EU experience, May 2019.

7.3 Improved precision of network specific assessments

As detailed in section 5.2, addressing network-specific requirements accounts for the majority (62 per cent) of the direct costs incurred by industry stakeholders in

undertaking TA processes. A significant proportion of these costs relate to trialling and testing requirements imposed by approving entities. For example, a supplier may be required to subject their asset to a field test for six months to enable the performance of the asset to be monitored prior to TA being granted.

Noting the importance of ensuring that network-specific considerations are appropriately addressed in the TA process, several stakeholders expressed the view that the requirement to conduct a field trial is often not based on a clear rationale. That is, trials are being undertaken without a clear need or objective being specified. The implementation of a measure that required approving entities to identify the specific objectives of a trial or test (e.g. voluntary charter) would reduce the number of unnecessary trials and tests that are required, hence reducing the direct costs and avoiding unnecessary delays for suppliers, contractors, and network operators.

Given the magnitude of the costs incurred in conducting trials and tests to address network-specific considerations, particularly for major TAs, such a solution could result in significantly greater cost savings than harmonisation solutions that target the direct costs incurred in addressing technical issues.